

MEDEDELINGEN LANDBOUWHOGESCHOOL
WAGENINGEN • NEDERLAND • 69-1 (1969)

THE LOGANIACEAE OF AFRICA VIII

STRYCHNOS III

Revision of the African species with notes on the extra-African

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(Received 14-VIII-1968)

Published February 19th 1969

H. VEENMAN & ZONEN N.V. - WAGENINGEN - 1969

7048732

Continued from Act. Bot. Neerl. 14: 218-229, 1965.

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INTRODUCTION

The present publication is a revision of the African species of *Strychnos* based on the material of 75 herbaria and on studies of living plants. The author has had the opportunity of visiting Africa three times and of travelling in five different countries to collect plants and to study their habit, ecology, and distribution in the field. He has seen living plants of 40 species. Of most of the species he has studied, the habit was not sufficiently known, and only in a few cases did any idea exist about their normal size. Several species which mostly are huge lianas, had previously only been recorded as climbing shrubs.

In January 1959 when it was decided that the author would undertake the revision of the African *Loganiaceae* he travelled in the Ivory Coast. There he became acquainted with the remarkable habit of several climbing *Strychnos* species. This proved to be of great advantage because it made it possible to understand what parts of the plants had generally been collected as herbarium specimens.

The plants are so large that a herbarium sheet cannot give an impression of the way of branching, which is often characteristic for a species. In the course of his second and third stays in Africa he returned to the Ivory Coast and also travelled in Liberia, Upper Volta, Cameroun, and the Central African Republic. Numerous species were collected several times, even if only in a vegetative condition, in various localities, and this added considerably to the knowledge of their distribution.

He studied the African material of the following herbaria:

- A Cambridge, Massachusetts – U.S.A.: Arnold Arboretum.
- ABI Abidjan, Côte d'Ivoire: O.R.S.T.O.M. (Institut d'Enseignement et de Recherches Tropicales = I.D.E.R.T.).
- ABT Avon, France: Laboratoire de Botanique Tropicale.
- ALF Maisons-Alfort, France: Institut d'Élevage et de Médecine Vétérinaire des Pays Tropicaux.
- AMD Amsterdam, Netherlands: Hugo de Vries-Laboratorium.
- B Berlin, Germany: Botanisches Museum.
- BM London, Great Britain: British Museum (Natural History).
- BO Bogor, Indonesia: Herbarium Bogoriense, Lembaga Biologi Nasional.
- BOL Cape Town, South Africa: Bolus Herbarium, University of Cape Town.
- BR Bruxelles, Belgium: Jardin Botanique de l'Etat.
- BREM Bremen, Germany: Übersee-Museum.
- C København, Denmark: Botanical Museum and Herbarium.
- COI Coimbra, Portugal: Botanical Institute of the University of Coimbra.
- E Edinburgh, Great Britain: Royal Botanic Garden.
- EA Nairobi, Kenya: The East African Herbarium.
- ENT Entebbe, Uganda: Forest Department.
- F Chicago, Illinois – U.S.A.: Chicago Natural History Museum.

- FHI Ibadan, Nigeria: Forest Herbarium Ibadan.
- FHO Oxford, Great Britain: Forest Herbarium, Department of Forestry, Commonwealth Forestry Institute, University of Oxford.
- FI Firenze, Italy: Herbarium Universitatis Florentinae, Istituto Botanico.
- FR Frankfurt, Germany: Forschungsinstitut und Naturmuseum Senckenberg.
- G Genève, Switzerland: Conservatoire et Jardin botaniques.
- GB Göteborg, Sweden: Herbarium, Institute of Systematic Botany, University of Göteborg.
- GC Legon, Ghana: Ghana Herbarium, University of Ghana.
- GH Cambridge, Massachusetts – U.S.A.: Gray Herbarium of Harvard University.
- GOET Göttingen, Germany: Systematisch-Geobotanisches Institut, Universität Göttingen.
- GRA Grahamstown, South Africa: Herbarium of the Albany Museum.
- GRO Groningen, Netherlands: Department for Systematic Botany of the Botanical Laboratory.
- HAL Halle, Germany: Institut für Systematische Botanik und Pflanzengeographie der Martin-Luther-Universität.
- H Helsinki, Finland: Botanical Museum, University of Helsinki.
- HBG Hamburg, Germany: Staatsinstitut für allgemeine Botanik und Botanischer Garten.
- IFAN Dakar, Senegal: Institut Français d'Afrique Noire.
- IRSC Brazzaville, République du Congo: Institut de Recherches Scientifiques au Congo.
- J Johannesburg, Union of South Africa: The Moss Herbarium, University of the Witwatersrand.
- JE Jena, Germany: Institut für Spezielle Botanik und Herbarium Haussknecht.
- K Kew, Great Britain: The Herbarium and Library.
- L Leiden, Netherlands: Rijksherbarium.
- LD Lund, Sweden: Botanical Museum.
- LE Leningrad, U.S.S.R.: Herbarium of the Komarov Botanical Institute of the Academy of Sciences of the U.S.S.R.
- LIB Monrovia, Liberia: Harley Herbarium, College of Forestry, University of Liberia.
- LINN London, Great Britain: The Linnean Society of London.
- LISC Lisboa, Portugal: Centro de Botânica da Junta de Investigações do Ultramar.
- LISJC Lisboa-Belem, Portugal: Jardim e Museu Agrícola do Ultramar.
- LISU Lisboa, Portugal: Institute of Botany, Faculty of Science.
- LY Lyon, France: Herbiers de la Faculté des Sciences de Lyon.
- M München, Germany: Botanische Staatssammlung.
- MO Saint Louis, Missouri – U.S.A.: Missouri Botanical Garden.
- MPU Montpellier, France: Institut de Botanique, Université de Montpellier.

- NBG Cape Town, South Africa: Compton Herb., National Botanic Gardens.
- NH Durban, South Africa: Natal Herbarium, Department of Agricultural Technical Services.
- NLI Nova Lisboa, Angola: Instituto de Investigação Agronómica de Angola, Departamento de Biologia Agrícola.
- NY New York, New York – U.S.A.: The New York Botanical Garden.
- OXF Oxford, Great Britain: Fielding Herbarium, Druce Herbarium, Department of Botany.
- P Paris, France: Muséum National d'Histoire Naturelle, Laboratoire de Phanérogamie.
- Pharm. Stockh. Stockholm, Sweden: Kungl Farmaceutiska Institutet.
- PR Praha, Czechoslovakia: Botanical Department of the National Museum.
- PRE Pretoria, Republic of South Africa: Botanical Research Institute, National Herbarium.
- PRF Pretoria, Republic of South Africa: Forest Research Institute, Forestry Department.
- S Stockholm, Sweden: Botanical Department, Naturhistoriska Riksmuseum.
- SAM Cape Town, South Africa: South African Museum Herbarium, National Botanic Gardens.
- SL Freetown, Sierra Leone: Department of Botany, Fourah Bay College, University College of Sierra Leone.
- SRGH Salisbury, Rhodesia: Government Herbarium.
- TCD Dublin, Ireland: School of Botany, Trinity College.
- TOM Torino, Italy: Istituto della Missioni della Consolata.
- U Utrecht, Netherlands: Botanical Museum and Herbarium.
- UC Berkeley, California – U.S.A.: Herbarium of the University of California.
- UCI Abidjan, Côte d'Ivoire: Herbier de l'Université de Côte d'Ivoire.
- UPS Uppsala, Sweden: Institute of Systematic Botany, University of Uppsala.
- US Washington, D.C. – U.S.A.: National Museum (Department of Botany).
- W Wien, Austria: Naturhistorisches Museum.
- WAG Wageningen, Netherlands: Laboratory of Plant Taxonomy and Plant Geography.
- WRSL Wroclaw, Poland: Instytut Botaniczny, Uniwersytetu Wroclawskiego.
- WU Wien, Austria: Botanisches Institut und Botanischer Garten der Universität Wien.
- YA Yaoundé, Cameroun: Service des Eaux et Forêts du Cameroun, Section de Recherches Forestières.
- Z Zürich, Switzerland: Botanischer Garten und Institut für Systematische Botanik der Universität Zürich.

In addition the extra-African material was studied preserved in some herbaria: BM, BR, C, FHO, GB, H, HAL, K, L, LINN, OXF, P, S, TCD, U, UPS, US, and WU.

When the delimitation of the African *Strychnos* species was completed as far as possible on the basis of the data at present available, the extra-African material of the genus was also studied in order to obtain a better over-all view of the sectional systematy in the genus and of the synonymy and distribution of the species. The moment of undertaking this comparative study was fortunate, because revisions of the American species (with supplements) by KRUKOFF (1942–1965), of the species occurring in Malesia by LEENHOUTS (1962), and of the Asiatic species by A. W. HILL (1917) could be consulted. Many specimens annotated by the above-cited authors, especially KRUKOFF, could be examined.

The present revision, however, does not include any new information on the delimitation of extra-African species. The latter were only studied in order to obtain knowledge of their relations with the African species.

One species, *S. potatorum*, occurs both in Africa and in Asia, which was a new and surprising result of these comparative studies.

GENERAL PART

HISTORY OF THE GENUS

LINNAEUS described the genus *Strychnos* and based it upon *S. nux-vomica*, the type species, and *S. colubrina*. It was described several times afterwards by various authors with mostly different type species, as is enumerated above the genus diagnosis.

Some authors of synonyms attempted to describe genera which could be segregated from *Strychnos*, e.g. HARVEY (1842), when describing *Brehmia*, and S. MOORE (1913), who described *Scyphostrychnos*. *Brehmia* was adopted by a few authors only, e.g. DE CANDOLLE (1845), but was abandoned shortly after, because most authors arrived at the conclusion that the only species of the latter genus, *B. spinosa*, is a true *Strychnos* species. *Scyphostrychnos* was maintained by DUVIGNEAUD (1948), but reduced to synonymy by the present author (1965).

A few African species were described long before 1900, e.g. *S. potatorum* L.f. (1781), *S. spinosa* Lam. (1794), *S. madagascariensis* Poir. (1808), *S. innocua* Del. (1826), and *S. decussata* (Pappe) Gilg (1862). The majority has been described, often several times, shortly before and after 1900 by BAKER, DE WILDEMAN, and GILG.

The most important improvement in our knowledge of the genus as a whole is of more recent date. A very good revision of the American species was made by KRUKOFF & MONACHINO (1942), with several supplements, of which the 7th by KRUKOFF (1965) is the most important. The Asiatic species have been revised by LEENHOUTS (1962), as far as they occur in the area of the Flora Malesiana. Far less complete is our knowledge of the other Asiatic species, of which the most recent revision is that of HILL (1917). From Africa there are the contributions to three floras. ONOCHIE & LEEUWENBERG in Fl. W. Trop. Afr. 2 (1963) (incomplete, as some new species were discovered afterwards), BRUCE & LEWIS in Fl. Trop. E. Afr. (1960) (incomplete, as some more species were represented by incomplete material (*S. johnsonii*, *S. urceolata*), or were hidden in the wrong genus (*S. mellodora* was described from E. Africa as *Gaertnera zimmermannii*)), and VERDOORN, Fl. S. Afr. 26 (1963) (accepted here, except for the following changes: *S. stuhlmannii* = *S. potatorum*, the subsp. of *S. innocua* cited = *S. madagascariensis*).

GEOGRAPHICAL DISTRIBUTION

The genus *Strychnos* is pantropical. It can be subdivided in 3 geographically separated groups of species, one in America, one in Africa, and one in Asia and Australia. The only exception is *S. potatorum* which occurs both in Africa and Asia.

The 75 African species known at present are variously distributed. The most widely distributed is *S. spinosa* which occurs throughout tropical Africa (not in

forests). This is followed closely by *S. innocua* and *S. usambarensis* which occupy slightly smaller areas. These in turn are followed by several species occurring mainly in East Africa, *S. decussata*, *S. henningsii*, *S. madagascariensis*, and *S. mitis*.

Very small areas are those of e.g. *S. melastomatoides* in Guinea and Sierra Leone, *S. millepunctata* in the Ivory Coast, *S. ternata* in eastern Cameroun, and *S. xylophylla* in the coastal area of Tanzania.

Several areas show something of the ecology of the species. *S. aculeata*, *S. campicola*, *S. camptoneura*, *S. congolana*, *S. densiflora*, *S. floribunda*, *S. icaja*, *S. johnsonii*, and *S. longicaudata* between them inhabit almost the entire central forest area of the continent.

S. afzelii, *S. barteri*, *S. cuminodora*, *S. dinklagei*, *S. melastomatoides*, *S. millepunctata*, *S. odorata*, *S. soubrensis*, and *S. splendens* inhabit the West-African forests, but sometimes only a part of this area.

S. chromatoxylon, *S. cuniculina*, *S. dale*, *S. dolichothyrsa*, *S. elaeocarpa*, *S. fallax*, *S. gnetifolia*, *S. kasengaensis*, *S. malchairii*, *S. mimfiensis*, *S. moandaensis*, *S. ngouniensis*, *S. tchibangensis*, and *S. zenkeri* are confined to Central Africa or a portion of it. *S. malcoclados* and *S. nigritana* occur in West and northern Central Africa, while *S. asterantha*, *S. boonei*, *S. chrysophylla*, *S. memecyloides*, *S. samba*, *S. talbotiae*, and *S. urceolata* occur in the forest area of Nigeria and Central Africa. The majority of the above enumerated species prefer river banks.

Several of the forest species do not occur only in the forest area, but penetrate into the savannas following the gallery forests, e.g. *S. kasengaensis*, *S. longicaudata*, and *S. nigritana*. The East-African forest species, *S. mellodora*, *S. mitis*, and *S. panganensis*, are even restricted to the gallery forests in the greater part of their areas, there being only a few closed forests in their distributional area.

S. angolensis and *S. scheffleri*, being widely distributed in Central and East Africa, occur both in the closed forest area and in the gallery forests.

The majority of the forest species inhabit riverine forests and therefore it is understandable that they occur in the gallery forests which often are reduced to small groves or thickets.

The true savanna species occur normally only in woodlands and bushlands. Nevertheless they may penetrate gallery forests, as e.g. *S. gossweileri*, *S. madagascariensis*, *S. matopensis*, and *S. spinosa*.

The savanna species are generally more widely distributed than those of the forests. *S. innocua* and *S. spinosa* which occupy a horse-shoe-shaped area adjacent to the central forest area, are the most widely distributed African species of the genus. *S. cocculoides* and *S. pungens* have been collected many times throughout Central, East, and northern South Africa. *S. henningsii* and *S. mitis* occur in western Angola and the eastern part of the African continent (*S. mitis* also in the Comoro Islands). *S. decussata*, *S. madagascariensis*, *S. myrtoides*, and *S. potatorum* are known from both the eastern part of the continent and Madagascar. Five of the twelve species occurring in Madagascar are endemic:

S. bifurcata, *S. diplotricha*, *S. mostueoides*, *S. pentantha*, and *S. trichoneura*. *S. variabilis* is only known from the lower Congo basin and a few localities in the neighbourhood.

Very small areas were recorded at the beginning of this chapter. Several species, however, are presumed to occupy larger areas than those known at present, e.g. *S. asterantha*, *S. canthioides*, *S. elaeocarpa*, *S. gnetifolia*, *S. mimfiensis*, *S. ndengensis*, *S. retinervis*, *S. talbotiae*, and *S. zenkeri*.

Near the borders of their areas the species occur in isolated localities; this is known especially of widely distributed species. *S. spinosa* can maintain itself on the Jebel Marra in Sudan, a mountain which is relatively moist. In the south in Cape Province it is restricted to the isolated forest reserves along the coast. It is probable that there growing conditions approach those of the relatively dry regions in the central part of its area. The same could be concluded after comparison of the data available on *S. decussata*, *S. henningsii*, and *S. mitis*, species which may have, however, a more restricted ecology as they have distinct gaps in their areas in regions from which many collections are known. *S. decussata* and *S. mitis* have a clear gap in the centre of their areas. It may be supposed that there the degree of humidity is too high.

On the other hand, the gap in the areas of *S. henningsii*, *S. lucens*, and *S. mitis* may be caused by the dryness of central and eastern Angola.

Two pairs of closely allied vicarious species are to be found in Africa: *S. lucens* and *S. nigritana* which have completely separated areas, and *S. innocua* and *S. madagascariensis* which have slightly overlapping areas.

A clearly disjunct area is shown by *S. usambarensis*, which occurs in the forests or the gallery forests in the greater part of tropical and northern South Africa. It has, however, never been collected in Cameroun, Central African Republic, and Gabon. The present author collected it repeatedly in the Ivory Coast, but never saw it in Cameroun, a country very rich in *Strychnos* species.

Cameroun may be considered as a centre of species-concentration, as 38 of the 75 species occur there. Although the surface area of Congo (Kinshasa) is about 10 times that of Cameroun, the number of *Strychnos* species in Congo is also about 38.

HABIT AND GROWTH

Some *Strychnos* species are trees, which may be shrublike. The following are forest trees: *S. elaeocarpa*, *S. gnetifolia* (?), *S. mellodora*, *S. mitis*, *S. retinervis* (?), *S. staudtii*, *S. ternata*, *S. xylophylla*, and *S. zenkeri*. The following are savanna trees: *S. bifurcata*, *S. cocculoides*, *S. decussata*, *S. henningsii*, *S. innocua*, *S. madagascariensis*, *S. mostueoides*, *S. myrtooides*, *S. potatorum*, *S. pungens*, *S. spinosa*, *S. variabilis*, and several extra-African species like *S. lucida*, and *S. pseudo-quina*. Specimens of the latter group may be shrub-like and are then sometimes very small, e.g. *S. cocculoides*, *S. pungens*, and *S. spinosa* (see note after *S. cocculoides*). *S. usambarensis* mostly a climbing shrub or a huge liana, is often noted in collections from East Africa as being a tree.

All other species are tendrilled climbers.

The climbers always bear hooked tendrils which are arranged according to three systems which are constant within the species:

1. Solitary and placed in the axils of scale-like bracts or ordinary leaves.
2. Paired and placed in the axils of scale-like bracts.
3. Arranged in 1–3 pairs above each other on short lateral branches and also placed in the axils of scale-like bracts.

The arrangement of the tendrils may show aberrations if a whole liana with many branches is investigated, but it is of particular value in identifying incomplete specimens. Aberrations are seen in the field in well-developed richly flowering specimens, e.g. herb. Gossweiler 8701 of *S. gossweileri* and herb. Leeuwenberg 5675 of *S. samba*; but rather young, often vegetative, specimens, especially when growing in poor conditions, are very constant in this character.

This regularity seems to be the same for the Asiatic species of which many are closely allied to African species. The same may be true for the majority of the American species – this at least is suggested by the herbarium specimens examined. However, there may be more exceptions with the American representatives of *Strychnos*, as KRUKOFF (in litt.) does not agree with the author's opinion on this point. The following exceptions may be noted:

S. jobertiana has solitary tendrils like *S. floribunda* in herb. Krukoff 8848 (BM) or two solitary tendrils side by side on one node of a branch in Glaziou 9941 (K, P). *S. peckii* has mostly solitary tendrils, but a compound system of tendrils is seen in herb. Krukoff 7631 (K).

The seedlings always produce two leafy cotyledons which are opposite and cordate or sometimes nearly ovate. Afterwards, there appears a leaf-bearing axis which becomes nodding when several pairs of leaves are developed. Somewhat later, a branch appears in or near the axil of one cotyledon. This branch is stronger and overtops the apex of the plant. In its turn it becomes nodding at the apex. In the axil of a leaf on the erect portion of this branch develops an again stronger branch which again overtops its predecessor. This sympodial growth-pattern is repeated during the plant's life-time. The third or later new apex usually bears some branches in the nodding portion when a bud in a leaf-axil on the erect portion gives way to his successor.

The present author observed this phenomenon not only in all climbers he studied alive, but also in the trees. He preserved seedlings of *S. elaeocarpa* (7006) and *S. staudtii* (6849) in the herbarium and he observed seedlings of *S. innocua* (seedling of herb. Leeuwenberg 4435) and *S. spinosa* (3508) in the hothouse.

The latter fact suggests that the tree species may have had climbing ancestors.

The young plants in the understory of the forest have usually larger, thinner, and more acuminate to even caudate leaves. In this stage even the tendrilled specimens of various species are easily confused with each other, e.g. *S. densiflora*, *S. dinklagei*, and *S. nigritana*; or *S. johnsonii* and *S. samba*; or *S. boonei*, *S. tchibangensis*, and *S. urceolata*; or *S. barteri* and *S. camptoneura*; or *S.*

soubrensis and *S. splendens*. When the tendrils are wanting, this resemblance may cause endless confusion of species, e.g. *S. dale* and *S. nigritana*; or *S. longicaudata* and *S. scheffleri*. Therefore, the young plants can be only identified by repeated comparative studies. It is impossible to make a key for them.

The plants may reach a considerable age as small shrubs in the understory of the forest before they climb to the tree tops in order to obtain enough light to flower. The latter has also been observed by KRUKOFF (1942, p. 253).

Nearly all climbing species flower only when they reach a forest edge or a tree top. The flowering branches have in that case the normal leaves, indicated here as sun-leaves. A clear exception to this rule is observed in *S. malacocladus*. The present author collected a specimen with sun-leaves in bud in Liberia (4608), vegetative specimens with shade-leaves in the Ivory Coast (3994, 4032, 4114, 4486), and a specimen with shade-leaves and a single fruit in Cameroun. The plant with the sun-leaves grew at a forest edge, while the other grew in the understory of the forest. The flowering and fruiting specimens from Liberia, Ivory Coast, Ghana, and Gabon studied by the author bear sun-leaves, but the flowering specimens collected by Hanke (527) and Zenker (117, 4571) from Cameroun have shade-leaves.

Most African *Strychnos* species are unarmed. Axillary spines occur only in *S. cocculoides*, *S. congolana*, and *S. spinosa*, all of the section *Spinosaes*, and *S. afzelii*. Spines occur more often in species from outside this part of the world, e.g. *S. axillaris*, *S. brasiliensis*, *S. nigricans*, *S. parvifolia*, and *S. poeppigii*.

A single species, *S. aculeata*, has spreading prickles even on the trunk. This phenomenon has never been observed in extra-African species.

The corolla may change its colour at anthesis, as is observed in *S. staudtii* (Breteler c.s. 2575) and *S. camptoneura* (Leeuwenberg 7478). They are often white and turn yellow. The species with white corollas and long white filaments have pale yellow or greenish anthers which turn dark brown or black at anthesis, e.g. *S. boonei* (Breteler 2896) and *S. soubrensis* (Leeuwenberg 4146).

ANATOMY

As far as is known, all species, except those of the section *Spinosaes*, and *S. henningsii*, have bark-islets in the wood. This has been observed in nearly all African and some extra-African species. Dr. A. M. W. MENNEGA (Bot. Museum, Utrecht) will publish more on this subject.

FLOWERING SEASONS

A few remarks only can be made on this very incompletely known phenomenon. They are based on field observations by the present author and deduced from dates provided by herbarium specimens.

Some species show a distinct flowering period which often is short. Several savanna species flower once a year in the dry season, often just before the bush-fire; this was observed many times with *S. cocculoides*, *S. decussata*, *S. innocua*,

S. madagascariensis, *S. potatorum*, *S. pungens*, and *S. spinosa*. These species are deciduous and new leaves and flowers appear shortly after or sometimes before the fruits and old leaves are shed.

A fixed flowering season may also occur in several forest species, but our knowledge about this is very incomplete. Several of them flower and bear the fruits of the preceding year at the same time, e.g. *S. aculeata*, *S. camptoneura*, *S. congolana*, *S. lucens*, *S. nigritana*, *S. scheffleri*, *S. soubrensis*, and *S. staudtii*. They flower in the dry season often soon after the first showers announcing the rainy season. In the latter period *S. afzelii*, *S. boonei*, *S. chrysophylla*, *S. dolichothyrsa*, *S. soubrensis*, *S. splendens*, and *S. urceolata* also flower; however there are only a few, mostly unsatisfactory, observations on these species.

S. elaeocarpa, and perhaps also *S. canthioides*, flower once a year in the rainy season.

A number of species may flower several times a year; this is probably the case with *S. dale*, *S. icaja*, and *S. mimfiensis*.

S. longicaudata and *S. matopensis* may have a rather long flowering period once a year, as they are often found with buds, flowers, and immature fruits on a single branchlet. For *S. longicaudata* this period is at the end of the dry and at the beginning of the rainy season.

More or less continuous or gregarious flowering may occur in *S. asterantha*, as the species has been observed with flowers and fruits at the same time from March to October (herb. Leeuwenberg 5247, 6288, 6999). This may also be true for *S. henningii*, *S. myrtooides*, and *S. variabilis*.

VERNACULAR NAMES

The list of vernacular names compiled from the labels of all the specimens examined proved to be very heterogeneous and so of doubtful value. Usually, several names are used side by side for several species together, e.g. the large-fruited savanna species of which the pulp is edible are called: Mtonga, Mkome, or Mkwakwa in Kiswaheli. Moreover several species may have the same name in different languages, e.g. Mtonga is used in Santoba and Zigua, Mkome in Bende, Chilala, Lamba, Nyamwezi, and Sima, and Mkwakwa in Chindao, Nalwe, Venda, Zigua, and Zulu.

The most important conclusion from the study of these series of names is that only in extremely few cases a vernacular name does cover a single species. The latter can be said of some Madagascan species: *S. decussata* is called Hazomby, *S. madagascariensis* Dangoa or Vakakoa, and *S. spinosa* Mokotra or Voavontaka.

USES

The pulp of the fruit of *S. cocculoides*, *S. innocua*, *S. madagascariensis*, *S. pungens*, and *S. spinosa* is edible, but only when the fruits are absolutely mature. This may also be true for *S. lucens* and *S. nigritana*.

The wood of *S. mitis* is used as timber.

The fruits of *S. aculeata*, and less often those of *S. camptoneura*, *S. icaja*, and *S. potatorum* are used as fish poison.

A decoction of the root bark of *S. densiflora* and especially *S. icaja* is used as an ordeal poison. More complete information on this usage is given by BISSET & LEEUWENBERG in *Lloydia* 31: 208–222. 1968. There are also a few notes on medicinal uses.

CITATION OF SPECIMENS

All specimens cited have been seen by the present author, unless marked 'not seen'.

The lecto- or neotypes have been chosen by the author, unless marked 'designated by'.

The lecto- or neotypes have been chosen from among the isotypes, syntypes, or iso-syntypes: e.g. Mann 175 (K) was an isotype of *S. aculeata*; Brédo 1091 (BR) was a syntype of *S. samba*; and Bachmann 1745 (E) was an iso-syntype of *S. henningsii*. The duplicates of the lectotypes are always cited as isotypes. Because of this, several synonyms have necessarily become homotypic: e.g. the holotype of *S. subscandens*, a synonym of *S. floribunda*, is the lectotype of *S. welwitschii*; this specimen was an iso-syntype of the latter name. The lectotype of *S. unguacha* var. *grandifolia*, a synonym of *S. innocua*, chosen from among the iso-syntypes, is also the lectotype of *S. xerophila*, chosen from among the syntypes.

Neotypes have been designated for e.g. *S. camptoneura* and *S. innocua*. The best specimen collected near the type locality has served for this purpose. The neotype of *S. henningsii*, designated by E. A. BRUCE (1955) is rejected here, as according to the Code an iso-syntype should have been chosen as lectotype.

The herbaria containing WAG-duplicates are not always cited. An exception is made for the types and neotypes.

RELATIONSHIP TO OTHER GENERA

The genus *Strychnos* belongs to the tribe *Strychnae* which comprise further the genera *Gardneria* and *Neuburgia*, both from Asia. The three genera resemble each other very much in their flowers, as can be seen from the figures in the *Flora Malesiana* (Loganiaceae, by LEENHOUTS, 1962). Furthermore *Gardneria* and *Strychnos* have in common the horny endosperm, which surrounds the more or less straight embryo.

They differ mainly as follows:

1. Leaves mostly 3–5-plinerved; tendrils often present; fruit 1–many-seeded; stipular line faint; stipules occasional (only in section *Spinosa* where they are mostly deciduous) **Strychnos** L.
- Leaves penninerved; tendrils absent; stipular line distinct or stipules present 2

2. Inflorescence lateral; stipular line connects petiole bases; fruit a 1-several-seeded berry **Gardneria** Wall.
 Inflorescence terminal; stipules interpetiolar, adnate to the petioles, in older leaves often split along a distinct suture; fruit drupaceous
Neuburgia Blume

TAXONOMIC PART

THE GENUS STRYCHNOS L.

Strychnos L. Sp. Pl. 189. 1753.

Type species: *S. nux-vomica* L.

Heterotypic synonyms: *Rouhamon* Aubl., Hist. Pl. Guian. 1: 93, t. 36. 1775. Type species: *R. guianensis* Aubl. (= *S. guianensis* (Aubl.) Mart.). Homotypic synonyms: *Lasiostoma* Schreb., Gen. Pl. 75. 1789. *Chemnicia* Scop., Introd. 139. 1777. *Toxicaria* Schreb., Naturforscher 19: 146. 1783. Type species: *T. americana* Schreb. (= *S. guianensis* (Aubl.) Mart.).

Curare v. Humb. et Bonpl., Voy. Reg. Equin. (= Relat. Hist.) 2: 549. 1819. Type species: *S. curare* H.B.K. (= *S. guianensis* (Aubl.) Mart.).

Narda Vell., Fl. Flum. 1: 108. 1825 and 3: t. 24. 1827. Type species: *N. spinosa* Vell. (= *S. brasiliensis* (Spreng.) Mart.).

Brehmia Harv. in W. J. Hooker, Lond. Journ. Bot. 1: 25. 1842. Type species: *S. spinosa* Lam. (*B. spinosa* (Lam.) Harv. ex D.C.).

Atherstonea Pappe, Sylva Cap. 2nd ed. 29. 1862. Type species: *A. decussata* Pappe (= *S. decussata* (Pappe) Gilg).

Erect or climbing shrubs, lianas, or trees. *Lianas*: up to at least 120 m long and 45 m high climbing in trees; trunk up to 30 cm in diam.; with curled tendrils which become more woody with age and are solitary or arranged in 1–3 pairs above each other on short branches, in the axils of small bracts or – only if solitary – sometimes in the axils of ordinary leaves, morphologically occupying the place of an inflorescence. *Trees*: usually less than 10 m high (savanna spp.), 10–35 (40) m (forest spp.); trunk 10–100 cm in diam.; without tendrils, often with arching branches (*S. usambarensis*, *S. xantha*). Wood mostly hard, usually with bark-islets (in Africa only not in section *Spinosae* and *S. hemingsii*); bark mostly thin, smooth or less often rough, in lianas often with large lenticels, sometimes thick and corky (*S. cocculoides*, *S. congolana*, *S. pseudo-quina*). *Branches* armed with axillary or sometimes terminal simple straight or slightly recurved spines (in Africa only in *S. afzelii* and section *Spinosae*), unarmed, or rarely with spreading prickles (*S. aculeata*), often lenticellate, rarely corky; branchlets hairy or glabrous, lenticellate or not, terete, quadrangular, or flattened (some American spp.), sometimes sulcate, especially when dry. *Stipules* reduced to an often ciliate and straight rim connecting the petiole-bases, present only in the section *Spinosae* (linear and deciduous, more or less persistent only in *S. congolana*). *Leaves* opposite, sometimes decussate, or on the main axis sometimes ternate, those of a pair or whorl equal or subequal, petiolate or sometimes sessile, mostly inserted on distinct leaf-cushions; petiole rounded beneath, somewhat channeled above; blade variously shaped – in leaves in lianas and climbing shrubs on the main axis and at the bases of the branchlets usually smaller and comparatively wider – orbicular to narrowly elliptic, mostly coriaceous, in the shade thinner, often larger, and more acute at the apex, entire; with 1–2 (3)

pairs of distinct secondary veins from or from above the base curved along the margin, usually not fully reaching the apex, anastomosing with the other veins or less often pinnately veined. Often some pairs of scale-like cataphylls at the base of new shoots, inflorescences, and the branches of the latter. *Inflorescence* terminal, axillary, or both, thyrsoid, 1-many-flowered, shorter or longer than the leaves, lax or congested, sometimes sessile. *Flowers* 4-5-merous, actinomorphic or with only sepals unequal. *Calyx* often subtended by 1-2 sepal-like bracteoles; sepals green or coloured approximately like the corolla, free or connate up to one-half of their length, equal, subequal, or sometimes unequal, imbricate, shorter or rarely longer than the corolla (*S. longisepala*, *S. ternata*, often *S. spinosa*), orbicular to linear, outside hairy or glabrous, inside usually glabrous, mostly ciliate, herbaceous to coriaceous and incrassate; the latter only when orbicular or nearly so. *Corolla* rotate to salver-shaped, white to yellowish, greenish, pale green, or rarely orange or ochraceous, thin at the base, always more or less thickened towards the lobes, on both sides variously hairy, papillose, or glabrous, but inside at the base always glabrous, sometimes with a corona at the mouth; lobes valvate in the bud, triangular to oblong, acute or subacute, entire, erect to recurved. *Stamens* exerted or included, inserted at the mouth of or in the corolla tube; filaments glabrous or sometimes hairy; anthers introrse, orbicular to narrowly oblong, usually narrower after the pollen is shed, basifixed, variously hairy or glabrous, often apiculate at the apex, cordate, deeply so, or less often sagittate at the base; cells 2, discrete, parallel or sometimes divergent at the base, dehiscent throughout by a longitudinal split. *Pistil* variously hairy or glabrous; ovary 2- or rarely 1-celled (*S. mellodora*, *S. spinosa*, *S. xylophylla*) or incompletely bilocular (fide KRUKOFF); style simple, included or exerted - if hairy - usually only at the base, persistent; stigma pale-coloured, mostly white, capitate, less often obscurely bilobed, or occasionally conical, minutely pubescent with glandular hairs. In each cell of a 2-celled ovary one axial placenta with 2 to about 50 ovules, attached to the middle of the septum. In a one-celled ovary one basal placenta which is mostly globose, with few (*S. mellodora*, *S. xylophylla*) or many ovules (*S. spinosa*). *Fruit* a berry, 1-2-celled, globose or nearly so (most variable in shape in *S. camptoneura*), mostly yellow to red, less often green when mature, sometimes brown (*S. elaeocarpa*) or blue-black (*S. potatorum*), immature often glaucous, glabrous, subtended by the persisting calyx, 0.8-18 cm in diam., 1-145-seeded, with a certain correlation between size, number of seeds, and thickness of the wall, often mucronate, sometimes stipitate, smooth, with a granular skin, or less often warty. Wall thin and soft in small fruits, thicker and brittle in (mature) larger (very hard in nearly mature!!), or in most very large fruits (*S. aculeata*, *S. ternata*) very hard. Pulp juicy, fleshy, often edible (*S. cocculoides*, *S. innocua*, *S. madagascariensis*, *S. pseudo-quina* (sweet), *S. pungens*, *S. spinosa*, and also in some small-fruited spp.). *Seeds* large, 0.5-3 (5) cm long, variably shaped, generally disk-shaped to subglobose, with the hilum in various positions. Testa thick and osseous to very thin and membranaceous, rough and scabrid-pubescent (only when thick) or smooth and sericeous to glabrous (winged only in

S. camptoneura). Endosperm horny, slightly diaphanous, creamy to dark brown, composed of two equal portions united at the margin. Embryo surrounded by the endosperm, straight; cotyledons cordate or nearly so, leafy, veined. Sometimes some collectors above the bracts, on the base of the sepals, and near the base of the petioles.

Distribution: Circumtropical, about 170 species.

IMPORTANT REFERENCES OF EXTRA-AFRICAN STRYCHNOS SPECIES

America:

- KRUKOFF, B. A. & J. MONACHINO, The American species of *Strychnos*, *Brittonia* 4: 248–322. 1942.
- & –, Supplementary notes on the American species of *Strychnos* 1, *Brittonia* 5: 21–24. 1943.
- & –, Suppl. notes Am. Str. 2, *Lloydia* 9: 62–72. 1946.
- & –, Suppl. notes Am. Str. 3, *Brittonia* 6: 343–351. 1948.
- & –, Suppl. notes Am. Str. 4, *Bol. Técn. Inst. Agron. Norte* 11: 5–15. 1947.
- & –, Suppl. notes Am. Str. 5, *Bol. Técn. Inst. Agron. Norte* 12: 5–16. 1947.
- & –, Suppl. notes Am. Str. 6, *Bol. Técn. Inst. Agron. Norte* 20: 3–12. 1950.
- , Suppl. notes Am. Str. 7, *Mem. N.Y. Bot. Gard.* 12 (2): 1–94. 1965, with key to the species.
- DUCKE, A., O genero *Strychnos* no Brasil, *Bol. Técn. Inst. Agron. Norte* 30: 1–64. 1955.
- , Notas suplementares para ‘O genero *Strychnos* no Brasil’, *Bol. Técn. Inst. Agron. Norte* 36: 77–86. 1959.

Asia:

- HILL, A. W., *Strychnos ignatii* and other east Indian and Philippine species of *Strychnos*, *Kew Bull.* 1911: 281–302. 1911.
- , The genus *Strychnos* in India and the East, *Kew Bull.* 1917: 121–210. 1917.
- LEENHOUTS, P. W., *Loganiaceae* in *Fl. Malesiana* 1 (6): 293–387. 1962, *Strychnos* p. 343–361.
- TIREL, C., *Loganiaceae* of continental Southeast Asia, *Adansonia Sér.* 2.8: 249. 1968 and 1969, ined.

SECTIONAL ARRANGEMENT

The genus *Strychnos* is subdivided into 12 sections (references, synonymy, typifications, diagnoses, and lists of species cited below) which are arranged in a more or less natural system. The species within the sections are placed in separate series for each part of the world, again in a more or less natural order. The mutual relationships are outlined and discussed at the end of this chapter. The present author follows KRUKOFF (1965) for the American species (except for the moving of *S. oiapocensis* to a different place in *Breviflorae*). He follows LEENHOUTS (1962) for the delimitation of the Asiatic species studied by that author and HILL (1917) for the other Asiatic species. The arrangement of both the African and Asiatic species as regards sections is proposed here for the first time.

Section *Strychnos* is especially recognizable by the long slender corolla tube. The other sections, which have shorter corolla tubes, are distinguished by the indumentum on the inner side of the corolla and (excepting *Breviflorae*) also by the arrangement of the tendrils. The shape and the indumentum of the seeds are important in some sections, especially *Dolichanthae*, *Scyphostrychnos*, and *Aculeatae*. The insertion of the stamens and indumentum of the pistil also have an important diagnostic value.

1. Section *Strychnos*

Type species: *S. nux-vomica* L.

Heterotypic synonyms: *Tubiflorae* A. W. Hill, Kew Bull. 1917: 124. 1917.

Type species: *S. tubiflora* A. W. Hill.

Longiflorae Prog. in Martius, Fl. Bras. 6 (1): 271. 1868; Solereder in Engler & Prantl, Nat. Pflanzenf. 4 (2): 37. 1892, partly (excl. *S. potatorum*, *S. laurina* (= *S. colubrina*), *S. multiflora* (= *S. colubrina*), *S. spinosa*, and *S. laxa*); Krukoff & Monachino, Brittonia 4: 261. 1942; Krukoff, Mem. N.Y. Bot. Gard. 12(2): 17. 1965. Type species not designated.

Trees, shrubs, or more often climbers, usually without spines (spines only in *S. lucida*). Tendrils – if present – solitary or paired (the latter only occasionally in some American species, e.g. *S. jobertiana*). Flowers (4–)5-merous. *Sepals* ovate to narrowly oblong, rounded to long-acuminate at the apex. *Corolla* long, glabrous or with indumentum of various densities and distributions both outside and inside, usually papillose; corolla tube manifestly longer than the calyx, longer than the lobes (except in *S. angustiflora*). *Stamens* hardly to conspicuously exerted, inserted at (or near?) the mouth of the corolla tube; filaments variable in length, often very short; anthers glabrous or – if pilose – acuminate at the base (American spp.). *Pistil* glabrous or pilose in the middle; ovary 2-celled (?); style long, slender, more than three times as long as the ovary. *Fruit* yellow to red (always?), globose or ellipsoid, variable in size, 1.5–12 cm in diam., 1–many-seeded. Wall thin to thick. *Seeds* usually flattened, mostly obliquely elliptic or nearly so, often plano-convex, often curved. Testa osseous,

thick, not sticking to the pulp and not easily overlooked when seed is washed, sericeous or densely scabrid-pubescent to subglabrous.

American species:

S. chlorantha Prog.
S. ramentifera Ducke
S. colombiensis Krukoff
S. asperula Sprague et Sandw.
S. rondeletioides Spruce ex Benth.
S. macrophylla Barb. Rodr.
S. barnhartiana Krukoff
S. brachiata Ruiz et Pav.
S. blackii Ducke (= prec.?)
S. trinervis (Vell.) Mart.
S. panamensis Seem.
S. tabascanana Sprague et Sandw.
 (= prec.?)
S. divaricans Ducke
S. eugeniifolia Monachino
S. krukoffiana Ducke
S. medeola Sagot ex Prog.
S. toxifera Rob. Schomb. ex Benth.
S. tomentosa Benth.
S. diaboli Sandw.
S. javariensis Krukoff
S. jobertiana Baill.
S. pseudo-quina A. St. Hil.
S. xinguensis Krukoff
S. amazonica Krukoff
S. solimoesana Krukoff
S. froesii Ducke
S. lobelioides Krukoff et Barneby
S. peckii B. L. Robinson
S. smithiana Krukoff
S. erichsonii Rich. Schomb. ex Prog.
S. gardneri A. D.C.
S. pubiflora Krukoff
S. pedunculata (A. D.C.) Benth.
S. mitscherlichii Rich. Schomb.
S. dariensis Seem.

Asiatic species:

S. kerrii A. W. Hill
S. tubiflora A. W. Hill
S. wallichiana Steud. ex A. D.C.
S. cinnamomifolia Thwaites
S. gauthierana Pierre ex Dop
S. spireana Dop
S. rupicola Pierre ex Dop
S. usitata Pierre ex Dop (= prec.?)
S. donnaiensis Pierre ex Dop (= prec.?)
S. dinhensis Pierre ex Dop (?)
S. cathayensis Merr.
S. ignatii Berg.
S. hainanensis Merr. et Chun (= prec.?)
S. lucida R. Br.
S. nux-vomica L.
S. nux-blanda A. W. Hill
S. cheliensis Hu
S. angustiflora Benth.

Notes. The sections *Longiflorae* and *Tubiflorae* are combined here as they share the following characters: the same ratio between tube and lobes of the corolla; style long and slender; tendrils mostly solitary. The seeds also often show resemblances, e.g. those of *S. erichsonii* and *S. ignatii*. The section should be called *Strychnos* as it includes the type species of the genus.

As to the ratio between the tube and the lobes of the corolla, *S. angustiflora* should be included in section *Rouhamon*. As to its habit, its terminal inflorescences, and its fruits, however, it shows a striking resemblance to *S. cinnamomifolia*, and so the present author prefers to follow HILL (1917) in placing the species here.

The lectotype species of the synonym *Tubiflorae* is designated for the same reason as that of *Breviflorae*. For comments see there.

2. Section **Rouhamon** (Aubl.) Prog. in Martius, Fl. Bras. 6(1): 275. 1868.

Basionym: *Rouhamon* Aubl., Hist. Pl. Guian. 1: 93. 1775, as genus.

Type species: *R. guianensis* Aubl. (= *S. guianensis* (Aubl.) Mart.). Homotypic synonym: *Intermediae* Solered. in Engler & Prantl, Nat. Pflanzenf. 4(2): 40. 1892, partly (excl. *S. pungens*, *S. occidentalis*, *S. innocua*, *S. aculeata*, *S. micrantha* Thwaites, *S. dalzellii*, and *S. axillaris*); Krukoff & Monachino, Brittonia 4: 295. 1942; Krukoff, Mem. N.Y. Bot. Gard. 12(2): 55. 1965.

Heterotypic synonyms: *Heterodoxae* Duvign., Bull. Soc. Roy. Bot. Belg. 85: 33. 1952. Type species: *S. stuhlmannii* Gilg (= *S. potatorum* L.f.).

Floribundae Duvign., l.c. p. 34. Type species: *S. floribunda* Gilg. Homotypic synonym: *Floribundae* ser. *Eufloribundae* Duvign., l.c.; Bruce & Lewis, Kew Bull. 1955: 627. 1956.

Floribundae ser. *Littorales* Duvign., l.c. p. 35. Lectotype species: *S. littoralis* A. Chev. ex Hutch. et Dalz. (= *S. floribunda* Gilg).

Booneae Duvign., l.c. p. 32. Type species: *S. boonei* De Wild.

Variabiles Duvign., l.c. p. 19. Type species: *S. variabilis* De Wild.

Unarmed climbers, shrubs, or trees. Tendrils – if present – solitary. *Inflorescence* axillary or less often terminal. *Flowers* 4–5-merous. *Sepals* ovate to narrowly oblong, rounded to long-acuminate at the apex. *Corolla* outside glabrous, minutely papillose-pubescent or puberulous (*S. boonei*); inside pilose to lanate with white hairs only in the throat to nearly on the whole surface, base of tube always, apex of lobes mostly glabrous; tube urceolate to cylindrical, variable in length (in African spp. 0.3–1.5(2) × as long as the lobes); lobes spreading or recurved. *Stamens* exerted, inserted at the mouth of the corolla tube; filaments variable in length, at least in African spp. usually longer when corolla tube shorter (especially *S. decussata* and *S. potatorum*), 0.5–2 × as long as the anthers which are glabrous. *Pistil* glabrous or less often pilose. *Fruit* small, yellow to red, blue-black (*S. potatorum*), or brown (*S. elaeocarpa*), globose or ellipsoid, 1–3 cm in diam., 1–2-seeded. Wall thin. *Seed* ellipsoid, depressed-globose, or approximately disk-like, flattened or not. Testa usually thin, cartilaginous, smooth, sticking to the pulp, densely and shortly pubescent or glabrous; or less often thick, osseous, densely scabrid-pubescent and rough or sericeous and smooth.

American species:

S. guianensis (Aubl.) Mart.
S. glabra Sagot ex Prog.
S. subcordata Spruce ex Benth.
S. bicolor Prog.
S. panurensis Sprague et Sandw.
S. duckei Krukoff et Monachino
S. hirsuta Spruce ex Benth.
S. cogens Benth.
S. melinoniana Baill.

African species:

S. potatorum L.f. (also in Asia)
S. decussata (Pappe) Gilg
S. usambarensis Gilg
S. floribunda Gilg
S. dale De Wild.
S. retinervis Leeuwenberg
S. elaeocarpa Gilg ex Leeuwenberg
S. ndengensis Pellegr.
S. gnetifolia Gilg ex Onochie et Hepper
S. boonei De Wild.
S. variabilis De Wild.

Notes. The section *Rouhamon* contains in the present author's delimitation the American species included in this section by KRUKOFF (1965) and several African species constituting four sections of DUVIGNEAUD (1952). They are here put together as they share the following characters: tendrils solitary; the same pattern of harness on the inner side of the corolla; rather long filaments inserted on the mouth of the corolla; the same relationship between the length of the corolla tube and of the lobes; fruits small; variation in seed characters about the same.

S. ndengensis of *Floribundae* agrees with *S. guianensis* as to the indumentum in the corolla and in addition has almost the same calyx and pistil. *S. floribunda* and *S. usambarensis* also agree with *S. guianensis* in the characters mentioned above, except that the indumentum in the corolla is less dense. *S. decussata*, included by DUVIGNEAUD in *Micranthae*, resembles *S. floribunda* strikingly in floral and seed characters, but the variation in proportions between the corolla tube and lobes and the length of the filaments is greater. The same is true for *S. potatorum*. *S. hirsuta* and *S. variabilis* agree more or less as to the sepals, the indumentum in the corolla, and the pistil.

S. floribunda should be the type species of section *Floribundae* according to the Code (Art. 22), and not *S. dale* which was chosen by DUVIGNEAUD.

3. Section **Breviflorae** Prog. in Martius, Fl. Bras. 6(1): 277. 1868; Solereder in Engler & Prantl, Nat. Pflanzenf. 4(2): 40. 1892, partly (excl. *S. medeola*, *S. psilosperma* (= *S. axillaris*), and *S. acuminata* (= *S. colubrina*)); Krukoff & Monachino, Brittonia 4: 305. 1942; Krukoff, Mem. N.Y. Bot. Gard. 12(2): 66. 1965.

Type species: *S. breviflora* A. D.C. (= *S. brasiliensis* (Spreng.) Mart.).

Heterotypic synonyms: *Malacocladae* Duvign., Lejeunia 11: 57. 1947, partly (excl. *S. cooperi* and *S. matopensis*). Type species: *S. malacoclados* C. H. Wright. Homotypic synonyms: *Micranthae* Duvign., Bull. Soc. Roy. Bot. Belg. 85: 29. 1952, partly (excl. *S. matopensis* and *S. atherstonei*). *Micranthae* ser. *Malacocladae* (Duvign.) Duvign., l.c. p. 30, partly (see the latter); Bruce & Lewis, Kew Bull. 1956: 155. 1956, partly (excl. *S. decussata*).

Micranthae ser. *Icajæ* Duvign., l.c. p. 30. Type species: *S. icaja* Baill.

Micranthae ser. *Acrotrichæ* Duvign., l.c. p. 30. Type species: *S. malchairii* De Wild.

Mites Duvign., l.c. p. 23. Type species: *S. mitis* S. Moore.

Ligustroides Duvign., l.c. p. 31; Bruce, Kew Bull. 1955: 127. 1955. Type species: *S. ligustroides* Gossw. et Mendonça (= *S. henningsii* Gilg).

Climbers with solitary (at least in *S. parviflora*, *S. castelnaeana*, *S. rubiginosa*, *S. torresiana*, *S. albiflora*, *S. parvifolia*, and the first 8 African spp.) or paired tendrils (at least in *S. grayi*, *S. nigricans*, *S. mattogrossensis*, *S. schultesiana*, and *S. chromatoxylon*, the latter with tendrils in 1–3 pairs), or trees or shrubs without tendrils (at least in *S. fendleri*, *S. brasiliensis*, *S. mitis*, and *S. henningsii*), unarmed, or with spines (*S. rubiginosa*, *S. parvifolia*, and *S. afzelii*; the latter sometimes only with blunt spines on thick branches which are thickened bases of small deciduous branchlets). *Inflorescence* axillary or terminal. *Flowers* 4–5-merous. *Sepals* suborbicular to narrowly oblong, rounded to subulate at the apex. *Corolla* outside glabrous or shortly or sparsely pubescent; tube very short, usually shorter than or about as long as the calyx, mostly as long as or shorter than the lobes, inside glabrous; lobes inside variably hairy or occasionally glabrous. *Stamens* more or less distinctly exserted, inserted at the mouth of the corolla tube or only in *S. mitis* in the tube itself; filaments shorter than or about as long as the anthers which are bearded or glabrous. *Pistil* glabrous or puberulent in the middle. *Fruit* small or large, ellipsoid or globose, yellow to red, about 1–10 cm in diam., one- to many-seeded. *Seeds* variously shaped, grooved only in *S. henningsii*. *Testa* either thick, rough, and scabrid-pubescent (*S. castelnaeana*, *S. rubiginosa*, *S. fendleri*, *S. acuta*, *S. parvifolia*, *S. pachycarpa*, *S. dolichothyrsa*, *S. urceolata*) or thinner, smooth, and glabrous (*S. brasiliensis*, *S. afzelii*, *S. mitis*, *S. henningsii*), or very thin and mostly sticking to the pulp (*S. poeppigii*, *S. longisepala*, *S. tarapotensis*, *S. icaja*, *S. mimfiensis*, *S. malchairii*, *S. campicola*, *S. malacoclados*, *S. angolensis*), or thin and woolly (*S. pachycarpa*, *S. icaja*).

American species:

S. parviflora Spruce ex Benth.
S. bovetiana Pires
S. castelnaeana Wedd.
S. rubiginosa A. D.C.
S. fendleri Sprague et Sandw.
S. torresiana Krukoff et Monachino
S. oiapocensis Froes
S. acuta Prog.
S. albiflora Prog.
S. parvifolia A. D.C.
S. grayi Griseb.
S. pachycarpa Ducke
S. nigricans Prog.

African species:

S. dolichothyrsa Gilg ex Onochie et Hepper
S. urceolata Leeuwenberg
S. afzelii Gilg
S. icaja Baill.
S. mimfiensis Gilg ex Leeuwenberg
S. malchairii De Wild.
S. campicola Gilg ex Leeuwenberg
S. malacoclados C. H. Wright
S. angolensis Gilg
S. mitis S. Moore
S. henningsii Gilg
S. chromatoxylon Leeuwenberg

- S. mattogrossensis* S. Moore (= prec.?)
S. schultesiana Krukoff (= prec.?)
S. malacosperma Ducke et Froes
S. poeppigii Prog.
S. longisepala Krukoff (= prec.?)
S. tarapotensis Sprague et Sandw.
 (= prec.?)
S. brasiliensis (Spreng.) Mart.

Notes. The indumentum on the inner side of the corolla varies as follows:

1. with small patch or line of densely pilose, lanate, or rather stiff hairs:
 - a. recurved and at apex: *S. mimfimensis*, *S. malchairii*, *S. campicola*.
 - b. slightly recurved and near apex: *S. castelnaeana*.
 - c. approximately at the middle: *S. rubiginosa*, *S. fendleri*, *S. torresiana*, *S. acuta*, *S. albiflora*, *S. oiapocensis*, *S. grayi*, *S. pachycarpa*, *S. nigricans*, *S. mattogrossensis*, *S. schultesiana*, *S. malacosperma*, *S. poeppigii*, *S. longisepala*, *S. tarapotensis*, *S. dolichothyrsa*, *S. urceolata*, *S. afzelii*.
2. with area of pilosity at base of lobes: *S. brasiliensis*, *S. icaja*, *S. malacoclados*, *S. angolensis*, *S. mitis*, *S. henningsii*.
3. completely lanate: *S. parviflora*.
4. glabrous: sometimes *S. icaja* and *S. henningsii*.

According to the present author, *Breviflorae* should contain not only the species enumerated by KRUKOFF (1965), but also those of sections *Mites* and *Ligustroides* and most of those in sections *Malacocladae* and *Micranthae*. Strongly in favour of the combination of DUVIGNEAUD's sections with *Breviflorae* is the fact that several American species are more or less intermediate between the African sections in regard to the differential characters. These sections were distinguished by the indumentum of the inner side of the corolla. *S. castelnaeana* is intermediate between *S. malchairii* and the species listed under no. 1c of the above enumeration. The species of no. 2 are intermediate in this character between the latter and *S. parviflora*. The seeds of the American species, *S. castelnaeana*, *S. rubiginosa*, *S. fendleri*, and *S. acuta*, resemble strikingly those of *S. dolichothyrsa* and *S. urceolata*, both species from Africa, in their shape and indumentum. The same resemblance can be seen between *S. brasiliensis*, on the one hand, and *S. afzelii* and *S. mitis*, on the other. The characteristic grooved seed of *S. henningsii* is exceptional. Seeds with the same shape and groove are only known from *S. diplotricha*, placed in *Penicillatae*.

S. breviflora (= *S. brasiliensis*) should be considered as the type species of *Breviflorae* according to the International Code of Botanical Nomenclature (New Rule, Edinburgh, Art. 22).

S. oiapocensis, which was placed between *S. malacosperma* and *S. longisepala* on account of the inflorescence characters by KRUKOFF (1965), is moved here to between *S. torresiana* and *S. acuta*. It resembles the latter two species more by the indumentum and sepals, according to the present author. Moreover, it may

be supposed that the tendrils of *S. malacosperma* and *S. longispala* will be paired and those of *S. acuta* solitary. The tendrils of *S. torresiana* are solitary.

S. chromatoxylon is placed in *Breviflorae* with some doubt. It is related to *S. nigricans* by the narrow sepals, lenticellate branches, large fruits, and the arrangement of the tendrils, which are paired in *S. nigricans* and in 1–3 pairs in *S. chromatoxylon*. The flowers are incompletely known and the wood anatomy is very different (A. M. W. MENNEGA, personal comm.). Furthermore, the fruit is subcordate at the base instead of rounded. More complete material might give evidence as to its taxonomical position and in that case it might even represent a section of its own.

4. Section **Penicillatae** A. W. Hill, Kew Bull. 1917: 123. 1917, partly (excl. *S. ledermannii* and *S. luzonensis*); Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 22. 1952.

Type species: *S. penicillata* A. W. Hill (= *S. axillaris* Colebr.). Homotypic synonym: *Penicillatae* ser. *Eupenicillatae* Duvign., l.c. p. 23.

Heterotypic synonym: *Penicillatae* ser. *Tchibangenses* Duvign., l.c. p. 23. Type species: *S. tchibangensis* Pellegr.

Climbers, shrubs, or trees, usually without spines (spines sometimes in *S. axillaris*). Tendrils – if present – solitary. *Inflorescence* axillary or terminal. *Flowers* 4–5-merous. *Sepals* ovate or nearly so, obtuse or acute (acuminate only in *S. trichoneura*). *Corolla* glabrous or slightly hairy outside, inside white-penicillate in the throat or on the lobes, further glabrous or (only in *S. diplo-tricha*) with a zone of pilosity near the insertion of the stamens; tube 1–2.5 × as long as the calyx, 0.8–1.7 × as long as the lobes which are suberect. *Stamens* included, inserted in the corolla tube or at the mouth (*S. benthamii*, *S. trichocalyx*, *S. dalzellii*, and often also *S. axillaris*), but always below the hairy ring; filaments mostly shorter than the anthers; anthers bearded at the base (ciliate all around sometimes in *S. myrtooides*). *Pistil* glabrous, often very short; ovary 2-celled (at least in African spp.); stigma capitate, sometimes sessile. In each cell 2–30 ovules (African spp.). *Fruit* small, ellipsoid or subglobose, yellow to red (always?), 8–18 mm in diam. (always?), 1(–2)-seeded. Wall thin. *Seed* variable, mostly elliptic and flattened, ellipsoid and not flattened in *S. tchibangensis* and *S. diplo-tricha*, in the latter with a deep lateral groove. Testa thin, cartilaginous, sticking to the pulp, either very shortly pubescent and smooth or very shortly scabrid-pubescent and rough; glabrous in *S. diplo-tricha*.

African species:

S. diplo-tricha Leeuwenberg
S. tchibangensis Pellegr.
S. matopensis S. Moore
S. longicaudata Gilg
S. pentantha Leeuwenberg
S. trichoneura Leeuwenberg
S. myrtooides Gilg et Busse

Asiatic species:

S. benthamii C. B. Clarke
S. trichocalyx A. W. Hill
S. dalzellii C. B. Clarke (= seq.?)
S. axillaris Colebr.
S. oophylla Gilg et Bened. (= prec.?)
S. ridleyi King et Gamble
S. melanocarpa Gilg (?)

S. mostueoides Leeuwenberg
S. bifurcata Leeuwenberg

S. henryi Merr. et Yamamoto (?)

Notes. The *Penicillatae* are accepted here largely as was done by HILL. The two excluded species are moved to two other sections. *S. ledermannii* is placed in *lanigerae* because of the woolly inner side of the corolla and the hairy pistil. *S. luzonensis* is better placed in *Brevitubae*, according to the present author, in view of its habit and floral characters, but unfortunately the tendrils are unknown. Besides the African species added to this section by DUVIGNEAUD, the present author includes further in it species from this part of the world.

Fairly constant throughout the whole section is the distance between the base of the corolla and the insertion of the stamens; this is also true for the distance between the base of the corolla and the brush-like ring and mostly also for the length of the corolla. The only character which varies is the length of the corolla tube, which may be shorter or longer than the lobes. The tube ends where the stamens are inserted or where the hair-ring is inserted. The former situation is found in the first three Asiatic species and often in *S. axillaris*, the latter in all other species and also often in *S. axillaris*. As these two different forms are known for *S. axillaris*, the present author prefers to leave these first three species in this section, although they approach *S. afzelii*, an African species of *Breviflorae*, in this character. In favour of this decision is that *S. trichocalyx* and *S. dalzellii* resemble strikingly *S. axillaris* and *S. longicaudata* in habit and shape of the flowers, and that *S. benthamii* shows an even more striking resemblance in these characters to *S. pentantha*.

As in *Breviflorae*, the species whose epithet is the basis for the section name, is considered as the type species. *S. penicillata* should also be the type species of the synonym *Penicillatae* ser. *Eupenicillatae*, and not *S. scortechinii* which was chosen by DUVIGNEAUD. The latter fact does not lead to any important changes in this case, as both the species names mentioned are synonymous with *S. axillaris*.

5. Section *Aculeatae* Duvign., Bull. Soc. Roy. Bot. Belg. 85: 21. 1952.

Type species: *S. aculeata* Solered.

The only species of this section is described on p. 49.

6. Section *Spinosa* Duvign., Bull. Soc. Roy. Bot. Belg. 85: 19. 1952; Bruce, Kew Bull. 1955: 35. 1955; Leeuwenberg, Act. Bot. Neerl. 14: 226. 1965.

Type species: *S. spinosa* Lam. Homotypic synonym: *Brehmia* Harv. in W. J. Hooker, Lond. Journ. Bot. 1: 25. 1842; De Candolle, Prod. 9: 18. 1845; Bentham, Journ. Linn. Soc. 1: 108. 1856 (as genus).

Shrubs, trees, or climbers, unarmed (*S. ternata*) or with straight or recurved spines. One pair of free narrowly oblong deciduous stipules or several pairs of

more or less connate and persistent linear stipules (*S. congolana*) in each leaf. Tendrils (only in *S. congolana*) paired. Bark often pale brown and corky. Wood without bark-islets. *Branches* lenticellate or not. *Inflorescence* terminal. *Flowers* 5-merous. *Sepals* pale green, connate at the base, narrowly oblong, subequal or sometimes unequal, acuminate to subulate at the apex. *Corolla* shorter or longer than the calyx, urceolate or campanulate, pale green (sometimes white in *S. cocculoides*), outside glabrous or minutely pubescent, inside with an entire narrow white-penicillate corona at the mouth; tube 1–2.7 × as long as the lobes (tube cleft from the insertion of the stamens to the corona in *S. congolana*); lobes triangular, erect or suberect. *Stamens* included, inserted on or near the base of the corolla tube; filaments glabrous, shorter to longer than the anthers which are ciliate all around with villose or sometimes pilose hairs. *Pistil* pubescent or glabrous (often in *S. congolana*), short; stigma often sessile, capitate. Ovary 2- or 1-celled (only in *S. spinosa*), with many ovules. *Fruit* large, yellow, orange, or green, globose, 6–15 cm in diam., many-seeded. Wall hard, thick. Pulp often edible. *Seed* flattened, obliquely elliptic or nearly so, often curved. Testa thick, osseous, smooth or slightly rough, shortly pubescent to practically glabrous.

Species (only in Africa):

S. cocculoides Bak.

S. spinosa Lam.

S. congolana Gilg

S. ternata Gilg ex Leeuwenberg

Notes. The *Spinosae* are maintained in accordance with DUVIGNEAUD's conception. The recently described *S. ternata*, which falls completely within it, is added.

7. Section *Brevitubae* A. W. Hill, Kew Bull. 1917: 123. 1917, partly (excl. *S. maingayi*, *S. ovata*, *S. villosa*, *S. lanceolaris*, *S. hirsutiflora* (= *S. villosa*), *S. andamensis*, and *S. panayensis* (= *S. ovata*)); Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 25. 1952.

Lectotype species: *S. vanprukii* Craib.

Heterotypic synonym: *Sambae* Duvign., l.c. p. 28. Type species: *S. samba* Duvign.

Spineless trees (*S. mellodora* and *S. xylophylla*) or more often climbers with paired tendrils. *Branches* usually not or hardly lenticellate; branchlets very often quadrangular. *Inflorescence* axillary or sometimes terminal. *Flowers* 4–5-merous, mostly small. *Sepals* ovate or orbicular, rounded to acute at the apex. *Corolla* glabrous or slightly hairy outside, inside pilose in the throat and/or on the lobes, but base of tube and mostly apex of lobes glabrous; tube often shorter than the calyx, lobes 1–6 × as long as the tube, spreading or recurved. *Stamens* hardly to conspicuously exerted, inserted at the mouth of the corolla

tube; filaments variable in length, but mostly as long as or longer than the anthers which are usually glabrous (at least in all African and some Asiatic spp.). *Pistil* glabrous or sometimes with some minute hairs; ovary mostly 2-celled (at least in African spp. except *S. mellodora* and *S. xylophylla*) or 1-celled (*S. mellodora* and *S. xylophylla*); style short; stigma capitate or sometimes obscurely bilobed. In each cell (2)5–25 ovules (only seen in African spp.); in 1-celled ovary 2–9 ovules. *Fruit* yellow to orange as far as is known, small (at least in African and some Asiatic spp.), about 1.5–2 cm in diam., globose or nearly so, 1–2(3)-seeded. *Seed* ellipsoid or nearly so, slightly flattened, not as much as in section *Lanigeræ*. Testa thin, cartilaginous, sticking to the pulp and easily overlooked when seed is washed, pubescent and smooth (when known), rough only in *S. flavescens*.

African species:

- S. mellodora* S. Moore
- S. xylophylla* Gilg
- S. samba* Duvign.
- S. johnsonii* Hutch. et M. B. Moss
- S. cuniculina* Leeuwenberg
- S. cuminodora* Leeuwenberg
- S. millepunctata* Leeuwenberg

Asiatic species:

- S. umbellata* (Lour.) Merr.
- S. paniculata* Champ. ex Benth. (= prec.?)
- S. aenea* A. W. Hill
- S. vanprukii* Craib
- S. tetragona* A. W. Hill
- S. confertiflora* Merr. et Chun
- S. luzonensis* Elm.
- S. quadrangularis* A. W. Hill
- S. flavescens* King et Gamble
- S. bicirrhosa* Lesch. ex Roxb.
- S. vitiensis* A. W. Hill

Notes. *Brevitubæ* in the delimitation of the present author comprise those species of HILL's *Brevitubæ* and *Lanigeræ* which are characterized by paired tendrils, a glabrous or hardly hairy pistil, and a thin testa. *Sambæ* of DUVIGNEAUD fall completely within this delimitation. The only species in this section with rough seeds, common in *Lanigeræ*, is *S. flavescens*. It is placed here as it has glabrous pistils in small flowers.

S. johnsonii and *S. vanprukii* resemble each other strikingly by the quadrangular branchlets, the leaves, and the flowers. They share this character of the branchlets with *S. samba*, *S. tetragona*, and *S. quadrangularis*. The small flowers of *S. samba* come very near to those of *S. tetragona* and *S. vitiensis*.

The lectotype species designated here is representative for the section.

8. Section *Lanigeræ* A. W. Hill, Kew Bull. 1917: 123. 1917, partly (excl. *S. potatorum* and *S. flavescens*).

Lectotype species: *S. colubrina* L.

Heterotypic synonym: *Heterophyllæ* Duvign., Bull. Soc. Roy. Bot. Belg. 85:

25. 1952; Bruce & Lewis, Kew Bull. 1956: 154. 1956. Type species: *S. moandaensis* De Wild.

Climbers. *Branches* lenticellate or not. *Tendrils* paired. *Inflorescence* axillary and/or terminal. *Flowers* (4-)5-merous, often small. *Sepals* ovate or orbicular or nearly so, rounded to acute at the apex. *Corolla* outside glabrous or sparsely and/or minutely pubescent, inside with a zone of pilosity or villosity in the throat, in the tube, and/or on the base of the lobes, but base of tube always and apex of lobes mostly glabrous; tube very short to rather long; lobes 0.6-3(10) × as long as the tube, triangular to oblong, suberect to recurved. *Stamens* hardly to conspicuously exerted, inserted at the mouth of the corolla tube; filaments variable in length, sometimes very short; anthers mostly bearded at the base, less often glabrous, or rarely ciliate all around (*S. dinklagei*). *Pistil* minutely pubescent to hirtio-pilose (glabrous only in *S. maingayi* subsp. *borneensis* Leenh.), especially in the middle; ovary usually glabrous at the base, 2-celled (at least in African spp.); style mostly glabrous at the apex; stigma rather large, capitate or sometimes (*S. scheffleri*) saucer-shaped. In each cell 5-20(25) ovules. *Fruit* orange or orange-yellow (at least in the African and some Asiatic spp.), small or medium-sized, globose or obliquely ellipsoid, 0.8-4(5) cm in diam., 1-10(15)-seeded. Wall thin or rather so. *Seed* mostly flattened, obliquely ovate, elliptic, or trullate, or tetrahedral, often irregularly curved. Testa osseous, with mostly thick, very short, erect hairs, rough (smooth only in *S. moandaensis*), rather thick, not sticking to the pulp.

African species:

S. talbotiae S. Moore
S. chrysophylla Gilg
S. memecyloides S. Moore
S. splendens Gilg
S. soubrensis Hutch. et Dalz.
S. ngouniensis Pellegr.
S. scheffleri Gilg
S. kasengaensis De Wild.
S. moandaensis De Wild.
S. panganensis Gilg
S. fallax Leeuwenberg
S. dinklagei Gilg

Asiatic species:

S. hypogyna C. B. Clarke
S. andamensis A. W. Hill
S. maingayi C. B. Clarke
S. ovata A. W. Hill
S. villosa A. W. Hill
S. curtisii King et Gamble
S. coriacea Thwaites
S. polytrichantha Gilg
S. oleifolia A. W. Hill
S. lanata A. W. Hill
S. micrantha Thwaites
S. myrioneura Gilg
S. colubrina L.
S. lenticellata A. W. Hill
S. borneensis Leenh.
S. ledermannii Gilg et Bened.
S. lanceolaris Miq.
S. polyantha Pierre ex Dop
S. thorelii Pierre ex Dop
S. rufa C. B. Clarke

Notes. *Lanigeræ* in the conception of the present author comprise those species of HILL's *Lanigeræ* and *Brevitubæ* which have paired tendrils, a pilose pistil, and a mostly rough and rather thick testa. As *Heterophyllæ* agree perfectly with this conception of *Lanigeræ*, they are included in this section.

Several Asiatic species, e.g. *S. andamensis*, *S. colubrina*, and *S. borneensis*, approach *S. scheffleri* and *S. splendens* in leaf and flower characters. The indumentum, the fruit, and the seeds of *S. kasengaensis* resemble very much those of *S. thorelii* and *S. rufa*.

9. Section **Phaeotrichæ** Duvign., Bull. Soc. Roy. Bot. Belg. 85: 18. 1952.

Type species: *S. phaeotricha* Gilg.

The only species of this section is described on p. 215.

Note. *Phaeotrichæ* are somewhat exceptional in the genus by the pubescent glands on the corolla lobes and the filaments.

10. Section **Densifloræ** Duvign., Bull. Soc. Roy. Bot. Belg. 85: 24. 1952, partly (excl. *S. vanderysti*); Bruce & Lewis, Kew Bull. 1956: 269. 1956.

Type species: *S. densiflora* Baill.

Shrubs, trees, or climbers. *Branches* mostly lenticellate. Tendrils – if present – paired. *Inflorescence* axillary or ramiflorous. *Flowers* 4–5-merous. *Sepals* ovate or orbicular or nearly so, mostly rounded at the apex (sometimes acute or obtuse in *S. pungens*). *Corolla* outside glabrous, inside with a brush-like ring of white lanate hairs in the throat and just at the base of the lobes (a second ring only in *S. staudtii*); tube cylindrical or nearly so, (0.7)1–1.7 × as long as the lobes; lobes narrowly triangular, thick, spreading. *Stamens* hardly exerted; anthers sessile or subsessile at the mouth of the corolla tube, mostly glabrous. *Pistil* pilose or hirtopilose in the middle (glabrous only in *S. staudtii*); ovary glabrous at the base, 2-celled; style thick, glabrous at the apex; stigma rather large. In each cell 6–60 ovules. *Fruit* orange or yellow, rarely white (*S. staudtii*), nearly mature bluish-green, globose or nearly so, few- to many-seeded, with somewhat granular skin, either large, 4–12 cm in diam., hard, and thick-walled, or smaller, not very hard, and thin-walled. Wall in thick-walled immature or dry fruits woody, in mature fresh fruits easily broken by hand. Pulp orange, often edible. *Seeds* mostly flattened, obliquely ovate, elliptic, or trullate, or tetrahedral, usually irregularly curved. Testa osseous, with thick, very short, erect hairs, rather rough, thick, not sticking to the pulp.

Species (only in Africa):

S. pungens Solered.

S. innocua Del.

S. madagascariensis Poir.

S. lucens Bak.

S. nigrimana Bak.
S. densiflora Baill.
S. zenkeri Gilg ex Bak.
S. staudtii Gilg

Note. *Densiflorae* are practically as in DUVIGNEAUD, only *S. vanderysti* is transferred to *Lanigerae*.

11. Section **Dolichanthae** Duvign., Bull. Soc. Roy. Bot. Belg. 85: 35. 1952.

Type species: *S. gossweileri* Exell.

Heterotypic synonym: *Syringiflorae* Duvign., l.c. p. 32, partly (excl. *S. sub-aquatica* and *S. sambensis*). Type species: *S. syringiflora* A. Chev. (= *S. melastomatoides* Gilg).

Often climbing shrubs, lianas, or sometimes small trees with often liana-like branches (*S. xantha*). Branches not lenticellate; branchlets terete or quadrangular. Tendrils – if present – in 1–3 pairs, occasionally in more or less irregular groups. Inflorescence axillary and sometimes also terminal. Bracts often shovel-shaped. Flowers 4(–5)-merous. Sepals orbicular or nearly so, at the apex mostly obtuse or rounded, sometimes acute. Corolla mostly white or creamy, outside glabrous or sometimes minutely papillose-pubescent, inside (often densely) pilose, but glabrous at the base of the tube and mostly at the apex of the lobes. Tube cylindrical or nearly so, shorter (0.6 ×) or longer (up to 3 ×) than the lobes which are oblong or narrowly triangular and recurved (spreading in *S. asterantha*). Stamens exserted, inserted at the mouth of the corolla tube; filaments glabrous, about 1–2.5 × as long as the anthers which are glabrous and cordate at the base. Pistil glabrous; ovary 2-celled, more or less abruptly narrowed into the slender style; stigma small, not thicker than the style, obscurely bilobed or capitate. In each cell 2–10 ovules. Fruit orange or yellow, when nearly mature pale green or glaucous, small or rather so, mostly soft, ellipsoid, obovoid, or less often globose, 2–2.5(4) × 1.5–2(3.5) cm, 1–10-seeded. Wall usually thin, when dry less than 1 mm thick, sometimes thicker (*S. barteri*, *S. tricalystoides*). Seed mostly flattened, often obliquely elliptic or ellipsoid, usually not curved, at one side with a deep pit, at the other with a bulge surrounded by a shallow groove, seemingly papillose; false papillae simulated by short curved hairs.

Species (only in Africa):

S. melastomatoides Gilg
S. xantha Leeuwenberg
S. odorata A. Chev.
S. asterantha Leeuwenberg
S. penninervis A. Chev.
S. barteri Solered.
S. gossweileri Exell

S. canthioides Leeuwenberg
S. tricalysioides Hutch. et M. B. Moss

Notes. The type species of *Syringiflorae* is chosen in accordance with the Code. The rejected type species of DUVIGNEAUD, *S. subaquatica* (= *S. scheffleri*), belongs to *Lanigerae*; it has the pilose pistil and the rough seeds which are characteristic for the majority of *Lanigerae*. *S. syringiflora* (= *S. melastomatoides*) has a glabrous pistil and seeds characteristic only of species of *Dolichanthae*.

12. Section **Scyphostrychnos** (S. Moore) Leeuwenberg, comb. nov.

Basionym: *Scyphostrychnos* S. Moore in Cat. Talbot's Nigerian Pl. 71. 1913, as genus.

The only species of this section is described on p. 75.

Notes. The most typical characters for this section are the corona and the flat winged seeds arranged in horizontal layers. This species is placed in the genus *Strychnos*, as it is more closely allied to the other species of the genus than was supposed by S. MOORE (1913; see also Act. Bot. Neerl. 11: 48. 1962).

DISCUSSION OF THE RELATIONSHIP OF THE SECTIONS

The more or less reticulate relationship of the sections is figured in chart 1. The lines of relationship will be discussed below after the corresponding letters.

A. The sections *Strychnos* and *Rouhamon* have several characters in common: tendrils solitary; the seeds show the same range of variation, e.g. those of *S. dariensis* resemble strikingly those of *S. guianensis*, those of *S. nux-vomica* and *S. lucida* resemble those of *S. potatorum*; *S. nux-vomica* and *S. potatorum* also show a striking resemblance as to branching and leaves.

B. The relationship between the sections *Rouhamon* and *Breviflorae* is based upon the following arguments. Primarily, they both have solitary tendrils and stamens inserted at the mouth of the corolla. Furthermore, *S. parviflora* has many hairs on the inner surface of the corolla lobes, just like *S. ndengensis* and *S. guianensis*, but the latter two also have hairs inside the tube. The corolla of *S. usambarensis* resembles strikingly that of *S. brasiliensis* but differs in the place of insertion of the indumentum, which is in the throat instead of on (the base of) the lobes. Furthermore, the ellipsoid seeds of the latter two species are very much alike in their thin, smooth, cartilaginous testa.

C, D. The section *Rouhamon* resembles both *Lanigerae* and *Brevitubae* in regard to the place of insertion of the stamens and of the indumentum in the corolla, but it differs from them in that its species have solitary instead of paired tendrils.

E. *Breviflorae* are related to *Penicillatae*. They both have small flowers, and brushes in the corolla (the latter in part of *Breviflorae* only); the seeds show the

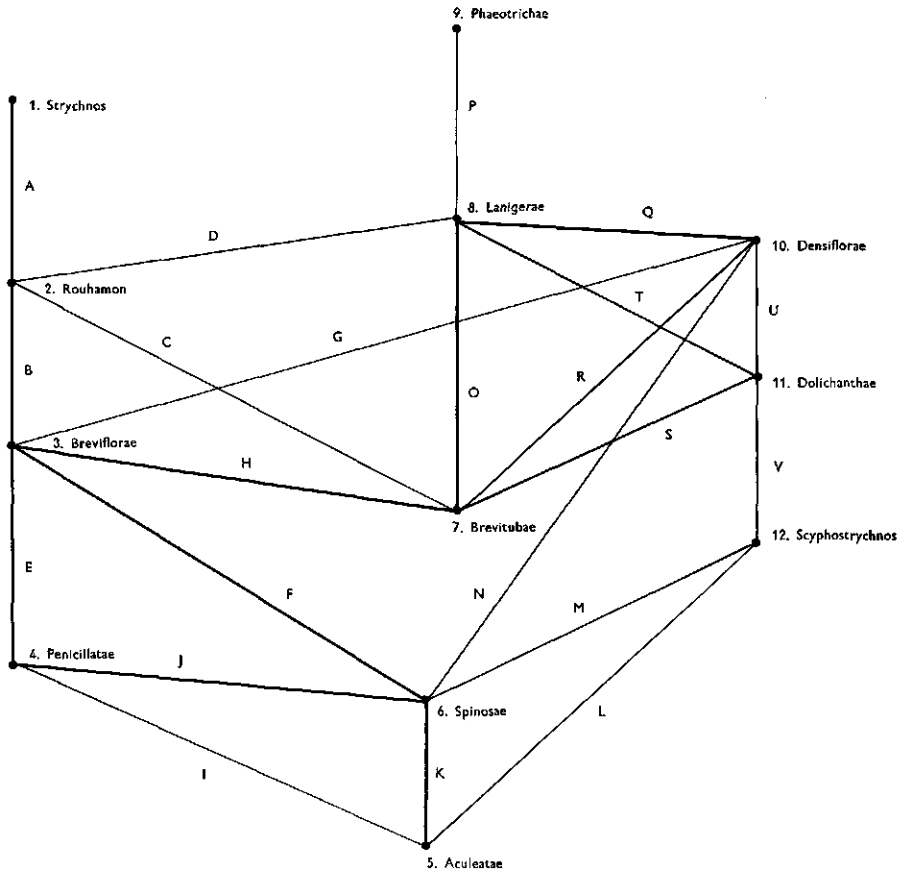


CHART 1. Relationship of the sections of *Strychnos*. The letters refer to the paragraphs of the discussion.

same range of variation. A curious feature is the glabrous, ellipsoid, deeply grooved, and strongly enrolled seeds found in both *S. henningsii* and *S. diplo-tricha*.

F. The relationship between *Spinosae* and species in *Breviflorae* which have paired tendrils is based upon the common characters of paired tendrils, narrow sepals, brushes on the inner surface of the corolla, and big fruits.

G. The same species in *Breviflorae* with paired tendrils resemble *Densiflorae* as they both have paired tendrils and mostly big fruits. The former differ from the latter by the narrow instead of broad sepals and by the indumentum on the inner surface of the corolla and on the pistil.

H. The resemblance of *Breviflorae* to *Brevitubae* is less evident, as the hairs in the corolla are on the lobes and not in the throat and the tendrils are mostly solitary instead of paired. The only clearcut character they have in common is the insertion of the stamens.

I, J, K. As to the flowers, *Aculeatae* are identical with the majority of *Penicillatae* and come close to *Spinosaes*, but the tendrils are placed in 1–3 pairs instead of solitary and the fruits are big instead of small. These big, hard-walled, many-seeded fruits they share also with *Spinosaes*, but they are laterally compressed, not globose as in the latter.

L. The *Aculeatae* and *Scyphostrychnos* have the habit, the tendrils in 1–3 pairs, and the big fruit in common, but the former differs from the latter by the lack of the corona, the laterally compressed, subglobose fruit (instead of not compressed and variable), and the rough, curved seeds (instead of smooth, not curved, and winged).

M. Characters, common to *Spinosaes* and *Scyphostrychnos*, are the corona (less conspicuous in the former), the big fruits, and the paired tendrils (1–3 pairs in the latter). A difference is in the place of insertion of the stamens: in the corolla tube in *Spinosaes*, at the level of the mouth of the corolla in *Scyphostrychnos*.

N. Characters, common to *Spinosaes* and *Densiflorae*, are the paired tendrils, the narrow corona (in the latter section only present in *S. staudtii*), and the mostly big globose fruits. The fruits in *Spinosaes* have a very hard wall which cannot be broken by hand when the fruit is mature and fresh as can be done with those of *Densiflorae*. Furthermore, the hairs in the corolla of *Densiflorae* are not as stiff as those of *Spinosaes*, the stamens are inserted at the mouth and not in the tube of the corolla, and the pistil of the former is conspicuously pilose.

O. The relationship of *Brevitubae* with *Lanigerae* is based on the common occurrence of paired tendrils and on the similar indumentum in the corolla and on insertion of the stamens. The most important difference lies in the indumentum on the pistil.

Borderline taxa are *S. flavescens* of *Brevitubae*, with a glabrous pistil and rough seeds, and *S. maingayi* subsp. *borneensis* of *Lanigerae*, also with a glabrous pistil. *S. maingayi* subsp. *maingayi* has a hairy pistil and rough seeds.

P. The resemblance of *Lanigerae* to *Phaeotrichae* concerns the paired tendrils, the place of insertion of the stamens, and the flattened seeds.

Q. *Lanigerae* are related to *Densiflorae* by the following characters: paired tendrils, the place of insertion of the stamens, a pilose pistil, and flat, often rough seeds. The difference lies mainly in the indumentum inside of the corolla.

R. *Brevitubae* have the following characters in common with *Densiflorae*: paired tendrils and insertion of the stamens at the mouth of the corolla. The former differ from the latter by the sparsely hairy or glabrous instead of distinctly pilose pistil, in the indumentum in the corolla, and by the small fruits.

S. The resemblance of *Brevitubae* to *Dolichanthae* concerns the indumentum in the corolla, the insertion of the stamens, and the paired tendrils (1–3 pairs in *Dolichanthae*). The curious dented seeds of *Dolichanthae* with curved hairs are unique in the genus.

T. *Lanigerae* and *Dolichanthae* have the indumentum in the corolla and the insertion of the stamens in common. However, the tendrils of the former are

paired instead of placed in 1–3 pairs, the seeds lack the curved hairs and are not dented, and the pistils are pilose instead of glabrous.

U. *Densiflorae* resemble *Dolichanthae* by the insertion of the stamens and the paired tendrils, but differ very much by their mostly pilose pistil with large stigma, the brushes in the corolla, and the rough, flat, not dented seeds with straight instead of curved hairs.

V. *Dolichanthae* resemble *Scyphostrychnos* by the arrangement of the tendrils, but differ strikingly in the flower, fruit, and seed characters.

KEY TO THE AFRICAN SPECIES BASED ON FLOWERING SPECIMENS

1. Stems with spreading prickles 1. *S. aculeata*
 Stems without prickles, sometimes with axillary spines 2
2. Inflorescence terminal 3
 Inflorescence axillary and sometimes also terminal at the same time . . . 23
3. Sepals narrow, twice as long as wide or more, acuminate to subulate . . . 4
 Sepals orbicular to triangular, rounded to acute; fruits small, up to 3 cm in diam. 10
4. Inflorescence large, paniculate, lax; mostly brown-hirsute liana with subcordate leaves; tertiary venation forming characteristic mussel-shell markings beneath 55. *S. phaeotricha*
 Inflorescence mostly smaller, seemingly umbellate 5
5. Small hirto-pubescent tree; leaves often subcordate; corolla densely villose inside, with spreading lobes; fruits small. Lower Congo Basin
 72. *S. variabilis*
 Pubescent or glabrous plants (if hirto-pubescent climbing); white-penicillate hairs on base of the suberect corolla lobes 6
6. Small hirto-pubescent liana with solitary tendrils; leaves up to 3 cm long; fruits small, about 1 cm in diam. Madagascar . . . 69. *S. trichoneura*
 Glabrous or pubescent trees or lianas with larger leaves and large globose thick-walled fruits, more than 5 cm in diam.; tendrils paired or absent (*Spinosa*) 7
7. Climber with paired tendrils; stipules more or less persistent, 4–12 on each node; corolla tube split 14. *S. congolana*
 Shrub or tree without tendrils; stipules soon deciduous, 4 on each node at the bases of the petioles; corolla tube not split 8
8. Medium sized forest tree; leaves large, 10–20 × 4–10 cm; colleters in the axils of the bracts; fruit wall 9–22 mm thick 68. *S. ternata*
 Mostly small savanna shrubs or trees; leaves smaller than in the preceding species, mostly less than 8 cm long; colleters absent or occasional; fruit wall 2–5 mm thick 9
9. Sepals outside mostly, at least apically glabrous, never with an even indumentum; branchlets usually glabrous; branches and bark not corky; ovary 1-celled 63. *S. spinosa*
 Sepals outside with an even pubescence; branchlets usually pubescent;

- branches and bark corky; ovary 2-celled 13. **S. cocculoides**
10. Pistil pilose, 3.5–4 mm long or more; corolla lobes recurved; stamens well-exserted 11
 Pistil glabrous or not, if pilose or pubescent up to 2 mm long and stamens not well-exserted; corolla lobes not recurved 12
11. All flowers distinctly pedicellate; leaves rather thin. East Africa
 52. **S. panganensis**
 At least some flowers sessile; leaves rather thick. Western Central Africa 45. **S. moandaensis**
12. Inflorescence paniculate, large, lax, many-flowered 13
 Inflorescence small, when lax few-flowered, otherwise congested and seemingly umbellate 16
13. Branchlets square, with square yellow pith; corolla glabrous outside
 59. **S. samba**
 Branchlets terete or nearly so, with terete pith; corolla minutely pubescent outside 14
14. Branches lenticellate; tendrils paired; pistil pubescent. West Africa
 20. **S. dinklagei**
 Branches not lenticellate; tendrils solitary; pistil glabrous 47
15. Pistil pilose; corolla with pilose ring inside; lobes spreading; stamens slightly exserted 16
 Pistil glabrous; corolla with stiff bristles inside on the base of the erect or suberect lobes by which the stamens are concealed (*Penicillatae*) . . . 17
16. Branchlets and leaves glabrous; leaf blades 3–11 cm long 24. **S. fallax**
 Branchlets brown-pubescent like leaves beneath on main veins; leaf blades 12–22 cm long 41. **S. memecyloides**
17. Corolla pubescent outside; inflorescence dense, about 15–50-flowered; sepals pubescent outside 18
 Corolla glabrous outside; inflorescence lax, 3–10-flowered; sepals mostly glabrous outside (see also 38. *S. matopensis*) 20
18. Branchlets quadrangular; tertiary venation prominent on both sides; corolla with two rings of hairs inside. Madagascar 21. **S. diplotricha**
 Branchlets terete or nearly so; corolla with bristles only at the base of the lobes 19
19. Branchlets densely appressed-pubescent; inflorescence very compact; leaves usually ovate or orbicular, mostly 2–5 × 1–3 cm, shortly petiolate (1–3(4) mm). East Africa 38. **S. matopensis**
 Branchlets sparsely pubescent to nearly glabrous; inflorescence lax, at least at the base; leaves usually elliptic, mostly 4–10 × 1.5–4 cm, with longer petiole (3–7 mm). Western Central Africa 66. **S. tchibangensis**
20. Liana with lenticellate branches and solitary tendrils; leaves rounded to emarginate at the apex 54. **S. pentantha**
 Shrub or tree; branches not lenticellate; leaves mostly acuminate 21
21. Leaves hairy above; pistil much longer than the calyx, 2–2.5 mm long; sepals halfway connate 6. **S. bifurcata**

- Leaves mostly glabrous above; pistil slightly longer than the calyx, up to 1.5 mm long 22
22. Leaves 1.2–3(3.3) cm long, rounded to acute or broadly and bluntly acuminate; hairy beneath and often also above; sepals connate up to one-third of their length 47. **S. myrtooides**
 Leaves 2–7 cm long, often long-acuminate, mostly glabrous above and often also beneath; sepals nearly free 46. **S. mostueoides**
23. Sepals narrow, at least twice as long as wide, acuminate to subulate; large liana with lenticellate branches and tendrils in 1–3 pairs
 11. **S. chromatoxylon**
 Sepals orbicular to triangular, rounded to acute 24
24. Pistil pilose or pubescent 25
 Pistil glabrous or (in 36. *S. malacoclados* and 59. *S. samba*) sometimes with a single hair 42
25. Leaves with a sharp apex; savanna tree or shrub with densely lenticellate branches and large globose fruits 57. **S. pungens**
 Leaves not with a sharp apex 26
26. Corolla with a brush-like ring in the throat; sepals always rounded or obtuse (*Densiflorae*) 27
 Corolla pilose or villose inside 32
27. Flowers 4-merous; savanna shrub or tree with mostly rounded leaves (acuminate leaves almost only in Madagascar) 28
 Flowers 5-merous; forest plants with acuminate leaves 29
28. Leaves glaucous, not or hardly paler beneath, mat or dull with mostly pale green reticulate prominent venation on both sides 30. **S. innocua**
 Leaves shining and dark green above, more distinctly paler beneath; tertiary venation reticulate, not or hardly prominent above
 35. **S. madagascariensis**
29. Tree; branches not lenticellate 75. **S. zenkeri**
 Lianas with paired tendrils; branches lenticellate 30
30. Leaves rather thickly coriaceous, with distinctly prominent reticulate tertiary venation; inflorescence-axis mostly pubescent; mature flower-buds 5.5–7 mm long; pistil 4.5–6 mm long 34. **S. lucens**
 Leaves with or without prominent venation; – if inflorescence-axis pubescent – leaves rather thin and less shining, drying darker; mature flower-bud 7.5–11 mm long; pistil 6–9 mm long 31
31. Branchlets usually distinctly lenticellate; old leaves often thinly coriaceous, usually drying with a flat margin and with a rather conspicuously reticulate tertiary venation above; inflorescence mostly congested; inflorescence-axis and pedicels often sparsely pubescent; mature bud 7.5–8 mm long, tube 1.5 × as long as the lobes, lobes about twice as long as wide, 3–3.5 mm long 19. **S. densiflora**
 Branchlets lenticellate or not; old leaves often thickly coriaceous, usually drying with a recurved margin and smooth above; inflorescence lax; inflorescence-axis and pedicels glabrous; mature bud 7.5–11 mm long,

- tube 1–1.3 × as long as the lobes, lobes 2.2–3 × as long as wide, 4–5 mm long 50. *S. nigritana*
32. Corolla lobes suberect; branchlets and leaves glabrous 33
 Corolla lobes spreading or recurved; branchlets and leaves usually with at least some hairs (see also 20. *S. dinklagei*) 34
33. Mature bud 4.5–6 mm long; glabrous or minutely pilose-pubescent outside on lobes; pistil pilose-pubescent, except for the glabrous base of ovary and apex of style, 3.2–4 mm long; calyx glabrous on both sides
 12. *S. chrysophylla*
 Mature bud 2 mm long, sparsely pubescent outside; pistil with a few hairs at apex of ovary, 2.5 mm long; calyx inside at base pubescent
 65. *S. talbotiae*
34. Leaves 12–22 cm long; pistil 2–2.2 mm long; stamens slightly exerted; branchlets brown-pubescent 41. *S. memecyloides*
 Leaves up to 12 cm long; pistil 4–8 mm long, sometimes shorter; stamens well-exserted 35
35. Corolla lobes 3–7 × as long as the tube; tube mostly shorter than the calyx; mature bud and pistil 3–4 mm long. West Africa (see also the east-African 52. *S. panganensis*) 63. *S. splendens*
 Corolla lobes 0.5–2 × as long as the tube; tube rarely shorter than the calyx 36
36. Leaves papery or thinly coriaceous 37
 Leaves coriaceous 39
37. Inflorescence lax; mature bud and pistil about 4–5 mm long; tendrils solitary 7. *S. boonei*
 Inflorescence congested; mature bud and pistil 6–8(9) mm long; tendrils paired 38
38. Leaves often subcordate, rarely cuneate at base; pistil at very base usually not glabrous, hirtio-pubescent; anthers with stiff erect hairs, if hairy
 49. *S. ngouniensis*
 Leaves cuneate at base, occasionally subcordate; pistil glabrous at base, further pubescent; anthers with pilose hairs, if hairy 61. *S. soubrensis*
39. All flowers distinctly pedicellate; leaves small, rather thin; mature bud 3.5–4 mm long; pistil 3.5–5 mm 52. *S. panganensis*
 At least some flowers nearly sessile 40
40. Leaves glabrous above; mature bud 7–9.5 mm long, glabrous outside or with a single hair; branchlets mostly glabrous, sometimes sparsely pubescent; main secondary leaf-veins prominent above. 60. *S. scheffleri*
 Leaves mostly pubescent on costa above and branchlets pubescent, if mature bud and pistil 6–7 mm long; main secondary veins less conspicuous, mostly not prominent above 41
41. Leaves mostly shining; inflorescence mostly about as long as the leaves; mature bud and pistil up to 4 mm long; fruit 13–15 mm diam.; seed smooth 45. *S. moandaensis*
 Leaves mostly mat; inflorescence much shorter than the leaves; mature bud

	and pistil (4)6–7 mm long; fruit about 3 cm diam.; seed rough	
		32. <i>S. kasengaensis</i>
42 (24).	Branchlets pubescent, often sparsely so	43
	Branchlets glabrous (see also 1. <i>S. aculeata</i>)	52
43.	Branches lenticellate	44
	Branches not lenticellate	46
44.	Stamens inserted in corolla tube; anthers bearded; inflorescence congested; mature bud 3.5–4 mm long. Forest tree. East Africa	44. <i>S. mitis</i>
	Stamens at mouth of corolla tube; anthers glabrous; inflorescence often lax	45
45.	Mature bud 4–6 mm and pistil 4–5 mm long; inflorescence lax; leaves obtuse, rounded, or broadly and bluntly acuminate (see also 25. <i>S. flori- bunda</i>)	18. <i>S. decussata</i>
	Mature bud 2–3.5 mm and pistil 1–2.5 mm long; inflorescence congested or not; leaves acuminate	71. <i>S. usambarensis</i>
46.	Inflorescence with some leafy bracts, large, lax, paniculate	47
	Inflorescence with some scale-like bracts only, congested or not	48
47.	Leaf blades glabrous, dull beneath; plant with cloves-odour, especially when living	22. <i>S. dolichothyrsa</i>
	Leaf blades slightly shining or mat beneath; barbate in the axils of the second pair of secondary veins	70. <i>S. urceolata</i>
48.	Peduncle longer than the remaining part of the inflorescence which is more or less congested. West Africa	2. <i>S. afzelii</i>
	Peduncle shorter than the remaining part of the inflorescence	49
49.	Petioles rugulose, pubescent like branchlets; inflorescence lax, sometimes transformed into rose-like galls	50
	Petioles not rugulose; inflorescence congested	51
50.	Sepals glabrous outside; corolla glabrous or minutely pubescent outside; leaves obtuse or nearly so, never sharply acuminate	3. <i>S. angolensis</i>
	Sepals and corolla pubescent outside; leaves sharply acuminate	
		36. <i>S. malacoclados</i>
51.	Corolla lobes with recurved brushes at apices inside; stamens inserted at the mouth; branchlets brown-pubescent like petioles and main leaf-veins beneath	8. <i>S. campicola</i>
	Corolla with a stiff erect brush-like ring in throat; stamens inserted in tube; branchlets – if hairy – usually sparsely pubescent; leaf-veins beneath glabrous or with some hairs	33. <i>S. longicaudata</i>
52.	Corolla with a distinct corona; flowers large; large glabrous black drying liana with tendrils in 1–3 pairs	9. <i>S. camptoneura</i>
	Corolla without or with an obscure corona	53
53.	Branches lenticellate	54
	Branches not lenticellate (see also 58. <i>S. retinervis</i>)	65
54.	Inflorescences in axils of scales at base of branchlets; branches dichoto- mously branched	56. <i>S. potatorum</i>
	Inflorescences in axils of ordinary leaves and sometimes also terminal	55

55. Mature flower-bud 2–3 mm and pistil 0.8–2.5 mm long 56
 Mature flower-bud 4–11 mm and pistil (3)4–10 mm long (see also 44. *S. mitis*) 59
56. Corolla inside with recurved brushes at apices of lobes 67
 Corolla inside pilose, villose, or rarely glabrous 57
57. Peduncle and pedicels glabrous; two distinct arcuate veins along leaf-margin; large liana 29. *S. icaja*
 Peduncle and pedicels pubescent; secondary veins not distinctly different. Forest trees. East Africa 58
58. Inflorescence lax, many-flowered; flowers 4-merous; corolla lobes 4–5 × as long as tube; anthers glabrous 40. *S. mellodora*
 Inflorescence more or less congested; flowers 4–5-merous; corolla lobes 0.8–1.6 × as long as the tube; anthers bearded 44. *S. mitis*
59. Mature bud 7–11 mm long; forest trees with congested inflorescences (habit of 58. *S. retinervis* unknown) 60
 Mature bud 4–6 mm long 62
60. Corolla inside with two rings of brush-like hairs 64. *S. staudtii*
 Corolla with one wide zone of pilosity inside 61
61. Stamens well-exserted; leaves coriaceous; several pairs of secondary veins as conspicuous as the arcuate; tertiary venation prominent on both sides 58. *S. retinervis*
 Stamens slightly exserted; leaves thickly coriaceous; secondary veins, except for the arcuate pair, not very conspicuous 23. *S. elaeocarpa*
62. Leaves rounded to bluntly acuminate; savanna trees and shrubs without tendrils, with lax inflorescences 18. *S. decussata*
 Leaves acuminate; forest lianas with solitary tendrils 63
63. Corolla lobes inside densely pilose all over; flowers 4-merous; sepals obtuse or rounded 48. *S. ndengensis*
 Corolla lobes inside at apex glabrous; flowers (4–)5-merous; sepals acute or less often subacute 64
64. Leaves with prominent reticulate venation on both sides or only beneath, usually larger than in the next species; mature buds and pistils 4–4.5 mm long 17. *S. dale*
 Leaves with venation not or obscurely prominent beneath, not so above; mature buds and pistils (4.5)5–6 mm long 25. *S. floribunda*
65. Corolla inside with brushes 66
 Corolla inside pilose 68
66. Brushes on apices of lobes, recurved; stamens on mouth of corolla tube . 67
 Brushes in throat, erect; stamens in tube 33. *S. longicaudata*
67. Leaves much paler and dull beneath, coriaceous or thinly coriaceous; secondary veins and costa shape a rather small angle 37. *S. malchairii*
 Leaves not or slightly paler and shining beneath, papery; secondary veins and costa shape a right angle 43. *S. mimfiensis*
68. Leaves with inconspicuous venation, dull on both sides; peduncle with a pair of bracteoles 26. *S. gnetifolia*

- Leaves with conspicuous venation, mat or shining at least above; peduncle without bracteoles 69
69. Mature flower-bud 1.8–3(4) mm and pistil 0.8–2.4(3) mm long (see also 53. *S. penninervis*) 70
- Mature flower-bud (3.5)4–8 mm and pistil (3)4–7 mm long (see also 51. *S. odorata*) 79
70. Savanna tree or shrub without tendrils 71
- Forest liana with tendrils 73
71. Inflorescence 1–2 cm long, congested; flowers 5-merous 28. **S. henningsii**
- Inflorescence 3–11 cm long, lax; flowers 4-merous 72
72. Peduncle and pedicels pubescent; leaves coriaceous; main secondary veins not much longer than the others 40. **S. mellodora**
- Peduncle and pedicels glabrous; leaves thickly coriaceous; main secondary veins nearly reaching the apex 74. **S. xylophylla**
73. Branchlets square; flowers 5-merous; inflorescence lax, usually distinctly pedunculate (see also 15. *S. cuminodora*) 74
- Branchlets terete or subangular and sulcate; flowers 4–5-merous, if 5-merous inflorescence congested and obscurely pedunculate 75
74. Branches and branchlets hollow, with a smooth-walled cylindrical cavity or less often not hollow and without a distinct pith; pale greenish on section when dry; mature buds 3.5–5 mm long 31. **S. johnsonii**
- Branches and branchlets with square yellow pith, which might shrink and leave a cavity in dry young thick branches, on section dark yellow when dry; mature buds 2.2–2.5 mm long 59. **S. samba**
75. Main secondary veins reaching the leaf-apex; tendrils solitary, usually on the branches where they are umbellately branched; flowers 4-merous; inflorescence lax 29. **S. icaja**
- Main secondary veins not reaching the leaf-apex; tendrils in 1–3 pairs; flowers 4- or 5-merous; inflorescence lax or congested 76
76. Leaves dull beneath, coriaceous; main secondary veins rather faint, not more conspicuous than the other; pistil 0.8 mm long; inflorescence very small, but lax; peduncle and pedicels very thin; flowers very small, 4-merous; sepals acute 4. **S. asterantha**
- Leaves mat or shining, papery or nearly so, main secondary veins more conspicuous than the other; pistil 2–2.5 mm long 77
77. Branchlets not grooved below the stipular line; leaves not punctate; tendrils in 1–2 pairs; seeds with a deep pit, seemingly papillose 51. **S. odorata**
- Branchlets grooved below the stipular line; tendrils paired; seeds not dented, smooth 78
78. Leaves with many minute translucent dots. Liberia, western Ivory Coast 15. **S. cuminodora**
- Leaves without or less often with some translucent dots. Congo (Kinshasa) 16. **S. cuniculina**
- 79 (69). Leaves rounded, acute or sometimes shortly acuminate (see also 42. *S. millepunctata*) 80

- Leaves acuminate or caudate 82
80. Four equal pairs of secondary veins; leaves dull beneath
53. *S. penninervis*
- Basal pair of secondary veins arcuate along the margin 81
81. Stamens well-exserted; filaments about twice as long as the anthers.
West Africa 5. *S. barteri*
- Stamens slightly exserted; filaments up to as long as the anthers. Central
Africa 27. *S. gossweileri*
82. Leaves caudate, thinly coriaceous; 3 main veins impressed above.
68. *S. tricalysioides*
- Leaves acuminate, coriaceous or not 83
83. Inflorescence lax; peduncle and its branches longer than flowers . . . 84
Inflorescence congested or rather so; at least branches shorter than
flowers 85
84. Branchlets square; leaves 3.5–10(14.5) cm long, slightly shining, also
beneath 31. *S. johnsonii*
- Branchlets terete; leaves 8–19 cm long, dull beneath. Guinea, Sierra
Leone 39. *S. melastomatoides*
85. Leaves with minute translucent dots; corolla outside pubescent. Ivory
Coast 42. *S. millepunctata*
- Leaves without dots; corolla outside glabrous 86
86. Tertiary venation prominent on both sides; leaves mostly drying pale
greenish-brown, mostly dull. East Africa 73. *S. xantha*
- Tertiary venation not or not distinctly prominent above; leaves drying dark
brown and slightly shining. Cameroun 10. *S. canthioides*

KEY TO THE AFRICAN SPECIES BASED ON FRUITING SPECIMENS

This key is based on living and dry material with mature fruits. The seeds of herbarium specimens were boiled and gently stripped of the pulp. In some species, especially in the sections *Rouhamon* and *Breviflorae*, the testa is very thin and therefore readily rubbed off. The fruits of some species are not yet known. These species key out with the related ones, as it is supposed their fruits and seeds will be alike. *S. canthioides* is related to *S. barteri*, *S. gnetifolia* and *S. ndengensis* to *S. floribunda*, *S. pentantha* and *S. trichoneura* to *S. bifurcata*, and *S. retinervis* to *S. elaeocarpa*. For this reason most species cited between brackets are not encountered elsewhere in the key. Pistil and sepal characters are used, if necessary, as there are often incomplete dry flowers in the infructescence. Moreover the sepals are persistent under the fruit.

1. Branchlets with prickles; fruit large, subglobose, laterally compressed,
about 10–18 cm. diam. 1. *S. aculeata*
- Branchlets without prickles, sometimes with axillary spines; fruits – if
large – not laterally compressed 2
2. Fruit 4–15 cm diam.; wall 5–20 mm thick, rarely less; seeds (10)30–100 . 3

- Fruit about 1–3 cm diam.; wall 1–3 mm thick; seeds 1–2(12) (see also 26.
S. gnetifolia) 13
3. Seed winged, about 3–5 cm diam., smooth, glabrous; pulp orange, turning
black; fruit often very large, pear-shaped, ellipsoid, or nearly so; large
liana, drying black 9. **S. camptoneura**
Seed unwinged, mostly scabrid or pubescent 4
4. Seed with a deep pit at one side; glabrous liana with thin caudate leaves
(see also 69) 68. **S. tricalysioides**
Seed not dented 5
5. Inflorescence terminal; branches often spiny; sepals narrow; fruits strictly
globose (*Spinosae*) 7 of first key, p. 36
Inflorescence axillary; spines none 6
6. Leaves with sharp apex; savanna tree or shrub 57. **S. pungens**
Leaves not sharp 7
7. Savanna shrubs or trees; leaves rounded at apex, acute or acuminate only
present in Madagascan and some east-African specimens
28 of first key, p. 38
Climber, mostly in the forest 8
8. Branches not lenticellate; branchlets often sulcate when dry; inflorescence
large 12. **S. chrysophylla**
Branches lenticellate 9
9. Fruit subcordate at the base; leaves not triplinerved; tendrils in 1–3 pairs
11. **S. chromatoxylon**
Fruit rounded at the base; leaves triplinerved; tendrils paired 10
10. Leaves thickly coriaceous, with more or less revolute margin 11
Leaves thinner, coriaceous; margin not revolute 12
11. Inflorescence-axis mostly pubescent. Congo, Angola, East Africa
34. **S. lucens**
Inflorescence-axis glabrous. West Africa, Cameroun, Central African
Republic, northern Congo 50. **S. nigritana**
12. Fruit pale yellow; wall about 5 mm thick; branchlets lenticellate
19. **S. densiflora**
Fruit darker, wall about 2 mm thick; branchlets not lenticellate, usually
sulcate when dry, often also when living 60. **S. scheffleri**
- 13(2). Fruit blue-black, with one ellipsoid sericeous seed; branches repeatedly
dichotomously branched; shrub or tree (see also 7. *S. boonei*)
56. **S. potatorum**
Fruit orange, yellow, red, or dark brown 14
14. Fruit orange, yellow, red, or rarely white, not lenticellate 15
Fruit dark brown, distinctly lenticellate 61 of first key, p. 41
15. Seed not dented, sometimes grooved and then glabrous; pistil hairy or
not 16
Seed with a deep pit at one side, covered by false papillae simulated by
curved hairs; pistil glabrous (*Dolichanthae*) 68
16. Seed ellipsoid or subglobose, not or hardly flattened, smooth 17

- Seed obliquely elliptic or tetrahedral, flattened, often rough 42
17. Seed with a deep groove, glabrous (see also 54. *S. pentantha* and 69. *S. trichoneura*) 18
- Seed without groove, pubescent or glabrous 19
18. Climber with solitary tendrils and terminal infructescences; branchlets pubescent. Madagascar 21. *S. diplotricha*
- Shrub or tree, without tendrils; infructescences axillary; branchlets glabrous 28. *S. henningsii*
19. Infructescence terminal 20
- Infructescence axillary and sometimes also terminal at the same time 25
20. Sepals narrowly triangular to subulate; plant hirt-pubescent 21
- Sepals orbicular to triangular; plant glabrous or pubescent 22
21. Shrub or small tree; leaves 3–9 cm long. Congo 72. *S. variabilis*
- Climber with solitary tendrils; leaves 1.2–3.3 cm long. Madagascar 69. *S. trichoneura*
22. Infructescence up to 1.5 cm long. Madagascar 24
- Infructescence about 3–15 cm long. Central Africa 23
23. Branchlets square, glabrous; infructescence paniculate, up to 15 cm long; tendrils paired 59. *S. samba*
- Branchlets terete, usually with some hairs; infructescence seemingly umbellate, about 3–5 cm long; tendrils solitary 66. *S. tchibangensis*
24. Leaves rounded to emarginate; climber with solitary tendrils 54. *S. pentantha*
- Leaves acuminate; repeatedly dichotomously branched shrub or treelet 6. *S. bifurcata*
25. Branchlets pubescent (see also 25. *S. floribunda*) 26
- Branchlets glabrous 30
26. Branches not lenticellate; climbers with solitary tendrils 27
- Branches lenticellate; climbers, shrubs or trees 36
27. Peduncle longer than the remaining part of the infructescence which is more or less congested; fruit laterally compressed. West Africa. 2. *S. afzelii*
- Peduncle shorter than the remaining part of the infructescence; fruits not compressed 28
28. Petiole sparsely pubescent; pistil 4–5 mm long, pilose; infructescence lax 7. *S. boonei*
- Petiole densely appressed-pubescent; pistil 1–2 mm long, glabrous or occasionally with a single hair 29
29. Petiole rugulose, pubescent like branchlets; infructescence lax 50 of first key, p. 40
- Petiole not rugulose; infructescence congested; plant dark brown-pubescent, drying dark brown 8. *S. campicola*
30. Branches not lenticellate (see also 58. *S. retinervis*) 31
- Branches lenticellate 36
31. Leaves dull, with inconspicuous venation. Nigeria, Cameroun 26. *S. gnetifolia*

- Leaves mat or shining; venation conspicuous 32
32. Tendrils solitary; fruit about 2.5–3 cm long 33
 Tendrils paired; fruit about 1–2 cm long 34
33. Fruit subglobose, 2.5–3 cm diam., with one large subglobose seed; leaves with 3 distinct nerves, not or slightly paler and shining beneath
 29. *S. icaja*
 Fruit ellipsoid, about 2.5 × 1.7 cm, with one ellipsoid seed; leaves with less conspicuous veins, distinctly paler and dull beneath. Congo (Kinshasa)
 37. *S. malchairii*
34. Leaves thinly coriaceous or papery; pistil 2–2.5 mm long
 79 of first key, p. 42
 Leaves coriaceous; pistil 3–4.5 mm long, rarely shorter 35
35. Branchlets square; leaves without dots 31. *S. johnsonii*
 Branchlets terete; leaves with minute translucent dots. Ivory Coast
 42. *S. millepunctata*
36. Tree or shrub, the latter only in savannas (see also 71. *S. usambarensis*) 37
 Climber with solitary tendrils 38
37. Forest tree; leaves mostly acuminate; pistil 2.3–3 mm long; seed glabrous
 44. *S. mitis*
 Savanna tree or shrub; leaves rounded, obtuse, or broadly and bluntly acuminate; pistil 4–5 mm long; seed minutely pubescent 18. *S. decussata*
38. Fruit subglobose, 2.5–3 cm diam.; leaves mostly large, dark green on both sides, with 3 distinct pale green nerves; seed large, subglobose, about 1.5–2 cm diam.; testa usually not visible 29. *S. icaja*
 Fruit ellipsoid, up to 2.2 cm long (see also 48. *S. ndengensis*) 39
39. Leaves papery, with distinctly impressed main veins above, often slightly bullate; fruit 1.5 × as long as wide; seed about 1.5–2 × as long as wide
 43. *S. mimfiensis*
 Leaves coriaceous or nearly so, not bullate; fruit 1–1.25 × as long as wide; seed subglobose or nearly so 40
40. Leaves dull and distinctly paler beneath; testa sticking to the pulp, usually not visible 37. *S. malchairii*
 Leaves mat or shining beneath; testa clearly visible, minutely pubescent . 41
41. Pistil 1–2.5 mm long; style on fruit – if present – up to 1.5 mm long, with capitate stigma; branches with epidermis peeling off; fruit often stipitate and/or laterally compressed 71. *S. usambarensis*
 Pistil 4–6 mm long; style on fruit – if present – 3–5 mm long, with capitate stigma; fruit sometimes stipitate, not compressed 63 of first key, p. 41
- 42(16). Seed smooth, minutely pubescent or glabrous (see also 65. *S. talbotiae*) 43
 Seed rough, scabrid; testa rather thick 48
43. Brown-hirsute climber with subcordate leaves; tertiary venation forming characteristic mussel-shell markings beneath 55. *S. phaeotricha*
 Plants glabrous or pubescent 44
44. Tree; branchlets glabrous. East Africa 72 of first key, p. 42

Climber; branchlets glabrous or not	45
45. Branchlets square, with square yellow pith; infructescence large	59. <i>S. samba</i>
Branchlets terete or nearly so	46
46. Tendrils solitary; infructescence congested; leaves glabrous on both sides or with some stiff brown hairs on main veins beneath	33. <i>S. longicaudata</i>
Tendrils paired; infructescence lax or nearly so	47
47. Leaves 2–7 cm long; fruits about 1.5 cm diam.	45. <i>S. moandaensis</i>
Leaves (7.5)12–22 cm long; fruits about 2–3 cm diam.	41. <i>S. memecyloides</i>
48. Infructescence terminal	49
Infructescence axillary and often at the same time terminal	56
49. Infructescence congested, with many dried up flowers; branchlets appressed-pubescent; leaves often orbicular	38. <i>S. matopensis</i>
Infructescence lax, without or with few dried up flowers	50
50. Pistil 3.5–4 mm long, pilose; leaves rather small, thin; fruit 8–18 mm diam.; branchlets mostly pubescent	52. <i>S. panganensis</i>
Pistil 1–2.2 mm long, glabrous or pubescent	51
51. Fruit 6–9 mm diam.; pistil glabrous; shrub or treelet. 22 of first key, p. 38	
Fruit mostly more than 15 mm diam.; pistil glabrous or not; climbers	52
52. Leaves glabrous on both sides	53
Leaves partially hairy beneath	55
53. Fruit laterally compressed, obliquely ovoid. West Africa	20. <i>S. dinklagei</i>
Fruit subglobose or ellipsoid	54
54. Leaves dull and much paler beneath, when young sparsely pubescent; tendrils solitary; pistil glabrous. Cameroun	22. <i>S. dolichothyrsa</i>
Leaves slightly shining beneath or nearly so; tendrils paired; pistil pilose. Gabon, Congo (both)	24. <i>S. fallax</i>
55. Leaves large, (7.5)12–22 cm long, sparsely pubescent on main veins beneath, not barbate; tertiary venation prominent beneath	41. <i>S. memecyloides</i>
Leaves smaller, 3–7.5(11.5) cm long, often barbate in angles of second pair of secondary veins; tertiary venation not or slightly prominent beneath	70. <i>S. urceolata</i>
56. Savanna tree or shrub; leaves rounded at apex, acuminate only in Madagascar and some East-African specimens	28 of first key, p. 38
Climber with paired tendrils or forest tree; leaves acuminate or nearly so	57
57. Forest tree	58
Climber	59
58. Pistil pilose; leaves 4–14 cm long	75. <i>S. zenkeri</i>
Pistil glabrous; leaves (8)10–20 cm long	64. <i>S. staudtii</i>
59. Leaves thickly coriaceous, mostly glabrous on both sides; margin revolute; tertiary venation prominent on both sides	60
Leaves coriaceous or papery; margin not revolute	61
60. Branches lenticellate; branchlets not sulcate when dry; leaves dark green	34. <i>S. lucens</i>

- Branches not lenticellate; branchlets distinctly sulcate; leaves often pale brownish-green when dry 12. *S. chrysophylla*
61. Leaves 8–50(67) mm long, ovate to elliptic, often cordate; fruit 8–18 mm diam.; seed 7–10 mm long 52. *S. panganensis*
 Leaves about 5–20 cm long 62
62. Leaves (7.5)12–22 cm long, glabrous above; branchlets brown-pubescent 41. *S. memecyloides*
 Leaves mostly about 5–10 cm long 63
63. Pistil 2.5 mm long; branches not lenticellate; branchlets glabrous like the leaves which are drying pale brownish-green (see also 12. *S. chrysophylla*) 65. *S. talbotiae*
 Pistil 3–9 mm long; branches lenticellate or not; branchlets glabrous or not like the leaves 64
64. Leaves glabrous on both sides and coriaceous 65
 Leaves hairy above, if coriaceous 66
65. Fruit mostly 15–25 mm diam., with 1–2, rarely up to 6 seeds. West Africa 63. *S. splendens*
 Fruit 3–4(6) cm diam., with 6–15 seeds. Central and East Africa 60. *S. scheffleri*
66. Leaves coriaceous 67
 Leaves thinly coriaceous or papery 38 of first key, p. 39
67. Leaves pubescent on costa above; branchlets pubescent. 32. *S. kasengaensis*
 Leaves glabrous above; branchlets sometimes sparsely pubescent 60. *S. scheffleri*
- 68(15). Infructescence minute, lax; pistil 0.8 mm long; leaves dull beneath; main secondary veins not more conspicuous than the other secondary veins 4. *S. asterantha*
 Infructescence rather large and/or congested; pistil more than 2 mm long 69
69. Leaves rounded, acute, or sometimes shortly acuminate 81 of first key, p. 43
 Leaves acuminate or caudate 70
70. Leaves caudate, thinly coriaceous; 3 main veins impressed above; pistil 4–4.5 mm long 68. *S. tricalysioides*
 Leaves acuminate; main veins not impressed above or only near the base 71
71. Leaves thinly coriaceous; pistil 2.4 mm long. Ivory Coast. 51. *S. odorata*
 Leaves thicker; pistil at least 4 mm long 72
72. Leaves 8–19 cm long, dull beneath. Sierra Leone, Guinea 39. *S. melastomatoides*
 Leaves 3–11 cm long 86 of first key, p. 43

1. *S. aculeata* Solered. in Engler, Bot. Jahrb. 17: 556. 1893; Baker in Fl. Trop. Afr. 4(1): 520. 1903; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 22. 1931; Chevalier, Rev. Bot. Appliq. 2: 363. 1947; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 20. 1960; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 43. 1963.

Figs. 1, p. 50, 2, p. 52; Map 1, p. 60

Type: Fernando Po: Mann 175 (holotype not seen, destroyed in B; lectotype: K, isotypes: GH, P).

Heterotypic synonyms: *S. mortehani* De Wild., Bull. Jard. Bot. Brux. 5: 50. 1915. Type: Congo: Equateur, Bumba Territory, Dundusana, Mortehan 485 (BR, holotype, photograph in K, neg. 2310; isotype: BR).

S. pseudo-jollyana A. Chev., Rev. Bot. Appliq. 23: 366. 1947, partly (excl. Chevalier 16360). Type: Ivory Coast: Guidéko, Sassandra R. basin, Chevalier 16395 (P, holotype, photograph in K, neg. 4482; isotype: K).

Large liana, at least up to 100 m long and 40 m high climbing in trees. Trunk 2.5–20 (22) cm in diam., prickly. Bark pale brown or pale grey-brown, shallowly fissured, not lenticellate; wood pale yellowish, fibrous. *Branches* not lenticellate, dark green or pale brownish; branchlets often sulcate when dry, variously prickly like trunk and branches (occasionally some not prickly), glabrous, dark green and shining when living. Prickles 3–5(9) mm long and at the base 3–5(9) mm wide, straight or recurved, flat. Tendrils in 1–3(4) pairs. *Leaves*: petiole glabrous, 2–12 mm long; blade shining on both sides, pale to dark green above, paler beneath, coriaceous to thickly papyraceous also when living, elliptic, oblong, or narrowly elliptic, comparatively narrower and usually larger towards the apices of the branchlets, 1.7–3.5 × as long as wide, (5)8–18 × (3)3.5–8 cm, in the shade up to 24.5 × 10 cm, apiculate or acuminate at the apex, at the base rounded or in apical leaves often cuneate, glabrous on both sides; one pair of secondary veins from or from above the base curved along the margin and often a faint submarginal pair; costa and main secondary veins in living leaves impressed above and prominent beneath; leaves at the base of the branchlets often suborbicular, 1.1–1.3 × as long as wide, 29–50 × 21–45 mm or smaller and often with inflorescences in the axils, usually rounded or retuse at the apex, rounded at the base. *Inflorescence* axillary, much shorter than the leaves, 1.5–7 × 0.8–3 cm, congested, seemingly umbellate. Peduncle 1–3 × as long as the remainder of the inflorescence, 0.7–5 cm long, glabrous as its branches, the pedicels, and the very small bracts. *Flowers* 5-merous. *Sepals* pale green, connate for one-third to one-half of their length, broadly orbicular or nearly so, about as long as wide, 1.5–1.8 mm long, rounded or obtuse at the apex, minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 2–2.7 × as long as the calyx, 2.4–5 mm long (complete bud 3–5 mm), white with outside pale green tube or pale green with greenish-white inner side, glabrous outside, inside with a flat brush of white hairs on the lobes; tube 0.8–1.9 × as long as the calyx, 1–2 × as long as the lobes, 1.2–3.2 mm long, amply cylindrical, slightly widened towards the throat, 1.5–2 mm wide at the base, 1.8–3 mm at the throat; lobes thick, triangular to ovate, 1–1.5 × as long

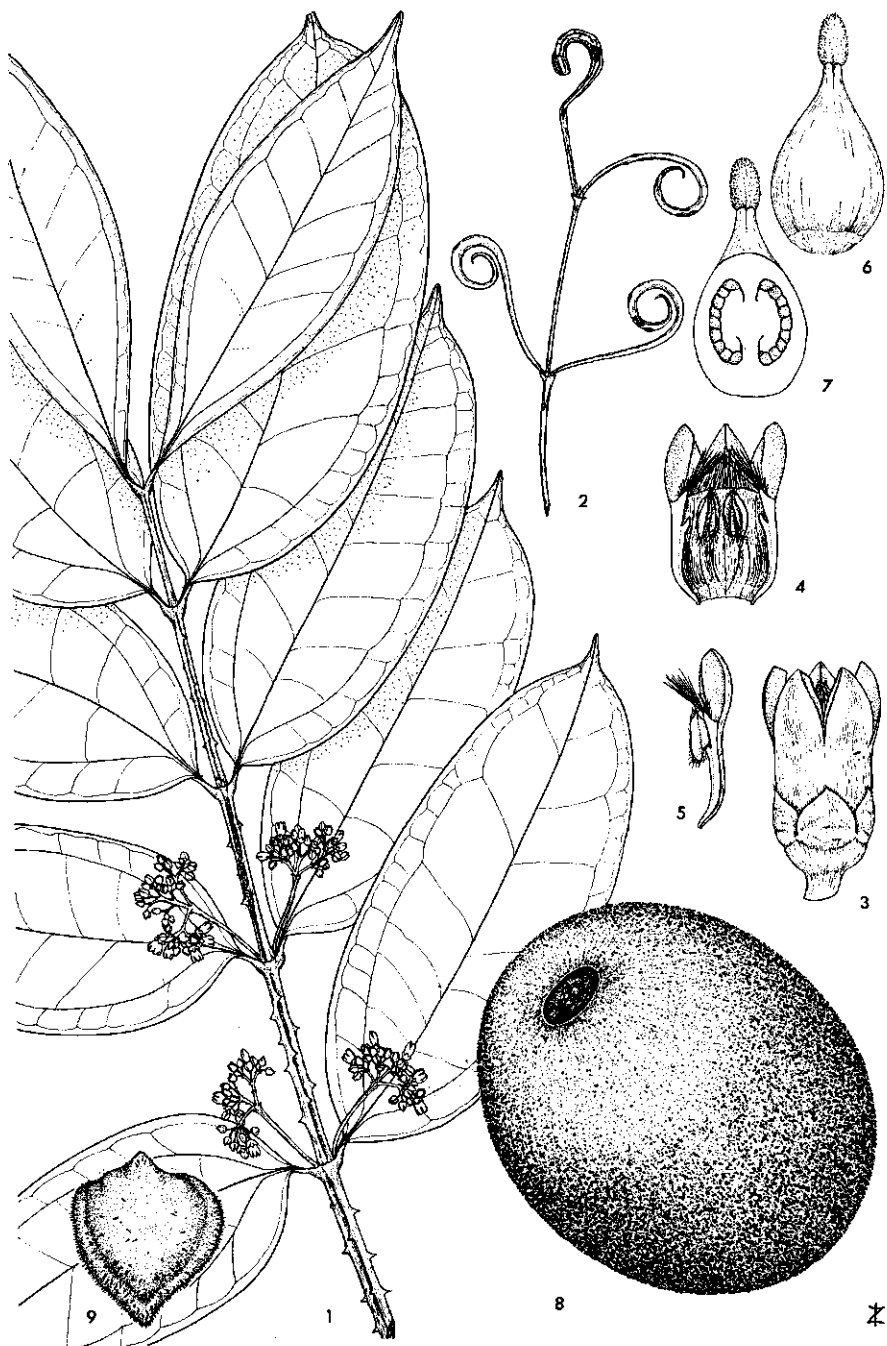


FIG. 1. *S. aculeata*: 1. branch, $\frac{1}{2} \times$; 2. tendrils, $\frac{1}{2} \times$; 3. flower, $5 \times$; 4. opened corolla with stamens, $5 \times$; 5. corolla lobe with stamen, $5 \times$; 6. pistil, $10 \times$; 7. pistil with longitudinal section of ovary, $10 \times$; 8. fruit, $\frac{1}{2} \times$; 9. seed, $1 \times$ (1. Le Testu 1937; 2. Mildbraed 8829; 3-7. Leeuwenberg 3923; 8. Leeuwenberg 3091; 9. Leeuwenberg 3981).

as wide, 1.2–2 × 1.2–1.5 mm, acute, erect. *Stamens* included; filaments glabrous, very short, about 0.5–1 × as long as the anthers, inserted on or somewhat above the middle of the corolla tube; anthers cordate, about 1–1.5 × as long as wide, 0.8–1.2 × 0.8–1 mm, deeply cordate at the base, ciliate with strigillose hairs all around, nearly so, or only at the base; cells divergent at the base. *Pistil* glabrous, 2–2.5 mm long; ovary ovoid, 1.5–2 × as long as wide, 1.5–2 × 0.8–1.5 mm, acuminate at the apex, 2-celled; stigma sessile, oblong. In each cell many ovules. *Fruit* large, very hard, like a bowl, subglobose, laterally compressed, dark green, yellow-green, or sometimes yellow, shining, (8 × 8.5 × 7.5) 10 × 10.5 × 9 – 12 × 12.5 × 11 (16.5 × 18.5 × 14.5) cm, 1–2-celled, with (20) 50–90 (145) seeds. Wall thick, very hard, coloured and hard like ivory when fresh, not shrinking, slightly knobby inside by which the thickness varies from 8 to 15 mm (even in a single fruit). Pulp creamy (like fruit wall on section and inside), few, containing saponine (producing much foam), with very strong fibres shaping an inner fruit-wall layer and the septum, if present. *Seeds* flattened, more or less plano-convex, obliquely ovate, elliptic, or trullate, usually irregularly curved, 1.2–1.8 × as long as wide, 20–35 × 16–25 × 4–8 mm, with thick mostly short erect hairs, rough, often with a raised line at one side with a cushion (hilum) in the middle.

Ecology: Rain forests or secondary forests, spread throughout the forest, not on river banks; alt. 0–700 m.

Distribution: West and Central Africa.

Uses: Fruits used as fish poison (testibus: Gossweiler 7585, 7664; Leeuwenberg 3981; Louis 3092; Offokansi FHI 59073; Oldeman 455; Serv. For. Côte d'Ivoire 1686; Tisserant 1237).

Sierra Leone: Bagru R. (Apr.) Mann 853 (K); Njala (May) Deighton 5052 (B, BR, K, P).

Liberia: near Yoma, left bank Mahe R., NE. of Bomi Hills, Leeuwenberg 4865 (WAG); *ibid.* (dry fr. only) van Meer 403a (WAG); Dukwia R. (dry fr. only) Cooper 319 (K); Bong Range, 32 km N. of Kakata, Leeuwenberg & Voorhoeve 4931 (WAG); Tapita area (July) Kwewon in coll. van Harten 20 (WAG); Sanokwele, Ganta District, Baldwin 9236 (K), (dry fr. only) Baldwin 9335 (K); Nimba Mts. (imm. fr.) Adam 20708 (K).

Ivory Coast: Tabou (Dec.) Serv. For. 1686 (P); 31 km S. of crossing of Hana R. and road Tai-Tabou (Mar.) J. de Wilde & Leeuwenberg 3590 (BR, K, WAG); 4 km N. of crossing of Hana R. and road Tai-Tabou (fr. Mar.) J. de Wilde & Leeuwenberg 3533 (BR, K, WAG); near Buyo, near Sassandra R. (Apr.) Oldeman 13 (WAG); 5 km S. of Tapéguhé, right bank Sassandra R., about 50 km NW. of Soubré (fr. June) Leeuwenberg 4515 (WAG); Guidéko (fr. May) Chevalier 16368 (P), 16395 (K, P, type of *S. pseudo-jollyana*); about 60 km WNW. of Sassandra, 5 km E. of Toro R. (fl., fr. Apr.) Leeuwenberg 4038 (WAG); about 40 km W. of Sassandra (fl., fr. Apr.) Leeuwenberg 4052 (WAG); about 30 km SW. of Guéyo (fl., fr. Mar. Leeuwenberg 3750 (WAG), 3793 (WAG), 3794 (WAG); 61 km N. of Sassandra, W. of Niapidou, Leeuwenberg 2532 (WAG); 56 km N. of Sassandra, E. of Béyo (Apr.) Leeuwenberg 3196 (BR, FHO, K, P, WAG), (seedlings) 4551 (WAG); 81 km NNE. of Sassandra, near Gobroko R. (fl., fr. Mar.) Leeuwenberg 3091 (BR, K, WAG); 55 km ENE. of Sassandra, about 15 km N. of Fresco (Mar.) Leeuwenberg 3083 (K, WAG); Nzida (June) Herb. I.D.E.R.T. 1589 (ABI); 9 km N. of Cosrou (May) Leeuwenberg 4252 (WAG); about 20 km W. of Abidjan (fr. Apr.) Leeuwenberg 3981 (ABI, WAG); *ibid.* (Oct.) Oldeman 455 (WAG), 458 (WAG); *ibid.* (Oct.) W. de Wilde 1101 (WAG); Abidjan Region, Schnell Dec. 1949 (ABT); NW. of Abidjan (Feb.) Bernardi 8115 bis (P); Yapo, Giovanetti 1196 (IFAN); *ibid.* (fl.) Nozeran 18 sept. 1950

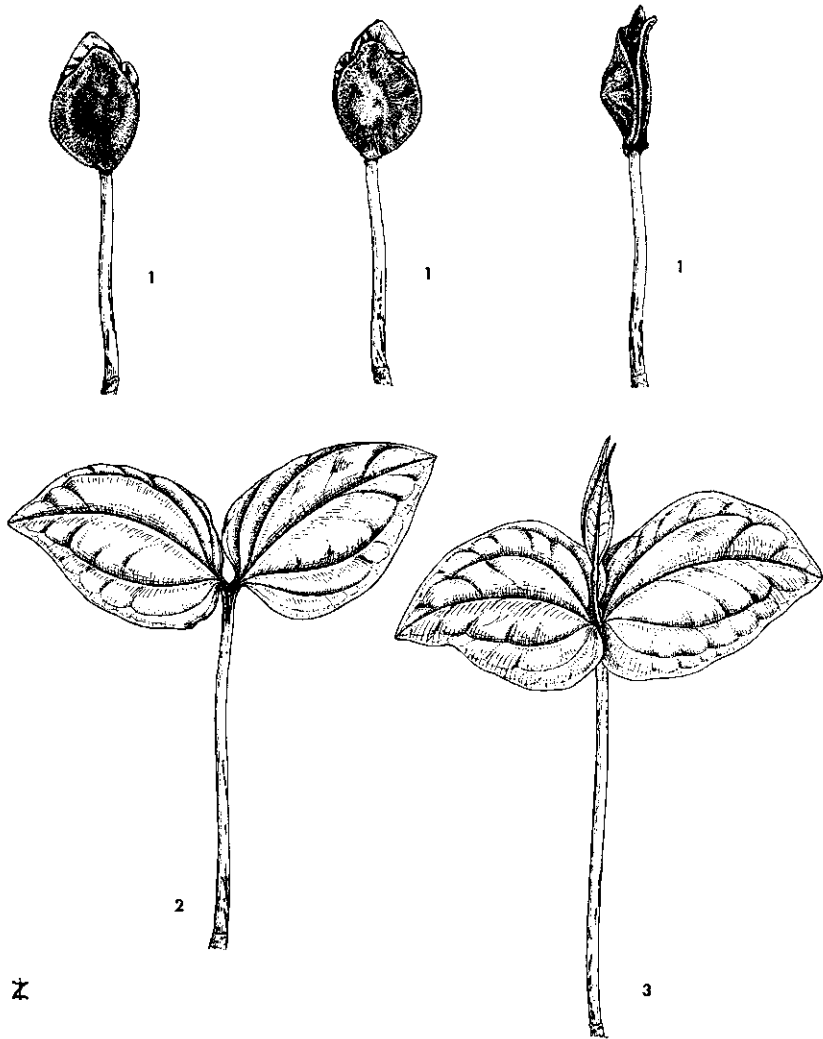


FIG. 2. *S. aculeata*: seedlings, $\frac{1}{2} \times$ (Leeuwenberg 3509): 1. with testa; 2. with cotyledons only; 3. with first leaves.

(MPU); W. of la Mé R., about 20 km NE. of Abidjan (fr. May) Leeuwenberg 4174 (WAG); Alépé, Chevalier 17894 (P); E. of Krinjabo, S. of Aboisso (fr. June) Leeuwenberg 4487 (WAG); 15 km NE. of Bianouan (fl., fr. Apr.) Leeuwenberg 3923 (WAG).

Ghana: near Axim (fr. only) Irvine March 1934 (K).

Nigeria: Sapoba, Kennedy 195 (FHO); Sapoba For. Res. (fl., imm. fr. June) Latilo FHI 56852 (FHI); *ibid.* (Nov.) Onochie FHI 35969 (FHI, K); Usonigbe For. Res., Keay & Onochie FHI 21582 (FHO); Agoi For. Res., Obubra District (fr. Mar.) Offokansi FHI 59073 (FHI); Oban, Talbot 1381 (K), 2013 (BM, MO).

Fernando Po: (bud) Mann 175 (GH, K, P, type).

Cameroun: S. Bokundu, Kumba Division, Anetoh FHI 29666 (K); 10 km W. of Masok (Apr.) Leeuwenberg 5353 (WAG); about halfway Edéa-Kribi, along road to Mboké (Apr.)

Leeuwenberg 5516 (WAG); 60 km SW. of Eséka, S. of Nyong R. (Mar.) Leeuwenberg 5024 (WAG); bank Kélé R., 30 km N. of Eséka (seedlings) Leeuwenberg 7469 (WAG); Oveng, 27 km N. of Sangmélina (seeds only) Breteler 2667 (WAG); 67 km E. of Yaoundé (fl., fr. May) Leeuwenberg 5717 (WAG); 16 km S. of Djouo, 2 km E. of Somalomo (fr. Feb.) Letouzey 4396 (P, WAG, YA); Ndjangané, 13 km S. of Ebaka (fl., fr. Dec.) Leeuwenberg 7388 (WAG); 43 km NW. of Bertoua, Breteler 1389 (WAG, YA); Djang, 40 km W. of Bertoua (fl. May) Breteler 2972 (BR, K, P, UC, WAG); Deng Deng, Mildbraed 8829 (K); near Dimako, 28 km SW. of Bertoua (fr. Aug.) Breteler 1736 (WAG, YA).

Central African Republic: 22 km N. of Berberati, Leeuwenberg 7261 (WAG); 27 km S. of Nola, along road to Salo, Leeuwenberg 7098 (WAG); Boukoko, N. of Bangui (Nov.) Tisserant 45 (P), 45 bis (P), 481 (P, WAG), 1237 (P, WAG).

Gabon: Ndjolé (Jan.) Thollon 86 (P); Tchibanga (Dec.) Le Testu 1937 (A, B, BR, FHO, IFAN, K, L, P, S, UC).

Congo (Brazzaville): Loubofo, near bank of Bouénza R. (fr. Nov.) Bouquet 676 (P).

Congo (Kinshasa): Léopoldville: Ipeke, Lac Léopold II, Gilbert 14610 (BR); Bokoro (Nov.) Jans 617 (BR). Equateur: Bumba Territory, Dundusana (bud Sept.) Mortehean 485 (BR, type of *S. morteheani*). Orientale: Yangambi (bud Jan., Nov., imm. fr. Aug.) Louis 2844 (BR, P, PRE, S), 3092 (BR, U, US), 6660 (BR, FHO, K, MO, P), 15897 (BR); *ibid.* (Oct.) Bolema 967 (BR, WAG). Kasai: Twanga, Mukumari-Lodja Road (fr. June) Germain 7536 (BR, K).

Angola: Cabinda, Belize (fl. Jan., Apr., Nov., fr. Apr.) Gossweiler 7112 (BM, COI, LISJC, LISU), 7585 (BM, COI, K, LISJC, LISU), 7664 (COI, K, LISJC, LISU).

Uganda: Budongo Forest, Bunyoro (fr. Oct.) Eggeling 3817 (ENT, K).

Cult.: Wageningen, from seeds collected on forest floor in Banco Forest, Ivory Coast in Jan. 1961 by H. C. D. de Wit: Leeuwenberg 3509 (WAG); Yaoundé, Cameroun, seedling of herb. Breteler 2667; Breteler 3006 (WAG); Adiopodoumé, Ivory Coast, seedling of herb. Leeuwenberg 3981; Leeuwenberg 4569 (WAG).

2. *S. afzelii* Gilg in Engler, Bot. Jahrb. 17: 572. 1893; Baker in Fl. Trop. Afr. 4(1): 522. 1903; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 22. 1931; Chevalier, Rev. Bot. Appliq. 27: 367, pl. 17 C. 1947; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 43. 1963.

Fig. 3, p. 54; Map 2, p. 60

Type: Sierra Leone: near top of Sugarloaf Mt., Freetown, Scott Elliot 4015 (K, lectotype; isotypes: BM, GH, P).

Heterotypic synonyms: *S. zizyphoides* Bak., Kew Bull. 1895: 96. 1895 and l.c. Type: Ghana: sin. loc., Burton & Cameron s.n. (K, holotype).

S. erythrocarpa Gilg in op. cit. 23: 199. 1896; Baker in Fl. Trop. Afr., l.c. Type: Togo: Misahöhe, Baumann 558 (holotype not seen, destroyed in B; no isotypes seen).

Liana, at least 10–50 m long, 3–40 m high climbing in trees. Bark dark brown, shallowly fissured, lenticellate. Branches terete, not lenticellate, dark brown or dark greenish-brown; branchlets ochraceous-pubescent, glabrescent, terete, often slightly sulcate and medium brown when dry, medium green when living; lateral branches in shade often thickened at the base, loosing the apex, and being transformed into rather blunt spines which are 7–25(35) mm long. Tendrils solitary, in the axils of ordinary leaves or small bracts. Leaves when living with odour of cloves, on the main axis often ternate or decussate; petiole short, 1–5 mm long, ochraceous-pubescent, glabrescent; blade slightly shining



FIG. 3. *S. afzelii*: 1. branch, $\frac{1}{2} \times$; 2. flower (usually broader), $8 \times$; 3. portion of corolla with stamen, $8 \times$; 4. stamen, $16 \times$; 5. pistil with ovary on longitudinal section, $32 \times$; 6. fruit, $\frac{1}{2} \times$; 7. seed, $1 \times$; 8. longitudinal section of seed with embryo, $1 \times$; 9. leaves, $\frac{1}{2} \times$ (1-5. Dinklage 2685; 6-8. Roberty 7855; 9. Leeuwenberg 3242).

and pale to dark green above, hardly shining and paler beneath, coriaceous or in the shade papyraceous or subcoriaceous, extremely variable in shape and size, orbicular, elliptic, obovate, or oblong, in leaves on the main axis and at the bases of the branchlets comparatively wider and often slightly broader than long, (0.8)1–2(3) × as long as wide, 12–110(145) × 9–55(65) mm, the largest mostly at the apices of the branchlets, especially in the shade, emarginate, rounded, obtuse, apiculate, or acuminate at the apex, more acute towards the apices of the branchlets, and in the shade, subcordate, rounded, or cuneate at the base, also more acute towards the apices of the branchlets, sparsely appressed-pubescent on both sides when young, glabrescent; one pair of secondary veins from above the base curved along the margin to the apex or nearly so, often also a faint submarginal pair. *Inflorescence* axillary, usually about half as long as the leaves, up to twice as long when flowering, elongate after anthesis, congested, or not, often nearly capitate, seemingly umbellate, about 4 × branched, 2 × 1–5 × 3 (8 × 5) cm. Peduncle about twice as long as the remainder of the inflorescence, densely to sparsely ochraceous-pubescent as the branches and the very short pedicels. Bracts small, very narrowly elliptic, sparsely pubescent. *Flowers* 5-merous. *Sepals* pale green, up to halfway connate, broadly triangular to suborbicular, about as long as wide, 0.5–0.6 mm long, acute, slightly apiculate, or obtuse at the apex, pubescent outside, ciliate, glabrous inside, without colleters. *Corolla* in the mature bud 3–4 × as long as the calyx, 1.8–2.2 mm long, white, creamy, pale yellowish-green with slightly darker lobes, or creamy at the base and pale green at the apex, changing at anthesis, urceolate or amply infundibuliform, sparsely pubescent outside, inside with a flat brush of white hairs on the lobes; tube 1–1.6 × as long as the calyx, 0.4–1 × as long as the lobes, 0.6–1 mm long, 0.5–0.6 mm wide at the base, 1–2.2 mm at the throat; lobes thick, narrowly triangular, 1.6–2.7 × as long as wide, 1–1.6 × 0.6–1 mm, acute, erect or suberect. *Stamens* included by the lobes; filaments short, about as long as the anthers, glabrous, inserted at the mouth of the corolla tube; anthers cordate, about as long as wide, 0.4–0.5 mm long, bearded with white hairs at the cordate base; cells divergent at the base. *Pistil* glabrous, 1.2 mm long; ovary broadly ovoid, 0.5 × 0.5 mm, acuminate, 2-celled; style very short; stigma white, globose or nearly so. In each cell 5 ovules. *Fruit* orange, obliquely ellipsoid, obliquely pedicellate, laterally compressed, slightly longer than wide and mostly somewhat wider than thick, 11 × 9 × 9–16 × 13 × 11 mm, 1(–2)-seeded; wall thin, rather hard; pulp few, orange. *Seeds* smooth, glabrous, ellipsoid, slightly flattened, more flattened and disk-shaped when dry, 10 × 9 × 4–14 × 11 × 6.5 mm, umbonate at one side in the middle.

Ecology: On river banks or on moist places in usually periodically inundated rain forests, secondary forests, or in coastal swamp forests; alt. 0–700 m.

Distribution: West Africa.

Senegal: Bank of Casamance R., Leprieur Apr. 1827 (BM, P); Cap Rouge, Leprieur May 1826 (IFAN); sin. loc., Perrottet 489 (BM).

Portuguese Guinea: Bissau, Brene (fr. Jan.) Espírito Santo 1720 (COI, K, LISC, LISJC); Bissau, Prabis (fr. Feb.) Espírito Santo 1811 (COI, K, LISC, LISJC).

Guinea: Rio Nunez, Heudelot 774 (P); Gangan (May) Roberty 17721 (G); Faranah (Mar.) Roberty 17240 (G); near Benty (June) Jacques-Felix 1709 (K, P); Nimba Mts., Schnell 3788 (IFAN, P).

Sierra Leone: near Wallia, Scarcies, Scott Elliot 4552 (K); near Moria, Scarcies (fr. Feb.) Scott Elliot 4480 (BM, GH, K, paratype); Musaia (fl. Feb., fr. Dec.) Deighton 4241 (K, P), 4262 (K), 4544 (K); Mowoleke bridge, Kamabai, Deighton 5438 (K); Sugarloaf Mt., near Freetown (Dec.) Scott Elliot 4015 (BM, GH, K, P, lectotype); *ibid.*, Deighton 5617 (K); Freetown (Apr.) Gledhill 474 (WAG), 479 (WAG); Matotaka, Thomas 1304 (K); Mayoso (Aug.) Thomas 1442 (K); Jigaya (Sept.) Thomas 2583 (K); Bumbuna (fr. Oct.) Thomas 3364 (K), 3845 (K); near Sinikoro, Jaeger 2041 (K); Loma Mts., Jaeger 7392 (WAG), 7437 (WAG), 8700 (WAG), 8731 (WAG), 8874 (WAG), 9341 (WAG); between Kondanbaia and Loma Mts., Morton & Gledhill SL 1137 (K); Rowal (July) Thomas 1036 (BR, K, P); near Taiama, Deighton 2555 (K); Njala (July) Deighton 2911 (K), 4816 (K); *ibid.* (?), Deighton 3190 (K); Mokunde, near Njala, Pyne 150 (K, P); Baiima, Deighton 5775 (K); Kasewe Hills For. Res. (June) Deighton 5828 (BR, K, P); Bumpe (fr. Nov.) Deighton 4839 (K), 4928 (K); Sumbuya, Deighton 2256 (K); near Pujehun (Apr.) Deighton 3691 (K); *sin. loc.*, Afzelius annis 1792–1794 (BM, UPS, also in herb. Thunberg 5277, paratype).

Liberia: Bomi Hills, Voorhoeve 813 (WAG); near Yoma, left bank Mahe R., NE. of Bomi Hills, Leeuwenberg 4856 (WAG); Gola Nat. For., Bomi Hills (Apr.) Bos 1925 (WAG); Boporo District, Baldwin 10340 (K); *ibid.*, Mecca (fr. Nov.) Baldwin 10398 (K); Stockton Creek, St. Paul's R. (May) Dinklage 2685 (A, B, PR, S, Z, distributed as *S. viridescens*); Dukwia R. (Feb.) Cooper 180 (BM, F, FHO, K, NY, US); near Haindii, near left bank St. Paul's R., 40 km N. of Kakata, Leeuwenberg & Voorhoeve 4916 (WAG); Du River (July) Linder 176 (A, K, LE); Totota range, Voorhoeve 415 (LIB, WAG); Gbata Ck., 32 km SW. of Suakoko, Leeuwenberg & Voorhoeve 4584 (WAG); Peátah, Linder 909 (A, K, LE); Jenneh (Apr.) Dinklage 2551 (B, distributed as *S. viridescens*); crossing Cestos R. and road Tapita-Zwedru (fl., fr. Apr.) J. de Wilde & Voorhoeve 3743 (BR, K, S, WAG); Grand Cess, Baldwin 11617 (K); Sino R., near Greenville, J. de Wilde 3777 (WAG); Ganta, Harley 583 (K), 1398 (K, LIB); *ibid.* (?) (May) Harley 1161 (LIB, WAG), 1411 (LIB, WAG); *ibid.* (?), Wanau (fr. Oct.) Harley 1756 (K, LIB); 10 km NE. of Ganta, Leeuwenberg & Voorhoeve 4591 (WAG); Sanokwele, Ganta District (fr. Feb.) Baldwin 9415 (K), 11025 (K); Nimba Mts., Leeuwenberg & Voorhoeve 4592 (WAG); *ibid.* (fl., fr. Jan.) van Meer 295 (WAG); km 28 of Zwedru-Kanweake Road (fl., fr. Feb.) van Meer 484 (WAG).

Ivory Coast: Pata-Idie, near Tabou, Guillaumet 1214 (ABI, WAG); Gliké, near Tabou, Schnell 1649 (IFAN, P); Grabo (July) Guillaumet 844 (ABI, WAG); Néromer, near Béréby (fr. Nov.) Oldeman 536 (WAG); near crossing of Hana R. and road Tai-Tabou (fl., fr. Mar.) J. de Wilde & Leeuwenberg 3600 (ABI, BR, FHO, K, S, WAG); *ibid.* (Oct.) W. de Wilde 1046 (WAG); *ibid.*, Guillaumet 1492 (ABI); N. of Troiya, 32 km SSE. of Tai (bud, fr. Mar.) J. de Wilde & Leeuwenberg 3564 (BR, K, S, WAG); between Troiya and Cavalley R., Aké Assi 6910 (WAG); N. of Tai, Leeuwenberg 3038 (WAG); Mt. Kouan, near Danané (Apr.) Chevalier 21272 (P); 10 km W. of Tapéguhé, right bank Sassandra R., about 50 km NW. of Soubré, Leeuwenberg 4521 (WAG); left bank Sassandra R., near Soubré, Leeuwenberg 3230 (WAG), 4085 (WAG); near Nigbi II, SSW. of Soubré, J. de Wilde 3270 (WAG); between Guidéko and Soubré (June) Chevalier 19100 (K, LY, P, cited as *S. caryophyllus*); 19 km W. of Guéyo, Leeuwenberg 4099 (WAG); 31 km S. of Gagnoa, Leeuwenberg 4508 (WAG); about 40 km W. of Sassandra (Apr.) Leeuwenberg 4060 (WAG); 56 km N. of Sassandra, E. of Béyo, Leeuwenberg 4001 (WAG); 49 km N. of Sassandra, near Dakpadou, Leeuwenberg 2856 (WAG); 34 km N. of Sassandra, bank Davo R. (Apr.) Leeuwenberg 4021 (WAG); 14 km N. of Sassandra, bank of Sassandra R. (Apr.) Leeuwenberg 3242 (BR, FHO, K, WAG), 4006 (WAG); Vavoua (fl., fr. Feb.) Roberty 7055 (G, Z); 31 km W. of Divo, along road to Lakota, Leeuwenberg 3989 (WAG); halfway Bouaflé-Daloo (Apr.) Leeuwenberg 3913 (ABI, WAG); *ibid.*, Aké Assi 6538 (WAG); Ouroumba Bocca, near Assakra, J. de Wilde 3224 (BR, K, WAG); Yapo, Roberty 12110 (G); 17 km W. of Abidjan, W. de Wilde 628 (WAG); bank la Mé R., near bridge in

Anyama-Alépé road, Leeuwenberg 4155 (WAG); N. of Alépé, Leeuwenberg 4161 (WAG); Alépé, Chevalier 17404 (P), 17895 (P); Aboisso, Chevalier 17765 (P); E. of Krinjabo, S. of Aboisso, Leeuwenberg 4482 (WAG); 15 km NE. of Bianouan, Leeuwenberg 3922 (WAG).

Ghana: near Tano R., about 75 km W. of Kumasi (fl., fr. Dec.) Oldeman 829 (WAG); E. of Bibiani, Adams 2007 (GC); Alabadi, near Elmina (Apr.) Scholes 289 (K); Josa Sacaco (?) (Apr.) Scholes 246 (K); between Worobong and Okraji, Afram Plains (May) Kitson 1138 (K); Achimota, Irvine 863 (FHO); Alaranyo, Hohoe District (fr. Oct.) St. Clair-Thompson 3591A (FHO); between Shiare and Chilinga (May) Morton A 3995 (K, WAG); sin. loc., Burton & Cameron s.n. (K, type of *S. zizyphoides*).

Dahomey: between Kétou and Lake Azzi, Chevalier 23030 (P).

Nigeria: Ilaro For. Res., Egbado District (fr. Dec.) Onochie FHI 31878 (FHI, K); Oloke-meji For. Res. (fr. Jan.) Taylor 116 (FHO); Gambari For. Res., Ibadan District, Onochie FHI 32235 (FHI, K); Owo, Ondo District (Apr.) Jones 3529 (FHO).

Cult.: Wageningen, seedling of herb. J. de Wilde & Leeuwenberg 3600, Ivory Coast, Hana R.: (fl. June, Nov.) Leeuwenberg 3560 (WAG), 7814 (WAG), 7816 (WAG); Adiopodoumé, Ivory Coast, seedling of herb. J. de Wilde & Leeuwenberg 3600: Leeuwenberg 4576 (WAG).

3. *S. angolensis* Gilg in Engler, Bot. Jahrb. 17: 571. 1893; Hiern in Cat. Welw. Afr. Pl. 1: 703. 1898; Baker in Fl. Trop. Afr. 4(1): 522. 1903; Duvigneaud, Lejeunia 11: 67. 1947; E. A. Bruce, Kew Bull. 1956: 157. 1956; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 29. 1960; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 43. 1963.

Fig. 4, p. 58; Map 3, p. 60

Type: Angola: Cuanza Norte, Pungo Andongo, Welwitsch 6020 (holotype destroyed in B; lectotype: BM, other isotypes seen: C, COI, G, K, LE, LISU).

Heterotypic synonyms: *S. lacourtiana* De Wild., Comp. d. Kasai 382. 1910. Type: Congo: Kasai, Bienge, Sapin C 11, Oct. 1907 (BR, holotype, photograph in K, neg. 2518; isotype: BR). Homotypic synonym: *S. angolensis* var. *lacourtiana* (De Wild.) Duvign., l.c. p. 71, pl. 15. f. 3–8, 10–11, pl. 16. f. 1a, 2–3.

S. bequaerti De Wild., Bull. Jard. Bot. Brux. 5: 42. 1915; Duvigneaud, l.c. 75, not De Wild., Rev. Zool. Afr. 10(1). Suppl. Bot. 5. 1922. Type: Congo: Katanga, near Lubumbashi, Bequaert 441 (De Wildeman errore 445) (BR, holotype; 2 sheets, fl. + veg., of latter photograph in K, neg. 2507).

S. likimiensis De Wild., Bull. Jard. Bot. Brux., l.c. p. 48. Type: Congo: Equateur, near Likimi, Malchair 504 (BR, holotype; isotype: BR, photograph in K, neg. 2506). Homotypic synonym: *S. angolensis* var. *likimiensis* (De Wild.) Duvign., l.c. p. 72, pl. 15. f. 12, pl. 16. f. 4.

S. mongonda De Wild., Bull. Jard. Bot. Brux. l.c. p. 50. Type: Congo: Equateur, near Likimi, Malchair 210 (BR, holotype; photograph in K, neg. 2505; isotype: BR).

S. cinnabarina Gilg ex Hutch. et Dalz., Fl. W. Trop. Afr. 2: 24. 1931 and Kew Bull. 1937: 335. 1937; Duvigneaud, l.c. p. 64, p. 15. f. 20–22. Type: Cameroun: Bipindi, Zenker 3430 (K, holotype; isotypes: BM, BR, E, G, GOET, HBG, L, M, MO, P, S, US, W, WU, Z).

S. nauphylla Duvign., l.c. p. 62, pl. 15. f. 25. Type: Congo: Katanga, Thielen, St. Jacques, Vanderyst 21536 (BR, holotype; photograph in K, neg. 2510).

S. tuvungasala Duvign., l.c. p. 76, pl. 15. f. 17–19, pl. 16. f. 5. Type: Congo:



FIG. 4. 1-7. *S. angolensis*: 1-2. branches, $\frac{1}{2} \times$; 3. flower, $5 \times$; 4. portion of corolla with stamen, $5 \times$; 5. fruit, $\frac{1}{2} \times$; 6. seed, $\frac{1}{2} \times$; 7. leaves, $\frac{1}{2} \times$ (1-4. Welwitsch 6020; 5-6. Breteler 1879; 7. Schlieben 1932, Welwitsch 4776, 6020). 8-13. *S. malacoclados*: 8-9. branches, $\frac{1}{2} \times$; 10. flower, $5 \times$; 11. portion of corolla with stamen, $5 \times$; 12. fruit (mostly larger), $\frac{1}{2} \times$; 13. leaves, $\frac{1}{2} \times$ (8-11. Bates 502; 12. J. de Wilde c.s. 3613; 13. Bates 502, Vigne 2515, Zenker 4571).

Katanga, km 3 of Likasi road, Ritschaert 1628 (BR, holotype; photograph in K, neg. 2511).

S. angolensis var. *latifolia* Duvign., l.c. p. 69, pl. 15, f. 9. Type: Congo: Kasai, Panzi, Vanderyst 15826 (BR, holotype; photograph in K, neg. 2508; isotype: BR).

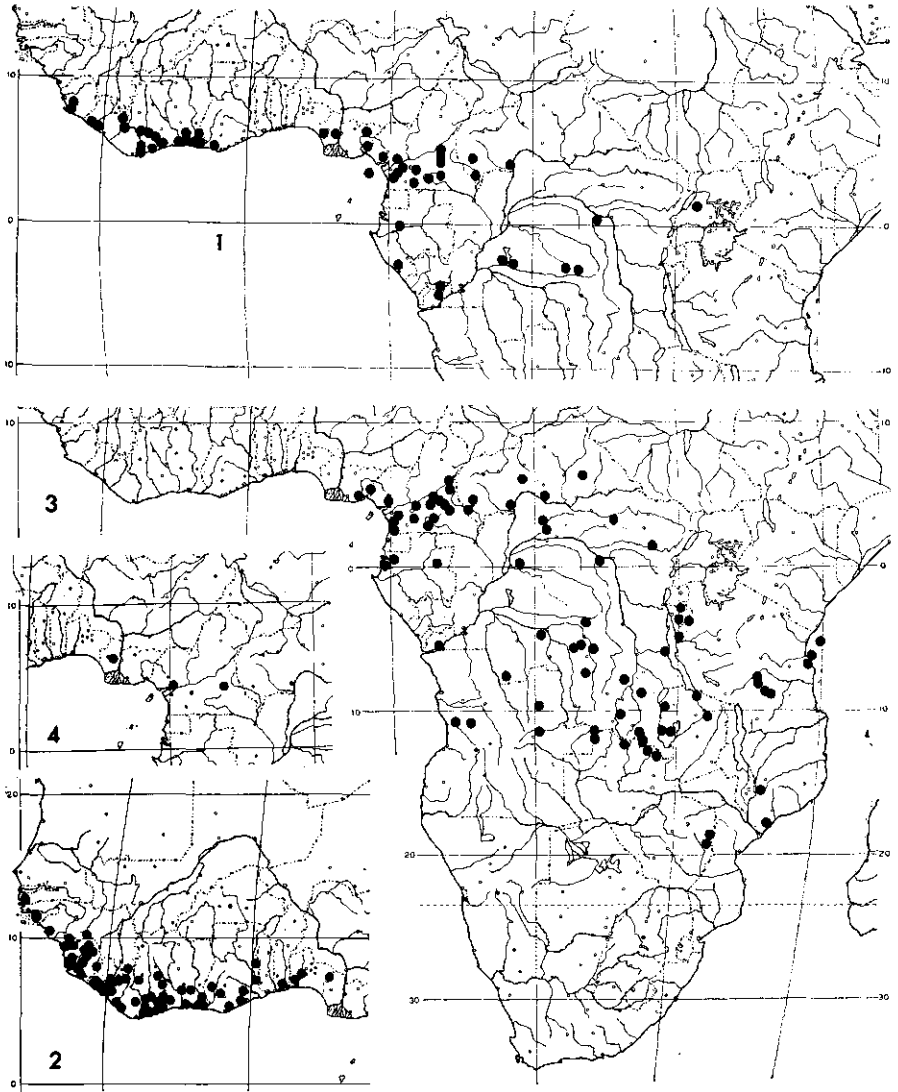
S. angolensis var. *tanganykae* Duvign., l.c. p. 70, pl. 15, f. 14. Type: Tanzania: Ulanga Distr., Mahenge, Schlieben 1932 (BR, holotype; photograph in K, neg. 2512; isotypes: B, BM, EA, LISC, M, P, SRGH, US, Z).

S. angolensis var. *tisseranti* Duvign., l.c. p. 70, pl. 15, f. 15–16. Type: Central African Republic: Mbokou and Kpalato Rs. junction, Bambari, Tisserant 449 (P, holotype).

S. cinnabarina var. *ctenotricha* Duvign., l.c. p. 65, pl. 15, f. 23. Type: Gabon: near Libreville, Klaine 2038 (P, holotype, photograph in K, neg. 2555; isotypes: BR, K, P).

S. cinnabarina var. *klaineana* Duvign., l.c. p. 67. Type: Gabon: near Libreville, Klaine 1540 (P, holotype, photograph in K, neg. 2556; isotypes: BR, K).

Climbing shrub or liana, 3–30 m high climbing over shrubs and in trees, or small semiscandent tree, 5–12 m high. Trunk 4–20 cm in diam. Bark smooth, thin, pale brown, not or slightly lenticellate, on section pale yellow; wood pale yellow. *Branches* not lenticellate, medium to dark brown when dry, usually hairy like the branchlets; branchlets ochraceous-pubescent, green, terete, not sulcate and medium brown when dry. Tendrils solitary, in the axils of small triangular bracts. *Leaves*: petiole ochraceous-pubescent, mostly transversely rugose when dry, 1–5(6) mm long; blade shining or mat and medium to dark green above, paler and with often dark veins beneath, papyraceous, coriaceous, or subcoriaceous, thinner in the shade, also when living, very variable in shape and size, ovate, broadly ovate, elliptic, narrowly elliptic, or narrowly ovate, 1–3.5 × as long as wide, broadest on the main axis and at the base of the branchlets, 1.8–7(10) × 1–4(5) cm, usually obtuse and apiculate, but often acute, sometimes obtusely acuminate or emarginate at the apex, rounded, cuneate, or sometimes subcordate at the base, glabrous or ochraceous-pubescent beneath on the costa and main secondary veins, especially at the base, and above on the costa near the base; one or two pairs of secondary veins from or from above the base curved along the margin; tertiary venation inconspicuous above, prominent beneath. *Inflorescence* axillary and sometimes also terminal, solitary, lax, few-flowered, about 0.5–1 × as long as the leaves, 1–5.5 × 0.6–2 cm, sometimes transformed into rose-like galls. Lateral branches usually 3-flowered. Peduncle and branches slender, ochraceous-pubescent as the very short pedicels. Bracts narrowly triangular or sepal-like, above glabrous or sometimes pubescent and with some large colleters at the base, beneath usually pubescent. *Flowers* 4–5-merous, even in a single inflorescence. *Sepals* pale green, equal or sometimes unequal and the larger about twice the size of the smaller, connate at the base up to one-third of their length, broadly ovate, 0.7–1.2 × as long as wide, (0.5)0.8–1.2 × (0.5)0.7–1 mm, acute or obtuse at the apex, glabrous on both



MAP 1. *S. aculeata*; Map 2. *S. afzelii*; Map 3. *S. angolensis*; Map 4. *S. asterantha*.

sides, ciliate, without colleter. *Corolla* in the mature bud 2.5–3 × as long as the calyx, 2–2.5 mm long, white or yellow, fading from white to yellow, subrotate, 4–4.5 mm in diam., glabrous or minutely papillose-pubescent outside, inside on the base of the lobes densely pilose with dirty white hairs (sometimes complete lobes pilose); tube very short, shorter than the calyx, 0.4–0.6 mm long; lobes ovate to triangular, 2.7–4.5 × as long as the tube, comparatively wider

in 4-merous flowers, 1.2–1.7 × as long as wide, 1.5–2 × 1–1.4 mm, acute, spreading. *Stamens* just exerted; filaments about as long as the anthers, inserted at the mouth of the corolla tube; anthers yellow, glabrous, ovate or sub-orbicular, 0.5–1 × 0.5–0.8 mm, deeply cordate at the base; cells parallel or slightly divergent at the base. *Pistil* glabrous, 1.2–1.6 mm long; ovary globose or broadly ovoid, 0.8–1.2 × 0.6–0.9 mm, more or less gradually narrowed into the style; style short or very short, 0.1–0.7 mm long; stigma capitate. In each cell 4–6 ovules. *Fruit* orange or red, immature glaucous, small, soft, ellipsoid or globose, 12 × 12–22 × 18 mm, 1-seeded, with smooth skin, slightly shining or mat, obliquely pedicellate. Wall thin, 1 mm thick. Pulp slimy, dirty brown. Seed shining when living, dark brown, smooth, approximately bean-shaped with an impressed hilum or ellipsoid, 8.5 × 6 × 5–15 × 11 × 9 mm, glabrous; testa very thin, easily rubbed off.

Distribution: Nigeria, Central and East Africa.

Ecology: On river banks in rain forests or in gallery forests; alt. 0–1500 m.

Nigeria: Eket District, Talbot anno 1913 (BM, K, Z); Oban Forest, Orem Res., Onochie FHI 36285 (FHI).

Cameroun: 24 km NE. of Douala, along road to Edéa, Breteler, J. de Wilde & Leeuwenberg 2578 (WAG); bank Lokoundjé R., near Ebéa, Leeuwenberg 5618 (WAG); Bipindi, Zenker 3430 (BM, BR, E, G, GOET, HBG, K, L, M, MO, P, S, US, W, WU, Z, type of *S. cinnabarina*), 3808 (BM, BR, E, G, GOET, HBG, K, L, LE, LY, M, MO, P, S, US, W, WRSL, WU, Z), (fl.) June 1907 (F), Nov. 1908 (F); bank Nyong R., about 65 km SSW. of Eséka, W. de Wilde 2730 (WAG); Nachtigal, bank Sanaga R., Leeuwenberg 6014 (WAG); bank Nyong R., 40 km SE. of Yaoundé (fr. Nov.) Breteler 1647 (BR, K, P, WAG, YA), 2010 (P, WAG); Biteye, about 60 km ENE. of Sangmélima, Bates 1791 (K); Lomié area, Dja R. (May) Mildbraed 5377 (HBG, cited as *S. hippocrateoides*); S. of Nguélémendouka, Breteler 2049 (WAG, YA); 27 km N. of Bertoua, near Gounté, Breteler c.s. 2376 (K, P, WAG); *ibid.*, Leeuwenberg 7340 (WAG); W. of Bertoua (fr. Sept.) Breteler 1879 (BR, K, P, WAG, YA); E. of Bertoua (Apr.) Breteler 1300 (BR, K, P, WAG, YA); bank Sanaga R., near Ebaka, Breteler 1444 (BR, K, P, WAG, YA); *ibid.*, Leeuwenberg 7387 (WAG); NW. of Deng Deng, near Lom and Djerem Rs. junction, Mildbraed 8342 (K); km 5 of road Bétaré Oya-Bertoua (Feb.) Breteler 1072 (BR, K, P, WAG, YA); Kongola (Apr.) Mildbraed 9026 (BM, K); bank Kadeï R., 40 km SSE. of Batouri (fr. Apr.) Letouzey 4860 (BR, K, P, WAG, YA); bank Kadeï R., 15 km SSE. of Batouri (fr. Mar.) Letouzey 4626 (P, WAG, YA).

Central African Republic: near Gamboula, bank Kadeï R., Leeuwenberg 7300 (WAG); bank Mambéré R., S. of Carnot, Leeuwenberg 7231 (WAG); Boukoko, N. of Bangui (fl. Sept., fr. June) Tisserant 2137 (P, WAG), 2589 (P); near conjunction of Mbokou and Kpalato Rs., Bambari Region (Jan.) Tisserant 449 (P, type of *S. angolensis* var. *tisseranti*); Wuwilé R., near Bambari (Oct.) Tisserant 768 (P, WAG); Dekoua, Chevalier 10618 (P); near Yalinga (fr. Feb.) Le Testu 4149 (P, WAG), 4585 (P).

Gabon: Cristal Mts., N. Hallé & Villiers 5276 (P); Cap Esterias (fr. Feb.) N. Hallé & Villiers 5440 (P), 5467 (P); near Libreville (fl., May–July, fr. June) Klaine 1540 (BR, K, P, type of *S. cinnabarina* var. *klaineana*), 2038 (BR, K, P, type of *S. cinnabarina* var. *stenotricha*), 2962 (P), 3242 (P, WAG), 3417 (P); Bélinga (fr. Nov.) N. Hallé 3303 (P).

Congo (Kinshasa): Léopoldville: Gombe Matadi, Thysville Territory (fr. Mar.) Compère 1767 (BR, K); near Panzi, Vanderyst 15826 (BR, type of *S. angolensis* var. *latifolia*), 17138 (BR). Equateur: Bolomba (fr. Nov.) Evrard 2740 (BR); near Likimi (Jan., Mar.) Malchair 210 (BR, type of *S. mongonda*), 504 (BR, type of *S. likimiensis*); Popolo, Budjala Territory (fr. Sept.) Evrard 1841 (BR, WAG). Orientale: near Bambesa, Pittery 536 (BR); Yangambi (Aug.) Louis 10664 (BR, K, MO, PRE), 16967 (BR); *ibid.*, Bolema 235 (BR, WAG); *ibid.*,

A. Léonard 101 (BR, WAG); *ibid.*, Yafunga 123 (BR). Kivu: Irangi Res., km 110 of road Kavumu-Walikale (July-Aug.) Troupin 4039 (BR, EA, K, LISC, P, WAG), 12529 (BR), 12588 (BR), 12608 (BR). Kasai: Bienge, Sapin C 11, Oct. 1907 (BR, type of *S. lacourtiana*); Tohanga, Lodja Territory, Germain 8020 (BR); Nsadi, Dibaya Territory (Jan.) Liben 2354 (BR, K, WAG); Merode, Vanderyst 23304 (BR); Thielen, St. Jacques, Vanderyst 21536 (BR, type of *S. nauphylla*). Katanga: bank Kafubwe R., E. of Lula, Symoens 6233 (BR); near Albertville, Schmitz 1588 (BR, PRE); Kisanga (Aug.) Quarré 5117 (BR); Kafubwe R. bank, Sakania Territory (fr. Sept.) Schmitz 6681 (BR, WAG); Banio, bank Kalule R., Likasi Territory, Schmitz 3872 (BR), 7778 (BR, K, WAG); SW. of Lubumbashi (Mar.-Apr.) Schmitz 2174 (BR, PRE), 3501 (BR); Likasi Road (Mar.) Ritschaert 1628 (BR, type of *S. tuvungasala*); near Lubumbashi (May) Bequaert 441 (type of *S. bequaerti* De Wild. 1915); Musoshi, 50 km SE. of Lubumbashi (Apr.) Schmitz 3551 (BR).

Burundi: Gisuru Mollo, Michel & Reed 502 (BR); Kiofi, Mosso, Michel & Reed 1350 (BR, PRE); Kiharo, Mosso, Michel & Reed 1652 (BR, PRE); Kininya, Mosso, Michel 2454 (BR).

Angola: Gabela (June) Gossweiler 4462 (BM, COI, K, NLD); Pungo Andongo (fl. Feb., Dec., fr. Dec.) Welwitsch 1230 (BM, LISU), 4776 (BM, LISU), 4777 (BM, LISU), 6020 (BM, C, COI, G, K, LE, LISU, P, type); Dala, Luanda Region, Gossweiler 11217 (COI, LISJC), 11619 (COI); near Vila Henrique de Carvalho, Lunda (Apr.) Exell & Mendonça 931 (BM, LISC, LISJC).

Tanzania: Ititie, Kigoma area (fr. Dec.) Azuma 1030 (EA); N. of Kibondo, Proctor 403 (EA, FHO, K); bank of Mukugwe R., 50 km S. of Kibondo (July) Eggeling 6212 (EA, K); Rondo R., Iringa District (Aug.) Carmichael 94 (EA, FHO, K, PRE); Magombera For. Res., Ulanga District, Semsei 3374 (BR, EA, K), 3399 (EA, K); Mahenge Plateau (Mar.) Schlieben 1932 (B, BM, BR, EA, LISC, M, MO, P, SRGH, US, Z, type of *S. angolensis* var. *tanganykae*); Pugu Road, SE. of Dar es Salaam (June) Vaughan 2829 (BM, EA, K). Pemba: Chake Chake Ck., Burt-Davy 22499 (FHO), 22528 (FHO); *ibid.*, Greenway 2782 (EA, K); *ibid.* (Aug.) Vaughan 297 (BM, EA), 521 (EA, FHO); Wesha, Vaughan 529 (EA, FHO); Ngezi Forest, Burt-Davy 22367 (FHO). Zanzibar: Nhonda (?), Sacleux 2602 (P).

Zambia: Kalene Hill, Mwinilunga District (fr. Sept.) White 3281 (BR, FHO, K); Biriuteshi (?), Mwinilunga District (fr. Nov.) Lewis 6180 (K); Mulungu Stream, Solwezi District, Milne-Redhead 616 (BR, K); SE. of Solwezi, White 3197G (FHO, K); Mufulira (fl. Mar., fr. Oct.) Fanshawe 1637 (K), 2124 (BR, K, SRGH); Kitwe (Feb.-Mar.) Fanshawe 2105 (BR, EA, K, LISC, SRGH), 2122 (BR, K), 2387 (BR, EA, K, LISC), Kitwe 1 (WAG); *ibid.*, Mutimushi 1373 (K, WAG); Ndola, Humbert 16870 (P); Ft. Rosebery (fr. Nov.) Mutimushi 1111 (K); Samfya (fr. Nov.) Mutimushi 1165 (K); *ibid.*, White 3119 (BM, BR, FHO, K, PRE), 3119A (FHO); *ibid.*, bank Mukula R., Symoens 9629 (K); 20 km S. of Kwambwa Boma (fr. Oct.) White 3530 (FHO, K); Mbesuma area (fr. July) Astle 838 (K, SRGH); above Lunzua R., Abercorn District, Richards 10193A (K); bank of Pungwe R., Inyanga District (fr. Oct.) Flowers 2346 (K, WAG); Pungwe Gorge, Inyanga District (Sept.) H. Wild 4613 (K, LISC, SRGH); Hondi R. Valley, Chase 836 (BM, SRGH).

Moçambique: Zambezia: 42 km from Lioma, between Lioma and Gurué Rs. (Sept.) Barbosa & Carvalho 4096 (K, PRE); between Quelimane and Marral (Sept.) Torre 3445 (LISC).

Cult.: Wageningen, seedling of herb. Breteler 1879; Leeuwenberg 7820 (WAG).

Note: *S. angolensis* is closely allied to *S. malacoclados* (q.v.).

4. *S. asterantha* Leeuwenberg, sp. nov.

Fig. 5, p. 63; Map 4, p. 60

Liana silvae ripariae. Cirrhi per 1-3 paria dispositi. Folia petiolata laminis coriaceis ellipticis apice acuminatis utrinque glabris. Inflorescentia parva gracilis axillaris pauciflora. Flores minimi tetrameri. Sepala pallide viridia

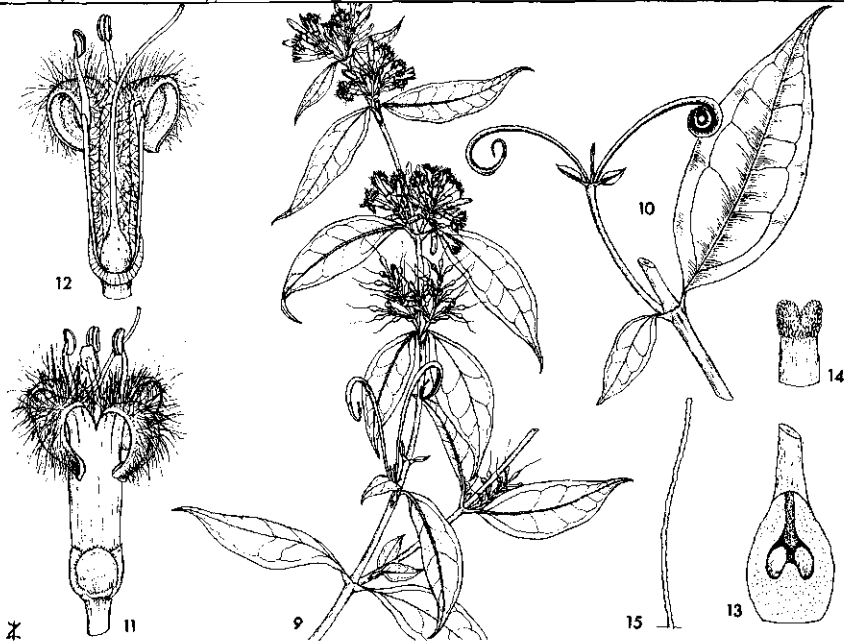
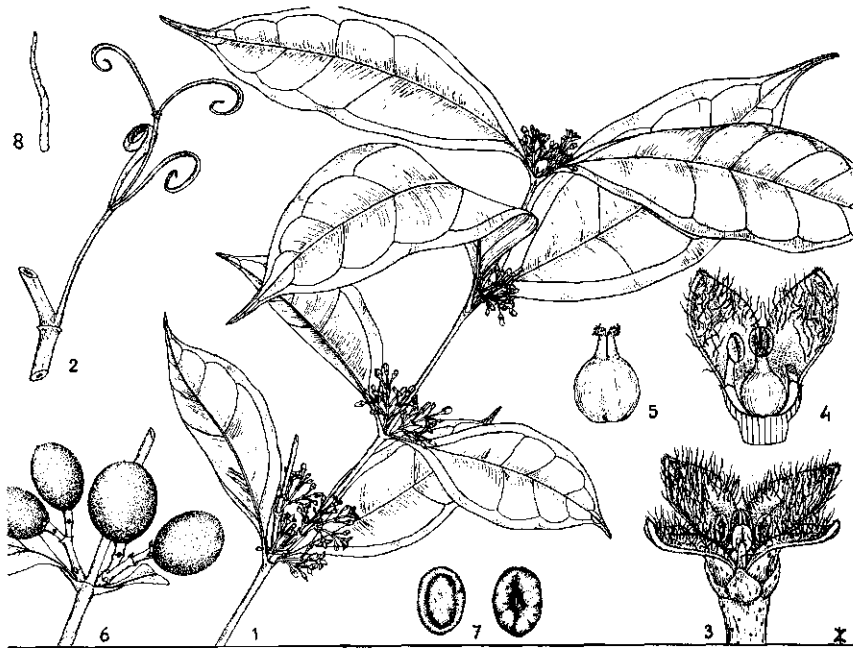


FIG. 5. 1-8. *S. asterantha*: 1. branch, $\frac{1}{2} \times$; 2. tendrils, $\frac{1}{2} \times$; 3. flower, $10 \times$; 4. opened flower, $10 \times$; 5. pistil, $15 \times$; 6. fruits, $\frac{1}{2} \times$; 7. seed both sides, $\frac{1}{2} \times$; 8. hair of corolla, $40 \times$ (1. Leeuwenberg 5247; 2. Leeuwenberg 7363; 3-5 and 8. Breteker 2963; 6-7. Leeuwenberg 6999). 9-15. *S. canthioides*: 9. branch, $\frac{1}{2} \times$; 10. branch with tendrils, $\frac{1}{2} \times$; 11. flower, $5 \times$; 12. opened flower, $5 \times$; 13. longitudinal section of ovary, $15 \times$; 14. stigma, $40 \times$; 15. hair of corolla, $30 \times$ (9-15. Leeuwenberg 7008).

triangularia vel suborbicularia apice acuta utrinque glabra. Corolla pallide flava extus glabra intus lobis pilosa. Stamina fauce corollae inserta filamentis antherisque glabris. Pistillum glabrum ovario biloculari. Fructus aurantiacus parvus ellipsoideus mono- vel bispermus semine ellipsoideo uno latere profunde excavato ut videtur papilloso papillis falsis pilis incurvatis compositis.

Type: Cameroun: 27 km SW. of Bertoua, near Doumé, Breteler 2963 (WAG, holotype; isotypes: A, BR, FI, K, LISC, M, P, SL, UC, YA, Z).

Liana 10 m high climbing in trees, 20 m long or more. Trunk 3 cm in diam. or more. Bark dark brown, with large lenticels; wood yellowish or pale yellow. *Branches* dark green to black, not lenticellate, terete, when dry medium brown and not sulcate; branchlets glabrous, dark green, when dry pale greenish-brown or medium brown, with epidermis peeling off, and often slightly sulcate. *Tendrils* in 1-2 pairs. *Leaves*: petiole glabrous, 4-7 mm long; blade dull or slightly shining on both sides, medium green above, pale green, with paler midrib, and dark green venation beneath, coriaceous also when living, elliptic, (1.5)2-3 × as long as wide, (3)5-11(15) × (1.2)2.5-6 cm, acuminate at the apex, cuneate at the base, glabrous on both sides; one inconspicuous pair of secondary veins curved along the margin; tertiary venation not very conspicuous, reticulate, prominent on both sides (in dry leaves); margin slightly revolute. *Inflorescence* axillary, rather congested, small, few-flowered, about 1 × 1 cm, slightly larger when in fruit, 2 × irregularly branched; branches subopposite. Peduncle, branches, and pedicels thin, glabrous. Bracts small, narrowly triangular, glabrous above, without colleters. *Flowers* 4-merous. *Sepals* pale green, connate at the base up to about one-third of their length, equal or subequal, triangular to suborbicular, 0.5 × 0.5 mm, acute at the apex, minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 3.5 × as long as the calyx, 1.8 mm long, and rounded at the apex, pale yellow, outside glabrous, inside pilose all over the lobes; tube very short, 0.3 mm long; lobes oblong, 5 × as long as the tube, 1.5 × 0.9 mm, acute, spreading. *Stamens* exerted; filaments slightly longer than the anthers, 0.6 mm long, glabrous, inserted at the mouth of the corolla tube; anthers oblong, 0.5 × 0.3 mm, deeply cordate at the base, glabrous; cells parallel. *Pistil* glabrous, 0.8 mm long; ovary broadly ovoid, 0.5 × 0.5 mm, 2-celled, rather abruptly narrowed into the style; style very short, 0.3 mm long; stigma capitate. In each cell 2 ovules. *Fruit* orange, immature dark green with glaucous bloom, 16 × 11 × 10-22 × 20 × 20 mm, 1-2-seeded. Wall thin. *Seed* flattened, obliquely elliptic, at one side with a deep pit, at the other with a bulge surrounded by a shallow groove, seemingly papillose; false papillae simulated by short curved hairs. Testa thick.

Distribution: Nigeria, Cameroun.

Ecology: Secondary forests, or riverine and gallery forests; alt. 0-700 m.

Nigeria: Sapoba For. Res., Ugboko District (June) Onochie FHI 31247 (FHI, K).

Cameroun: 17 km E. of Kopongo, along road to Masok, right bank Bolobo R. (fl. Mar., Aug., fr. Oct.) Leeuwenberg 5247 (WAG), 6288 (WAG), 6999 (WAG), all numbers of same

plant; 27 km SW. of Bertoua, near Dimako (May) Breteler 2963 (A, BR, FI, K, LISC, M, P, SL, UC, WAG, YA, Z, type); 10 km N. of Doumé, along road to Bertoua, Leeuwenberg 7373 (WAG).

Note. This species resembles *S. malchairii* De Wild. by the dull leaves, but differs strikingly by the tendrils in 1–2 pairs instead of solitary and the thin corolla lobes which are entirely pilose inside instead of thick and with recurved apical brushes.

5. *S. barteri* Solered. in Engler, Bot. Jahrb. 17: 556. 1893; Oliver in W. J. Hooker, Icones 23: t. 2284. 1894; Baker in Fl. Trop. Afr. 4(1): 523. 1903; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 24. 1951; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 44. 1963. **Fig. 6, p. 66; Map 5, p. 73**

Type: S. Nigeria: Onitsha, Barter 1246 (holotype not seen, destroyed in B; lectotype: K, other isotypes seen: GH, LE, P).

Large liana, 30–100 m long and 10–40 m high climbing in trees. Trunk 3–16 cm in diam. Bark dark brown, with large lenticels; wood hard, pale yellowish. *Branches* not lenticellate, sometimes slightly sulcate when dry; branchlets glabrous, medium to dark green, pale or dark brown when dry, terete, not sulcate. Tendrils in 1–3 pairs. *Leaves*: petiole glabrous, 4–10 mm long; blade in flowering branches: shining and pale to dark green above, hardly shining and slightly paler beneath, often drying black and/or turning greyish beneath, coriaceous also when living, elliptic, narrowly elliptic, or narrowly obovate, 1.5–2.8 × as long as wide, 3–10 × 1.5–6 cm, rounded, apiculate, or shortly acuminate at the apex, cuneate at the base, glabrous on both sides; one pair of secondary veins from somewhat above the base curved along the margin and often a faint submarginal pair; tertiary venation reticulate, prominent on both sides; in shade-branches (differential characters only): often much larger, but very variable in shape and size, thinly coriaceous or papyraceous, usually more shining beneath, up to about 20 × 8 cm, acuminate to caudate at the apex, cuneate or rounded at the base; on main axis: suborbicular, cordate, or nearly so, 1–1.5 × as long as wide, about 3 × 2.5–7 × 6 cm, rounded or cordate at the base, rounded to acuminate at the apex; main secondary veins from or from above the base. *Inflorescences* axillary, several together, congested or sometimes not, 0.2–0.4 × as long as the leaves, 1–3 × 1–2 cm, 2–3 × branched, few-flowered. Peduncle, branches, and pedicels glabrous, short. Bracts ovate, approximately shovel-shaped, and about 3 × as long as the sepals, or sepal-like, glabrous. *Flowers* 4-merous. *Sepals* equal, connate at the base up to one-quarter of their length, ovate to suborbicular, 1.4–2 × as long as wide, 1–1.5 × 0.7–1.1 mm, acute, obtuse, or rounded at the apex, minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 4–6 × as long as the calyx and 5.8–7 mm long, white, outside glabrous, inside pilose on the base of the lobes and on the tube except for the glabrous base;

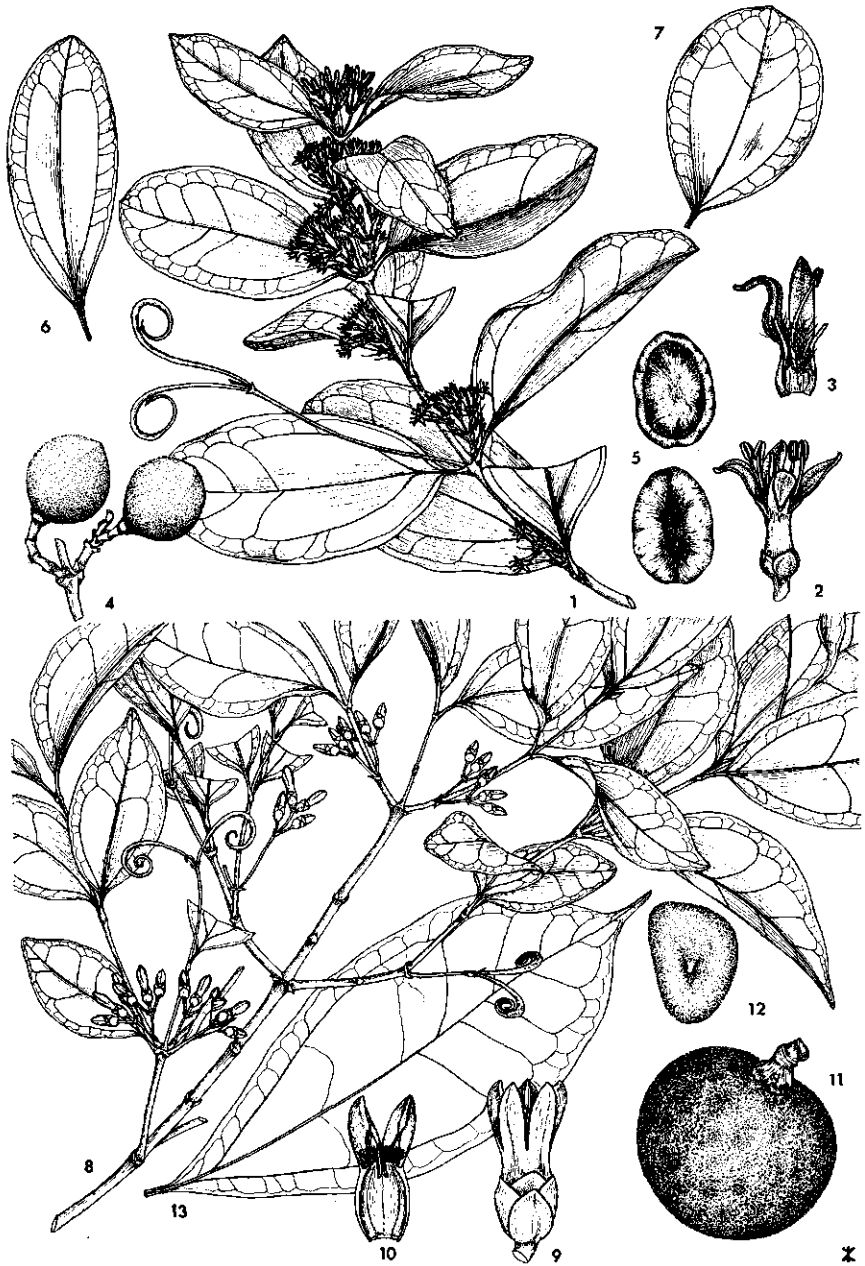


FIG. 6. 1-7. *S. barteri*: 1. branch, $\frac{1}{2} \times$; 2. flower, $3 \times$; 3. portion of corolla with stamen, $3 \times$; 4. fruits, $\frac{1}{2} \times$; 5. seed, two sides, $1 \times$; 6-7. leaves, $\frac{1}{2} \times$ (1-3. Barter 1247; 4-5. Leeuwenberg 3855; 6. FHI 16060; 7. FHI 3363); 8-12. *S. nigritana*: 8. branch, $\frac{1}{2} \times$; 9. flower, $2 \times$; 10. portion of corolla with stamen, $2 \times$; 11. fruit, $\frac{1}{2} \times$; 12. seed, $1 \times$; 13. leaf, $\frac{1}{2} \times$ (8. Irvine 2766; 9-10. FHI 21957; 11-12. J. de Wilde c.s. 3602; 13. Freeman 319).

tube about twice as long as the calyx, 0.9–1.5 × as long as the lobes, 2.8–4.5 mm long, slightly widened towards the throat; lobes oblong, 2–3.5 × as long as wide, 2.5–3.2 × 0.9–1.3 mm, acute, recurved. *Stamens* well-exserted; filaments glabrous or sparsely pubescent, about twice as long as the anthers, 1–2.5 mm long, elongating at anthesis, inserted at the mouth of the corolla tube; anthers oblong, 0.6–1.1 × 0.4–0.6 mm, glabrous, rounded at the base; cells parallel. *Pistil* glabrous, 4–6 mm long; ovary globose or ovoid-conical, 1 × 1 mm, 2-celled, rather abruptly narrowed into the style; style 3–5 mm long, elongating at anthesis, thin; stigma obscurely bilobed. In each cell 10 ovules. *Fruit* orange, obliquely ellipsoid or obovoid, 20 × 16 × 15–32 × 22 × 22 mm, 1- or several-seeded. Wall thin, rather hard, 1–2 mm thick. *Seed* white (in dry fruits often dark brown), obliquely ellipsoid, 13 × 10 × 4–20 × 14 × 10 mm, at one side with a deep pit, at the other with a bulge surrounded by a shallow groove, seemingly papillose; false papillae simulated by short curved hairs.

Distribution: West Africa.

Ecology: Mostly on river banks in rain forests, montane rain forests, and secondary forests, which are often periodically inundated; alt. 0–1300 m.

Guinea: Niger R. source, Jaeger 103 (WAG); Nimba Mts., Schnell 3497 (P), 4397 (ABT).

Sierra Leone: Rowal, Thomas 1055 (K); Tingi Mts., N. Kono (fr. Apr.) Morton & Gledhill SL 1920 (WAG); near Madina, Limba (fl., fr. Apr.) Scott Elliot 5569 (K), 5659 (K); Loma Mts. (Mar.) Jaeger 1615 (K, WAG), 7108 (WAG), 7653 (WAG), 8499 (WAG), 8503 (WAG), 9673 (WAG).

Liberia: Bong Range, 32 km N. of Kakata, Leeuwenberg & Voorhoeve 4964 (WAG); Ganta (?), Harley s.n. (LIB); Nimba Mts. (fr. Jan.) Adam 20554 (K, P); *ibid.*, Leeuwenberg & Voorhoeve 4688 (WAG), 4747 (WAG), 4761 (WAG); near Nimba Mts., Mt. Bélé (fr. Mar.) Adam 21222 (P).

Ivory Coast: W. of road Tai-Tabou, between Troiya and Cavally R., Aké Assi 6911 (WAG), 6915 (UCI); ENE. of Néromer, Guillaumet 1379 (ABI, WAG); Mt. Tonkouï, Aké Assi 5520 (WAG), 6946 (WAG); *ibid.* (fr. Apr.) Leeuwenberg & Bouquet 3855 (ABI, WAG); 10 km W. of Tapéguhé, right bank Sassandra R., about 50 km NW. of Soubré, Leeuwenberg 4511 (WAG); Guidéko, near Sassandra R. (fr. May) Chevalier 16351, partly (P), 16360 (P); 31 km S. of Gagnoa, bank Davo R., Leeuwenberg 4116 (WAG); about 30 km SW. of Guéyo, Leeuwenberg 4103 (WAG); 56 km N. of Sassandra, E. of Béyo, Leeuwenberg 3996 (WAG); about 25 km W. of Sassandra, Leeuwenberg 4037 (WAG); 72 km N. of Sassandra, along road to Lakota, Leeuwenberg 4077 (WAG); Affouka, bank la Mé R., Adzopé Road (fr.) Debray 24 Jan. 1964 (WAG); Forêt du Téké, Aké Assi 6892 (WAG); 15 km N. of Aboisso, Leeuwenberg 4500 (WAG); about 15 km NE. of Bianouan, Leeuwenberg 3952 (WAG); Abengourou (fr. Feb.) Aké Assi 6969 (UCI).

Ghana: near Elmina (?), Scholes 47 (GC).

Nigeria: Shasha For. Res., Ijebu Province (Feb.) Richards 3094 (BM, BR, COI, GB, LISC, MO, NY, S, US, WAG), 3429 (BM, MO); Omo and Shasha For. Res., E. of Sunmoge, Keay FHI 16060 (FHO, K); Ubulubu, Thomas 2265 (K); Idanre, Ondo District (fl., fr. Apr.) Symington FHI 3363 (FHI, FHO); Onitsha, Barter 1247 (GH, K, LE, P, type), 1759 (K).

Cameroun: about 20 km W. of Victoria, Leeuwenberg 6910 (WAG); 3 km S. of Victoria, near Bimbia, Leeuwenberg 6960 (WAG), 6961 (WAG).

Cult.: Adiopodoumé, Ivory Coast, seedling of herb. Leeuwenberg & Bouquet 3855; Leeuwenberg 4570 (WAG).

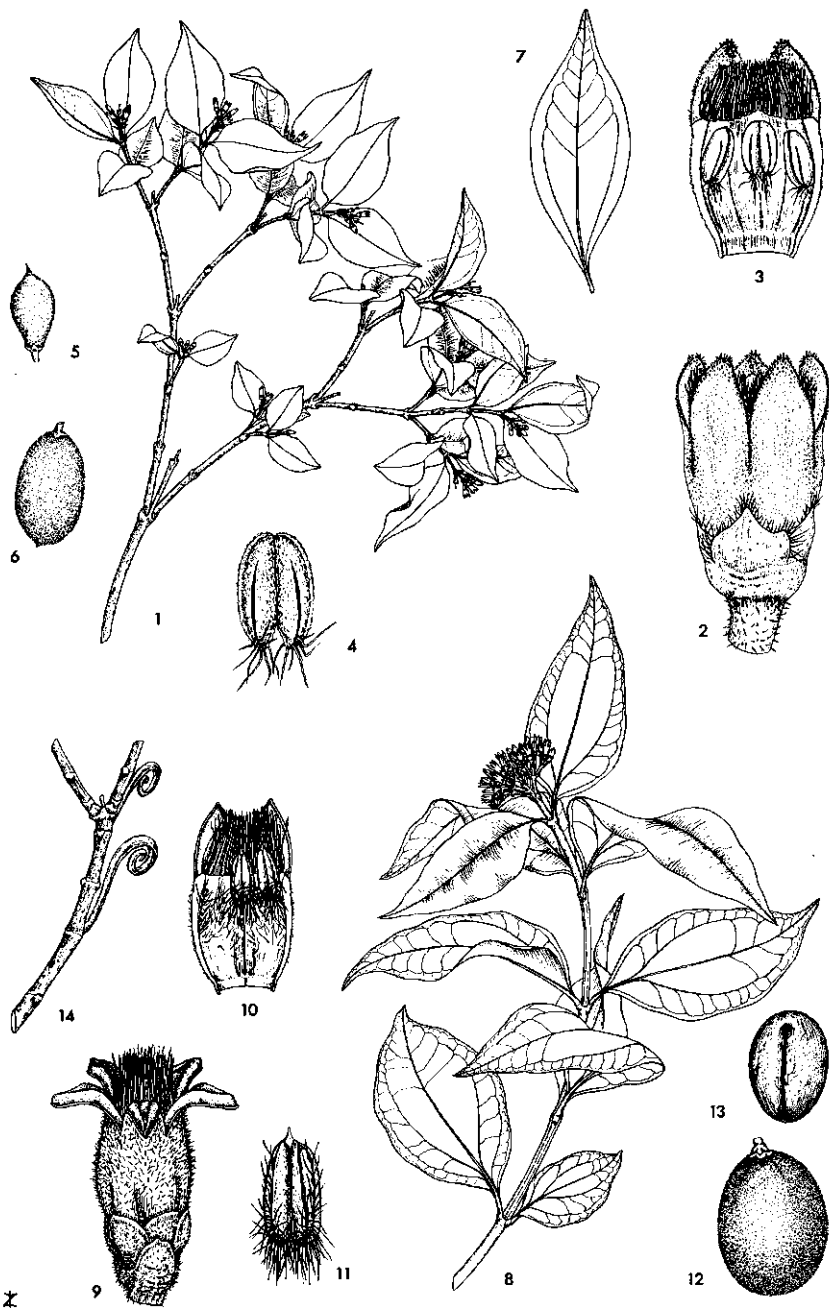


FIG. 7. 1-7. *S. bifurcata*: 1. branch, $\frac{1}{2} \times$; 2. flower, $10 \times$; 3. portion of corolla with stamens $10 \times$; 4. anther, $20 \times$; 5. immature fruit, $1 \times$; 6. mature fruit, $1 \times$; 7. leaf, $\frac{1}{2} \times$ (1-4. Res. Nat. 9719; 5, 7. Perrier de la Bâthie 9558; 6. Serv. For. 12851); 8-14. *S. diplotricha*: 8. branch, $\frac{1}{2} \times$; 9. flower, $5 \times$; 10. portion of corolla with stamens, $10 \times$; 11. anther, $10 \times$; 12. fruit, $1 \times$; 13. seed, $1 \times$; 14. branch with tendrils, $\frac{1}{2} \times$ (8-11. Humbert 28340; 12-13. Perrier de la Bâthie 16941; 14. Humbert 30025).

Note. The only clearcut differential character distinguishing *S. barteri* from *S. gossweileri* is the length of the filaments:

S. barteri:

Filaments about $2 \times$ anthers.

S. gossweileri:

Filaments $0.2-1 \times$ anthers.

6. *S. bifurcata* Leeuwenberg, sp. nov.

Fig. 7, p. 68; Map 6, p. 73

Arbor parva ramis saepissime bifurcatis inermibus. Folia breviter petiolata laminis subcoriaceis ovatis vel ellipticis apice acuminatis. Inflorescentia terminalis perparva laxa pauciflora pedunculo pedicellisue pubescentibus. Flores pentameri parvi. Calyx cupuliformis. Corolla extus glabra, intus basi loborum subreceptorum penicillata. Stamina inclusa filamentis brevibus medio tubo insertis antheris oblongis pilis basi cordata barbatis. Pistillum glabrum ovario biloculari. Locula placentis ovula pauca gerentibus. Fructus monospermus ellipsoideus. Semen ellipsoideum testa laevi glabra.

Type: Madagascar: Andromomavo Canton, Soalala District, Randriamiera in coll. Res. Nat. 9719 (P, holotype; isotype: WAG).

Tree, 5–10 m high. *Branches* not lenticellate, pale grey or pale brown, repeatedly dichotomously branched; branchlets brown-pubescent, often sulcate when dry. *Leaves*: petiole short, pubescent, 1–4 mm long; blade slightly shining on both sides or not, somewhat paler beneath, thinly coriaceous, ovate, elliptic, or narrowly elliptic, $1.5-3 \times$ as long as wide, $15-70 \times 10-28$ mm, obtusely or acutely acuminate at the apex, cuneate at the base, minutely pubescent on the costa above and sometimes also beneath; one pair of secondary veins from or from above the base curved along the margin; tertiary venation not or slightly prominent on both sides. *Inflorescence* terminal, very small, lax, few-flowered, $0.5 \times 0.5-1 \times 1$ cm, $1 \times$ branched. Peduncle, branches, and pedicels pubescent. Bracts small, approximately sepal-like. *Flowers* 5-merous. *Calyx* cup-shaped; sepals halfway connate, equal or subequal, nearly triangular, $1-1.4 \times 0.8-1.2$ mm, acute at the apex, minutely ciliate, glabrous on both sides or outside with a single hair, without colleters. *Corolla* in the mature bud $2.5 \times$ as long as the calyx, 3–3.5 mm long, white (?), outside glabrous, inside with a brush of stiff white (?) hairs on the base of each lobe; tube $1.6 \times$ as long as the calyx, $2-2.5 \times$ as long as the lobes; lobes oblong, $1 \times 0.6-1.2 \times 1$ mm, acute, suberect. *Stamens* included; filaments short, about $0.3 \times$ as long as the anthers, inserted on the middle of the corolla tube; anthers oblong, $0.8 \times 0.4-1 \times 0.5$ mm, bearded with pilose hairs at the cordate base; cells parallel. *Pistil* glabrous, 2–2.5 mm long; ovary ovoid or nearly so, $0.8-1 \times 1$ mm, 2-celled; style 1.2–1.5 mm long; stigma capitate. In each cell 8–12 ovules. *Fruit* small, ellipsoid, about 1–1.5 cm in diam., 1-seeded. *Seed* ellipsoid, probably shaped like that of *S. henningsii*. Testa smooth, glabrous, rather thick.

Distribution: Madagascar.

Ecology: Woodlands.

Madagascar: Andromomavo Canton, Soalala District (Oct.) Randriamiera in coll. Res. Nat. 9719 (P, WAG, type); Stampitso, Ambongo, Perrier de la Bâthie 9558 (P, paratype); Filanjara (fr. Jan.) Serv. For. 12851 (P, paratype).

Note. This species differs from the nearest relative as follows:

Costa pubescent above; sepals halfway connate; pistil much longer than the calyx, 2–2.5 mm long, with distinct style **S. bifurcata**
Costa glabrous above; sepals nearly free; pistil comparatively short, hardly longer than the calyx, 1 mm long; stigma sessile **S. mostueoides**

They resemble each other by the shape of the leaves, the disposition of the inflorescence, the indumentum in the corolla, and the insertion of the stamens.

7. **S. boonei** De Wild., Bull. Jard. Bot. Brux. 5: 45. 1915; Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 32. 1952; Duvigneaud, Staquet & De Wit, Bull. Soc. Roy. Bot. Belg. 85: 56. 1952; Bruce & Lewis, in Fl. Trop. E. Afr. Loganiaceae 30. 1960; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 43. 1963.

Fig. 8, p. 71; Map 6, p. 73

Type: Congo: Orientale, Nala, Boone 83 (BR, lectotype; photograph in K, neg. 2516; isotype: BR).

Large liana, at least 5–20 m high climbing in trees, 30–100 m long or more. Trunk 3–10 cm in diam., or perhaps even more. Bark smooth, pale brown, thin, often inconspicuously lenticellate; wood pale yellow. *Branches* not lenticellate, pale grey-brown; branchlets sparsely appressed-pubescent with especially below the stipular line ranked hairs, terete, not sulcate and dark brown when dry. Tendrils solitary, in the axils of small bracts. *Leaves*: petiole sparsely pubescent, 2–7 mm long, blade mat or slightly shining, above medium to dark green, beneath paler and often with dark veins, papyraceous to thinly coriaceous, also when living, ovate, narrowly ovate, elliptic, or narrowly elliptic, comparatively wider on the main axis and at the bases of the branchlets, 1.6–3 × as long as wide, 3–10 × 1–4.5 cm, acuminate at the apex, cuneate, rounded, or on the main axis sometimes subcordate at the base, above glabrous (often with pubescent hairs on the costa when young), beneath sparsely pubescent on the costa and main secondary veins, especially at the base; one pair of distinct secondary veins from or from somewhat above the base curved along the margin and a faint submarginal pair; tertiary venation close, reticulate. *Inflorescence* axillary and terminal, solitary, 0.2–0.5 × as long as the leaves, 1.5–3 × 1–2.5 cm, lax, 2–4 × branched from low down, few-flowered. Peduncle, branches, and pedicels appressed-pubescent with often ranked hairs to subglabrous. Bracts small, triangular to ovate, pubescent to subglabrous beneath, lower above often pubescent and with minute colleters at the base, other glabrous above, without colleters. *Flowers* 5-merous, sweet-scented. *Sepals* green, connate at the base, equal or subequal, broadly ovate, ovate, or nearly triangular, (0.8)1–1.5 × as long as wide, (0.8)1–1.5 × 1–1.2 mm, obtuse, acute, or less often rounded at the apex, minutely ciliate, minutely puberulous

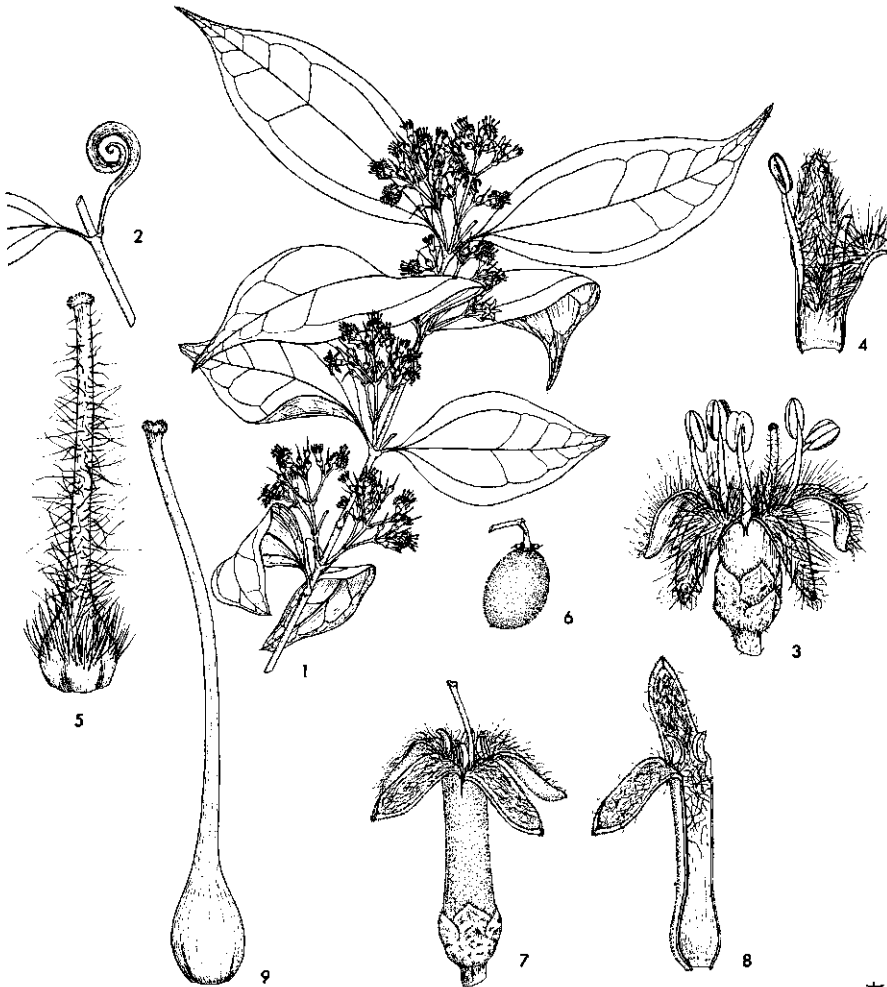


FIG. 8. 1-6. *S. boonei*: 1. branch, $\frac{1}{2} \times$; 2. portion of branch with tendril, $\frac{1}{2} \times$; 3. flower, $5 \times$; 4. opened corolla with stamen, $5 \times$; 5. pistil, $10 \times$; 6. fruit, $\frac{1}{2} \times$ (1-5. Bretelet 2954; 6. Gérard 5256). 7-9. *S. gossweileri*: 7. flower, $5 \times$; 8. portion of corolla with stamens, $5 \times$; 9. pistil, $10 \times$ (7-9. Gossweiler 9180); habit, leaves, and seeds as in *S. barteri*.

to glabrous outside, glabrous inside, without colleters. *Corolla* in the mature bud $3-5 \times$ as long as the calyx, (4.2) 4.5-5 mm long, and rounded at the apex, white or creamy, in bud yellow or orange, outside obscurely puberulous to glabrous, inside densely pilose except for the glabrous base of the tube (lobes entirely hairy inside); tube short, $0.9-2.2 \times$ as long as the calyx, 1.2-2.2 mm long; lobes oblong, $1.4-2(2.5) \times$ as long as the tube, $2.7-3.5 \times$ as long as wide, $2.7-3.2 \times 0.8-1.2$ mm, acute, recurved (in young flowers spreading). *Stamens* well-exserted; filaments white, glabrous, $1.7-2.5 \times$ as long as the

anthers, 1.8–2.5 mm long, narrowed towards the apex, inserted at the mouth of the corolla tube; anthers yellow, turning black, oblong, about twice as long as wide, 0.8–1.2 × 0.4–0.7 mm, deeply cordate at the base, glabrous; cells parallel. *Pistil* pilose, 4.2–5.4 mm long; ovary globose or ovoid, 0.8–1.2 × 0.8–1.2 mm, pilose except for the usually glabrous base, rather abruptly narrowed into the style, 2-celled; style pilose (apex often glabrous), rather thin, 3–4.2 mm long; stigma capitate. In each cell 5–9 ovules. *Fruit* dark purple with plum-like bloom (teste Charter FHI 38704), immature glaucous, small, soft, ellipsoid or subglobose (?), 2.5 cm in diam. (teste Charter), 1-seeded, with a somewhat granular skin. Wall thin. *Seed* ellipsoid, slightly flattened at one side, 14 × 7–11 × 4–9 mm; testa not seen, deciduous, sticking to the pulp.

Distribution: Nigeria and northern Central Africa.

Ecology: Rain forests or secondary forests, often on river banks; alt. 200–1300 m.

Nigeria: Sapoba For. Res., Benin District (May) Keay FHI 37032 (FHI, K); Ugo, Usognibe District (fr. July) Charter FHI 38704 (FHI, K); Ugun For. Res., Ishan District (June) Olorunfemi FHI 38067 (FHI, FHO, K, P, WAG).

Cameroun: Bipindi, Zenker 4270 (BM, BR, E, G, GOET, HBG, K, L, LE, M, MO, P, S, W, WU), June 1911 (F); bank Kélé R., 30 km N. of Eséka, Leeuwenberg 7462 (WAG); about 20 km NW. of Yaoundé, Leeuwenberg 7473 (WAG); 25 km E. of Yaoundé, Breteler, J. de Wilde & Leeuwenberg 2466 (P, WAG); near Oveng, km 27 of road Sangmélima-Yaoundé, Breteler 2687 (K, P, WAG, YA); km 25 of road Nanga Eboko-Bertoua, Leeuwenberg 7450 (WAG); Bitye R., about 60 km ENE. of Sangmélima, Bates 869 (BM, MO, Z); near vallies of Dja and Edjuné Rs., Letouzey 3807 (P, YA); N. of Lomié, Leeuwenberg 6593 (WAG); Djang, 40 km W. of Bertoua (May) Breteler 1349 (WAG, YA), 2954 (BR, K, P, WAG, YA); 44 km NW. of Bertoua (May) Breteler 2896 (BR, K, P, WAG, YA); near Tounggrélo, 27 km SW. of Bertoua, Breteler c.s. 2392 (BR, K, P, WAG); near Dimako, 28 km SW. of Bertoua, Breteler 1719 (BR, K, P, WAG, YA), 1729 (BR, K, P, WAG, YA); 18 km N. of Bertoua, along road to Deng Deng, Breteler c.s. 2424 (WAG); E. of Bertoua, Breteler 1853 (BR, K, P, WAG, YA); 24 km NE. of Bertoua, along road to Bétaré Oya, Breteler c.s. 2437 (WAG); km 27 of same road, near Gouté, Breteler c.s. 2372 (BR, WAG), 2390 (P, WAG); km 12 of road Yokadouma-Moloundou, Breteler 1542 (BR, K, P, WAG, YA).

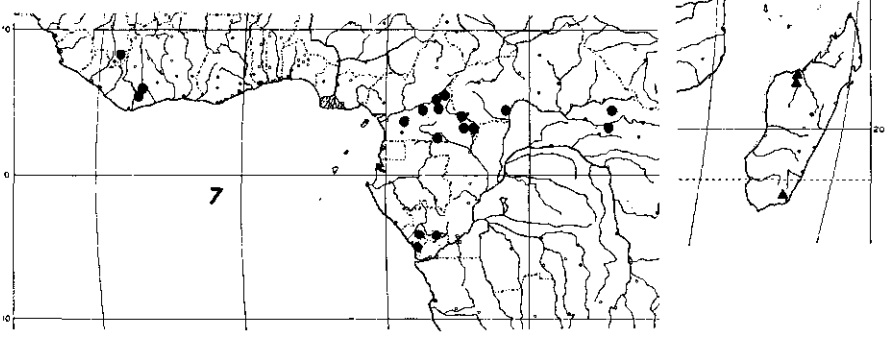
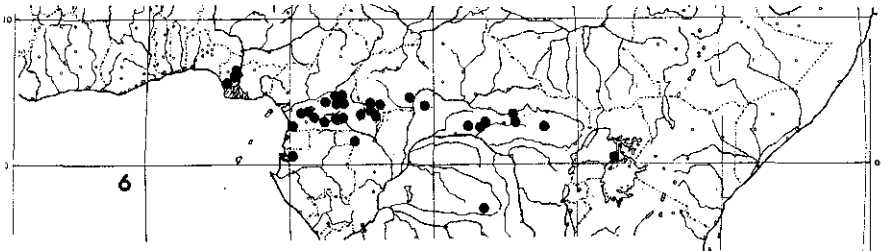
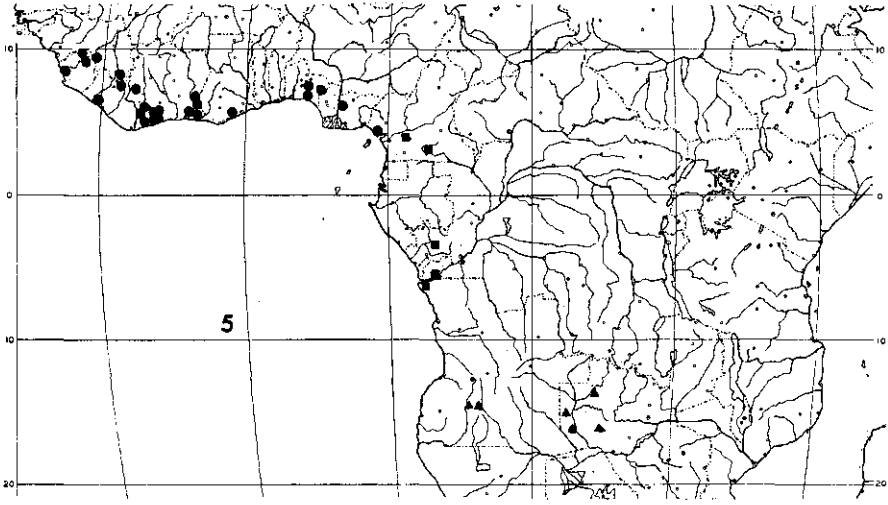
Central African Republic: Berberati (June) Tisserant 3535 (P); N. of Bania, W. of Mambéré R., Leeuwenberg 7205 (WAG); km 49 of road Garigombo (= Garégoumo)-Sosso, Leeuwenberg 6262 (WAG); km 27 of road Nola-Salo, Leeuwenberg 7095 (WAG); Boukoko, N. of Bangui (fl. Apr.-July, fr. Aug.) Tisserant 6 (P, WAG), 911 (P, WAG), 1450 (P, WAG), 1479 (P, WAG), 1849 (P, WAG), 2419 (P, WAG).

Gabon: Cristal Mts., NE. of Méla, N. Hallé & Villiers 5234 (P).

Congo (Brazzaville): Sembé, Sandberg Sembé 45 (Pharm. Stockh., WAG).

Congo (Kinshasa): Equateur: Boyambi (May) Evrard 947 (BR, PRE); Bumba Territory, Dundusana (June) De Giorgi 1036 (BR, paratype); *ibid.*, Mortchan 29 (BR, paratype). Orientale: Mobwasa (June) Lemaire 352 (BR, paratype); *ibid.* (May) Bokwake in coll. Vermoesen 354 (BR); Kulu, Brands 666 (BR); Angodia, N. of Bambesa (May-June) Lebrun 2901 (BR, C), 3011 (BR, P); Bambesa (fr. Aug.-Sept.) Gérard 1990 (BR, K, P, WAG), 3849 (BR), 5256 (BR, K, WAG); Madabu, Zobia, Buta Territory (May) Gérard 3930 (BR, K, WAG); Nala (Feb.) Boone 83 (BR, lectotype); Lutanga, Lodja-Sankuru Territory, Germain 7587 (BR).

Uganda: Mengo District, Bajo (Mar., June) Dümmer 2771 (BM, K, US), 3218 (BM, US).



MAP 5. ● *S. barteri*, ■ *S. gossweileri* with ▲, the 'caespitosa' form; Map 6. ● *S. boonei*, ▲ *S. bifurcata*; Map 7. *S. campicola*.

8. *S. campicola* Gilg ex Leeuwenberg, sp. nov. (Gilg, in Mildbraed, Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped. 1910–11. 2: 62. 1922, nomen).

Fig. 24, p. 175; Map 7, p. 73

Liana vel frutex scandens ferrugineo-pubescentis cirrhis solitariis. Folia laminis etiam viventibus coriaceis, subcoriaceis vel papyraceis ellipticis vel ovatis. Inflorescentia axillaris congesta foliis multo brevior. Flores pentameri parvi. Sepala late ovata vel triangularia apice acuta. Corolla lutea extus breviter pubescens intus lobis suberectis crassis apice pilis incurvatis profulta. Stamina corollae fauce inserta filamentis brevibus antheris basi sagittata pilis rigidis minimis barbatis. Pistillum glabrum ovario biloculari. Locula placentis ovula pauca gerentibus. Fructus ellipsoideus monospermus. Semen opacum ellipsoideum testa laevi.

Type: Cameroun: N. of Nkolbisson, W. of Yaoundé, Leeuwenberg 5447 (WAG, holotype; isotypes: A, B, BR, C, COI, E, EA, F, FHO, FI, G, GOET, HAL, HBG, IFAN, K, L, LD, LISC, LY, M, MO, NY, P, PRE, S, TCD, U, UC, W, WRSL, YA, Z).

Climbing shrub or liana, 3–20 m high climbing in trees or over shrubs, at least up to 25 m long, mostly very dark brown when dry. Trunk at least 4.5 cm in diam. Bark pale grey, smooth, thin, lenticellate; wood pale yellowish. *Branches* not lenticellate, terete, dark brown and not or hardly sulcate when dry; branchlets dark rusty-brown, rusty-brown-pubescent. Tendrils solitary. *Leaves*: petiole rusty-brown-pubescent, 3–9 mm long; blade slightly shining and medium to dark green above, mat and paler beneath, coriaceous, thinly coriaceous, or papyraceous also when living, thinner in the shade, elliptic, narrowly elliptic, ovate, or narrowly ovate, comparatively narrower towards the apices of the branchlets, (1.2) 2–3 (3.5) × as long as wide, (5) 7–11 (13) × (1.5) 2.5–5 (7.5) cm, acuminate or in the shade often nearly caudate at the apex, cuneate or rounded at the base, glabrous above, rusty-pubescent especially or only on the costa and main secondary veins beneath; one or sometimes two pairs of secondary veins from or from above the base curved along the margin and mostly a faint submarginal pair; other secondary veins very small; costa and main secondary veins impressed above and tertiary venation, which is reticulate, prominent on both sides when leaves dry. *Inflorescence* axillary, solitary, congested, several-flowered, much shorter than the leaves, 1 × 1–2 × 2 cm, 2–3 × branched. Peduncle, branches, and pedicels short, rusty-pubescent. Bracts small, approximately sepal-like, glabrous above, without colleters. *Flowers* 5-merous. *Sepals* pale green, connate at the base, equal or subequal, broadly ovate to triangular, inside 1 × 1 mm (outside 1.5 × 1 mm), acute at the apex, ciliate, outside rusty-pubescent, inside glabrous, without colleters. *Corolla* in the mature bud 2–2.5 × as long as the calyx (as only 1 mm of corolla tube in calyx) and 2.5–3.3 mm long, yellow, outside shortly pubescent except for the glabrous base (in calyx), inside with small recurved brushes of white (?) hairs just below the apex of the lobes, further glabrous; tube short 1–1.5 mm long, wide, gradually widened towards the throat, at the base 1 mm, at the

throat 1.5–1.8 mm wide; lobes narrowly triangular, 1.6–2 × as long as wide, 1.5–1.8 × 0.9–1 mm, thick at the apex, acute, suberect. *Stamens* slightly exerted; filaments short, 0.5–1 × as long as the anthers, glabrous, inserted at the mouth of the corolla tube; anthers oblong, 0.8–0.9 × 0.5–0.7 mm, with some minute stiff hairs at the deeply sagittate base; cells often slightly divergent at the base. *Pistil* glabrous, 2 mm long; ovary ovoid or broadly ovoid, 1.1–1.2 × 0.8–0.9 mm, rather abruptly narrowed into the style; style 0.8 mm long; stigma capitate. In each cell 5–6 ovules. *Fruit* orange (?), immature pale green, small, ellipsoid, about 1.2 × as long as wide, 16–21 × 13–17 mm, narrower when immature, 1-seeded. Wall thin, about 0.3 mm thick in dry fruits. *Seed* ochraceous, not flattened, ellipsoid, 9 × 7 × 6–17 × 11 × 9 mm, glabrous, smooth; testa thin, usually sticking to the pulp.

Distribution: West and Central Africa.

Ecology: Rain forests, secondary forests, gallery forests, or thickets on rocky slopes; alt. 0–900 m.

Guinea: Nimba Mts. (?), Schnell 821 (IFAN, P).

Ivory Coast: 7 km N. of crossing of Hana R. and road Tai-Tabou, J. de Wilde & Leeuwenberg 3523 (WAG); Mt. Niénokoué, Guillaumet 1504 (ABI, WAG); 10 km W. of Tapé-guhé, right bank Sassandra R., about 50 km NW. of Soubré, Leeuwenberg 4516 (WAG).

Cameroun: Mt. Eloumden, SW. of Yaoundé, Breteler, J. de Wilde & Leeuwenberg 2327 (WAG, YA); N. of Nkolbisson, W. of Yaoundé, Breteler c.s. 2259 (K, P, WAG), 2879 (BR, K, P, S, WAG, YA); *ibid.* (Apr.) Leeuwenberg 5447 (type, herbaria see above); 9 km N. of Lomié, Leeuwenberg 6738 (WAG); km 25 of road Nanga Eboko-Bertoua, Leeuwenberg 7451 (WAG); 6 km E. of Bertoua, Breteler 1660 (BR, K, P, WAG, YA); near conjunction of Lom and Djerem Rs. (Mar.) Mildbraed 8577 (K, P), 8780 (K); Mali (= Mari) R. Falls, about 8 km N. of Bétaré Oya, Leeuwenberg 7768 (WAG); Yendi, E. of Yokadouma, Mildbraed 4721 (HBG, cited by Gilg.).

Central African Republic: near Gamboula, bank Kadeï R., Leeuwenberg 7299 (WAG); km 27 of Nola-Salo road, Leeuwenberg 7089 (WAG); Boukoko, N. of Bangui (fl. Apr., fr. Aug.-Sept.) Tisserant 1435 (P, WAG), 1850 (P, WAG), 2265 (P, WAG).

Congo (Brazzaville): Kitabi (Nov.) Lecomte A 87 (P, WAG); Mpanga (Nov.) Bouquet 692 (P, WAG).

Congo (Kinshasa): Orientale: Buta Territory, Bambesa (fl. Apr., fr. Sept.) Gérard 4857 (BR, WAG), 5177 (BR, WAG), 5436 (BR); Tukpwo, bank Banzolo R., Gérard 1230 (BR, PRE).

Angola: Cabinda, Pango Mungo (fr. Feb.) Gossweiler 6276 (COI, LISJC, LISU).

Note. The two other species with recurved brushes on the corolla lobes, *S. malchairii* and *S. mimfiensis*, are glabrous.

9. *S. camptoneura* Gilg et Busse in Engler, Bot. Jahrb. 36: 93. 1905 and in Mildbraed, Wiss. Ergebn. Zw. Zentr.-Afr. Exp. 62. 1922; Leeuwenberg, Acta Bot. Neerl. 11: 48, fig. 1. 1962; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 44. 1963.

Fig. 9, p. 77; Map 8, p. 83

Types: Cameroun: Victoria, Buchholz s.n. July (holotype not seen, destroyed in B; no isotype seen) and 39 km E. of Douala, Breteler, J. de Wilde & Leeuwen-

berg 2572 (WAG, neotype; iso-neotypes: A, B, BOL, BR, BREM, C, COI, E, EA, F, FHO, FI, G, HAL, HBG, IFAN, K, L, LISC, M, MO, NBG, NLI, P, PRE, S, SL, SRGH, TCD, U, UC, US, W, WRSL, YA, Z).

Heterotypic synonyms: *Scyphostrychnos talbotii* S. Moore in Cat. Talbot's Nigerian Pl. 71, p. 10. 1913; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 24. 1931, not *Strychnos talbotiae* S. Moore, l.c. p. 69. Type: Nigeria: Calabar Province, Oban, Talbot 1664 (BM, holotype; isotypes: K, Z).

Scyphostrychnos psittaconyx Duvign., Bull. Class. Science. Sér. 5. 34: 98, fig. 1. 1948. Type: Congo: Orientale, Yangambi, Isalowe For. Res., Louis 3429 (BR, holotype; isotypes: BR, FHO, P).

Large liana, up to 120 m long, 20–45 m high climbing in trees, drying dark brown or black. Trunk 2–25 cm in diam. Bark dark brown, with large lenticels, with annular leaf scars; wood pale yellow to deep ochraceous, with pale brown bark-islets. *Branches* not or slightly lenticellate, sometimes sulcate when dry; branchlets glabrous, not lenticellate, shining and dark green, dark brown to black when dry, terete or nearly so, often slightly sulcate when dry; main axis terete. Tendrils in 1–3 pairs. *Leaves*: petiole glabrous, 7–17 mm long, blade shining and dark green above, less shining to dull and mostly paler beneath, drying dark brown to black, coriaceous or thinly coriaceous also when living, thinner in the shade, elliptic, narrowly elliptic, or on the main axis often ovate, larger or smaller in the shade, smaller and comparatively wider on the main axis and at the bases of the branchlets, (1.2) 1.5–3 × as long as wide, 6–22(31) × 3–10(12) cm, acute or shortly acuminate at the apex, often longer acuminate in the shade, cuneate or rounded at the base, on main axis rounded to cordate, margin revolute in sun leaves (flowering branches), glabrous on both sides; the basal pair of secondary veins larger than the other but mostly not more conspicuous, curved along the margin. *Inflorescence* axillary or occasionally terminal, solitary, often branched from low down, lax or congested, 0.3–0.7 × as long as the leaves, 4.5–6.5 × 4–6 cm, few-flowered, 2–3 × branched. Peduncle and branches mostly long, glabrous and pale green as the pedicels and bracts. Bracts glabrous, approximately sepal-like, lower larger, upper smaller than the sepals. *Flowers* 5-merous. *Sepals* pale green, connate at the base, orbicular, 2–3.5 mm long, rounded at the apex, minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 3.3–4 × as long as the calyx, 8–11.5 mm long, and rounded at the apex, white or yellow, outside glabrous, inside with a minutely ciliate undulate or more or less distinctly 5-lobed corona that is contracted at the mouth; corona lobes – if present – truncate and only at the apex undulate and minutely ciliate; corolla tube campanulate or cylindrical, often ventricose when living, 1.7–2 × as long as the calyx, 0.9–1.2 × as long as the lobes, 4–6 mm long; lobes thick, triangular to ovate, 1.7–2.6 × as long as wide, 4–6 × 1.7–3 mm, acute, spreading or recurved. *Stamens* included in the corona; filaments glabrous, very short, about 0.2–0.4 × as long as the anthers, inserted at the mouth of the corolla tube (corona thought away); anthers narrowly oblong, 2.2–3 × 0.6–0.7 mm, sagittate at the base, ciliate all around

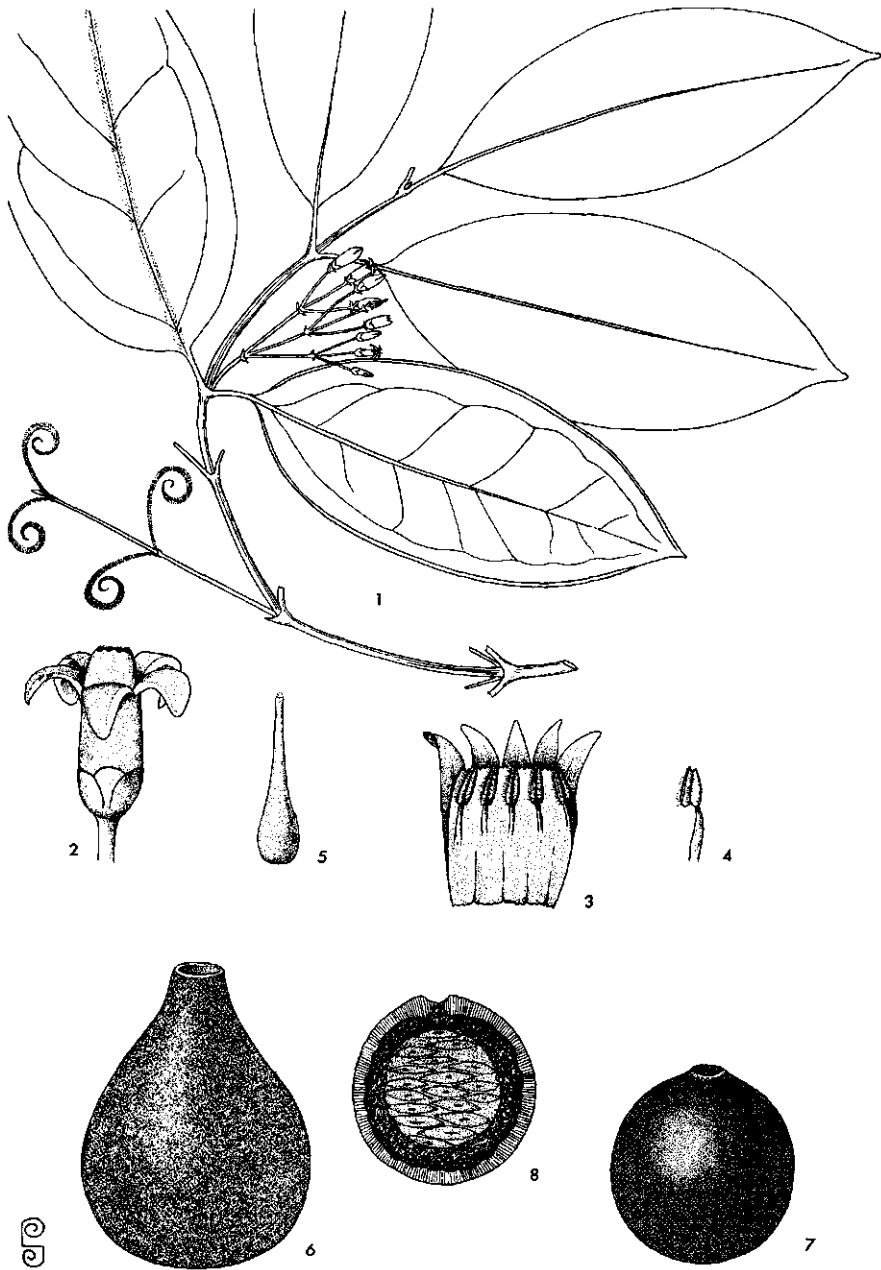


FIG. 9. *S. camptoneura*: 1. branch, $\frac{1}{2} \times$; 2. flower, $3\frac{1}{2} \times$; 3. opened corolla with stamens, $3\frac{1}{2} \times$; 4. stamen, $5 \times$; 5. pistil, $3\frac{1}{2} \times$; 6-7. fruits, $\frac{1}{4} \times$; 8. longitudinal section of fruit preserved in spirit, $\frac{1}{4} \times$ (1, 3-5. Breteler 1332; 2, 6. Leeuwenberg 7478; 7-8. Leeuwenberg 3974).

or only at the base; cells parallel. *Pistil* glabrous, 8–9 mm long; ovary ovoid, about $1.5 \times$ as long as wide, $3-4 \times 2-2.5$ mm, 2-celled, gradually narrowed into the style; style 5–5.5 mm long; stigma capitate. In each cell about 50 ovules. *Fruit* large, hard, like a bowl, often slightly obliquely pedicellate, variable in shape and size, globose, ellipsoid, slightly pear-shaped, or sometimes ovoid, mat, pale glaucous to yellow, usually somewhat longer than wide, $6.5 \times 6-20 \times 13.5$ cm, apiculate or rounded at the apex, 2-celled, with (2) 10–112 seeds in horizontal layers. Wall thick, hard, knobby inside by which the thickness varies from (2) 6 to 13 mm (even in a single fruit). Pulp orange, turning black, containing very strong fibres shaping an inner fruit-wall layer and the septum. *Seeds* medium brown, darkening in rotting fruits, flattened, convex, especially at one side, obliquely suborbicular, ovate, triangular, or oblong, not or slightly curved, $1-1.7 \times$ as long as wide, $25-50 \times 20-40 \times 3-6$ mm or sometimes smaller, glabrous, with a narrow irregular wing, which is 1–6 mm wide.

Distribution: West and northern Central Africa.

Ecology: In rain forests or secondary forests, often on moist places; alt. 0–700 m.

Liberia: Belleyella, Baldwin 12205 (K, dry fr. only); Gola Nat. Forest, Bomi Hills (July) van Meer 8 (WAG); 9 km E. of Yoma, 20 km NE. of Bomi Hills (fr. Aug.) Leeuwenberg 4828 (WAG), 4875 (WAG); Bong Range, 32 km N. of Kakata, Leeuwenberg & Voorhoeve 4919 (WAG), 4960 (WAG); *ibid.* (?), Voorhoeve 1290 (WAG), 1313 (WAG); Monrovia, Dinklage 2854 (B); Devilbush near Paynesville, 16 km E. of Monrovia, Leeuwenberg & Voorhoeve 4820 (WAG); *ibid.* (July) van Harten 5 (WAG).

Ivory Coast: W. of Tapéguhé, right bank Sassandra R. between Soubré and Buyo (Dec.) Guillaumet 1784 (WAG); E. of Béyo, 56 km N. of Sassandra, Leeuwenberg 4035 (WAG); Nzida Forest, Herb. I.D.E.R.T. 1736 (ABI); Yapo Forest, Aké Assi 18 Oct. 1958 (ABI); W. of la Mé R., about 20 km NE. of Abidjan, Leeuwenberg 4171 (ABI, WAG); E. of Krinjabo, Leeuwenberg 4484 (WAG); 15 km NE. of Bianouan (fr. Apr.) Leeuwenberg 3974 (ABI, WAG); Abengourou, Aké Assi 6968 (UCI).

Nigeria: Omo For. Res., Ijebu District (Apr.) Onochie FHI 15529 (FHI, K); Sapoba, Benin Province, Kennedy 2220 (FHO, WAG); *ibid.*, Sapoba For. Res., near Agika, Latilo FHI 56871 (FHI, K, WAG); Oban, Talbot 1664 (BM, K, Z, type of *Scyphostrychnos talbotii*).

Cameroun: left bank Mungo R., near bridge in road Loum-Kumba, Leeuwenberg 6848 (WAG); Mombo, southern Bakosi, Kumba District, Olorunfemi FHI 30566 (K); 39 km E. of Douala, along road to Edéa (Feb.) Breteler, J. de Wilde & Leeuwenberg 2572 (herbaria see above, neotype); E. of km 21 of Yabassi-Douala road (fr. Aug.) Leeuwenberg 6394 (WAG); 10 km W. of Masok, Leeuwenberg 5273 (WAG); E. of km 58 of Edéa-Kribi road, Leeuwenberg 5702 (WAG); right bank Kélé R., 30 km N. of Eséka, Leeuwenberg 7470 (WAG); bank Nyong R., 60 km SW. of Eséka (Mar.) W. de Wilde 2169 (WAG); about 20 km NW. of Yaoundé (fl., fr. Jan.) Leeuwenberg 7478 (WAG); SSW. of Mayos (May) Letouzey 3968 (P, WAG, YA); N. of Lomié (fr. Sept.) Leeuwenberg 6619 (WAG); 15 km E. of Dimako (fr. Dec.) Leeuwenberg 5826 (WAG), 7325 (WAG); 6 km E. of Bertoua (Apr.) Breteler 1332 (BR, K, P, WAG, YA); 5 km S. of Batouri (fr. Apr.) Letouzey 4838 (P, WAG, YA); 50 km SW. of Batouri (Apr.) Breteler 2833 (BR, K, P, WAG); S. of Badékok, W. of km 45 of Yokadouma-Moloundou road, Leeuwenberg 6114 (WAG).

Central African Republic: 22 km N. of Berberati, along road to Carnot, Leeuwenberg 7265 (WAG); Boukoko, N. of Bangui (Dec.-Feb., Apr.) Tisserant 36 (P, WAG), 1283 (P), 1331 (P, WAG), 1379 (P, WAG), 2077 (P, WAG).

Gabon: Bélinga (fr. Nov.) N. Hallé 3122 (P).

Congo (Brazzaville): Mbéré, Ongondza Territory, Boundji, Bouquet 1462 (P); Fort. Rousset, Bouquet 1470 (P); Mondoko, Makoua-Ouessou road (fl., fr. July) Bouquet 1559 (P, WAG); Mbila road, near Mouyabi, Bouquet & Sitha 2271 (WAG).

Congo (Kinshasa): Orientale: Buta (Apr.) Lebrun 2624 (BR, MO, P, paratype of *Scyphostrochnos psittaconyx*); Yangambi (fl. Mar.-Apr., Oct., fr. June, Sept.-Oct.) Louis 380 (BR, K, P, paratype of *Scyphostrochnos psittaconyx*), 3224 (BR, paratype of *Sc. psitt.*), 3324 (BR, MO, paratype of *Sc. psitt.*), 3429 (BR, FHO, P, type of *Sc. psitt.*), 3706 (BR, paratype of *Sc. psitt.*, DUVIGNEAUD erroneously cited 3006), 3758 (BR, K, WAG), 4113 (BR, S, U, paratype of *Sc. psitt.*), 5941 (BM, BR, L, LISC), 5984 (BR, EA, MO), 16158 (BR), 16691 (BR); *ibid.* (Mar.) Devred 4188 (BR, WAG).

Cult.: Wageningen, seedling of herb. Leeuwenberg 3974; Leeuwenberg 4990 (WAG); Ivory Coast, Adiopodoumé, seedlings of same plant, Leeuwenberg 4573 (WAG).

10. *S. canthioides* Leeuwenberg, sp. nov.

Fig. 5, p. 63

Liana glabra silvae densae cirrhis per paria dispositis. Folia laminis subcoriaceis plerumque anguste ovatis vel ellipticis apice acuminatis. Inflorescentia axillaris et terminalis pauciflora. Flores tetrameri omnes pedicellati odorantes. Sepala suborbicularia apice rotundata. Corolla alba extus glabra intus dense pilosa tubo cylindrico lobis oblongis recurvatis. Stamina exserta fauce corollae inserta filamentis longis albis antheris glabris cordatis. Pistillum glabrum ovario biloculari. Locula placentis ovula dua gerentibus stylo filiformo. Fructus ignotus verisimiliter parvus monospermus.

Type: Cameroun: 3 km E. of km 58 of Edéa-Kribi road, Leeuwenberg 7008 (WAG, holotype; isotypes: A, B, BM, BR, C, COI, E, FHO, FI, G, HBG, K, L, LD, LISC, M, MO, P, PRE, S, U, W, YA, Z).

Liana climbing in trees. Branches green, terete, not lenticellate, like the branchlets which are glabrous and often sulcate when dry. Tendrils in 1 (-3) pairs. Leaves: petiole 2-4 mm long, glabrous; blade shining on both sides, less so to mat when dry, not or hardly paler beneath, rather thinly coriaceous, mostly narrowly ovate to narrowly elliptic, but on main axis often ovate, (1.5) 2-4 × as long as wide, 3-11 × 0.8-3.7 cm, acuminate at the apex, cuneate or rounded at the base, glabrous on both sides; one pair of secondary veins from or from above the base, curved along the margin and often a faint submarginal pair; costa and base of main secondary veins somewhat impressed above; tertiary venation reticulate, not very conspicuous. Inflorescence axillary and terminal, rather lax, few-flowered, shorter than the leaves, 1 × 1-5 × 3 cm, 1-3 branched. Peduncle, branches, and pedicels glabrous. Lower bracts leafy, other shovel-shaped, glabrous on both sides, without colleters, and about 2-3 × as long as the sepals. Flowers 4-merous, sweet-scented, all pedicellate. Sepals pale green, connate at the base, suborbicular, as long as wide, 1-1.2 mm long, rounded at the apex, glabrous on both sides, minutely ciliate, without colleters. Corolla in the mature bud 5-6 × as long as the calyx, 5-7 mm long, and tapering at the apex, white, outside glabrous, inside densely pilose except for the glabrous very base of the tube; tube cylindrical or nearly so, 2.5-3.5 × as long

as the calyx, 1–1.4 × as long as the lobes, 2.5–4 mm long; lobes oblong, 2–3 × as long as wide, 2.2–3.2 × 1–1.2 mm, acute, recurved. *Stamens* exerted; filaments white, glabrous, 2.4–3 × as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, 0.5–0.6 × 0.3–0.4 mm, glabrous, cordate at the base. *Pistil* glabrous, 4.5–6.2 mm long, ovary often broadly ovoid, 0.5 × 0.5–1 × 0.6 mm, 2-celled, pale green; style filiform, white, 4–5.2 mm long; stigma very small, often obscurely bilobed. In each cell 2 ovules. *Fruit* unknown, supposed to be small. *Seeds* are supposed to be like those of *S. barteri*.

Distribution: Only twice collected in one locality in Cameroun.

Ecology: Rain forest or old secondary forest with *Lophira alata* Banks ex Gaertn. f.; alt. about 100 m.

Cameroun: 3 km E. of km 58 of Edéa-Kribi road (Oct.) Leeuwenberg 6814 (A, B, BR, BREM, COI, E, EA, ENT, F, FHO, FI, G, GOET, HAL, HBG, IFAN, K, L, LD, LISU, LY, M, NY, P, SL, SRGH, TCD, U, UPS, US, WAG, YA, paratype), 7008 (type, herbaria see above).

Note. *S. canthioides* is closely allied to *S. barteri* and *S. tricalysioides* by the branches, tendrils, and flowers. It differs from them as follows:

Sun-leaves coriaceous, shining, rounded to shortly acuminate; tertiary venation reticulate, prominent on both sides; about 10 ovules	S. barteri
Sun-leaves rather thinly coriaceous, acuminate; costa not or slightly impressed above; tertiary venation hardly prominent; 2 ovules	S. canthioides
Sun-leaves subcoriaceous, dull, caudate; costa distinctly impressed above; about 10 ovules	S. tricalysioides

11. *S. chromatoxylon* Leeuwenberg, sp. nov. Fig. 10, p. 81; Map 9, p. 83

Liana magna silvae densae. Lignum trunci et ramorum colores varias ostendens. Folia petiolis glabris laminis penninerviis coriaceis vel papyraceis ellipticis apice acuminatis glabris. Inflorescentia axillaris pedunculis pedicellisque minute pubescentibus. Flores pentameri solum in albastro noti. Sepala angusta subulata. Corolla extus glabra. Stamina corolla inserta antheris cordatis. Fructus subglobosus basi subcordatus durus parie lignosa seminibus paucis oblique ellipticis testa rugosa.

Type: Cameroun: near Dimako, 28 km SSW. of Bertoua, Breteler 2161 (WAG, holotype; isotypes: G, P, YA).

Large liana, at least 30 m long and 20 m high climbing in trees. Trunk 3–5 cm in diam. or more. Bark pale grey, with some large lenticels, thick, outer bark on section orange-brown; wood pale yellow, with large bark-islets which are whitish or yellowish and turning reddish as the wood when freshly cut. *Branches* pale grey-brown, lenticellate, terete, not or slightly sulcate when dry; branchlets glabrous, not lenticellate, when dry dark brown and sulcate, or when leaves

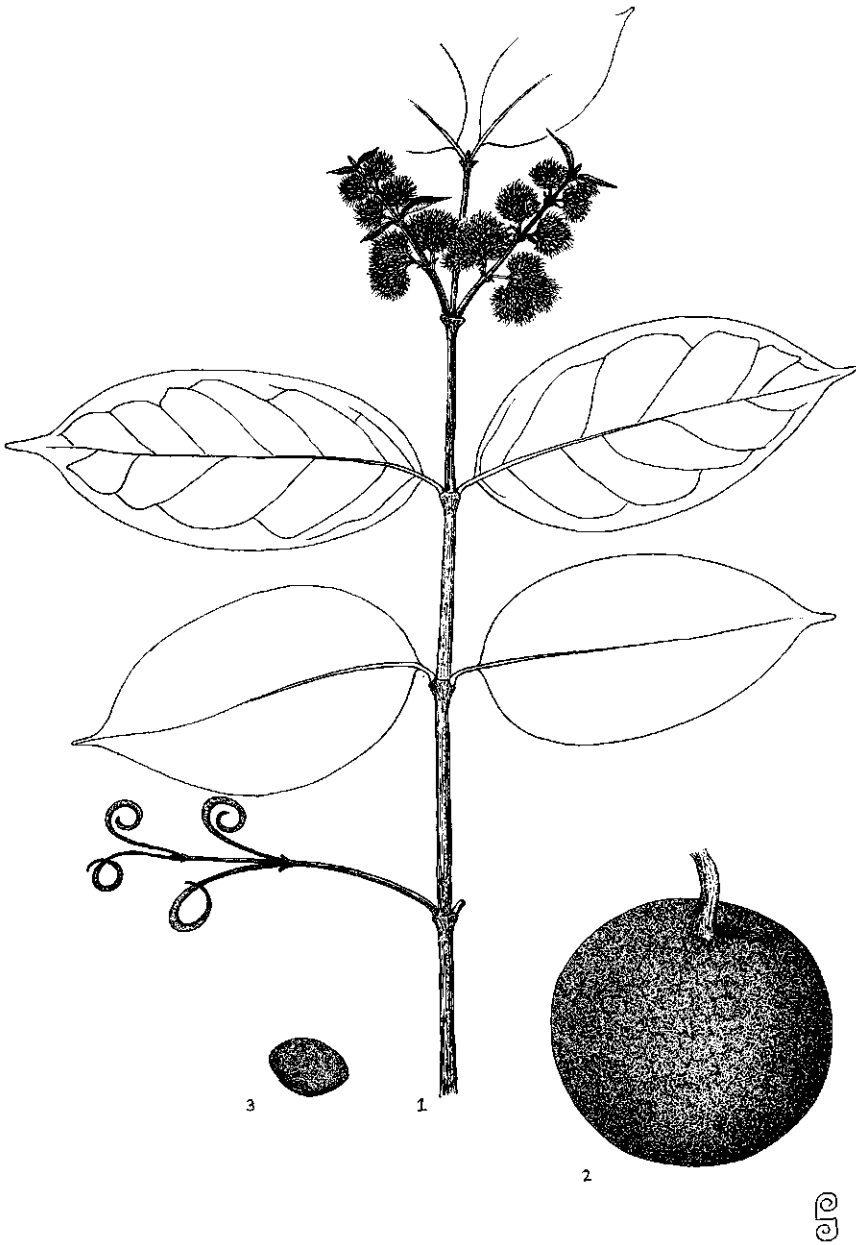


FIG. 10. *S. chromatoxylon*: 1. branch, $\frac{1}{2} \times$; 2. fruit, $\frac{1}{2} \times$; 3. seed, $\frac{1}{2} \times$ (1. Breteler 2161; 2-3. Tisserant 43).

mature like branches. Tendrils in 1–3 pairs. *Leaves*: petiole glabrous, 5–11 mm long; blade slightly shining or mat and dark green above, mat and paler beneath, coriaceous or papyraceous, also when living, elliptic, (1.7)2–3 × as long as wide, 5–15 × 2.5–6 cm, acuminate or in the shade caudate at the apex, cuneate or rounded at the base, glabrous on both sides; 4–6 pairs of secondary veins, basal pair not longer as is usual in the genus; tertiary venation reticulate, prominent beneath, inflorescence axillary, congested (?). Peduncle, branches, and pedicels minutely pubescent. *Flowers* 5-merous. *Sepals* narrowly triangular, subulate, glabrous. *Corolla* glabrous outside. *Stamens*: filaments inserted at the mouth (?) of the corolla tube; anthers cordate, bearded (?). *Pistil* glabrous (?). *Fruit* large, depressed-globose, 6 × 6–6.5 × 7 cm, subcordate at the base, rugulose, about 5-seeded. Wall very hard, 5 mm thick. Much fibrous pulp. *Seed* flat, obliquely elliptic, about 1.5–2 cm in diam., scabrid; testa thick.

Distribution: Eastern Cameroun, western Central African Republic.

Ecology: Rather dry forest with *Celtis* and *Sterculiaceae*; alt. 400–650 m.

Cameroun: near Toungrélo, 27 km SW. of Bertoua, along road to Doumé, Bretelet 2621 (K, WAG, YA); near Dimako, 28 km SSW. of Bertoua (galled buds) Bretelet 2161 (G, P, WAG, YA, type).

Central African Republic: Boukoko, N. of Bangui (fr. Dec.) Tisserant 43 (P).

Notes. *S. chromatoxylon* resembles *S. congolana* of section *Spinosa* and some American species of *Breviflorae* (*S. nigricans*, *S. mattogrossensis*, and *S. schultesiana*) by the narrow sepals and the tendrils, although these are in 1–3 pairs in *S. chromatoxylon* and in a single pair in the others. It resembles the above-mentioned American species of *Breviflorae* also by the lenticellate branches. From *S. congolana* it differs especially by the bark-islets in the wood which are absent in *S. congolana*, the not corky bark, the absence of spines, and the depressed-globose basally subcordate instead of strictly globose fruits.

From these American *Breviflorae* species it differs in the same fruit characters and by the thick bark and larger bark-islets.

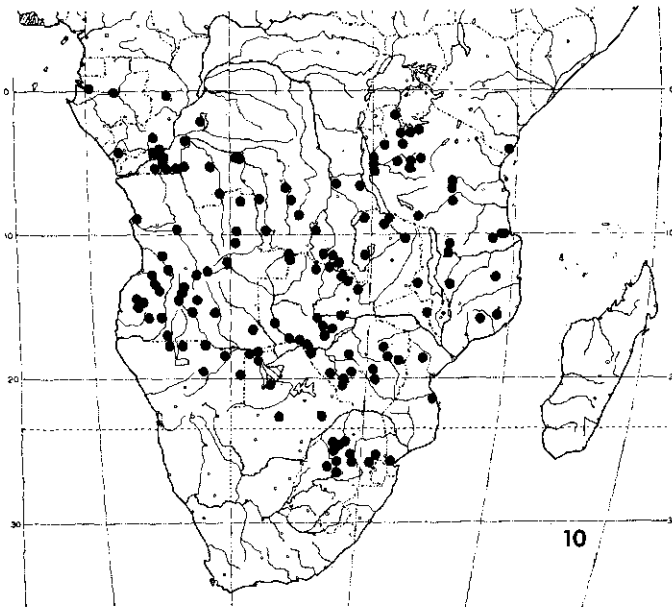
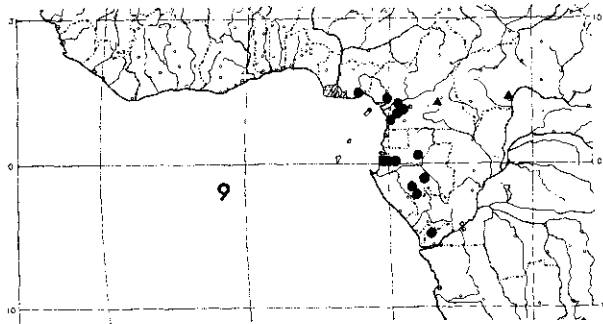
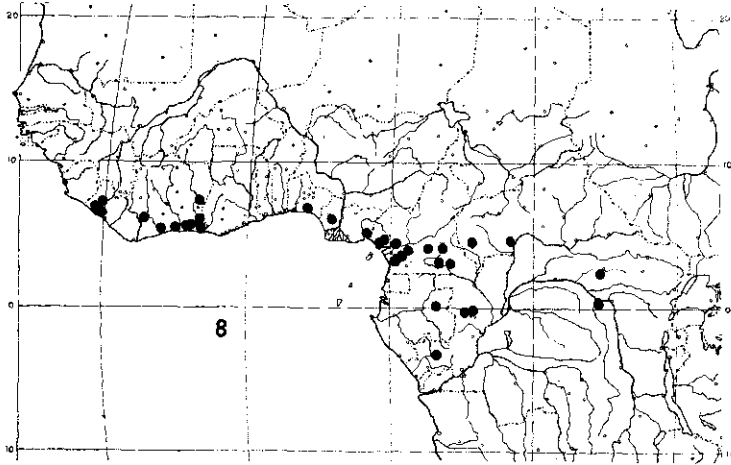
Although this new species differs widely from the species of *Breviflorae* indicated, it is preferred to include it in *Breviflorae* because of the characters available at the moment. When the species is more completely known, it might represent a section of its own.

12. *S. chrysophylla* Gilg in Engler, Bot. Jahrb. 28: 119. 1899; Baker in Fl. Trop. Afr. 4(1): 525. 1903; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 43. 1963.

Fig. 11, p. 85; Map 9, p. 83

Type: Cameroun: Waterfall near Ebéa, Lokoundjé R., Dinklage 221 (holotype not seen, destroyed in B; lectotype which was isotype seen: HBG).

Heterotypic synonym: *S. eketensis* S. Moore, Journ. Bot. 52: 29. 1914; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 24. 1931. Type: S. Nigeria: Eket District, Kwa Ibo R., Talbot 3237 (BM, holotype; isotypes: BM, K, Z).



MAP 8. *S. camptoneura*; Map 9. ● *S. chrysophylla*, ▲ *S. chromatoxylon*; Map 10. *S. cocculoides*.
 Meded. Landbouwhogeschool Wageningen 69-1 (1969)

Large liana, 10–25 m high climbing in trees, at least 40 m long. Trunk 8 cm in diam. Bark pale brown, thin, inconspicuously lenticellate, on section pale yellow; wood pale yellow, with brown bark-islets. *Branches* greenish-brown to pale brown, not lenticellate, often sulcate like the branchlets; branchlets glabrous, pale green to greenish-brown and dark-brown-spotted, often sub-quadrangular and 4-sulcate when living, distinctly sulcate when dry. Tendrils paired. *Leaves* usually large; petiole glabrous, 5–10 mm long; blade shining or hardly so when living, dark green above, paler, often yellowish-green, beneath, when dry greenish-brown, coriaceous also when living, elliptic or narrowly elliptic, comparatively wider in leaves on the main axis and at the bases of the branchlets, $1.25\text{--}3 \times$ as long as wide, $(4)8\text{--}20(25) \times (2.5)4\text{--}11$ cm, apiculate or acuminate at the apex, cuneate or rounded at the base, glabrous on both sides; one or two pairs of secondary veins from or from above the base curved along the margin and often a faint submarginal pair; costa impressed above and as the veins prominent beneath, tertiary venation reticulate, prominent on both sides. *Inflorescence* axillary, solitary, $0.3\text{--}1 \times$ as long as the leaves, often large, rather lax, many-flowered, about $1.2\text{--}2 \times$ as long as wide, $(2.5)6\text{--}14 \times (1.5)4\text{--}7$ cm, $3\text{--}4 \times$ branched. Peduncle and branches rather stout, glabrous as the short pedicels. Bracts triangular, sepal-like, or occasionally leafy, glabrous on both sides, with or without colleters above at the base or in the middle, lower about $3 \times$ as long as the sepals. *Flowers* 5-merous. *Sepals* pale green, connate at the base up to one-quarter of their length, orbicular, oblong, or ovate, $1\text{--}1.5 \times$ as long as wide, $1.5\text{--}2 \times 1\text{--}1.5$ mm, rounded or obtuse at the apex, ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud $3\text{--}4 \times$ as long as the calyx, $4.5\text{--}6$ mm long and rounded at the apex, pale green, campanulate, 3 mm wide at the throat, rather abruptly thickened in the throat, outside glabrous or sparsely and minutely (pilose-)pubescent on the lobes, inside with a ring of villose hairs in the throat; tube short, $0.7\text{--}1.5 \times$ as long as the calyx, $1.5\text{--}2$ mm long; lobes thick, $1.8\text{--}2.3 \times$ as long as the tube, oblong, $2.2\text{--}2.5 \times$ as long as wide, $3\text{--}4 \times 1.4\text{--}1.8$ mm, acute, suberect. *Stamens* exerted; filaments $0.7\text{--}1 \times$ as long as the anthers, $0.9\text{--}1.5$ mm long, glabrous, inserted at the mouth of the corolla tube; anthers oblong, $1.3\text{--}1.5 \times 0.9\text{--}1$ mm, bearded at the cordate base with pilose hairs; cells parallel. *Pistil* pilose-pubescent, $3.2\text{--}4$ mm long; ovary ovoid, pilose-pubescent, except for the glabrous base, $2\text{--}2.5 \times 1.2\text{--}1.4$ mm, gradually narrowed into the style, 2-celled; style short, $1.2\text{--}1.5$ mm long, pilose at the base; stigma capitate. In each cell 10–15 ovules. *Fruit* yellow (teste Klaine 2140), not very large, rather soft when mature, globose, 3–4 cm in diam., with 3–6 or more seeds. Wall rather thick. *Seed* flattened, more or less plano-convex, obliquely ovate, elliptic, or trullate, usually irregularly curved, $22\text{--}25 \times 14\text{--}20 \times 5\text{--}6$ mm, with thick very short erect hairs, rather rough. Testa thick.

Distribution: S. Nigeria, Cameroun, Gabon, Congo (Brazzaville).

Ecology: Rain forests, often on river banks; alt. 0–700 m.

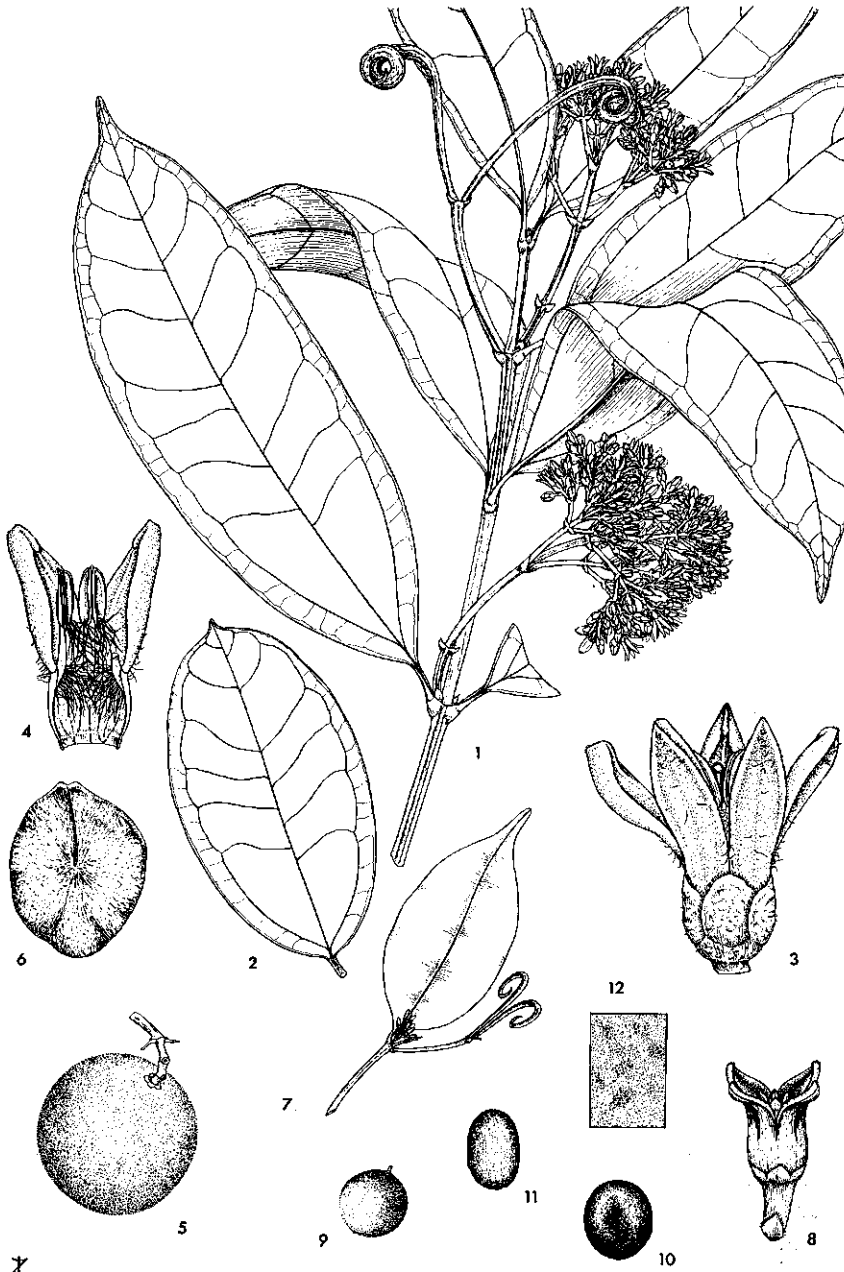


FIG. 11. 1-6. *S. chrysophylla*: 1. branch, $\frac{1}{2} \times$; 2. leaf, $\frac{1}{2} \times$; 3. flower, $5 \times$; 4. portion of corolla with stamens, $5 \times$; 5. fruit, $\frac{1}{2} \times$; 6. seed, $1 \times$ (1, 3-4. Le Testu 9377; 2. Leeuwenberg 7456; 5-6. N. Hallé & Cours 6152). 7-12. *S. cuculina*: 7. branch, $\frac{1}{2} \times$; 8. flower, $5 \times$; 9. fruit, $\frac{1}{2} \times$; 10-11. seeds, two sides, $1 \times$; 12. portion of leaf, $15 \times$ (7-11. Germain 4502; 12. Jans 1053).

Nigeria: Eket District, Kwa Ibo R., Talbot 3237 (BM, K, Z, type of *S. eketensis*).

Cameroon: 39 km E. of Douala, along road to Edéa, Breteler, J. de Wilde & Leeuwenberg 2610 (BR, K, P, WAG, YA); 13 km SW. of Eséka, bank Nyong R., Leeuwenberg 5159 (WAG); 10 km W. of Masok, near Ekem R., right bank Sanaga R. (Apr.) Leeuwenberg 5383 (WAG); bank Kélé R., 30 km N. of Eséka, Leeuwenberg 7456 (WAG); Ebéa Falls, Lokoundjé R., Dinklage 221 (HBG, type); bank Nyong R., about 65 km SSW. of Eséka, W. de Wilde 2702 (WAG), 2763 (WAG).

Gabon: near Libreville (fl., fr. Feb., Sept.-Oct.) Klaine 828 (P), 1454 (P), 2140 of which most duplicates erroneously distributed as 240 (A, BR, FHO, FI, MO, NY, P, S, UC), 2146 (P), 2385 (K, P), 2487 (BR, K), 3065 (BR, P), 3373 (A, FHO, K, P, S, UC), 3373a (P), 3426 (BR, IFAN, K, P, PRE); *ibid.*, near Sibanga, Jolly 63 (P); Mfoua, about 150 km E. of Libreville (Oct.) Bates 547 (BM, G); bank Korno R., Chevalier 26857 (P, WAG); Abanga, N. Hallé 2456 (P); Nzec (Nov.) Le Testu 9377 (P, WAG); Mimongo (fr. May) N. Hallé & G. Cours 6152 (P); Dibaça, Upper Ngounyé R. (Oct.) Le Testu 6354 (P); Libèla, Lastourville region (Oct.) Le Testu 8415 (P, WAG).

Congo (Brazzaville): Moanda (Oct.) Koechlin 9117 (IRSC, WAG).

Note. *S. chrysophylla* differs from its nearest relative, *S. talbotiae*, as follows: Calyx glabrous on both sides; corolla in bud 4.5–6 mm long, glabrous or minutely pilose-pubescent outside on lobes; pistil pilose-pubescent, except for glabrous base of ovary and apex of style ***S. chrysophylla***
Calyx inside at base pubescent; corolla in bud 2.5 mm long, sparsely pubescent outside; pistil with few hairs at apex of ovary ***S. talbotiae***

13. *S. cocculoides* Bak., Kew Bull. 1895: 98. 1895 and in Fl. Trop. Afr. 4(1): 533. 1903; Hiern, Cat. Welw. Afr. Pl. 3: 704. 1898; Gilg & Busse in Engler, Bot. Jahrb. 36: 110. 1905; Duvigneaud, Lejeunia 13: 114. 1949 and Bull. Soc. Roy. Bot. Belg. 85: 20, f. 6A. 1952; Bruce, Kew Bull. 1955: 38. 1955; Coates Palgrave, Trees Centr. Afr. 200–203. 1957 with habit photo and col. dr. of branch, fl., fr.; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 16, f. 3 (1–5). 1960; Verdoorn in Fl. S. Afr. 26: 149. 1963. Fig. 12, p. 88; Map 10, p. 83

Type: Angola: Huila District, between Lopollo and Monino, Welwitch 4779 (BM, holotype; isotypes: COI, G, K, LE, LISU, P).

Heterotypic synonyms: *S. goetzei* Gilg in Engler, Bot. Jahrb. 28: 123. 1899 and in op. cit. 32: 179. 1902; Baker in Fl. Trop. Afr. l.c. p. 534. Type: Tanzania: Iringa/Ulanga District, Utschungwe (Uzungwa) Mts., Goetze 643 (holotype not seen, destroyed in B; no isotypes seen).

S. dekindtiana Gilg, Notizbl. Bot. Gart. Berlin 2: 258. 1899; Baker in Fl. Trop. Afr. l.c. p. 534. Type: Angola: Huila District, Dekindt 1032, partly (holotype not seen, destroyed in B; lectotype: P; the LISU sheet of this number is *S. pungens* Solered.).

S. schumanniana Gilg in Baum, Kuene-Samb. Exped. 330. 1903; Baker in Fl. Trop. Afr. l.c. p. 624. 1904; Prain & Cummins in Fl. Cap. 4(1): 1054. 1909. Type: Angola: Cubango R., near Massaca, Baum 299 (G, lectotype; isotypes: BM, E, K, W).

S. suberosa De Wild., Ann. Mus. Congo Sér. 5. 1: 177. 1904; Baker in Fl. Trop. Afr. l.c. p. 624. Type: Congo: Léopoldville, Lemfu, Gillet 2261 (BR, lectotype, photograph in K, neg. 2208).

S. suberifera Gilg et Busse in Engler, Bot. Jahrb. 36: 107. 1905. Type: Tanzania: near Lindi, Mayanga, Busse 2524 (G, lectotype; isotypes: BM, BR, EA, HBG, LY). Homotypic synonym: *S. spinosa* var. *suberifera* (Gilg et Busse) Aubrév., Fl. Soud.-Guin. 441. 1950.

S. thomsiana Gilg et Busse, l.c. p. 111. Syntypes: Angola: Huila District, Keputu Mt., Dekindt 9a and 9b (not seen, destroyed in B; no iso-syntypes seen).

S. thomsiana var. *elegans* Gilg et Busse, l.c. p. 112. Type: Angola: Huila District, Tyivingiro, Dekindt 492 (MPU, lectotype; isotypes: LISC, MPU).

S. paralleloneura Gilg et Busse, l.c. p. 112. Type: Angola: Huila District, Keputu Mt., near Otchipongolo, Dekindt 1037 (LISC, lectotype).

S. suberosa T. R. Sim, Forest Fl. and Forest Resources Port. E. Afr. 90, pl. 76. 1909. Type: Moçambique: Magenja da Costa, near Lourenço Marques, Sim 6013 (PRE, holotype).

Deciduous shrub or small tree, (0.30) 1–6 (8) m high, sometimes flowering on one-year shoots with small leaves on old fire-cut stumps. Trunk 4–25 cm in diam., branched from low down; bark pale grey to pale brown, thick, corky, longitudinally ridged, not scaly, nor lenticellate; wood hard, whitish, without bark-islets. *Branches* pale to dark brown when dry, more or less fissured and corky by which often irregularly thickened, not lenticellate, often with recurved or sometimes straight spines, sometimes terminating in a straight spine; branchlets yellow-green and often tinged with red, when living greenish-brown, dark brown, reddish-brown, or purplish-brown and often sulcate when dry, pubescent or sometimes glabrous, sometimes (especially when older) fissured like branches. Stipules deciduous or sometimes persistent, 4 on each node, at the bases of the petioles, narrowly triangular, 1–2 mm long. *Leaves*: petiole short, pubescent or less often glabrous, 2–8 mm long; blade mat or shining and pale to dark green above, mat and paler beneath, veins often pale on both sides, coriaceous, young thinner and papyraceous when dry, very variable in shape and size, orbicular, ovate, elliptic, or sometimes narrowly elliptic, usually comparatively wider on flowering branches, smaller (as in *S. spinosa*) on the very spiny young shoots on fire-cut stumps), 1–1.5(2.2) × as long as wide, 2–6(10) × 1–5(9) cm, emarginate, rounded to acute and apiculate, or sometimes acuminate at the apex, rounded, subcordate, or cuneate at the base, often slightly bullate or subpapillose, often with hair-pockets in the angles of the main veins beneath, pubescent or less often glabrous on both sides; 1–3 pairs of secondary veins from or from above the base curved along the margin; venation impressed above, prominent and conspicuous beneath. *Inflorescence* terminal, seemingly umbellate, congested, 2.5–4 × 2–5 cm, mostly many-flowered, 3–4 × branched. Peduncle, branches, and pedicels sometimes sparsely pubescent. Bracts linear or nearly so, upper sepal-like, lower larger, sometimes sparsely pubescent beneath, above mostly pubescent at the apex and with some hairs at the base, occasionally also some colleters at the base. *Flowers* 5-merous. *Sepals* pale green, connate at the base, narrowly triangular, equal, subequal, or some-

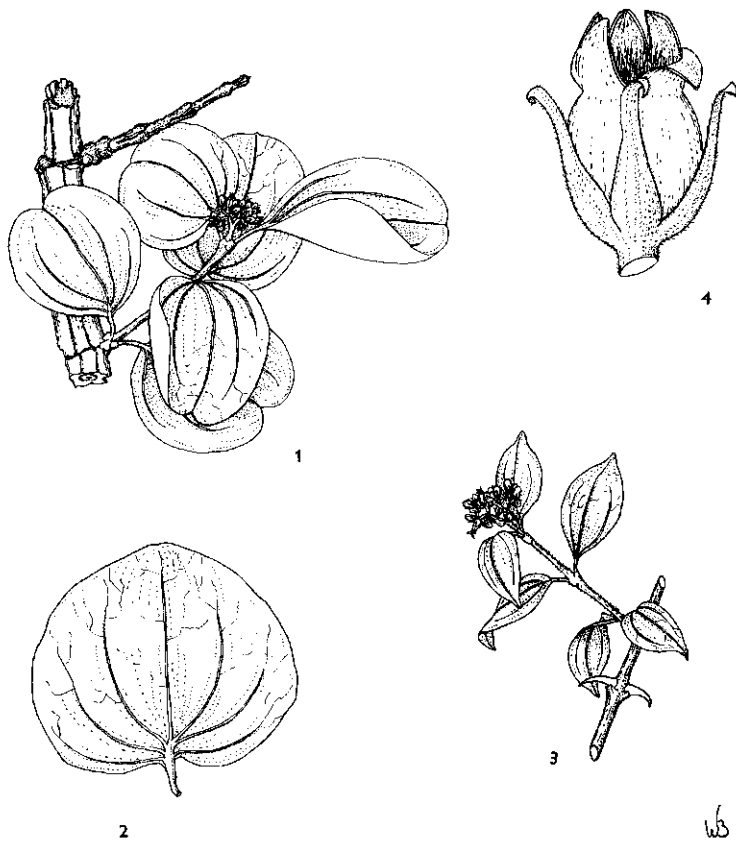


FIG. 12. *S. cocculoides*: 1, 3. branches, $\frac{1}{2} \times$; 2. leaf, $\frac{1}{2} \times$; 4. flower, $6 \times$ (1. O. B. Miller 1946; 2. Eyles 4547; 3. Gossweiler 1520 b; 4. Brain 6556).

times unequal, (2)2.5–5 \times as long as wide, 2–5 \times 0.7–1.3 mm, elongate at anthesis, acuminate or subulate at the apex, not distinctly ciliate, outside pubescent with an even indumentum of mostly erect hairs, inside pubescent at the apex and glabrous at the base or sometimes entirely pubescent, without colleters. *Corolla* when mature 1–2 \times as long as the calyx, (3.4)4–5 mm long, pale green, greenish, white, or greenish-yellow, sparsely pubescent or glabrous outside, inside with a narrow entire white-penicillate corona at the mouth of the tube; tube 1–2 \times as long as the lobes, (2)2.5–3 \times 2–3 mm, urceolate or campanulate, often somewhat contracted at the throat; lobes triangular, 1–2 \times as long as wide, 1.3–2.5 \times 1–1.5 mm, acute, erect or suberect. *Stamens* included; filaments glabrous, 0.4–1 \times as long as the anthers, inserted at 0.4–1 mm from the base of the corolla; anthers oblong or elliptic, 1.2–1.5 \times 0.8–1.2 mm, deeply cordate at the base, ciliate with villose hairs all around by which they are coherent; cells parallel. *Pistil* pubescent, 1.8–2.8 mm long; ovary ovoid, broadly

ovoid, or globose, 0.8–1.3 × as long as wide, 1–1.6 × 1–1.4 mm, acuminate or rounded at the apex, 2-celled; style mostly very short; stigma oblong, large, up to 0.9 mm long. In each cell about (30–) 50 ovules. *Fruit* large, hard, resembling an orange, globose, yellow or orange, often speckled with green, nearly mature dark green and mottled with pale green, when immature often blue-green, often slightly shining, with granular skin, 6–11 cm in diam., with about 10–100 seeds. Wall rather thick, 2–5 mm thick, thickened inside above the pedicel. Pulp edible. *Seeds* ochraceous, flattened, more or less plano-convex, obliquely ovate or elliptic, usually irregularly curved, about 1.2–1.6 × as long as wide, 12 × 8 × 2.5 – 22 × 15 × 4 mm, slightly rough, very shortly pubescent.

Distribution: Central, East, and northern South Africa.

Ecology: Woodland; alt. 400–2000 m.

Gabon: Ogooué R. (July) Thollon 888 (P); Ovanyo, Duparquet 417 (P).

Congo (Brazzaville): Fort Rousset (Oct.) Aubréville 229 (P); Pangala, Brazzaville Region, Babet 23 Nov. 1930 (P); Upper Loubété R., Babet Sept. 1930 (P); between Brazzaville and Joseph du Nkoué (July) Chevalier 27348 (P); Kinkala road, Mahitou-Tonkama itinerary (June) Bouquet 41 (P); bank Djili R., 23 km from Brazzaville, de Néré 1255 (IRSC); Brazzaville (July) Chevalier 4052 (P), 4060 (P), 4197 bis (P), 27297 (P); Musana (?) (fl.) Hâkauson 15 Sept. 1931 (LD, S).

Congo (Kinshasa): Léopoldville: Mvuazi, Kimpudi (Oct.) Devred 822 (BR, K); Lower Congo basin, Duvigneaud 317, partly (P); Kimuenza, Mildbraed 3572 (HBG), 3660 (HBG); *ibid.*, Lovanium (Oct.) Carlier 238 (BR); *ibid.*, Evrard 6466 (BR), 6467 (BR); *ibid.*, Robijns 4154 (BR); Kinshasa, Couteaux 1034 (BR); Source Geba (Oct.) Vanderyst 35027 (BR); Kisantu, Duvigneaud 33 (P); *ibid.*, Gillet anno 1900 (BR, photograph in K, neg. 2259, paratype of *S. suberosa* De Wild.); *ibid.*, Vanderyst 24658 (BR), Oct. 1908 (BR); between Inkisi and Kisantu (Oct.) Vanderyst 35895 (BR); Yokolo, Kisantu (Sept.) Vanderyst 34866 (BR); Mbiri, Kisantu (Aug.) Louis 60 (BR, K); Zomfi, Madimba Territory, Compère 1438 (BR); Kimpako, Germain 2159 (BR); *ibid.*, Vanderyst 30741 (BR); Lemfu, Butaye in coll. Gillet 2261 (BR, lectotype of *S. suberosa* De Wild.); between Kwango R. and Dembo (Oct.) Butaye 1505 (BR); Kimvula, Popokabaka Territory, Pauwels 235 (BR); *ibid.* (Apr.) Duvigneaud 737 (P); Bokomfumudisu, Popokabaka Territory, Pauwels 935 (BR); Middle Kwango R., Duvigneaud 853 (P); Ikusama, Kwango-Wamba road, Germain 2471 (BR); Lazaret St. Jean Berchmans, Wombali, Vanderyst Oct. 1908 (BR); Kikwit (June) Duvigneaud 1090 (P); Kiyaka, Kikwit Territory, Devred 1394 (BR, K, WAG); Kiyaka-Kwango (Aug.) Devred 2412 (BR, K); Lake Léopold II, Jans 134 (BR); Kahemba, Jermander 70 (BR). Kivu: Tembwe Sud, 50 km N. of Mobwa, Lake Tanganyika, van Meel 1027 (BR). Kasai: near source of Mishibu R., tributary of Kasai R., Port-Franqui Region (fr. Nov.) Huet 11 (BR); Bienge, Sapin Oct. 1907 (BR); Kasendji, Haute Lomani, Mullenders 2267 (BR); Gandajika (Oct.) Risopoulos 461 (BR); Kabuluku, Luisa Territory (July) Liben 3393 (BR, K, LISC, WAG). Katanga: Elsakum, Luizi, Kundelungu (Sept.) Lukuesa 383 (BR); Kaniama, Haute Lomani (June) Mullenders 225 (BR), 942 (BR, PRE); Kamina, Haute Lomani Mullenders 1109 (BR), 1373 (BR); Sandoa, Liben 3794 (BR, WAG); Kayombo-Mokabe Kasari road, Hoffmann 950 (BR); Chisangwe, Homblé 93 (BR); 12 km NW. of Lubumbashi (Oct.) Gathy 561 (LISC), 689 (BM, SRGH), 1064 (SRGH), 1319 (BM), 2097 (K), 2169 (K); near Lubumbashi, Burt-Davy 18040 (BR, K); *ibid.*, Humbert 15949 (= Quarré 3928) (BR, P, WAG); *ibid.*, Keyberg, Duvigneaud 1207 (P); 5 km NE. of Lubumbashi (fl. Oct., fr. Jan.) (tree under observation 56) Schmitz 556 (BR, PRE), 3450 (BR), 3623 (BR), (obs. tree 538) 2847 (BR), 3667 (BR), 5022 (BR); 8 km SW. of Lubumbashi (Mar., Oct.) (obs. tree 292) Schmitz 5171 (BR, WAG), 5321 (BR, with seedlings).

Angola: Luanda: Luanda (Apr., June, Dec.) Gossweiler 93 (COI), 1520 (BM, COI),

1520b (LISJC); 12 km from Luanda, along road to Catete (Nov.) Mendes 473 (LISC); Luanda, road to Cuanza (fl., fr. Apr.) Monteiro, Santos & Murta 32 (LISC); near Luanda, Welwitsch 6019 (BM, C, COI, K, LE, LISU, P); between Alto dos Cruzes and Quicune, Welwitsch 4763 (BM, COI, K, LISU), 4767 (BM, LISU); Museque de Selut (?) (Mar.-Apr.) Welwitsch 4764 (BM, LISU). Malanje: Malanje, J. J. de Almeida anno 1903 (LISJC); *ibid.*, Marques 10, partly (COI); *sin. loc.*, Gossweiler 1119 (BM, K, P), 1124 (BM, K, P). Luanda: Dundo, Soares in coll. Cavaco 10 (P); Vila Henrique de Carvalho (= Saurimo) (Sept.) Carrisso & Mendonça 424 (COI); *ibid.* (Aug.) Young 671 (A, BM, S); between Vila Henrique de Carvalho and Dala, Exell & Mendonça 1065 (BM, COI, LISJC). Cuanza Sul: Cela, Teixeira 437 (NLI, WAG); *ibid.* (Aug.) Teixeira & Sales 6100 (NLI); *ibid.*, Futa, Teixeira & Figueira 5780 (NLI, WAG). Benguela: Dende, Ganda, V. de Almeida 742 (NLI); between Ganda and Caconda, Fazenda Xangorolo, Hundt 1022 (BM). Huambo: Huambo Plateau, Gossweiler 54 (NLI); Nova Lisboa, Chianga (Sept.) Teixeira & Andrade 7993 (LISC). Bié: Munhango (fr. Jan.) de Campos Andrada 40 (LISC), 41 (LISC); between Cutato and Cuchi Rs., Ganguellas, Gossweiler 2409d (COI). Moxico: Vila Luso, Càmeara 16 (NLI, WAG). Moçamedes: Camucuo (Oct.) Teixeira & Andrade 4299 (NLI, WAG); Lungo, Teixeira 1150 (NLI, WAG). Huila: Caconda (Oct.) Anchieta 60 (LISU); 5 km from Sá da Bandeira, along road to Hoque (Oct.) Teixeira 3005 (NLI, WAG); Princera Amelia, Cubango, Ganguellas (Oct.) Gossweiler 2055 (BM, COI), 2409 (BM, LISJC); Vila Artur de Pavia, Mendes 1963 (LISC); Quilemba (Sept.) Teixeira 2803 (NLI, WAG); Tchivinguiro, near Humpata (Nov.) Correia 1181 (LISC); *ibid.* (Oct.-Nov.) Dekindt 492 (LISC, MPU, lectotype of *S. thomsiana* var. *elegans*); *ibid.*, Serra da Chela (Oct.) Gossweiler 13084 (LISC, NLI); Huila, Palanca (Jan.) Torre 8546 (LISC); Huila, Dekindt 5a (E), *s.n.* (COI, LISC, NLI); Kamungua Mt., Dekindt 9 Oct. 1899 (LISC); Otchipongolo, Dekindt 1037 (LISC, lectotype of *S. paralleoneura*); Keputu (all fl.) Dekindt 29 Sept. 1899 (LISC), 19 Oct. 1899 (LISC), 10 Nov. 1899 (LISC); Monhino, Dekindt 264 (LISC); between Mucha and Omballa Rs. (fl.) Dekindt 2 Nov. 1899 (LISC); Omahini R. (fl.) Dekindt 10 Oct. 1899 (LISC); near Huila (Oct.) Dekindt 283 (LISC), 1032, partly (P, type of *S. dekindtiana*); between Lopollo and Monino, Welwitsch 4779 (BM, COI, G, K, LE, LISU, P, type), 4780 (BM, COI, G, K, LISU, P); Gambos (= Chibemba), Dekindt 585 (LISC); *ibid.*, near Chimbolelo Peak, Azancot de Menezes 707 (K); Mulondo (Oct.) C. Henriques 196 (BM, K, LISC); Vila Pereira d'Eca (Oct.) Mendonça 4559 (LISC). Cuando-Cubango: Vila Serpa Pinto, Mendes 2442 (LISC); *ibid.*, Teixeira 5 (LISC, NLI); Longa, P. de Almeida 410 (NLI, WAG); Cubango R., near Massaca (Oct.) Baum 290 (BM, E, G, K, W, lectotype of *S. schumanniana*); Cuito-Cuanavale, Mendes 2940 (LISC); Santa Cruz, Teixeira 149 (NLI). District and locality unknown: 'Giant Sable Country' (Sept.) A. G. Curtis 268 (GH).

Kenya: Mombasa, Humbert & Swingle 4318 (P).

Tanzania: Ntangelamela, near Bukoba, J. Ford 834 (K); Miombo Forest, Geita, Mwanza District, Watkins 298 (F.H. 2773) (EA, FHO); Sima, Mwanza, Watkins 79 (F.H. 2361) (EA, FHO); near Geita, W. Mwanza, Burt 6541 (BM, BR, K, P); Buyungu, Kibondo, Buha District, Maclean H 37/33/26 (EA), H 37/33/27 (EA); Kahama District, 30 km along Ushiroambo road, Burt 5460 (BM, BR, EA, FHO, K); from Gombe stream to Missongo, E. shore of Lake Tanganyika, Pirozynski 306 (K, WAG); Kazuramimba, Kigoma District, Moreau 9077 (EA); Simbo Res., Tabora, Wigg F.H. 1116 (EA, FHO); Tabora District, Akiley 5026 (EA, K); S. Tabora, at Kakoma, C. H. N. Jackson 119 (K); Tabora and Kakoma (fr. Apr.) H. A. Lindeman 81 (BM); Iru, Tabora District, Wallace 20 (K); Kalimva, Tabora District, Shabani 43 (K); 17 km S. of Tabora, Sihonge road, Boaler 495 (EA, K); between Goweko and Igalula, Ngulu District, Peter 35006 (B); Kasikati R. Basin, 80 km S. of Kigoma, Itani 90 (EA); near Mangoni, Dodoma District 4593 (K); Kitapilimwa, about 18 km E. of Iringa-Dodoma road, Mathias & D. Taylor A 144 (EA); Tanangosi, SW. of Iringa (Nov.) G. Brown H 54 (EA, K); Mbosi, Mbeya District (Nov.) Davies 740 (EA, K, SRGH); *ibid.* (Nov.) Jessel 69 (EA, K); Lutamba Lake, 40 km W. of Lindi (Nov.) Schlieben 5570 (B, BM, BR, G, LISC, M, MO, P, S, WAG, Z); Rondo Plateau, Lindi District (Dec.) Milne-Redhead & P. Taylor 7640 (B, BR, EA, K, LISU), 7642 (BR, EA, K); 7 km W. of Nachingwera, Lindi District, Evans 20 (EA); Mayanga, Lindi District (fr. May) Busse 2524 (BM, BR, EA, G, HBG, LY, lectotype of *S. suberifera*; all veg.; the fruits described not seen), 2524a (EA, paratype of *S. suberifera*,

photograph in K, neg. 2289); Songea, E. Ungoni, Busse 735 (EA, G, LY, P, the latter only fruits); Msamala Baraya, Miila, Tanner 86 (EA).

Zambia: S. of Chipampa, Lake Mweru, Chiengi District (fr. June) Michelmore 371 (K); Sunzu Hills, Abercorn District, Burt 6345 (BM, BR, K); near Lunzua R., near Abercorn, R. E. Fries 395a (UPS); 50 km SW. of Abercorn, N. side of Lunzua R. valley (fr. May) Boaler 933 (EA, K); Abercorn-Mpulungu road (fl., fr. Sept.) Bullock 1117 (BR, K); Kalungu R. Terrace, near Isoka (Oct.) Astle 977 (K, SRGH); Kalene Hill, Mwinilunga, Duff 12/32 (FHO); 1 km S. of Matonchi Farm, Mwinilunga District, Milne-Redhead 4459 (K); Mutanda Bridge, Solwezi District (fr. June), Milne-Redhead 621 (BR, K); between Solwezi and Lubumbashi, Stevenson 240/31 (FHO); between Kawendimusi and Bangweulu (Sept.) R. E. Fries 768 (UPS); Samfya, Fort Rosebery District, White 3186 (BR, FHO, K); Mufulira, Eyles 8156 (K, SRGH); Kitwe, Fanshawe Kitwe 6 (WAG); Ndola, Fanshawe 826 (K); *ibid.* (fl., Oct., fr. Feb.) R. G. Miller 170 (BM, FHO), 300a (FHO, NY), 300b (FHO, NY); *ibid.* (Oct.) White 3515 (BM, BR, FHO, K); 2 km from Ndola, Symcoens 9996 (K, LISC); between Bwana and Mkubwa, R. E. Fries 396 (UPS); Namwala, Read 18 (K); Chilanga, Rogers 8594, partly (Z); near Senanga, Barotseland (July) Codd 7221 (BM, BR, COI, EA, K, L, PRE, SRGH, UPS); Mapanza (fl. May, Oct., fr. May) Robinson 281 (K), 350 (K); 3 km S. of Masuku Mission, Gwembe District (fr. Mar.) White 2344 (FHO, K); near Choma, Mazubuka District (fr. June) White 2935 (BR, FHO, K); Sesheke District, Gairdner 92 (K); Kazungula (fl.) Jalle 26 Oct. 1892 (P); Dambwa For. Res., 6 km N. of Livingstone, White 1874 (FHO, K); Livingstone, Morze 21 (FHO); *ibid.* (Oct.) Rogers 7237 (BOL, K, Z); Bombwe, near Livingstone (Oct.) Martin 305/32 (EA, FHO); Munshiwemba (Oct.) Stohr 345 (BOL).

Rhodesia: Salisbury (Oct.) Brain 6238 (MO, SRGH); *ibid.* (fl. Oct.-Nov., fr. Dec.) Eyles 3694 (BOL, K, NGB, SRGH), 4541 (K, SRGH), 4543 (K, SRGH), 4546 (K, SRGH), 4547 (K, SRGH); *ibid.*, Humbert 15462 (P); *ibid.*, Lanjouw 1213a (U); Victoria Falls, Wankie District, Armitage 275/59 (SRGH); *ibid.*, Obermeyer SRGH 36521 (PRE); *ibid.*, T. R. Sim 19283, partly (PRE); Gokwe District, Vincent 78 (MO, SRGH); Marandellas (Oct.) Rattray 753 (K, SRGH); Marandellas District (Oct.) Corby 533 (SRGH); Rusape (Oct.) Davies 848 (BR); *ibid.*, Th. C. E. Fries, Norlindh & Weimarck 3318 (LD), 3369 (LD); *ibid.* (Nov.) Munch 39 (K); Umvuma-Mtao (Oct.) Brain 6556 (SRGH); Mtao For. Res., English 7/47 (FHO, SRGH); Mtao District (Oct.) Eyles (?) SRGH 4317 (SRGH); Nyamandhlovu District (fr. June) Denny 131 (SRGH); Nabla (Oct.) Steedman 197 (SRGH); Matopos District, Gordon Park, Cuthbertson SRGH 27234 (SRGH); Matobo District, O. B. Miller 1904 (SRGH); *ibid.*, Besna-Kobila Farm (Nov.) O. B. Miller 1946 (K, MO, PRE, SRGH); Fort Victoria-Limbabwe road (Oct.) Davies 2613 (SRGH); Victoria District Monro 555 (BM, SRGH), 591 (BM, SRGH); *sin. loc.* Lees 53/51 (FHO); Pitt-Schenkel 15 (FHO).

Malawi: Kasungu (fr. Aug.) Brass 17433 (K, MO, NY, SRGH, US).

Moçambique: Cabo Delgado: km 11 of Montepuez-Namuno road (fr. Dec.) Torre & Paiva 9712 (LISC). Niassa: Amaramba, km 13 of Mandimba-Massangulo road (Oct.) Mendonça 655 (LISC); Mandimba, Pedro & Pedragão 3487 (EA). Tete: Moatize, between Zóbuè and Metengobalama, Correia 397 (LISC). Zambezia: between Alto Ligonha and Alto Molócuè, Barbosa & M. F. de Carvalho 4406 (K, SRGH). Moçambique: Nametil, Pedro & Pedragão 4451 (EA). Manica e Sofala: Gorongosa, Nat. Park of Caça, Torre & Paiva 9136 (LISC). Inhambane: Cubine, Le Testu 617 (P); Lourenço Marques: Magenja da Costa, near Lourenço Marques, Mazaya, Sim 6013 (PRE, type of *S. suberosa* T. R. Sim, non De Wiid.).

S.W. Africa: near Oshikango, Ovamboland, Rodin 2664 (BOL, K, MO, UC, US); near Omupanda, Ovamboland (Sept.) Rautanen 682 (WAG, Z); 9 km E. of Kuringkuru, Okavango Territory (fr. Dec.) de Winter 3826 (K, M); 17 km S. of Runtu, along road to Karakowisa, Okavango Territory, de Winter 3759 (K, M); near Okavango R., Watt 28 (PRE); Andara, Merxmüller & Giess 2040 (M, PRE); Bwabwata, W. Caprivi Strip (Oct.) Watt 20 (M); NE. of Grootfontein, Schoenfelder 222 (PRE); W. of foot of Aha Mts., Grootfontein District, Story 6343 (M).

Botswana: Tsodilo Hills, C. H. Banks 7 (PRF); Ngamiland (?) (Dec.-Jan) Curson 3311 (PRE); *ibid.* (?), O. B. Miller B/434 (FHO); 300 km NW. of Molepolole (fr. June) Story 4916

(K, PRE); Palapye, de Beer 569 (K, SRGH); Kwena Res., O. B. Miller B/240 (PRE); N. Kalahari, Schoenfelder 4 (PRE).

S. Africa: Transvaal: Potgietersrus (Dec.) Thode A 1737 (K); between Vaalwater and Elmeston, Wedermann & Oberdieck 1763 (K); Naboomspruit, Mosdene, Galpin 221 (L, NBG); 16 km NW. of Nylstroom (Sept.) Codd 6151 (K, SRGH); 23 km from Nylstroom, along road to Pietersburg (Oct.) Story 5962 (K); km 24 of same road (Oct.) Story 5961 (K, SRGH); 6 km NE. of Nylstroom (fl., fr. Oct.) Marais 901 (K, PRE); near Nylstroom, Prosser 1737 (J, K); Warmbad (Oct.) Acocks 1442 (S: coll. Hafström); *ibid.*, Burt-Davy 2154 a (PRF); 11 km N. of Warmbad (Oct.) Marais 899 (K, WAG); near Pretorius Kop, Nelspruit District, Codd & Verdoorn 5459 (MO); Loskop Dam Nature Res., Middelburg District (Oct.) Mogg 30548 (K); Olifants R. Gorge, Middelburg District, Mogg 22477 (K, PRE); Waterval, Gen. Hertzog's Farm, near Pretoria (fr.) Pole-Evans 13 May 1933 (K, SRGH); Barberton (Dec.) Thorncroft 2203 (FHO), 2204 (FHO); Magaliesberg, near Wonderboom (Nov.) Schlechter 3630 (BM, BOL, BREM, G, K, LE); Wonderboom Res., Pretoria, Repton 1757 (PRE); Pretoria (Oct.) Robertson PRF 2155 (PRF); Meintjes Kop, Pretoria, Mogg 16423 (PRE); Rietfontein, slope of Magaliesberg (Oct.) Merxmüller 119 (M); Rooikop (Nov.) Pole-Evans 281 (EA).

Cult.: Congo (Kinshasa): Katanga, Keyberg, near Lubumbashi, Schmitz 4287 (BR, seedlings of herb. 556 = obs. tree 56), 4288 (BR, WAG, seedlings of herb. 2847 = obs. tree 538).

Note. Annual burning prevents the plant attaining normal size and such specimens of *S. cocculoides* remain a low shrub with stems and leaves like sucker shoots, which may, however, flower, e.g. herb. Teixeira & Andrade 7993 and bear fruit, e.g. herb. Gossweiler 2409, 2409 d, and Mendes 1963, 2442.

14. *S. congolana* Gilg in Engler, Bot. Jahrb. 28: 120. 1899; Baker in Fl. Trop. Afr. 4(1): 521. 1903; E. A. Bruce, Kew Bull. 10: 38. 1955, partly (excl. syn. *S. djalonis* A. Chev.); Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 16. 1960, partly (excl. syn. *S. djalonis*); Leeuwenberg, Act. Bot. Neerl. 11: 48–49, f. 2. 1962, partly (excl. shrubs and trees); Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 41. 1963, partly (excl. syn. *S. chloropetala* A. W. Hill).

Fig. 13, p. 93; Map 11, p. 94

Type: Congo: Kivu, near Kasongo, Dewevre 931 (BR, holotype, photograph in K, neg. 2309).

Heterotypic synonyms: *S. viridiflora* De Wild., Pl. Bequaert. 2: 101. 1923, not A. W. Hill (1925). Type: Congo: Orientale, Irumu, Bequaert 2807 (BR, holotype, photograph in K, neg. 2205; isotype: BR).

S. lecomtei A. Chev. ex Hutch. et Dalz., Fl. W. Trop. Afr. 2: 22. 1931 and Kew Bull. 1937: 333. 1937 (Chevalier, Expl. Bot. Afr. Occ. Franç. 1: 443. 1920, nomen); Chevalier, Rev. Bot. Appliq. 27: 368, pl. 17 B. 1947. Type: Ivory Coast: near Bingerville, Chevalier 15402 (P, holotype, photograph in K, neg. 2296).

Liana, at least 20–35 m long, often shrublike and flowering when regrowing from stump. Trunk 3–10 cm in diam.; bark pale brown, thick, corky, not lenticellate; wood pale yellowish, without bark-islets. Branches with some mostly recurved spines, not lenticellate; branchlets pale green to pale brown, pubescent or glabrous. Tendrils paired. Stipules on main axis and often on

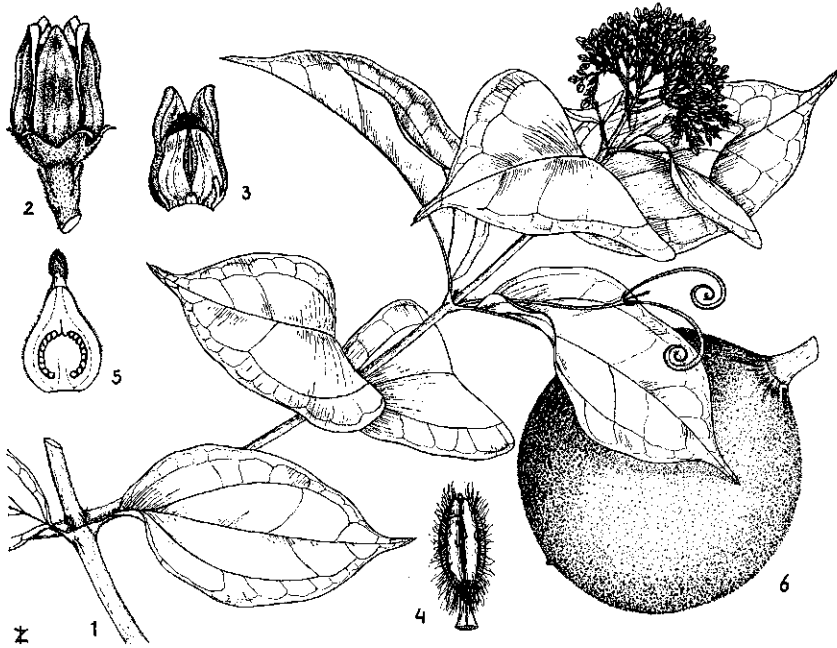
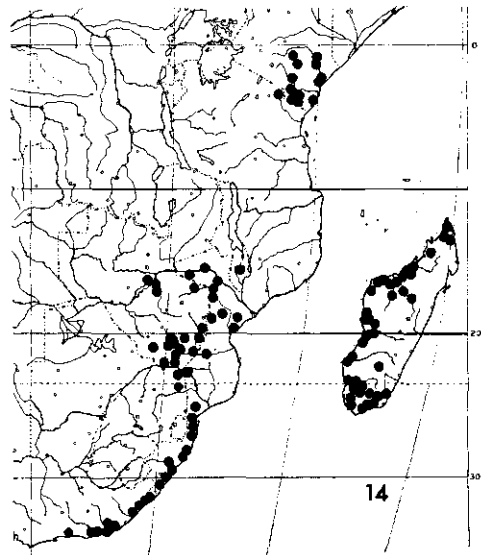
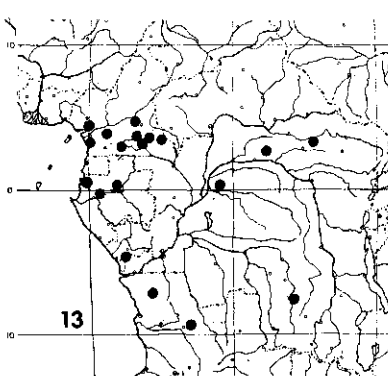
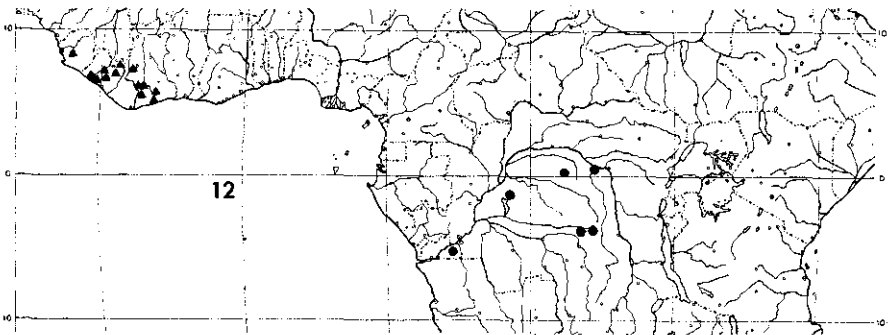
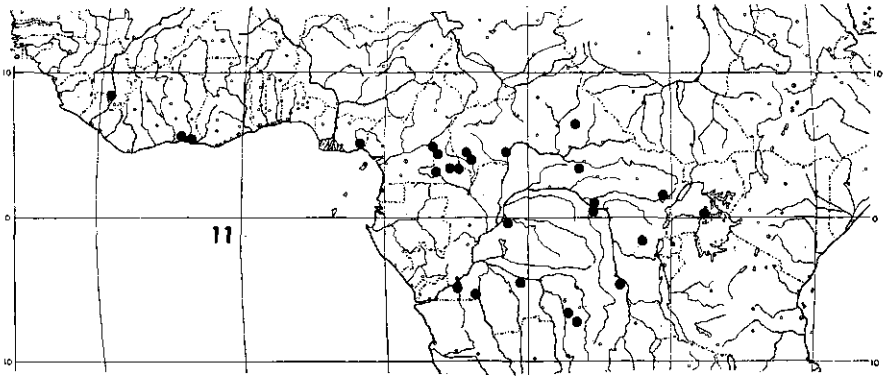


FIG. 13. *S. congolana*: 1. branch with linear stipules, $\frac{1}{2} \times$; 2. flower, $4 \times$; 3. longitudinal section of corolla inside with bases of filaments; lobes inside partially united by corona, $4 \times$; 4. stamen, $8 \times$; 5. longitudinal section of ovary, $8 \times$; 6. fruit, $\frac{1}{2} \times$ (1-6. Leeuwenberg 3146).

branches, linear, very small, 4-12 on each node. *Leaves*: petiole short, pubescent or glabrous, 2-7 mm long; blade mostly shining and pale to dark green above, less shining to mat beneath, herbaceous or in the sun more often thinly coriaceous, mostly papyraceous when dry, ovate, narrowly ovate, or oblong, $1.5-2.5 \times$ as long as wide, $5-15 \times 2-7.5$ cm, usually abruptly acuminate to caudate at the apex, rounded or subcordate at the base, pubescent or glabrous on both sides; 1 or 2 pairs of secondary veins from above the base and an additional faint pair curved along the margin; venation reticulate. *Inflorescence* terminal, $2-3 \times 2.5-6$ cm, many-flowered, $4-5 \times$ branched, rather congested. Bracts sepal-like, pubescent to nearly glabrous beneath, without colleters. Peduncle, branches, and pedicels pubescent. *Flowers* 5-merous. *Sepals* pale green, connate at the base, equal or subequal, narrowly oblong, $1.8-3 \times$ as long as wide, $1.2-3 \times 0.6-1$ mm, long-acuminate at the apex, usually not ciliate, glabrous or especially at the base puberulous outside, glabrous inside, without colleters. *Corolla* when mature $1.8-3.3 \times$ as long as the calyx and $3-5 \times 2-3.5$ mm, pale green, widely cylindrical to urceolate, glabrous or minutely puberulous outside, inside with a narrow white-penicillate corona; tube $1-2 \times$ as long as the calyx, $1.7-2.5 \times$ as long as the lobes, longitudinally cleft from the



MAP 11. *S. congolana*; Map 12. ▲ *S. cuminodora*, ● *S. cuniculina*; Map 13. *S. dale*; Map 14. *S. decussata*.

insertion of the stamens to the corona (by which it is actually false from the insertion of the stamens); lobes triangular, 1.2–1.6 × as long as wide, 1.2–1.8 × 0.8–1.3 mm, acute, erect. *Stamens* included; filaments as long as the anthers, glabrous, inserted near the base of the corolla tube (actually on the mouth); anthers oblong, 1 × 0.8–1.2 × 1 mm, cordate at the base, ciliate all around with villose hairs; cells parallel. *Pistil* glabrous or pubescent, 2 mm long; ovary ovoid, 2-celled, gradually narrowed into the very short style; stigma capitate. In each cell about 40–50 ovules. *Fruit* large, globose, pale green to yellow (?), 7–10 cm in diam., thick-walled, many-seeded. Wall 5 mm thick. *Seeds* pale ochraceous, obliquely ovate or elliptic, 20 × 12–14.5 × 5 mm, often rather smooth, glabrous or nearly so.

Distribution: West and northern Central Africa.

Ecology: Rain forests, secondary forests, or gallery forests; alt. 0–900 m.

Guinea: Sérédou, Herb. I.D.E.R.T. 2414 (ABI).

Ivory Coast: Adiopodoumé, 17 km W. of Abidjan (May) Herb. I.D.E.R.T. 1573 (ABI); *ibid.* (Apr., June) Leeuwenberg 3146 (BR, FHO, K, P, WAG), 3701 (ABI, WAG), 4467 (ABI, WAG); near Bingerville, Chevalier 15402 (P, type of *S. lecomtei*; photograph: K, neg. 2296), 15407 (K, LY, P); Grand Bassam (Jan.) Pobéguin 199 (P).

Nigeria: Old Calabar, W. C. Thompson 121 (E, K).

Cameroon: 12 km N. of Ndemba II, along new road to Bélabo, Leeuwenberg 5966 (WAG); km 24 of road Bertoua-Bétaré Oya, Breteler, J. de Wilde & Leeuwenberg 2432 (K, P, WAG); 6 km E. of Bertoua (fr. Mar.) Breteler 1224 (WAG, fr. only), 1303 (WAG, YA), 1655 (WAG, YA); 3 km N. of Lomié, Leeuwenberg 6514 (WAG); 19 km W. of Yokadouma, Leeuwenberg 6184 (WAG); Yendi, E. of Yokadouma (Mar.) Mildbraed 4742 (HBG, cited as *S. transiens*).

Central African Republic: 22 km N. of Berberati, along road to Carnot, Leeuwenberg 7264 (WAG); 4 km N. of Bania, W. of Mambéré R., Leeuwenberg 7204 (WAG); Boukoko, N. of Bangui (Mar.) Tisserant 2630 (P); Yalinga region, Le Testu 4592 (P, WAG).

Congo (Kinshasa): Léopoldville: Binza, Jans 494 (BR); Dinga, Callens 2367 (BR); bank Nyangi R., between Kwango and Wamba Rs. (July) Germain 2463 (BR); Mpangu, Popokabaka Territory, Pauwels 1810 (BR); Ipamu, Vanderyst 12223 (BR). Equateur: Eala, Lee-mans 626 (BR). Orientale: La Kulu, Brands 521 (BR); Yangambi (fl. Feb.-Apr., Nov., fr. Feb.-Mar., June-July) Louis 2829 (BR), 4263 (BR, EA, K, MO, P, dupl. erroneously often as 4363), 12561 (BR, C, PRE), 13523 (BR), 13702 (BR, K), 14343 (BR), 14538 (MO, P), 15309 (BR), 16404 (BR), 16449 (BR), 16449 bis (BR), 16744 (BR), 16771 (BR), 16835 (BR), 16903 (BR); *ibid.*, Bolema 1211 (BR, WAG); *ibid.*, Gilbert 7943 (BR), 10143 (BR); Irumu (Mar.) Bequaert 2807 (BR, type of *S. viridiflora*; photograph: K, neg. 2205). Kivu: Irangi, near km 110 of road Kavumu-Walikale (Mar.) Troupin 6412 (BR); near Kasongo, Dewevre 931 (BR, type; photograph: K neg. 2309). Kasai: road Nsadi-Kalenda, Dibaya Territory, Liben 2282 (BR, K, WAG); Madika Forest, near Mwene-Ditu (fr. Feb.) Carlier A 28 (BR, PRE). Congo (Kinshasa): *sin. loc.*, H. Du Bois 138 bis (BR).

Uganda: Kampala-Entebbe road, Mengo District (Nov.) Lab. Staff in coll. Snowden 2369 (K).

Cult.: Wageningen, seedlings of herb. Breteler 1224; Leeuwenberg 3510 (WAG), 7821 (WAG).

15. *S. cuminodora* Leeuwenberg, Act. Bot. Neerl. 14: 219, f.l. 7-10. 1965.

Fig. 28, p. 187; Map 12, p. 94

Type: Ivory Coast: 25 km SW. of Guéyo, Leeuwenberg & Brader 3737 (WAG, holotype; isotypes: A, BR, K, MO, P).

Liana, up to 40 m long and 20 m high climbing in trees. Trunk at least 6 cm in diam. Wood yellowish. *Branches* not lenticellate; branchlets glabrous, pale green, often dark brown when dry, with 2 longitudinal grooves below the stipular line, often subquadrangular; main axis when young sometimes also grooved, but less so. Tendrils paired. *Leaves*: petiole glabrous, 2-7 mm long; blade dark green and slightly shining above, paler, often with darker veins and mat beneath, thinly coriaceous or papyraceous also when living, ovate, narrowly ovate, elliptic, or narrowly elliptic, 1.5-3.6 × as long as wide, (2)3-10(11.5) × 1.5-6 cm, distinctly acuminate at the apex (acumen 7-15 mm long, narrow), cuneate, rounded, or occasionally subcordate at the base, glabrous on both sides, without odour when living, often with a faint sal-ammoniac- or *Cuminum*-odour when dry; one pair of secondary veins from or from above the base curved along the margin and often a faint submarginal pair. *Inflorescence* axillary, rather congested, short, 0.1-0.2 × as long as the leaves, 1-1.2 × 1-1.2 cm, few-flowered, 1-2 × branched. Peduncle, branches, and pedicels short, glabrous. Bracts narrowly triangular or sepal-like, glabrous beneath, pubescent above at the base, without colleters. *Flowers* 4-5-merous. *Sepals* pale green, connate at the base up to about one-third of their length, equal, broadly ovate, about as long as wide, 0.5-1.2 × 0.5-1.2 mm, obtuse or acute at the apex, minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 2-6 × as long as the calyx, 2-3(4) mm long, and rounded at the apex, pale yellow, outside glabrous, inside pilose except for the glabrous apices of the lobes and base of the tube or practically entirely glabrous; tube short, 1-2.4 × as long as the calyx, 1.2 mm long; lobes 1-1.5 × as long as the tube, oblong, 1.3-1.8 × 0.8-1.2 mm, acute, suberect. *Stamens* exerted; filaments glabrous, about 1-1.5 × as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong or ovate, 0.6 × 0.3-0.5 mm, deeply cordate at the base, glabrous; cells parallel. *Pistil* glabrous, 2-2.4 mm long; ovary ovoid or globose, 0.6 × 0.6 mm, 2-celled; style 1.2-1.7 mm long; stigma obscurely bilobed or capitate. In each cell 5-9 ovules. *Fruit* orange, small, soft, globose, 10-12 mm in diam., one-seeded. Wall thin. *Seed* subglobose, at least 7 × 6 × 6 mm, smooth. Testa thin.

Distribution: Guinea (Nimba Mts.), Liberia, western Ivory Coast.

Ecology: Moist places in rain forests or secondary forests, often on river banks; alt. 0-700 m.

Guinea: Nimba Mts., Schnell 4459 (ABT).

Sierra Leone: Yonibana, Thomas 4085 (K), 5027 (K), 5032 (K, paratype of *S. millepunctata*), 5121 (K), 5253 (K).

Liberia: 9 km E. of Yoma, 20 km NE. of Bomi Hills, Leeuwenberg 4880 (WAG); left

bank Mahe R., 12 km NE. of Bomi Hills, near Yoma, Leeuwenberg 4821 (WAG), 4857 (WAG); *ibid.*, J. de Wilde & Voorhoeve 3857 (BR, K, WAG); Bong Range, 32 km N. of Kakata, Leeuwenberg & Voorhoeve 4920 (WAG); right bank Gbata Ck., 32 km SW. of Suakoko, Leeuwenberg & Voorhoeve 4590 (WAG); Péahtah (Oct.) Bequaert in coll. Linder 1065 (A, K); Ganta (Aug.) Harley 989 (K, LIB); Nimba Mts. (fr. Dec.) Adam 20220 (K, P); *ibid.*, Leeuwenberg & Voorhoeve 4616 (WAG).

Ivory Coast: Man-Danané road, Aké Assi 3836 (ABI); *ibid.*, J. de Wilde 856 (WAG); Zanié Forest, between Guiglo and Tai, Jaeger 4535 (WAG); *ibid.*, Schnell 6016 (ABT); 4 km E. of Troiya, 24 km S. of Tai, Guillaumet 1445 (ABI, WAG); 7 km N. of crossing Hana R. and Tai-Tabou road, J. de Wilde & Leeuwenberg 3526 (BR, K, WAG); *ibid.*, Guillaumet 645 (ABI); near Tapéguhé, right bank Sassandra R., 50 km NW. of Soubré, Leeuwenberg 4529 (WAG), 4535 (WAG); Monogaga, 40 km W. of Sassandra (Nov.) Guillaumet 1604 (WAG); *ibid.*, Leeuwenberg 4045 (WAG); 9 km NE. of Monogaga, Leeuwenberg 4055 (WAG); about 25 km SW. of Guéyo (May) Leeuwenberg & Brader 3737 (A, BR, K, MO, P, WAG, type).

16. *S. cuniculina* Leeuwenberg, sp. nov. **Fig. 11, p. 85; Map 12, p. 94**

Frutex scandens cirrhis per paria dispositis. Folia elliptica vel ovata apice acuminata vel caudata utrinque glabra. Inflorescentia axillaris minima pauciflora bracteis parvis fere sepaliformibus suffulta. Flores pentameri. Sepala parte basali connata triangulari-ovata apice acuta utrinque glabra. Corolla parva extus glabra intus fauce pilis sparsis profulta. Stamina exserta filamentis antheris oblongis glabris aequilongis. Pistillum glabrum ovario late ovoideo biloculari. Fructus parvus mollis globosus vel fere globosus monospermus semine depresso-globoso vel -ellipsoideo pubescenti laevi testa tenui vestito.

Type: Congo: Orientale, between Yabongengo and Yamfela, Isangi Territory, Germain 4502 (BR, holotype; isotypes: PRE, WAG).

Liana climbing over shrubs or in trees. Trunk 2–3 cm in diam. Branches not lenticellate, terete, dark brown and not sulcate when dry; branchlets glabrous, when dry dark brown and slightly sulcate. Tendrils paired. *Leaves*: petiole glabrous, 2–5 mm long; blade slightly shining on both sides, paler beneath, thinly coriaceous, elliptic or ovate, $(1.5)2\text{--}2.7 \times$ as long as wide, $3\text{--}8 \times 1.5\text{--}4$ cm, acuminate or caudate at the apex, cuneate or rounded at the base, glabrous on both sides; one pair of secondary veins from or from above the base curved along the margin, and often a faint submarginal pair; tertiary venation reticulate, slightly prominent beneath. *Inflorescence* axillary, small, congested, few-flowered, $0.5 \times 0.5\text{--}2 \times 2$ cm, $2 \times$ branched. Peduncle, branches, and pedicels minutely pubescent or glabrous. Bracts small, approximately sepal-like. *Flowers* 5-merous. *Sepals* up to halfway connate, ovate to triangular, 1×0.8 mm, acute at the apex, minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 3.2–3.5 mm long, and rounded at the apex, white (?), outside glabrous, inside with some pilose hairs in the throat; tube 1.2–1.5 \times as long as the calyx, 1.2–1.5 mm long; lobes 1.3–1.7 \times as long as the tube, oblong, 2×1.2 mm, suberect. *Stamens* slightly exserted; filaments glabrous, as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, $0.6\text{--}0.8 \times 0.4\text{--}0.5$ mm, deeply cordate at the base, glabrous; cells parallel.

Pistil glabrous, 2.2–2.4 mm long; ovary often broadly ovoid, 1–1.2 × 0.9–1 mm; style 1.2 mm long; stigma capitate. In each cell 11 ovules. *Fruit* orange, small, soft, globose or nearly so (?), about 12–15 mm in diam., 1-seeded. Wall thin. Seed ochraceous, depressed-globose or -ellipsoid, 7 × 7 × 5.5–10 × 9 × 8 mm, pubescent, smooth. Testa thin, sticking to the pulp.

Distribution: Congo (Kinshasa).

Ecology: Swamp forests, *Brachystegia* forests; alt. about 0–500 m.

Congo (Kinshasa): Léopoldville: Timansi, Zundu, Compère 1256 (BR), 1677 (BR); Nseti (fr. Feb.) Jans 1053 (BR). Equateur: Itipo-Iboko road, Bikoro Territory (fr. Apr.) Evrard 6153 (BR, WAG); Djolu, Evrard 5727 (BR, WAG). Orientale: between Yabongengo and Yamfela, Isangi Territory (fl., fr. Nov.) Germain 4502 (BR, PRE, WAG, type).

Notes. *S. cuniculina* is very closely allied to *S. cuminodora* from West Africa. The only clearcut differential character is the punctuation of the leaves. The leaves of *S. cuminodora* have many minute translucent dots, those of *S. cuniculina* not or only a few.

The name '*cuniculina*' refers to the shape of the seeds, which resemble rabbit droppings.

17. **S. dale** De Wild., Bull. Jard. Bot. Brux. 5: 47. 1915.

Fig. 14, p. 99; Map 13, p. 94

Type: Congo: Equateur, Bumba Territory, Dundusana, Mortehan 1062 (BR, holotype; isotype: K).

Large liana, 10–40 m high climbing in trees, 30–50 m long or more. *Leaves:* blade elliptic or narrowly elliptic, 1.7–3(4) × as long as wide, (5)8–17 × (2)4–9 cm, acuminate or more or less apiculate at the apex, cuneate or rounded at the base; tertiary venation conspicuous, prominent on both sides, especially beneath. *Corolla* in the mature bud (3.8)4–4.5 mm long; tube 2–3 × as long as the calyx, 1–1.5 × as long as the lobes, 2–3 mm long; lobes 1.5–2.5 × as long as wide, 1.5–2.5 × 0.8–1.2 mm. *Stamens:* anthers 0.6–1 × 0.5–0.7 mm. *Pistil* (3.8)4–4.5 mm long; ovary 1–1.5 × 0.8–0.9 mm; style 2–3.5 mm long. *Fruit* slightly larger than in *S. floribunda*, 20–22 × 15 mm, not yet seen mature. Other characters as *S. floribunda*.

Distribution: Cameroun, Gabon, Congo, Angola.

Ecology: Rain forests or secondary forests; alt. 0–750 m.

Cameroun: 25 km NE. of Douala, along road to Edéa, Leeuwenberg 6328 (WAG); E. of km 58 of Edéa-Kribi road, Leeuwenberg 5522 (WAG), 6306 (WAG), 6813 (WAG); Nkolbisson, 7 km W. of Yaoundé, Leeuwenberg 5448 (WAG); Bitye, about 60 km ENE. of Sangmélina, Bates 1081 (BM, BR, MO, NY, Z), 1309 (BM); 44 km S. of Abong Mbang, along road to Lomié, Leeuwenberg 6489 (WAG); 8 km E. of Lomié, along road to Eschienbot, Leeuwenberg 6721 (WAG); 10 km N. of Ndemba II, S. of Ebaka, Leeuwenberg 5842 (WAG);

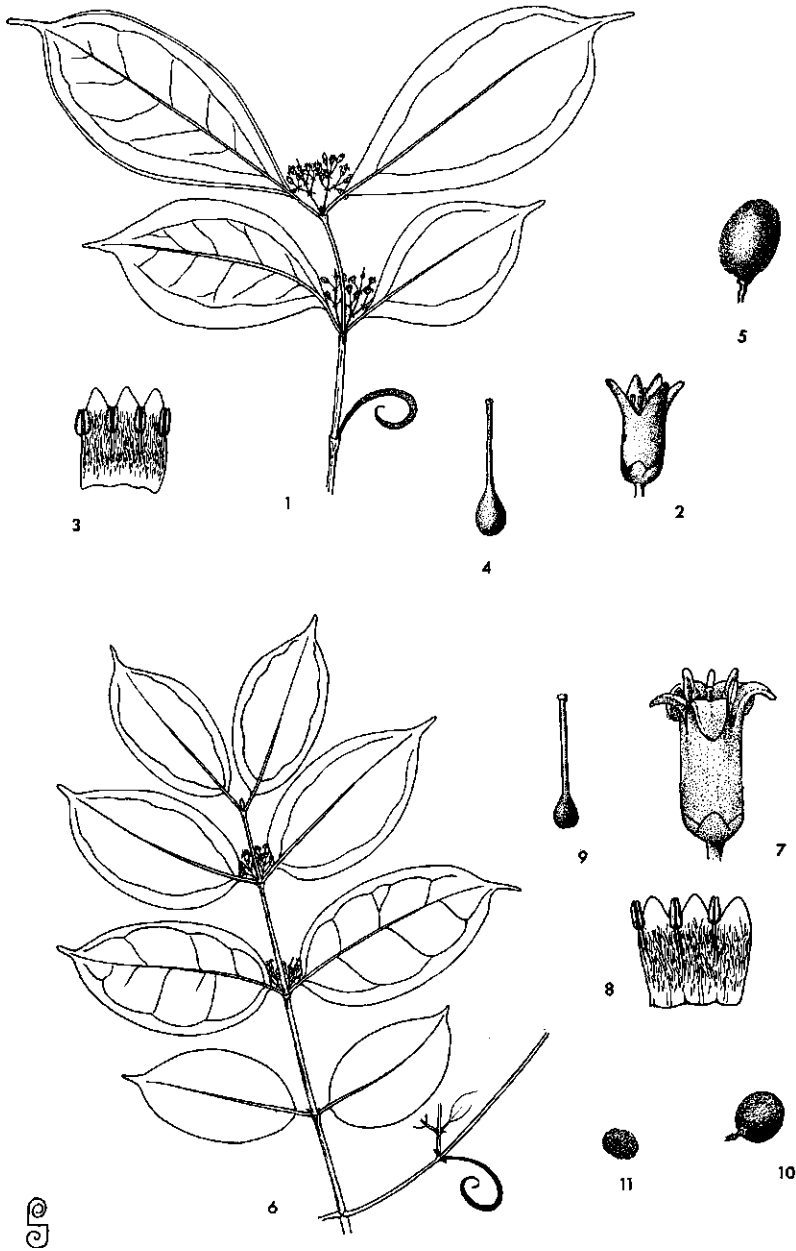


FIG. 14. 1-5. *S. dale*: 1. branch, $\frac{1}{2} \times$; 2. flower, $2\frac{1}{2} \times$; 3. portion of corolla with stamens, $2\frac{1}{2} \times$; 4. pistil, $3\frac{1}{2} \times$; 5. fruit, $\frac{1}{2} \times$ (1-4. Le Testu 9301; 5. Leeuwenberg 6813); 6-11. *S. floribunda*: 6. branch, $\frac{1}{2} \times$; 7. flower, $3 \times$; 8. portion of corolla with stamens, $3 \times$; 9. pistil, $3 \times$; 10. fruit, $\frac{1}{2} \times$; 11. seed, $\frac{1}{2} \times$ (6-9. Leeuwenberg 4506; 10. Leeuwenberg 7381; 11. J. de Wilde c.s. 3441).

between Mang and Asip, 60 km ENE. of Lomié, Letouzey 5562 (BR, K, P, WAG, YA); 6 km S. of Yokadouma, Leeuwenberg 6126 (WAG).

Gabon: near Libreville, Klaine 3205 (BR, IFAN, K, P, distributed as *S. trillesiana*), 3364 BR, K, P); between Ogooué R. and Cameroun boundary, Le Testu 9301 (P, WAG), 9495 (P, WAG); Ayem, 10 km SW. of Ndjolé, N. Hallé 1964 (P).

Congo (Kinshasa): Equateur: between Bokolongo and Djoa, Bolomba Territory, Evrard 3548 (BR, WAG); Dundusana, Bumba Territory (Jan.) Mortejan 1062 (BR, K, type). Orientale: Bambesa, Buta Territory (Sept.) Gérard 5694 (BR, WAG). Katanga: Kaniama, Haute Lomani, Mullenders 2343 (BR).

Angola: Cabinda: Belize (fl., fr. Feb., Nov.) Gossweiler 7578 (BM, COI, K, LISJC, LISU), 7856 (BM, BR, COI, K, LISJC, LISU, MO). Congo: Bembe (Feb.) Gossweiler 7405 (BM, COI, LISJC, LISU). Malanje: Quela (Nov.) von Nolde 494 (BM).

Notes. It is difficult to separate *S. dale* from *S. floribunda*, as there are some intermediate specimens. Although their differences are not very clear, the present author prefers to keep them separate. They can be distinguished in the field at least in Cameroun. The branchlets of *S. dale* are often more stout, the leaves usually larger and less shining to mat, and the fruits slightly larger. Mature fruits of *S. dale* are not yet known.

Differential characters of *S. dale* and *S. floribunda* are given under the description of the latter.

18. *S. decussata* (Pappe) Gilg in Engler, Bot. Jahrb. 28: 121. 1899; Verdoorn, Bothalia 3: 587–588, f. 2. 1939 and 7: 11. 1959; E. A. Bruce, Kew Bull. 1956: 156. 1956; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 29. 1960; Verdoorn in Fl. S. Afr. 26: 139. 1963.

Fig. 18, p. 129; Map 14, p. 94

Basionym: *Atherstonea decussata* Pappe, Silv. Cap. 2nd ed. 29. 1862.

Type: S. Africa: Cape Province, Bathurst, Kowie, Atherstone s.n. (TCD, neotype; iso-neotype: K, designated by Miss Verdoorn (1959)). Homotypic synonym: *S. atherstonei* Harv., Thes. Cap. 2: 41, t. 164. 1863 with *S. baculum* Harv. in syn.; Prain & Cummins in Fl. Cap. 4 (1): 1051. 1909; Marloth, Fl. S. Afr. 3(1): 49, pl. 14C. 1932 (as *atherstonii*); Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 30. 1952.

Heterotypic synonym: *S. boinensis* Jumelle et Perrier, Ann. Mus. Col. Marseille Sér. 2. 5: 403. 1907. Type: Madagascar: Boina, Ankaladina Forest, banks of Betsiboka R., Perrier de la Bâthie 1380 (P, holotype; isotype: K).

Shrub or small tree, 2–12 (17) m high. Trunk 8–30 (45) cm in diam. Bark smooth, pale to dark grey; wood hard. Branches lenticellate, pale brown or pale grey to black when dry; branchlets lenticellate or not, pale ochraceous or pale brown, not or obscurely sulcate, and terete or nearly so when dry. Tendrils none. Leaves: petiole glabrous, 2–7 (10) mm long; blade shining and dark green above, paler beneath, pale greenish- or yellowish-brown when dry, subcoriaceous, also when living, very variable in shape and size, obovate, elliptic, narrowly elliptic, narrowly obovate, ovate, or narrowly ovate, (1)1.5–3(4) × as long as wide, (1)2–5(11.5) × (0.4)0.8–3(6.5) cm, rounded, obtuse, or broadly

and bluntly acuminate at the apex, cuneate or rounded at the base, glabrous on both sides; one or two pairs of secondary veins from or from somewhat above the base curved along the margin and often a faint submarginal pair; tertiary venation reticulate, not very conspicuous; margin often slightly enrolled. *Inflorescences* axillary and sometimes also terminal, or ramiflorous, often appearing before the season's new leaves, often several together, lax, several-flowered, $1.5 \times 1.5 - 3 \times 2.5$ cm, $1-2 \times$ branched. Peduncle, branches, and pedicels slender, minutely or conspicuously papillose-pubescent or less often glabrous. Bracts small, triangular or sepal-like, above glabrous, lower often with colleters at the base. *Flowers* (4-) 5-merous, fragrant. *Sepals* connate up to one-quarter of their length, equal, subequal, or occasionally unequal, broadly ovate to triangular, $1-1.5(1.7) \times$ as long as wide, $1-1.3 \times 0.6-1$ mm (when unequal smallest 0.6×0.4 mm), acute or obtuse at the apex, minutely ciliate, glabrous on both sides or like the pedicels minutely or conspicuously papillose-pubescent outside, without colleters. *Corolla* in the mature bud $3.5-5 \times$ as long as the calyx, 4-6 mm long, and rounded at the apex, white, creamy, or yellow, outside glabrous or minutely papillose-pubescent, inside densely pilose except for the glabrous apex of the lobes and base of the tube; tube short-campanulate or nearly cylindrical, often much widened towards the throat, very variable in length, $1-2.5 \times$ as long as the calyx, 1-3.2 mm long, at the throat (1.5)2-3 mm wide; lobes oblong or narrowly triangular, $0.6-3 \times$ as long as the tube, $1.7-2.5 \times$ as long as wide, $1.7-3.5 \times 1-1.6$ mm, acute, spreading or sometimes recurved. *Stamens* exserted; filaments short or long, very variable in length and elongate at anthesis, longer in flowers with shorter corolla tube (like in *S. potatorum*), $0.5-2 \times$ as long as the anthers, glabrous, often narrowing from a rather broad base, inserted at the mouth of the corolla tube; anthers oblong, $0.8-1.3 \times (0.4)0.5-1$ mm, glabrous, deeply cordate at the base; cells parallel. *Pistil* glabrous, slender, 3.8-5.2 mm long; ovary ovoid or narrowly ovoid, $1-2 \times 0.8-1.2$ mm, gradually narrowed into the style, 2-celled; style 1.8-3.9 mm long; stigma capitate or sometimes bilobed, often rather small. In each cell 5-10 ovules. *Fruit* orange, nearly mature glaucous or green, small, soft, ellipsoid or globose, sometimes stipitate, $1.5-2 \times 1.5-1.9$ mm, 1(-2)-seeded, with somewhat granular skin, slightly shining. Wall thin, dry, about 0.3 mm thick. Pulp edible. *Seeds* pale grey-brown, not or hardly flattened, ellipsoid, slightly longer than wide and wider than thick, $10 \times 10 \times 7 - 16 \times 12 \times 9$ mm, densely and shortly appressed-pubescent, smooth, with a central hilum at the flattened or shallowly dented side; testa sticking to the pulp, often wrinkled in dry fruits.

Distribution: East and South Africa and Madagascar.

Ecology: In woodlands, often near rocks, sometimes on river banks, in Madagascar in often dry forests and bushes on limetone; alt. 0-1500 m.

Kenya: Nzue District, Kitui District (fr. Jan.) Bally 1939 (EA, K); Kandelongwe (Dec.) L. C. Edwards 219 (EA); between Nuus and Mt. Endau, Vincent (?) 612 (EA); Ikutha, Kitui

District (fl., fr. Nov.) L. C. Edwards 56 (EA); W. of Bura, Tana R. District, J. Martin EAH 13022 (EA); km 50 of Garsen-Malindi road (fr. Nov.) Greenway 9499 (EA, FI, K, PRE); Karawa, 50 km S. of Garsen (fl., fr. Oct.) Polhill & Paulo 612 (BR, EA, K); *ibid.*, Rawlins 789 (EA, K); Ngulia, Tsavo National Park, Greenway 9761 (EA, K, PRE); Voi, Tsavo Nat. Park (Nov.) Hucks 513 (K); Voi, Mazinga Hill, Bally 8622 (EA, K); km 37 of Voi-Mombasa road (Oct.) Napper 1346 (BR, EA, K, PRE); Buchuma, Teita District, Verdcourt 3191 (EA, K, PRE); Kasigao Mt., Teita District (Oct.) Boy Jeana 8853 (EA); N. of Dakatcha, Kilifi District, I. R. Dale K 1086 (EA, K, PRE).

Tanzania: Mbuyuni, Moshi District (Nov.) Scott Elliot 6235 (K).

Zambia: Lusito (fr. May) Fanshawe 6599 (K).

Malawi: Mpatamanga Gorge, Blantyre District (Dec.) Chapman 1070 (FHO, PRE, SRGH).

Rhodesia: Kariba Gorge (fr. Sept.) Goldsmith 34/59 (SRGH); bank Manora R., Urungwe District, Phipps 927 (K, LISC, SRGH); Unsengesi R., Darwin District, Whellan 890 (K, SRGH); Rhino hotel, Lundi R., Chibi District (Dec.) Davies 1453 (K, SRGH); Manavegadzi, Gwanda District, Drummond 5747 (SRGH); Chitsa's Kraal, Sabi-Lundi District, H. Wild 3397 (BR, K, S, SRGH); Lundi R., Smuts PRE 29243 (PRE); Ndanga District (fr. May) Armitage 107/55 (SRGH), 112/55 (BR, SRGH); E. of Chipinda Pools, Ndanga District, McGregor 75/51 (FHO, SRGH); Triangle, Ndanga District (Oct.) Mylne 33/51 (FHO, SRGH); *ibid.*, (fl., fr. Oct.) Wormald 72/51 (MO, SRGH, UC); Mtilikwe R., Ndanga District (fl., fr. Oct.) Seymour-Hall 48/51 (SRGH), 49/51 (FHO, SRGH); *ibid.* (Oct.) B. R. Thompson 88/51 (FHO, SRGH); Beitbridge District (Nov.) Davies 2832 (K, SRGH); Lundi R., Nuanetsi District (fr. May) Davies 594 (MO, SRGH); Sibonjla Escarpment, Nuanetsi District (fr. June) Farrell 219 (PRE); Clarendon Cliffs, Nuanetsi District (fr. Apr.) Drummond 7808 (K, WAG); Malangwe R., S. of Mateke Hills (fr. May) Drummond 5670 (BM, BR, K, LISC, PRE, SRGH); Sabi and Lundi Rs. Junction (fr. June) H. Wild 3494 (BR, EA, K, LISJC, NY, PRE, SRGH); Chikwakwana, Eastern Border (fr. Aug.) Chorley 3673 (SRGH); Odzi R., Hot Springs, Melsetter District (Nov.) Chase 4704 (BM, BR, COI, K, LISC, MO, PRE, SRGH, WAG).

Moçambique: Tete: Chicoa, Songa Mts. (fl., fr. Dec.) Torre & M.F. Correia 13909 (LISC), 13938 (LISC); km 25 of Tete-Changara road (fr. Mar.) Torre & M.F. Correia 15288 (LISC); Tomo-Mazoe road, Nyaponzo Hill (fr. Sept.) H. Wild 2606 (BR, K, SRGH); Sisitso, Zumbo District, Zambesi R. (fr. July) Chase 2740 (BM, LISC, MO, SRGH). Manica e Sofala: Bárúè, Mungari, km 54 of road to Tambara (Dec.) Torre & M.F. Correia 13690 (LISC); Gorongosa, Torre & Paiva 9072 (LISC); Bárúè, 116 km from Vila Gouveia, along road to Changara (Dec.) Torre & M.F. Correia 13752 (LISC); Macanga, Massamba-Metenge road (fr. July) de Campos Andrada 1703 (COI); Chinizua, Beira region (fr. Apr.) Gomes e Sousa 4346 (K). Gaza: 15 km S. of Massangena, Save R. Valley (fr. Dec.) Hornbey 2485 (SRGH); between Limpopo and Nuanetsi Rs. (July) Smuts 337 (BM, K, PRE). Lourenço Marques: Magude (fr. Dec.) Mendonça 3207 (LISC); Moamba (Dec.) Torre 2178 (LISC); Boane (Nov.) Torre 6838 (LISC, WAG); Lourenço Marques, Sim 20643 (PRE); Maputo R. (fr. Feb.) Hornbey 2557 (SRGH); *ibid.*, near Mahau (fr. Feb.) Gomes e Sousa 3968 (COI); Maputo, Salamanga, Mendonça 3560 (LISC). Right bank Zambesi R. (fr.) Surcouf 5 Dec. 1926 (P).

S. Africa: Transvaal: Pafuri, Kruger Nat. Park, van der Schijff & Marais 3703 (K, MO); SE. of Klapperfontein, Kruger Nat. Park (fr. Apr.) van der Schijff 2914 (K); Dzungweni Hill, 20 km SE. of Punda Maria (fr. Nov.) Codd & Verdoorn 4590 (K); near Punda Maria (fr. June) Codd 4252 (K); 15 km NW. of Punda Maria, Levubu R. bank, Codd 5380 (K); Wambia, Kruger Nat. Park (Dec.) van der Schijff 3346 (K); 8 km W. of Letaba (Apr.) Codd 6513 (PRE). Natal: Zululand: Ingwavuma District, Ndumu Game Res. (fr. Jan.) Tinley 412 (K, M, SRGH); Hluhluwe Game Res., Hlabisa District (fr. Jan.) Ward 3963 (K, NH); False Bay, Hlabisa District (Nov.) Ward 2727 (PRE); Mtubatuba District, Ward 4532 (K); Dukuduku Forest, Hlabisa District (Nov.) Strey 5476 (K, PRE, S); Somkele (fl.) Wylie Nov. 1903 (AMD); Hluhluwe-False Bay, Hlabisa District, E. J. Moll 2827 (K); Nyassa (fl.) Wylie Oct. 1903 (LD); Umkangala (Oct.) Gerstner 4951 (K, NY); *sin. loc.*, Gerrard 262 (BM, K, W). Middledrift, Kranskop District, D. Edwards 2076 (FHO, K); Essiena, Lower Tugela R. (fr. Feb.) D. Ed-

wards 3009 (K); Durban, Umhlanga Rocks (fr. Mar.) Marriot VI PRE 23185 (K); near Durban (Nov.) Gerrard & M'Ken 847 (K, S, TCD); *ibid.* (fr. Mar.) Marriot II PRE 23186 (BM, K); *ibid.* (Nov.-Dec.) J. Medley Wood 1926 (K), 5496 (BM, BOL, E, F, GRA, MO, S, US), 6566 (F); *ibid.*, Bulwer Park (Nov.) Wylie NH 23244 (NH); Dumisa, Ifafa R. (Nov.) Rudatis 1226 (BM, E, G, GRO, HBG, JE, K, L, LY, M, P, PR, W, WAG, WRSL, Z). Cape Province: Ntsubane Forest, Lusikisiki (Nov.) Fraser PRF 2201 (PRF); Port St. Johns, Bonhoff PRF 5037 (PRF); Gogogo Forest, Port St. Johns District, Forester PRF 3678 (PRF); Cwebe Forest, Conservator Umtata PRF 1882 (PRF); Manubie Forest (fr. May) Human PRF 5254 (PRF); Port Alfred (Nov.) Galpin 1113 (GRA), 3047 (PRE); Port Elisabeth (fr. Apr.) Ecklon & Zeyher 3368 (K, LE, W); Alexandria Forest, Archibald 6084 (K); *ibid.*, Hilligan PRF 1513 (PRF); Olifant's Hoek, near Alexandria, Nightingale 1000 (BM, BOL, G, GH, K, NBG, P, UPS, W); *ibid.* (Aug.-Sept.) Forester PRF 12726 (PRF); Main Forest Res., Alexandria District (fl.) Forester in coll. R.J. Poynton 31 Oct. 1961, PRF 12105 (K, PRF); The Fountain Valley, Kaba, Alexandria District (fr. July) Archibald 5519 (K, PRE); Albany District, Comins 1641 (FHO, K, M, SRGH), 1643 (K, M, S); *ibid.*, 3 km NE. of Howieson's Poort Dam, Story 3239 (GRA); near Grahamstown (fr. Apr.) Story 6020 (K, M); Bathurst, Kowie R. (fl.) Atherstone 27 Nov. 1863 (K, TCD, neotype); Zwartkop R. Valley, near Groendal, Uitenhage District (fr. Aug.) J. Sim 242 (GRA); Thesen's Forest, Brackenhill, Knysna (fr. Oct.) Conservator Knysna PRF 8342 (PRF); *sin. loc.*, Eastern Frontier, MacOwan s.n. (S); *sin. loc.*, Tyson BOL 26986 (BOL).

Madagascar: Diégo-Suarez (fl.) d'Alleizette Nov. 1906 (L, P); between Sakaramy and Mt. des Français (fl., fr. Nov.) Homolle 334 (P), 360 (P); Lower Rodo R., SE. of Sahafary Plateau (fr. Feb.) Capuron Serv. For. 24514 (P, WAG); Analamera Mts., Diégo-Suarez Province (Jan.) Humbert 19135 (P, WAG); Ankarana Mts. Diégo-Suarez Province (Dec.-Jan.) Humbert 18922 (P, WAG), 18982 (P, WAG); Ankara, Diégo-Suarez Province (fr. Oct.) Serv. For. 15197 (P); Anjavibe, Vohémar (fr. Aug.) Serv. For. 14707 (P); Andampy, Vohémar (fr. Nov.) Serv. For. 15502 (P); Analabe Mts., Diégo-Suarez Province (fr. Aug.) Serv. For. 14264 (P, WAG); Tsimabirano Forest, Antonibé Canton (fr. May) Serv. For. 19111 (P); near Majunga, Perrier de la Bâthie (Oct.) 8599 (P), 17687 (K, P); *ibid.* (fl.) Kaudern 20 Oct. 1912 (S); Ampijoroa, Majunga (fr. May) Serv. For. 4970 (P); Mahajamba Bay, Boina (fr. May) Perrier de la Bâthie 4494 (P); Tsiampihy Forest, near Besaraha (Dec.-Jan.) Léandri, Capuron & Razafindrakoto 2221 (P, WAG); Baly (fr. June) Decary 7843 (P, WAG); Ambaratabe, Soalala (Dec.) Randriamiera Res. Nat. 7758 (P, WAG); Andranomavo, Soalala (fr. May) Res. Nat. 4064 (P); *ibid.*, Randriamiera Res. Nat. 6873 (P, WAG); Ambovongidro, Soalala (fr. July) Serv. For. 4004 (P); Ankoakibe, Soalala (Dec.) Randriamiera Serv. For. 7755 (P); Ampijoroa, Marovoay (fr. Mar.-Apr.) Serv. For. 7343 (P), 9852 (P, WAG); Middle Mahavavy R., Ambongo (fr. Nov.) Perrier de la Bâthie 1764 (P); Ankaladina, Betsiboka, Boina (fl., fr. Oct.) Perrier de la Bâthie 1380 (K, P, type of *S. boinensis*); E. Beloka (fr. Aug.) Serv. For. 3949 (P); Ankara Plateau (fr. Nov.) Perrier de la Bâthie 1764 bis (P); Tsingy de Mamoroka, Serv. For. 16 (P); Tsiampihy Forest, E. of Besaraha, Antsalova District (Dec.) Capuron Serv. For. 6847 (P, WAG); Tsimembo, S.W. of Antsalova, Léandri, Capuron & Razafindrakoto 2313 (P, WAG); Andatsaka, along Belo-Antsalova road (Jan.) Serv. For. 6593 (P); right bank Tsiribihina R., near mouth, Perrier de la Bâthie 11437 bis (P); Andoharano, Tsiribihina, Belo (fr. Dec.) Serv. For. 17864 (P); Tsingy du Bemaraha (fr. Mar.) Léandri 1102 (P, WAG); Marofandilia Forest, Morondava, Perrier de la Bâthie 8604 (P); Morondava (fr. Sept.) Bosser 9892 (P); *ibid.*, Grevé 29 (P); Misokitra Forest, Befasy, Morondava (fr. May) Serv. For. 5305 (P, WAG); Morombé, S.W. (fr. Feb.) Decary 18754 (P); Ihotry Lake, Morombé District (Oct.) Decary 16180 (P); near Andrenialamahitsy, N. of Ihotry Lake (May) Capuron Serv. For. 24120 (P, WAG); Kitranga, Ihosy (fr. Apr.) Serv. For. 10128 (P); Lower Fiherenana R. (Nov.) Humbert 11544 (P, WAG); Tuléar (fr. Mar.) Serv. For. 9402 (P); Ihera, Tuléar (Dec.) Serv. For. 15343 (P); km 69 of Tuléar-Sakaraha road, Serv. For. 5938 (P, WAG); Ianapera, Onilahy R., Perrier de la Bâthie 12745 (P); Behara, Amboasary (fr. Mar.) Rakodoniama Res. Nat. 5167 (P); *ibid.* (Feb.) Rakotoson Res. Nat. 10674 (P); Mahafaly Region, Grevé 47 (K, P, PRE, distributed as *S. greveana*); between Bekily and Tsivory, Seyrig 51 (P); Ampandrandava (fr. Apr., Sept.) Seyrig 641 (P), 641 B (P); near Isomono, Manambolo R., Mandrare R. Basin,

Humbert 12996 bis (P); Anadabolava, Middle Mandrare R. (fr. Mar.) Bosser 16050 (P); 50 km from Beraketa, Bosser 10283 (P); Anaramalinika, Maromby, Amboasary (fr. Oct.) Serv. For. 15676 (P); Betsipotika, Morondava (fr. Oct.) Serv. For. 13871 (P); SW. of Ifotaka (fr. Nov.) Lam & Meeuse 5469 (L, WAG); 30–35 km N. of Ambia, near Antanimoro, Androy (fr. Feb.) Humbert & Capuron 28802 (P); base of Angavo Mts., E. of Antanimora (fr. Feb.) Capuron 11714 (P, WAG); Angavo, Antanimora, Ambovombé (fr. Mar.) Serv. For. 14018 (P, WAG); Beara Forest (fr. Sept.) Serv. For. 1536 (P); between Ambaro and Antanimora, Androy (fr. Aug.) Serv. For. 7582 (P, WAG); Marovaho, Ambovombé (fr. Mar.) Serv. For. 14314 (P); Sihanamaro, Ambovombé (Dec.) Serv. For. 15663 (P, WAG); Ambovombé, South (Oct.) Bosser 10104 (P), 10520 (P); *ibid.* (Feb.) Decary 8541 (P); Berenty, Mandrare R. Valley (fr. Feb.) Capuron Serv. For. 406 (P); *sin. loc.*, Grevé 265 (BM, P, PRE); (fr. Oct.) Morat 874 (P).

Cult.: Edinburgh, Great Britain, Leeuwenberg 3519 (WAG).

19. *S. densiflora* Baill., *Adansonia* 12: 369. 1879; Baker in *Fl. Trop. Afr.* 4(1): 528. 1903; Hutchinson & Dalziel, *Fl. W. Trop. Afr.* 2: 24. 1931, partly (excl. *syn. S. jollyana* A. Chev. and Chevalier 16351, 16360, and 16395); Chevalier, *Rev. Bot. Appliq.* 27: 372. 1947, partly (excl. *syn. S. martreti* A. Chev., *S. fleuryana* A. Chev. and *S. nigritana* Bak., and pl. 16A, which are *S. nigritana*); Aubréville, *Fl. Soud.-Guin.* 440, pl. 96. 8–9. 1950; Onochie & Leeuwenberg in *Fl. W. Trop. Afr.* 2nd ed. 2: 43. 1963, partly (excl. *syn. S. martreti* A. Chev.).

Fig. 19, p. 135; Phot 1, p. 105; Map 15, p. 107

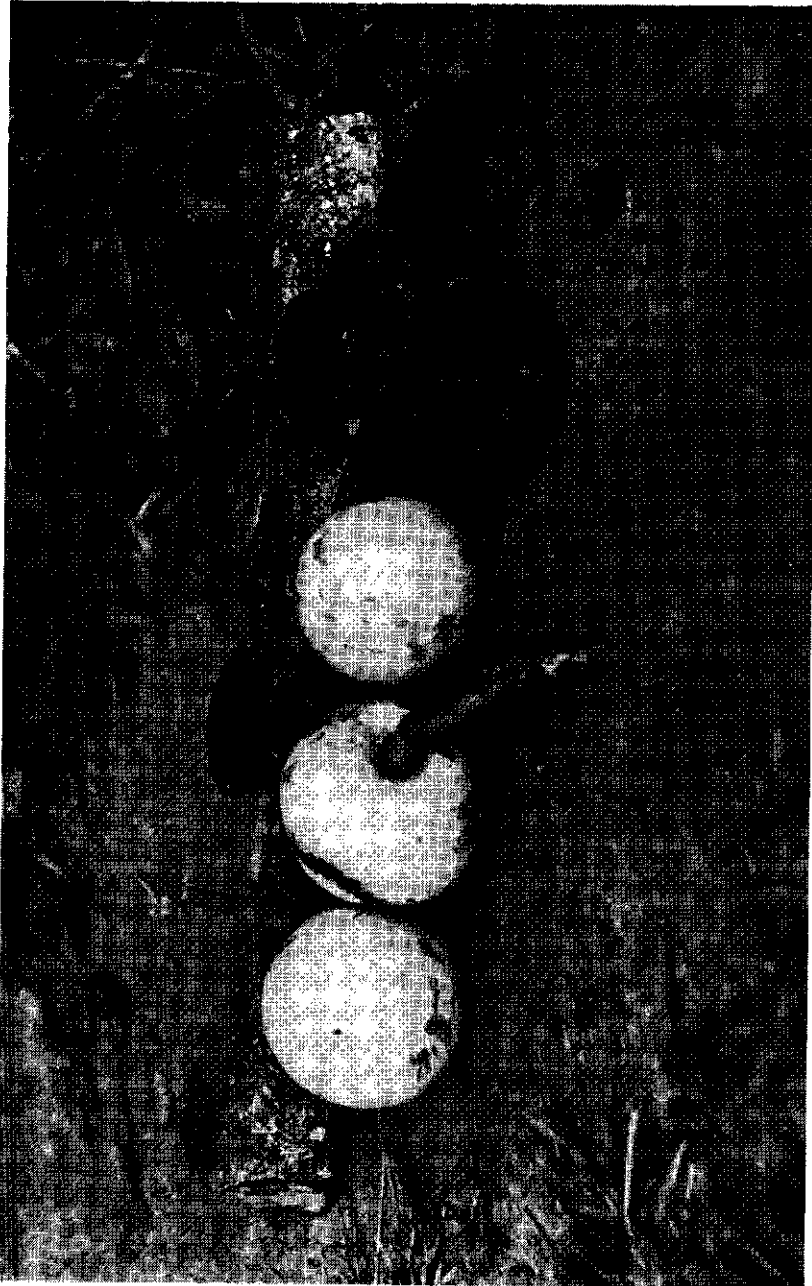
Type: Guinea: Fouta Djallon, Heudelot 861 (P, holotype; isotypes: K, WAG).

Heterotypic synonyms: *S. suaveolens* Gilg in Engler, *Bot. Jahrb.* 17: 566. 1893. Type: Congo: Orientale, Monbuttu Region, Gadda, Schweinfurth 3597 (K, lectotype; isotypes: P, S, WU).

S. chlorocarpa Gilg in Engler, *Bot. Jahrb.* 28: 120. 1899; Baker, *l.c.* p. 521. Type: Sierra Leone: *sin. loc.*, Afzelius s.n. (holotype not seen, destroyed in B; lectotype: BM, other isotype seen: UPS).

S. hirsutostylosa De Wild., *Bull. Jard. Bot. Brux.* 5: 43. 1915. Type: Congo: Equateur, Bumba Territory, Dundusana, Mortehan 1099 (BR, holotype).

Liana, at least 20–35 m long and 20 m high climbing in trees. Trunk 7–12 cm in diam. Bark pale grey, lenticellate; wood creamy. *Branches* pale grey, when dry often pale brown, lenticellate; branchlets glabrous, distinctly lenticellate, glabrous, pale green to grey, when dry dark brown. Tendrils paired. *Leaves*: petiole glabrous, (4)6–10 mm long; blade shining or mat and dark green with often pale green costa and main secondary veins above, less shining or mat and often slightly paler and with often pale green costa beneath, coriaceous or thinly coriaceous in the sun, papyraceous or thinly coriaceous in the shade also when living, elliptic or narrowly elliptic, 1.5–3 × as long as wide, 6.5–18 × (1.5)2.5–7.5(9.5) cm, apiculate or acuminate to, especially in the shade, nearly caudata at the apex, cuneate or rounded at the base, glabrous on both sides; one pair of secondary veins from above the base and often also a faint pair from the base curved along the margin; costa and main secondary veins impressed above,



PHOT. 1. *S. densiflora*: fruits, leaves, woodsample (Leeuwenberg 7416).

prominent beneath; tertiary venation not distinctly reticulate, prominent or not; margin not or hardly revolute. *Inflorescences* axillary, usually several together, small, rather congested, $0.1\text{--}0.3 \times$ as long as the leaves, $1.5\text{--}4 \times 1.5\text{--}3$ cm, $2\text{--}3 \times$ branched, few-flowered. Peduncle, branches, and pedicels sparsely pubescent with often more or less ranked hairs or glabrous. Bracts small, approximately sepal-like, beneath glabrous, above minutely appressed-pubescent at the base or sometimes glabrous, without colleters. *Flowers* 5-merous. *Sepals* pale yellowish-green, free, subequal or unequal, broadly ovate, orbicular, or broadly orbicular, $0.75\text{--}1 \times$ as long as wide, $2\text{--}3.5 \times 2.5\text{--}4$ mm, rounded at the apex, minutely ciliate, outside glabrous, inside minutely appressed-pubescent at the base or sometimes glabrous, without colleters. *Corolla* in the mature bud $2.5\text{--}2.7 \times$ as long as the calyx, $7.5\text{--}8$ mm long, and slightly tapering at the apex, white or tube greenish-white and lobes greenish-yellow, outside glabrous, inside with a brush-like ring of white hairs in the throat and just on the base of the lobes; tube $1.5\text{--}2 \times$ as long as the calyx, $1.5 \times$ as long as the lobes, $4.5\text{--}5 \times 2\text{--}3$ mm, widely cylindrical; lobes narrowly triangular, about twice as long as wide, $3\text{--}3.5 \times 1.6\text{--}1.8$ mm, very thick, especially at the apex, acute, spreading. *Stamens* slightly exerted; filaments $0.2 \times$ as long as the anthers, glabrous, inserted at the mouth of the corolla tube; anthers oblong, $2\text{--}3 \times$ as long as wide, $1.4\text{--}2.5 \times 0.7\text{--}0.9$ mm, shortly sagittate at the base, glabrous or sometimes with few pilose hairs at the base; cells parallel. *Pistil* pilose in the middle, $6\text{--}7$ mm long; ovary ovoid or oblong, glabrous or pilose at the apex, $2.5\text{--}3.5 \times 1.5\text{--}2$ mm, 2-celled, gradually narrowed into the style; style thick, pilose except for the glabrous apex, $3.5\text{--}4.2$ mm long; stigma capitate. In each cell about 50 ovules. *Fruit* large, yellow, nearly mature pale glaucous, globose, $3\text{--}10$ cm in diam., $8\text{--}25$ -seeded. Wall hard, $3\text{--}5$ mm thick. *Seed* irregularly tetrahedral or elliptic, rough, about $25 \times 15 \times 7$ mm.

Distribution: West and Central Africa.

Ecology: Rain forests, mostly on periodically inundated river banks; alt. 0–500 m.

Guinea: Fouta Djallon, Heudelot 861 (K, P, WAG, type); Nimba Mts., Schnell 3056 (IFAN).

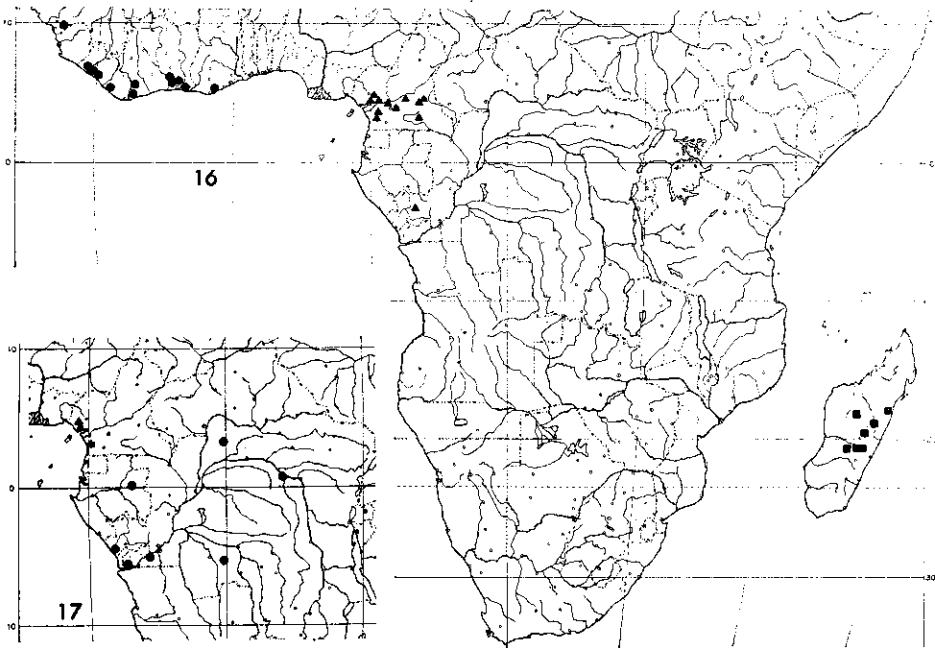
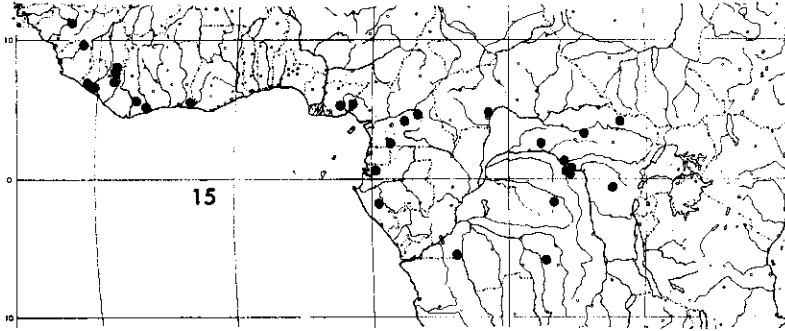
Sierra Leone: near Erimakuna, Falaba (Mar.) Scott Elliot 5406 (BM, K); sin. loc., Afzelius 40 (UPS), s.n. (BM, UPS, type of *S. chlorocarpa*).

Liberia: NE. of Bomi Hills, Gola-Yoma Nat. For., Mahe R. bank (bud, fr. Feb.) van Meer 403 (WAG); *ibid.* (Apr.) J. de Wilde 3847 (BR, K, S, WAG); *ibid.*, Leeuwenberg 4823 (WAG), 4848 (WAG); Bong Range, 32 km N. of Kakata, Leeuwenberg 4932 (WAG); Ganta (?), Harley 1125 (LIB, WAG), 26 Oct. 1936 (LIB, WAG); Nimba Mts., Leeuwenberg & Voorhoeve 4625 (WAG), 4709 (WAG).

Ivory Coast: 14 km S. of Tai, J. de Wilde & Leeuwenberg 3572 (ABI, BR, FHO, K, WAG); about 50 km W. of Sassandra, 5 km NE. of Monogaga, Leeuwenberg 4068 (WAG); 15 km N. of Aboisso, Leeuwenberg 4499 (WAG).

Nigeria: Ikotewa, along Ikan road, Calabar District (fr. July) Ujor FHI 31634 (FHI); Oban District, Talbot s.n. (K).

Cameroun: Tom, 12 km E. of Nyabesan, near Ambam, Ntem R. bank, Raynal 10208 (P,



MAP 15. *S. densiflora*; Map 16. ● *S. dinklagei*, ▲ *S. dolichothyrsa*, ■ *S. diplotricha*; Map 17. ▲ *S. elaeocarpa*, ● *S. fallax*.

YA); Sanaga R. bank, near Ebaka (May) Breteler 1434 (K, P, WAG, YA); *ibid.* (fr. Dec.) Leeuwenberg 7416 (WAG); 29 km W. of Nanga Eboko, left bank Sélé R., near bridge in road to Yaoundé, Leeuwenberg 5988 (WAG).

Central African Republic: Boukoko, N. of Bangui (Oct.) Tisserant 2610 (P, WAG).

Gabon: Cristal Mts., N. Hallé & Villiers 4735 (P); between Pagha and Bioutabi (?), Upper Ngounyé R. (Nov.) Le Testu 5100 (P).

Congo (Kinshasa): Léopoldville: Kingama Kuni, Popokabaka Territory, Pauwels 2125 (BR). Equateur: Bumba Territory, Dundusana (Jan.) Morteihan 1099 (BR, type of *S. hirsutostylosa*); Yokole, km 11 of Ikela-Lodja road, Evrard 6195 (BR, K, WAG). Orientale: near

Bambesa, Pittery 540 (BR), 541 (BR); Gadda, near Niangara, Monbuttu Region (Apr.) Schweinfurth 3597 (K, P, S, WU, type of *S. suaveolens*); between Lilèko and Basoko (Sept.) Louis 11408 (BR, K, P, PRE); near Isangi (bud, nearly mature fr.) Germain 4605 (BR, PRE, WAG); Yambao, 25 km NW. of Yangambi (fr. Apr.) Louis 8956 (BR); about 12 km N. of Busukutu, near Londo R. (fl., nearly mature fr. Feb.) Germain 164 (BR). Kivu: between Walikale and Lubutu, Bequaert 6673 (BR). Kasai: Mwanzangoma R., Dibaya Territory, Liben 2229 (BR, WAG).

20. *S. dinklagei* Gilg in Engler, Bot. Jahrb. 28: 121. 1899; Baker in Fl. Trop. Afr. 4(1): 520. 1903; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 24. 1931; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 41. 1963.

Fig. 15, p. 109; Phot. 2, p. 111; Map 16, p. 107

Type: Liberia: Grand Bassa, Fishtown, Dinklage 1690 (B, holotype; isotypes: E, P).

Large liana, 2–20 m high climbing over shrubs or in trees, 20–40 m long or more. Trunk 5–13 cm in diam. Bark pale grey or dark brown- and grey-brown-spotted, with large lenticels, on section yellow or medium brown; wood creamy. *Branches* lenticellate, dark brown, sometimes partially paler, not sulcate when dry; branchlets medium green, minutely pubescent to glabrous, when leaves mature often lenticellate, when dry dark brown or black and often sulcate. Tendrils paired. *Leaves*: petiole minutely pubescent to glabrous, 2–7 mm long; blade shining or slightly so and dark green above, less shining and paler beneath, coriaceous, also when living, thinner in the shade, elliptic or narrowly elliptic, usually comparatively narrower toward the apices of the branchlets, (1.2)1.8–3 × as long as wide, 3–10(13) × 2–5(6.5) cm, sometimes some smaller, in the shade not larger than in the sun, apiculate, acuminate, or less often some rounded at the apex, more acute in the shade, cuneate or rounded at the base, glabrous on both sides; one or two pairs of secondary veins from or from somewhat above the base curved along the margin nearly to the apex, and a faint submarginal pair; tertiary venation reticulate, prominent beneath in dry leaves, less so in living; margin of sun-leaves somewhat revolute. *Inflorescence* terminal, sometimes also axillary, occasionally only axillary, large, lax, many-flowered, 6 × 5–15 × 20 cm, 4–7 × branched. Peduncle, branches, and pedicels, minutely pubescent to glabrous. Lower bracts leafy; other small, narrowly triangular or sepal-like (lower most of them occasionally with minute colleters at the base above), glabrous above. *Flowers* 5- or occasionally 4-merous. *Sepals* greenish-white, free, equal, broadly ovate, about as long as wide, 0.6–1 × 0.6–1 mm, obtuse or rounded at the apex, minutely ciliate, minutely pubescent outside, glabrous inside, without colleters. *Corolla* in the mature bud 2.8–3.3 × as long as the calyx, 2–3 mm long, and rounded at the apex, white or greenish-white, campanulate to subrotate, outside minutely pubescent, especially near the base (very base glabrous), inside pilose at the base of the lobes; tube very short, 0.9–1.3 × as long as the calyx, 0.6–1.2 mm long, widened towards the throat; lobes thick, triangular to ovate, 1.2–2 × as long as the tube, 1–1.7 × as long as wide, 1.2–2 × 1–1.3 mm, acute, spreading. *Stamens* exerted;



FIG. 15. 1-7. *S. dinklagei*: 1-2. branches, $\frac{1}{2} \times$; 3. flower, $4 \times$; 4. portion of corolla with stamen, $4 \times$; 5. anther, $12 \times$; 6. fruits, $\frac{1}{2} \times$; 7. seed, $1 \times$ (1, 6. Leeuwenberg 2356; 2. Leeuwenberg 3326; 3-4. Leeuwenberg 3332; 7. Leeuwenberg 3706). 8-14. *S. melastomoides*: 8-9. branches, $\frac{1}{2} \times$; 10. flower, $2 \times$; 11. portion of corolla with stamen, $2 \times$; 12. portion of corolla hair, $30 \times$; 13. fruit, $\frac{1}{2} \times$; 14. seed, $1 \times$ (8. Deighton 3375; 9. Scott Elliot 5592; 10-12. Chevalier 13181; 13-14. Scott Elliot 4292 (GH)).

filaments glabrous, very short, 0.3–0.5 × as long as the anthers, inserted at the mouth of the corolla tube; anthers cordate to orbicular, 0.5–0.7 × 0.5–0.6 mm, ciliate with white pilose hairs at the base, at the apex, and often at the margin; cells parallel or slightly divergent at the base. *Pistil* minutely pubescent, 1.3–1.5 mm long; ovary broadly ovoid or globose, glabrous at the very base, 0.7–1.2 × 0.7–1.2 mm, 2-celled, rather abruptly narrowed into the style; style short, 0.5–0.6 mm long, at the apex often glabrous; stigma capitate. In each cell 5–10 ovules. *Fruit* orange, small, soft, obliquely ovoid, laterally compressed, 18 × 13 × 10–24 × 16 × 14 mm, 1-seeded, slightly shining. Wall thin, about 0.5 mm thick. Pulp orange, slimy. *Seed* white when living, dry pale brown, elliptic, flattened, nearly equal-sided, 15 × 10 × 5–18 × 12 × 5.5 mm, with thick very short erect hairs, rough.

Distribution: West Africa.

Ecology: Rain forests or secondary forests, often on river banks; alt. 0–250 m.

Guinea: Friguiafé (fr. Feb.) Boismare 139 in coll. Chilou 3614 (IFAN).

Liberia: near Yoma, left bank Mahe R., 12 km NE. of Bomi Hills, Leeuwenberg 4864 (WAG); Duport, about 15 km E. of Monrovia (June) J.J. Bos 2041 (WAG), 2267 (WAG); *ibid.* (fr. Mar.) J. de Wilde & Voorhoeve 3623 (BR, K, WAG); *ibid.*, Leeuwenberg & Voorhoeve 4816 (WAG); *ibid.* (June) Voorhoeve 313 (LIB, WAG); Bong Range, 32 km N. of Kakata, Leeuwenberg & Voorhoeve 4961 (WAG); Fishtown, Grand Bassa (Aug.) Dinklage 1690 (B, E, P, type), 1977 (BR, G, P, W, Z), 2100 (B, BM, E, G, K, WU); left bank Sino R., near Greenville, J. de Wilde 3778 (WAG).

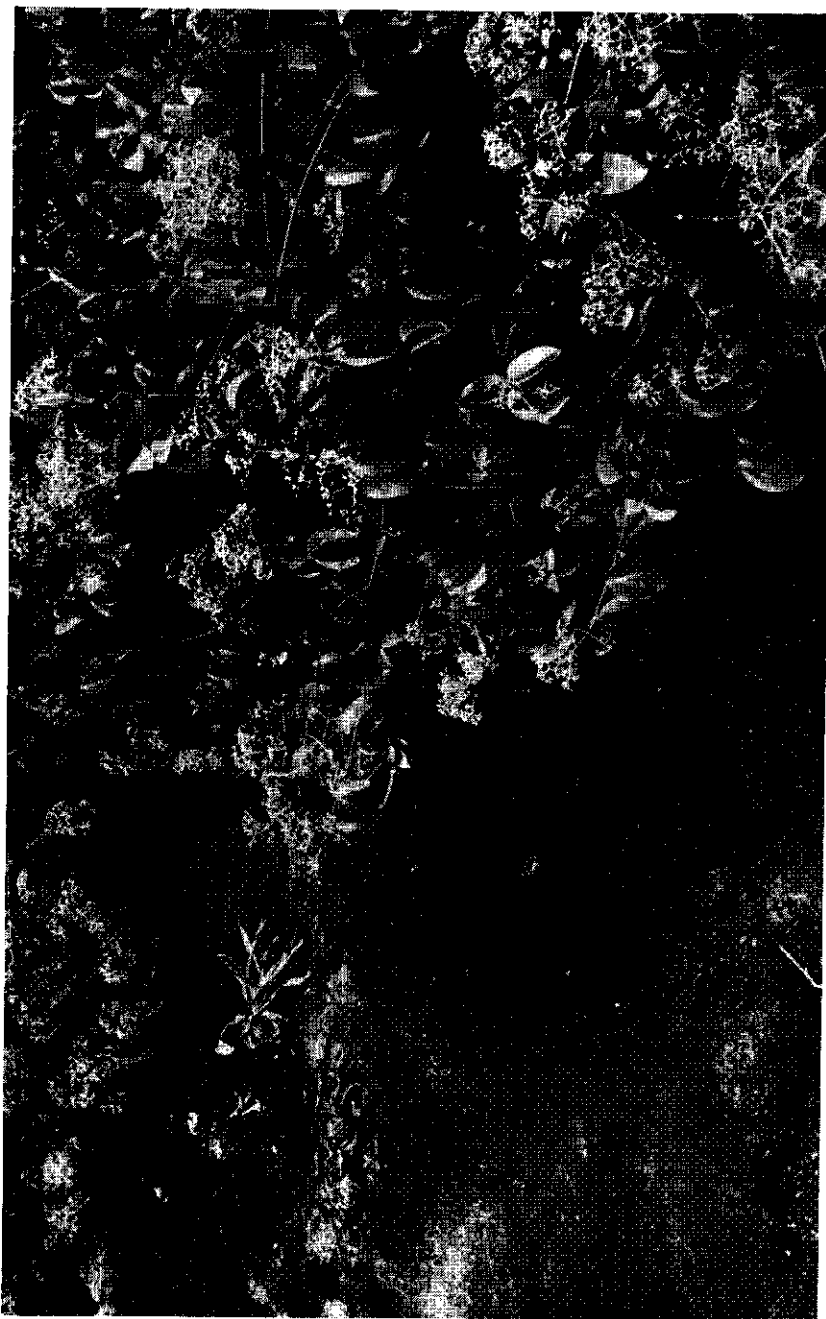
Ivory Coast: 5 km E. of Tabou, Guillaumet 1257 (ABI, WAG); near Troiya, Cavally R. bank, W. of Tai-Tabou road (Feb.) Aké Assi 6918 (WAG); left bank Nzi R., 19 km N. of Ndouci (May) Leeuwenberg 4260 (WAG, with seedlings); Rocher de Brafouédi, 75 km NW. of Abidjan (fl. July, fr. Sept.) Aké Assi 3099 (WAG), 6775 (WAG); *ibid.* (Aug.) W. de Wilde 678A (WAG), 678B (WAG); *ibid.* (fl. Apr., July, few fl. Dec., fr. Mar.) Leeuwenberg 2305 (WAG), 3332 (BR, FHO, K, P, WAG), 3706 (ABI, WAG), 4567 (WAG); *ibid.* (Aug.) Oldeman 267 (WAG); Yapo Forest, 4 km S. of Bécédi-Brignan (Aug.) Oldeman 244 (WAG); Abouabou Forest, between Abidjan and Grand Bassam (July) Aké Assi 4381 (WAG); *ibid.* (fl.) Bouquet Feb. 1958 (ABI, WAG); *ibid.*, J. de Wilde 3162 (BR, K, WAG); *ibid.*, Giovannetti 223 (IFAN), 234 (IFAN); *ibid.* (Feb.-Mar.) Herb. I.D.E.R.T. 2243 (ABI), 3835 (ABI); *ibid.* (Jan., Apr.-May) Leeuwenberg 2356 (BR, FHO, K, WAG), 2394 (BR, FHO, K, P, WAG), 2405 (BR, K, WAG), 3326 (BR, FHO, K, P, WAG), 4233 (WAG); *ibid.*, Nozeran 6 Sept. 1950 (MPU); *ibid.* (fl., fr. Jan.) Oldeman 845 (WAG), 847 (WAG); Grand Bassam (Dec.) Schnell 3950 (ABT, IFAN), 3951 (ABT, IFAN).

Ghana: Bronyibima, near Elmina (fr. Nov.) J.B. Hall 2120 (K); Kwase, Cape Coast District, Chipp 574 (K).

Cult.: Wageningen, seedling of herb. Oldeman 845: Leeuwenberg 3561 (WAG); *ibid.*, seedling of herb. Leeuwenberg 3706: Leeuwenberg 7817 (WAG).

21. *S. diplotricha* Leeuwenberg, sp. nov. **Fig. 7, p. 68; Map 16, p. 107**

Frutex scandens vel liana magna ramis inermibus cirrhis solitariis profultis. Folia breviter petiolata laminis coriaceis forma variabili anguste ovatis vel ellipticis apice obtusis vel subacuminatis vel rotundatis mucronatisque basi



PHOT. 2. *S. dinklagei*: flowering plants at edge of granitic rock (Leeuwenberg 3332).

cuneatis glabris vel infra costa pilis paucis minutis obtectis. Inflorescentia terminalis pauciflora pedunculis pedicellisque pubescentibus. Flores pentameri. Sepala late ovata apice acuta vel obtusa ciliata extus breviter pubescentia. Corolla intus fauce penicillata et apud insertionem staminum zona pilosa lobis tubo brevioribus suberectis. Stamina inclusa tubo corollae inserta filamentis brevibus antherisque basi cordata barbatis. Pistillum glabrum ovario biloculari. Fructus parvus ellipsoideus monospermus. Semen ellipsoideum glabrum laeve fossa longitudinali profunda profultum.

Type: Madagascar: Mts. west of Itremo, western Betsileo, Humbert 28340 (P, holotype; isotype: WAG).

Climbing shrub or often large liana. *Branches* grey-brown, lenticellate or more often not, often slightly sulcate when dry, often hairy like the branchlets; branchlets more or less appressed-pubescent with often (?) brown hairs, quadrangular, brown or ochraceous when dry. *Tendrils* solitary. *Leaves*: petiole short, shortly pubescent to glabrous, 2–5 mm long; blade shining and dark green on both sides, coriaceous, very variable in shape, ovate, narrowly ovate, or elliptic, 1.2–3.7 × as long as wide, (2)3–7(9) × (1)1.5–3(5.5) cm, obtuse to subacuminate or rounded and mucronate at the apex, cuneate or seemingly rounded (and cuneate at the very base) at the base, glabrous on both sides or with some minute hairs at the base of the costa beneath; one or two pairs of secondary veins from or from above the base curved along the margin and usually a faint submarginal pair; tertiary venation reticulate, when leaves dry prominent on both sides. *Inflorescence* terminal, rather congested, several-flowered, 1.5 × 1.5–4 × 3 cm, 2–4 × branched. Peduncle, branches, and pedicels pubescent. Lower bracts leafy, other small, triangular or sepal-like, glabrous above and sometimes with small colleters at the base. *Flowers* 5-merous. *Sepals* connate at the base, equal or subequal, broadly ovate, about as long as wide (inside), 1.5 × 1.2–1.7 × 1.3 mm outside and 1.2 × 1.2–1.4 × 1.3 mm inside, acute or obtuse at the apex, ciliate, shortly pubescent outside, glabrous inside, without colleters. *Corolla* in the mature bud 3–3.5 × as long as the calyx, 5–5.2 mm long, and obtuse at the apex, white or outside pale green and inside white, campanulate or nearly so, outside shortly pubescent, especially in the middle, glabrous at the base, inside white-penicillate in the throat and mostly with a narrow zone of pilose hairs near the insertion of the stamens; tube about twice as long as the calyx, 1.2–1.3 × as long as the lobes, 2.8–3.2 mm long, 2.5 mm wide at the throat; lobes thick, triangular, 1.7 × as long as wide, 2–2.2 × 1.2–1.3 mm, acute, suberect. *Stamens* included; filaments very short, 0.5–0.7 × as long as the anthers, pilose or glabrous, inserted at two-thirds from the base of the corolla tube; anthers narrowly cordate, 1.2 × 0.8 mm, bearded at the deeply cordate base; cells parallel or slightly divergent at the base. *Pistil* glabrous, 2.7–3 mm long; ovary depressed-globose, 1 × 1.2 mm, abruptly narrowed into the style, 2-celled; style 2 mm long, thick; stigma capitate. In each cell 14–20 ovules. *Fruit* orange (?) or yellow (?), small, soft, ellipsoid, 16–18 × 12–13 mm, 1-seeded, slightly shining, with smooth skin.

Wall thin. *Seed* not flattened, ellipsoid, $15 \times 11 \times 10$ mm, glabrous, smooth, with a deep lateral groove.

Distribution: Madagascar.

Ecology: Montane rain forests; alt. 800–1600 m.

Madagascar: Betampona, near Ambodiriana, W. of Tamatave, Perrier de la Bâthie 17452 (P); Ambatoharanana, near Antsevabe (Mar.) Cours 4100 (P); Analamazaotra Forest, Perrier de la Bâthie 8602 (P, WAG); Tsinjoarivo (fl., fr. Feb.) Perrier de la Bâthie 16941 (P, WAG); W. of Itremo, W. Betsileo (Jan.-Apr.) Humbert 28340 (P, WAG, type), 30025 (P); Faliarivo, W. of Ambositra (Jan.) Humbert & Capuron 28036 (P, WAG); Andina, near Ambositra (Dec.) Perrier de la Bâthie 18604 (P, WAG).

Notes. *S. diplotricha* belongs to section *Penicillatae* and is most closely allied to *S. tchibangensis* by the disposition of the inflorescence, the shape of the leaves, and the size of the flowers. It differs from that species by the reticulation of the leaves, the second hair ring in the corolla, which is absent in *S. tchibangensis*, and the deeply grooved seed.

22. *S. dolichothyrsa* Gilg ex Onochie et Hepper, Kew Bull. 16: 385. 1962; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 41. 1963 (both partly, excl. Latilo FHI 31811).

Fig. 16, p. 115; Map 16, p. 107

Type: Cameroun: Bipindi, Zenker 4943 (K, holotype; isotypes: BM, BR, COI, FHO, G, GOET, HBG, L, LE, LY, M, MO, P, PR, PRE, S, W, WAG, Z).

Large liana, up to 40 m high climbing in trees, 40–100 m long. Trunk 3–13 cm in diam. Bark dark brown, with large lenticels; wood pale brownish. *Branches* not lenticellate, terete, dark brown and slightly or not sulcate when dry; branchlets densely and shortly appressed-pubescent with ochraceous hairs, glabrescent, terete, dark brown and not sulcate when dry. Tendrils solitary, in the axils of ordinary leaves or small bracts. *Leaves* with cloves-odour when living; petiole minutely pubescent, 4–8 mm long; blade shining or mat and dark green above, dull and very pale green beneath, coriaceous, thinner in the shade, elliptic, narrowly elliptic, or on the main axis often suborbicular, $(1.2)2-3(3.7) \times$ as long as wide, $(3.5)4.5-11.5(14) \times (2)3-4.5(6.5)$ cm, in the shade up to 16×7.5 cm, acuminate at the apex, cuneate or rounded at the base, sparingly and minutely pubescent on both sides when young, soon glabrous; one or two pairs of secondary veins from or from above the base curved along the margin and often also a faint submarginal pair; margin somewhat revolute, especially in the thick sun-leaves. *Inflorescence* terminal, and sometimes at the same time axillary, lax, many-flowered, about $9-20 \times 5-20$ cm, 4–5 \times branched. Peduncle, and branches slender, shortly pubescent like the very short pedicels. Lower bracts leafy, other small, deminishing in size, narrowly triangular or approximately sepal-like, shortly pubescent on both sides, without colleters. *Flowers* 5-merous. *Sepals* pale green, about halfway connate, equal, $0.8-1 \times 0.5-0.8$ mm, pubescent outside, glabrous inside, without colleters;

lobes triangular, about as long as wide, acute, not distinctly ciliate. *Corolla* in the mature bud $2.5-3 \times$ as long as the calyx, $2.5-3 \times 2$ mm, and rounded at the apex, greenish-white or pale green, urceolate, outside minutely pubescent, inside pilose on the base of the lobes; tube about as long as the calyx, but exceeding it as the latter is spreading in open flowers, $1(-1.2)$ mm long; lobes $1.5-2 \times$ as long as the tube, triangular, $1.5-2 \times 1-1.2$ mm, acute, slightly spreading. *Stamens* just exerted; filaments glabrous or minutely pubescent inside, very short, $0.3-0.5 \times$ as long as the anthers, inserted at the mouth of the corolla tube; anthers ovate, $0.8 \times 0.5-0.6$ mm, bearded at the cordate base; cells parallel. *Pistil* glabrous, $1.4-2$ mm long; ovary globose or broadly ovoid, $0.7-1$ mm in diam., often rather abruptly narrowed into the style, 2-celled; style $0.7-1$ mm long; stigma capitate. In each cell about 7-10 ovules. *Fruit* orange, rather small, soft, ellipsoid, $20 \times 20 \times 17-32 \times 32 \times 26$ mm, 1-2-seeded, smooth, mat. Wall thin. *Seed* obliquely elliptic, flattened, $15 \times 13 \times 3-20 \times 15 \times 6$ mm, more or less plano-convex, rather rough, densely pubescent with very thick short erect hairs.

Distribution: Cameroun, Gabon (not yet collected), Congo (Brazzaville).

Ecology: Rain forests or secondary forests, mostly on river banks; alt. 0-800 m.

Cameroun: Bipindi, Zenker 4943 (BM, BR, COI, FHO, G, GOET, HBG, K, L, LE, LY, M, MO, P, PR, PRE, S, W, WAG, Z, type); 49 km SW. of Eséka, right bank Nyong R., about 1 km N. of Songbong (fl. Mar., fr. June) W. de Wilde 2160 (WAG), 2736 (WAG, YA), 2755 (WAG); *ibid.*, Leeuwenberg 5113 (WAG); about 65 km SW. of Eséka, about 15 km S. of Songbong (fr. July) W. de Wilde 2804 (WAG); 25 km NE. of Douala, along road to Edéa, Leeuwenberg 6329 (WAG); 3 km E. of km 21 of Yabassi-Douala road, Leeuwenberg 6409 (WAG); 8 km W. of Masok, Leeuwenberg 5200 (WAG); 10 km W. of Masok near Ekem R. (Mar.-Apr.) Leeuwenberg 5257 (WAG), 5387 (WAG); 40 km NW. of Yaoundé (Apr.) Leeuwenberg 5439 (WAG); 33 km E. of Yaoundé, along road to Ayos, Breteler, J. de Wilde & Leeuwenberg 2471 (BR, K, P, WAG, YA); km 25 of Nanga Eboko-Bertoua road, Leeuwenberg 7447 (WAG); 18 km N. of Bertoua, along road to Deng Deng, Breteler c.s. 2422 (BR, K, P, WAG, YA); near Dimako, 28 km SW. of Bertoua, Breteler 1744 (WAG, YA); 15 km E. of Dimako, Leeuwenberg 5833 (WAG), 7357 (WAG); 10 km N. of Doumé, Leeuwenberg 7359 (WAG); 5 km N. of Lomié, Leeuwenberg 6631 (WAG).

Congo (Brazzaville): near Komono, Bouquet & Sitha 2332 (IRSC, WAG).

23. *S. elaeocarpa* Gilg ex Leeuwenberg, sp. nov. (Gilg in Mildbraed, Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped. 1910-11.2: 62. 1922, nomen).

Fig. 16, p. 115; Map 17, p. 107

Arbor parva silvae densae pluviosae. Truncus erectus cylindricus cortice laevi griseo vel bruneo. Rami inermi lenticellati fere nigri. Folia glabra laminis crasse coriaceis ellipticis vel anguste ellipticis apice acuminatis vel apiculatis basi cuneatis infra conspicue pallidioribus. Inflorescentia axillaris congesta ut videtur fasciculata pauciflora. Flores tetrameri. Sepala suborbicularia apice obtusa vel acuta minutissime ciliata utrinque glabra. Corolla lactea extus glabra

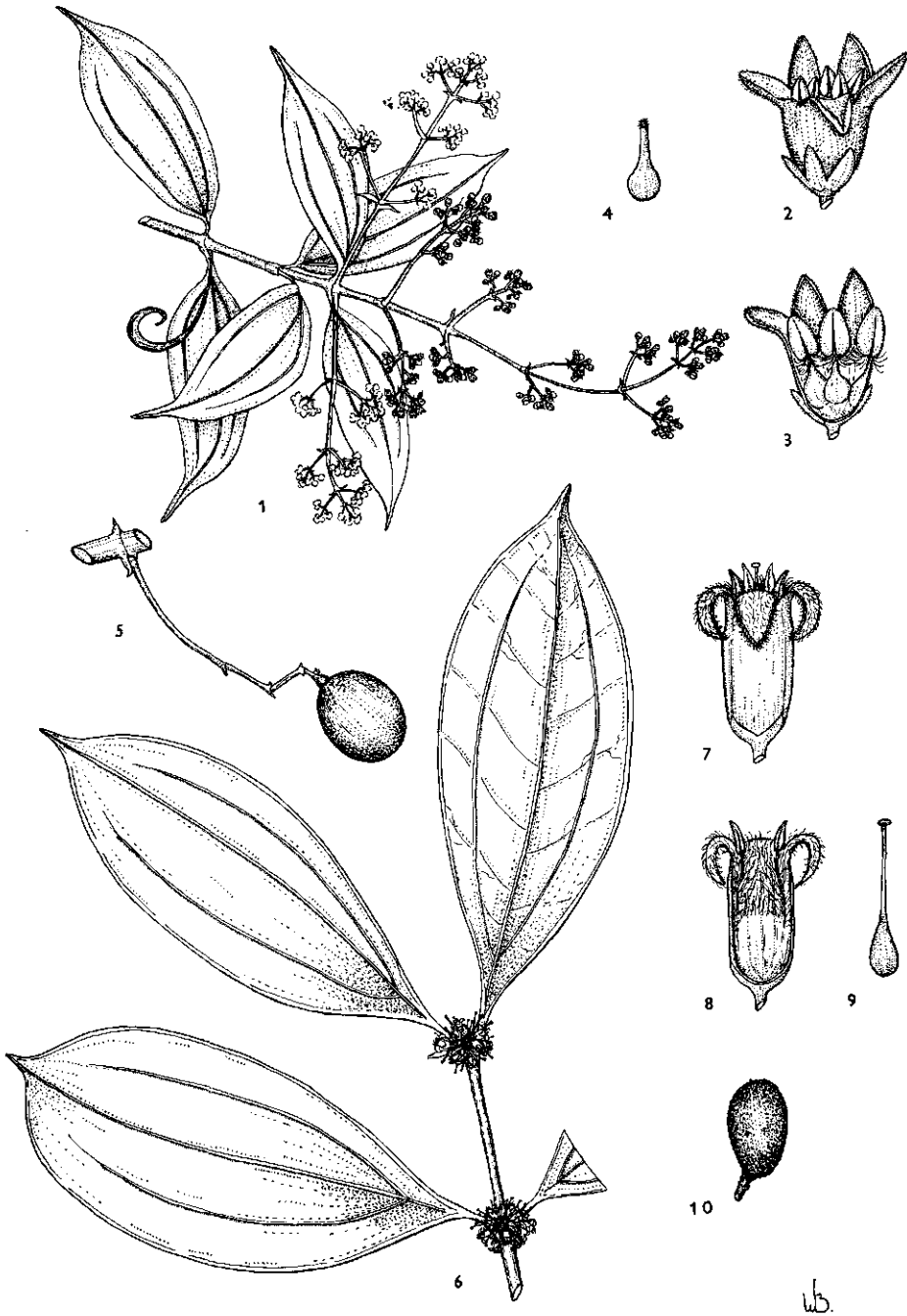


FIG. 16. 1-5. *S. dolichothyrsa*: 1. branch, $\frac{1}{2} \times$; 2. flower, $7 \times$; 3. opened flower, $7 \times$; 4. pistil, $7 \times$; 5. fruit, $\frac{1}{2} \times$ (1-4. Leeuwenberg 5439; 5. W. de Wilde 2755); 6-10. *S. elaeocarpa*: 6. branch, $\frac{1}{2} \times$; 7. flower, $3\frac{1}{2} \times$; 8. opened flower, $3\frac{1}{2} \times$; 9. pistil, $3\frac{1}{2} \times$; 10. fruit, $\frac{1}{2} \times$ (6-9. Leeuwenberg 7005; 10. Leeuwenberg 6305).

intus dense pilosa tubo cylindrico lobisque oblongis recurvatis. Stamina glabra paulo exserta filamentis antheras oblongas aequantibus. Pistillum glabrum ovario biloculari styloque gracili. Fructus bruneus parvus oliva similis sed conspicue lenticellatus monospermus. Semen ellipsoideum glabrum laeve testa tenuissima.

Type: Cameroun: 4 km E. of km 65 of Edéa-Kribi road, Leeuwenberg 7005 (WAG, holotype; isotypes: A, B, BM, BOL, BR, BREM, C, COI, E, EA, ENT, F, FHO, FI, G, GB, GOET, GRA, GRO, HAL, HBG, IFAN, IRSC, K, L, LD, LISC, LISU, LY, M, MO, MPU, NBG, NLI, NY, P, PRE, PRF, S, SL, SRGH, TCD, TOM, U, UC, UPS, US, W, WRSL, YA, Z).

Small tree, 6–10 m high. Trunk 15–25 cm in diam. Bark smooth, pale grey to dark brown, thin, 1.5 mm thick; wood very pale brownish, hard, with small bark-islets. *Branches* lenticellate, terete, very dark brown to black and partially pale brown, not sulcate when dry; branchlets glabrous, not lenticellate, pale to very dark brown and often somewhat sulcate when dry. *Leaves*: petiole glabrous, 7–10 mm long; blade slightly shining on both sides, dark green above, especially when living much paler beneath, thickly coriaceous, elliptic or narrowly elliptic, $1.7\text{--}3 \times$ as long as wide, $8\text{--}17 \times 3\text{--}7(9)$ cm, acuminate or apiculate at the apex, cuneate at the base, glabrous on both sides; one pair of secondary veins from or from above the base curved along the slightly revolute margin; tertiary venation reticulate, not very conspicuous. *Inflorescences* axillary, several together, congested, seemingly fasciculate, few-flowered, $1\text{--}1.5 \times 1$ cm, $1\text{--}2 \times$ branched. Bracts approximately sepal-like. *Flowers* 4-merous, sweet-scented. *Sepals* pale green, connate at the base, subequal, suborbicular, $1\text{--}1.2 \times$ as long as wide, $1\text{--}1.2 \times 0.8\text{--}1.2$ mm, obtuse to acute at the apex, very minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud $6\text{--}7 \times$ as long as the calyx, 7–8.5 mm long, and tapering at the apex, white or creamy, outside glabrous, inside densely pilose except for the glabrous base of the tube and apex of the lobes; tube cylindrical or nearly so, $3\text{--}4 \times$ as long as the calyx, $1\text{--}1.4 \times$ as long as the lobes, 3.7–5 mm long, at the throat 2–2.2 mm wide; lobes oblong, $2.3 \times$ as long as wide, 3.5×1.5 mm, acute, recurved. *Stamens* slightly exserted; filaments glabrous, as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, $1\text{--}1.1 \times 0.4\text{--}0.6$ mm, glabrous, cordate at the base; cells parallel. *Pistil* glabrous, 6–8.5 mm long; ovary ovoid, $1.7 \times 1\text{--}1.2$ mm, 2-celled; style slender, 4.5–6.8 mm long; stigma capitate, small. In each cell 5–15 ovules. *Fruit* dark brown, small, soft, obliquely ellipsoid, $20 \times 13 \times 13\text{--}25 \times 16 \times 16$ mm, rounded or mucronate at the apex, distinctly lenticellate, 1-seeded, mat, with rather rough skin. Wall thin. *Seed* pale brown, ellipsoid, $15\text{--}17 \times 8\text{--}10 \times 7\text{--}9$ mm, smooth, glabrous. Testa thin, sticking to the pulp.

Distribution: Cameroun.

Ecology: Rain forests or old secondary forests, sometimes on river banks, not far from the coast; alt. 50–200 m.

Cameroun: left bank Mungo R., near bridge in Loum-Kumba road, Leeuwenberg 6845 (WAG); Likomba Plantation, 15–35 km NE. of Victoria (fl., fr. Oct.) Mildbraed 10521 (A, K, cited by Gilg), 10527 (A, K, cited by Gilg); Tiko, Dunlap 168 (K); 2 km E. of km 58 of Edéa-Kribi road, along road to Mboké (fl. Oct., fr. Aug.) Leeuwenberg 6307 (WAG), 7009 (WAG); 5 km E. of km 65 of Edéa-Kribi road (fl. Oct., fr. Aug.) Leeuwenberg 5671 (WAG), 5671a (WAG), 6305 (WAG), 7005 (herbaria see above; type), 7006 (WAG, one year old seedlings of 7005), 7007 (WAG, very young seedlings of 7005).

Notes. Gilg cited the two above-mentioned numbers of the Mildbraed collection without description. I had the opportunity to collect a fine specimen with many duplicates, some of which were distributed before the publication of the present description, and therefore it is very suitable as the type.

The numbers 7006 and 7007 were collected at the base of 7005. Dr. T. W. J. GADELLA will publish the chromosome number. The root tips of 7007 were fixed in Karpechenko's fixation mixture in the field.

S. elaeocarpa resembles *S. ndengensis* by the dense hairiness inside the corolla, and by the lenticellate branches. The leaves are less similar. The two species differ mainly by the habit, *S. ndengensis* being a liana with solitary tendrils.

Furthermore *S. elaeocarpa* resembles *S. floribunda* more or less in the floral characters. This caused the confusion of the two species in the Flora of W. Trop. Africa. *S. elaeocarpa* differs from *S. floribunda* by the habit and the remarkable warty brown fruits. The fruits of *S. floribunda*, a liana with solitary tendrils, are smooth and orange.

24. *S. fallax* Leeuwenberg, sp. nov. **Fig. 17, p. 119; Map 17, p. 107**

Liana ramis inermibus lenticellatis. Folia glabra breviter petiolata laminis subcoriaceis ellipticis apice acuminatis basi cuneatis vel rotundatis. Inflorescentia terminalis pedunculis pedicellisque glabris vel minute pubescentibus. Flores pentameri parvi. Sepala ovata vel triangularia apice acuta minute ciliata extus breviter pubescentia. Corolla extus pubescens intus fauce pilosa tubo brevi calyce aequilongi lobis patentibus. Stamina breviter exserta corollae fauce inserta antheris oblongis basi cordata barbatis. Pistillum pilosum ovario bilocularem. Fructus aurantiacus parvus ovoideus lateraliter compressus bi- vel trispermus. Semen oblique ovatum vel ellipticum scabridum testa chartacea.

Type: Congo (Brazzaville): Pointe-Noire Region, Koechlin 5507 (WAG, holotype; isotype: IRSC).

Liana. Trunk 3–10 cm in diam. Branches dark brown, lenticellate, not sulcate when dry; branchlets glabrous, lenticellate when leaves mature, terete or nearly so, dark brown and often slightly sulcate when dry. Tendrils paired. Leaves: petiole, short, glabrous, 1–4 mm long; blade slightly shining on both sides (dry), paler beneath, thinly coriaceous, elliptic, (1.5)2–3 × as long as wide, 3–11 × 1.5–5 cm, acuminate at the apex, cuneate or rounded at the base, glabrous on both sides; one pair of secondary veins from or from somewhat above the base curved along the margin, and often a faint submarginal pair; costa and often

main secondary veins impressed above; tertiary venation reticulate, prominent beneath and mostly also above. *Inflorescence* terminal, rather lax, 3–4 × 2–3 cm, in fruit up to 9 × 9 cm. Peduncle, branches, and pedicels glabrous or minutely pubescent. Lower bracts leafy, other small, narrowly triangular or sepal-like, upper most glabrous above and without colleters. *Flowers* 5-merous. *Sepals* connate for one-third of their length, equal, ovate to triangular, 1 × 0.8 mm, acute at the apex, minutely ciliate, shortly pubescent outside, glabrous inside, without colleters. *Corolla* in the mature bud 3 × as long as the calyx, 3 mm long, and rounded at the apex, white (?), minutely pubescent outside, inside with a pilose ring in the throat; tube short, as long as the calyx, 1 mm long; lobes 2 × as long as the tube, 2 × 1.2 mm, acute, spreading. *Stamens* slightly exerted; filaments glabrous, 0.5 × as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, 0.6 × 0.5 mm, bearded at the deeply cordate base; cells parallel. *Pistil* pilose, 1.5 mm long; ovary ovoid, 1 × 0.8 mm, 2-celled, gradually narrowed into the style; style 0.5 mm long; stigma capitate. In each cell 5–6 ovules. *Fruit* orange or orange-yellow, small, soft, ovoid, laterally compressed, 19 × 18 × 14 – 25 × 23 × 16 mm, 2–3-seeded, with a smooth skin. Wall thin, dry about 0.3 mm thick. *Seed* flattened, more or less plano-convex, obliquely ovate or elliptic, often irregularly curved, 12 × 10 × 4 – 15 × 12 × 5 mm, with an acute end, with thick very short erect hairs, rather rough. Testa chartaceous, not sticking to the pulp.

Distribution: Gabon, Congo (both).

Ecology: In moist forests (*Gilbertiodendron*), often on river banks or in gallery forests; alt. 0–1000 m.

Gabon: Bélinga, N. Hallé 4147 (P, WAG).

Congo (Brazzaville): Pointe-Noire Region (Dec.) Koechlin 5507 (IRSC, WAG, type).

Congo (Kinshasa): Léopoldville: new Boma-Banane road (fr. Feb.) Wagemans 1376 (BR), 1408 (BR); Zundu, Mpioka R. (fr. Mar.) Compère 1686 (BR); Kinkasi (fr. Feb.) Callens 301 (BR, K). Equateur: Basankusu, near Maniete R. (fr. Sept.) Evrard 4777 (BR, K, WAG); near Ingende, L. Dubois 788 (BR). Orientale: Yandji Lake, Isangi (fr. Aug.) Germain 5160 (BR, K, PRE).

Notes. The name of this species is chosen because it resembles fallaciously three well defined species which belong to three different sections. It is placed here in *Lanigeræ* with the last of these three species, *S. moandaensis*.

First of all, it shows a resemblance with *S. tchibangensis* by the terminal inflorescence, the outside pubescent corolla, and the bearded anthers. It differs from the latter in leaf characters which are difficult to define and as follows: Tendrils solitary, pubescent; corolla in the mature bud 4.5 mm long; pistil glabrous; seeds ellipsoid, glabrous, smooth, not much flattened; testa thin, sticking to the pulp ***S. tchibangensis***
 Tendrils paired, glabrous; corolla in the mature bud 3 mm long; pistil pilose; seeds obliquely ovate or elliptic, flattened, shortly and densely pubescent, rather rough ***S. fallax***

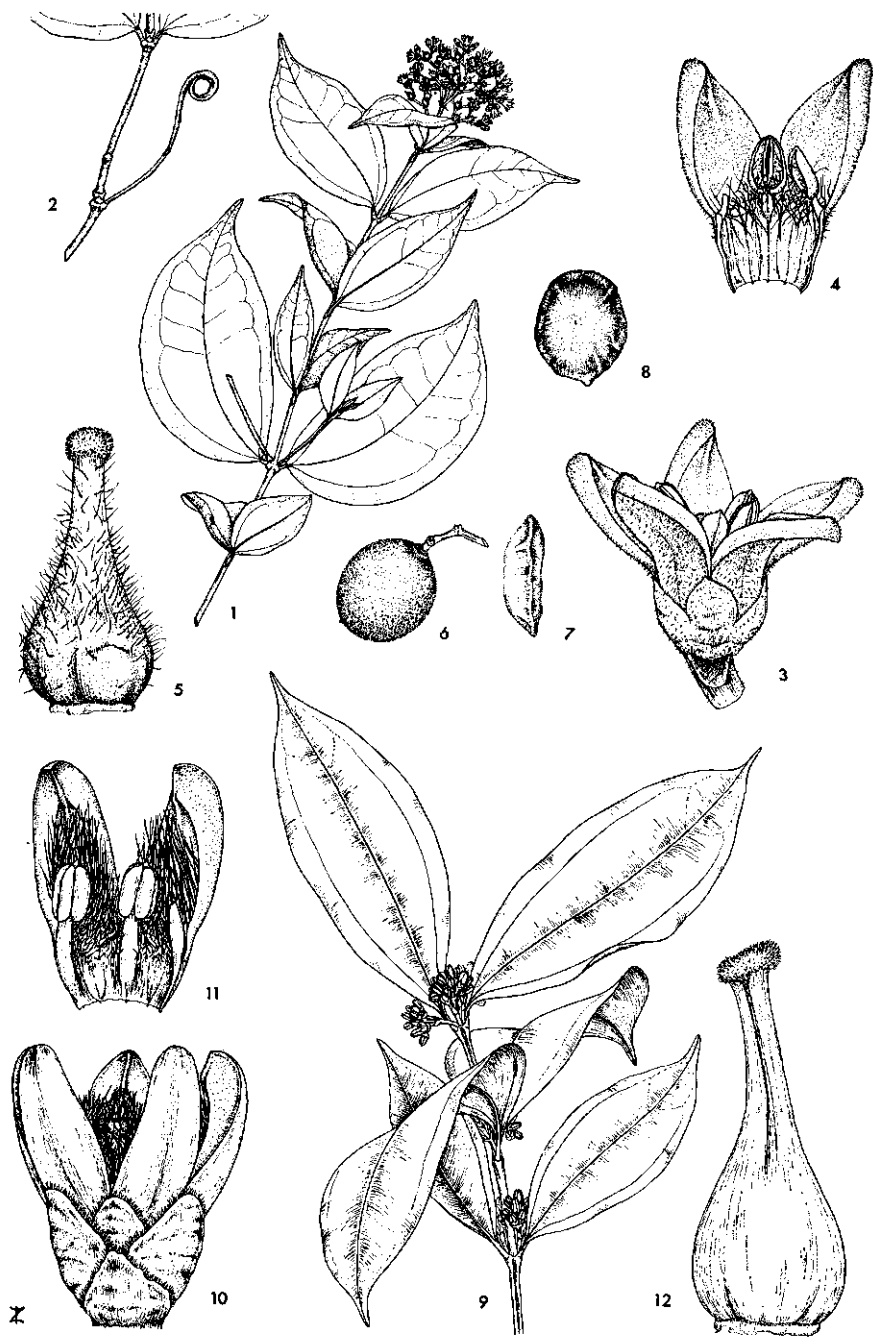


FIG. 17. 1-8. *S. fallax*: 1. branch, $\frac{1}{2} \times$; 2. branch with tendrils, of which one lost, see articulation, $1 \times$; 3. flower, $10 \times$; 4. portion of corolla with stamens, $10 \times$; 5. pistil, $20 \times$; 6. fruit, $1 \times$; 7-8. seed, two sides, $1 \times$ (1, 3-5. Koechlin 5507; 2. Germain 5160; 6-8. Compère 1686). 9-12. *S. gnetifolia*: 9. branch, $\frac{1}{2} \times$; 10. flower, $10 \times$; 11. portion of corolla with stamens, $10 \times$; 12. pistil, $20 \times$ (9-12. Zenker 2961).

Than it resembles *S. malchairii* by the shape and venation of the leaves and the size of the fruits. From this species it differs more clearly by the following characters:

Tendrils solitary; leaves mostly dull beneath; corolla lobes thick, with recurved brushes at the apex; seed ellipsoid, glabrous, smooth . . . ***S. malchairii***
Tendrils paired; leaves slightly shining beneath (dry); corolla lobes not thick, pilose at the base; seed flattened (see above) ***S. fallax***

Finally, it resembles *S. moandaensis* even more by the leaves, the small flowers, and the pilose pistil. From this species it differs as follows:

Inflorescence axillary and often also terminal; branchlets mostly pubescent; pistil 2.8–4 mm long; seed smooth; fruit not laterally compressed ***S. moandaensis***
Inflorescence terminal; branchlets glabrous; pistil 1.5 mm long; seed rough; fruit laterally compressed ***S. fallax***

25. ***S. floribunda*** Gilg in Engler, Bot. Jahrb. 17: 566. 1893; Baker in Fl. Trop. Afr. 4(1): 527. 1903; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 44. 1963, partly (excl. syn. *S. togoensis* Gilg et Busse; Thomas 5032, Kersting 691, Dunlap 168, Mildbraed 10521, 10527, Chipp 574); Leeuwenberg, Act. Bot. Neerl. 14: 219. 1965. **Fig. 14, p. 99; Map 18, p. 123**

Type: Congo: Orientale, Monbuttu Land, Kapili R., Schweinfurth 3558 (holotype not seen, destroyed in B; lectotype: K; other isotypes seen: BM, P, S).

Heterotypic synonyms: *S. welwitschii* Gilg, l.c. p. 573; Hiern in Cat. Welw. Afr. Pl. 3: 703. 1898, partly (as for Welwitsch 1260, 4765, 4774, 6017 partly, 6018); Baker, l.c. p. 524; E. A. Bruce, Kew Bull. 10: 627, f. 1A. 1956. Type: Angola: Luanda, between Quicuxe and Cacuaco, Welwitsch 6018 (BM, lectotype; isotypes: C, COI, K, LE, LISU, P). Homotypic synonym: *S. subscandens* Bak., Kew Bull. 1895: 96. 1895. The holotype of this name is the lectotype of the preceding.

S. microcarpa Bak., Kew Bull. 1895: 97. 1895. Type: Angola: Luanda, between Quicuxe and Cacuaco, Welwitsch 4765 (BM, holotype; isotypes: COI, G, K, LISU, P).

S. malifolia Bak. in Fl. Trop. Afr. 4(1): 525. 1903. Type: Angola: Luanda, Ambriz, Monteiro Oct. 1872 (K, holotype).

S. henriquesiana Gilg, Notizbl. Bot. Gart. Berlin 1: 75. 1895, not Baker (1893). Type: Angola: Luachimo R., Marques 273 (holotype not seen, destroyed in B; lectotype: LISU; other isotype seen: COI). Homotypic synonym: *S. marquesii* Bak. in Fl. Trop. Afr. 4(1): 530. 1903.

S. moloneyi Bak., Kew Bull. 1895: 97. 1895 and in Fl. Trop. Afr. 4(1): 527. 1903; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 24. 1931, partly (excl. syns. *S. togoensis* Gilg et Busse, *S. chrysocarpa* Bak.; Johnston 98, Dunlap 168, Kersting 691, Talbot 157, and Linder 1242). Type: Sierra Leone: Near Berria, Falaba, Scott Elliott 5431 (K, lectotype).

S. littoralis A. Chev. ex Hutch. et Dalz., Fl. W. Trop. Afr. 2: 24. 1931 and Kew Bull. 1937: 334. 1937 (with *S. warneckei* Gilg in syn.), partly (excl. Mildbraed 10521, 10527) (A. Chevalier, Expl. Bot. Afr. Occ. Franç. 1: 443. 1920, nomen); Chevalier, Rev. Bot. Appliq. 27: 370, pl. 19 A. 1947. Type: Ivory Coast: between Tabou and Bériby, Chevalier 19953 (P, holotype; isotypes: K, LY, P).

Climbing shrub or liana, 1.50–30 m high climbing over shrubs and in trees, 10–30 m long or more. Trunk 4–13 cm in diam. Bark dark brown, lenticellate, smooth, thin; wood yellow. *Branches* very dark brown or paler and with epidermis peeling off, lenticellate, terete, not sulcate when dry; branchlets green, glabrous or occasionally minutely pubescent, rarely lenticellate, pale to dark brown and often slightly sulcate when dry. Tendrils solitary. *Leaves*: petiole glabrous, 2–9 mm long; blade often slightly shining and dark green above, less shining to dull and paler and often glaucous beneath, coriaceous or subcoriaceous also when living, thinner in the shade, very variable in shape and size, elliptic, narrowly elliptic, narrowly ovate, or less often ovate, sometimes narrower towards the apices of the branchlets, 1.5–3(4) × as long as wide, 4–10(12) × 1.5–5(6) cm, acuminate or in the shade often caudate at the apex, cuneate, rounded, or rarely subcordate at the base, glabrous on both sides; one or two pairs or secondary veins from or from above the base curved along the margin, outer pair usually faint; tertiary venation not very conspicuous, often slightly prominent beneath. *Inflorescence* axillary and occasionally also terminal, lax or congested, 0.1–0.5 × as long as the leaves, 1–4.5 × 1–3 cm, 1–2 × branched, few-flowered. Peduncle, branches, and pedicels thin, minutely papillose-pubescent or glabrous. Bracts narrowly triangular or almost sepal-like, at least upper often (?) without colleters. *Flowers* (4–)5-merous. *Sepals* green or greenish, connate up to one-quarter of their length, subequal or unequal and then the longest up to 1.5 × as long as the shortest and wider or narrower, triangular, ovate, or narrowly triangular, 1–2(3) × as long as wide, 0.8–1.5 × (0.3)0.6–0.8(1.2) mm, acute or sometimes subacute at the apex, minutely ciliate, glabrous on both sides or outside minutely papillose-pubescent, without colleters. *Corolla* in the mature bud 3.5–5 × as long as the calyx, 4.5–6 mm long, and rounded at the apex, white or greenish-white, outside glabrous or minutely papillose-pubescent, especially on the tube above, inside often densely pilose except for the glabrous apex of the lobes and base of the tube; tube cylindrical or nearly so, 1.7–4.4 × as long as the calyx, 0.7–1.5(2) × as long as the lobes, 2–3.3 mm long; lobes narrowly triangular, 1.5–3 × as long as wide, 1.5–3 × 1–1.6 mm, acute, spreading or recurved. *Stamens* exerted; filaments glabrous, 1–1.5(2) × as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, 1.2–3 × as long as wide, 0.6–1 × 0.25–0.8 mm, rounded to deeply cordate at the base, glabrous; cells parallel. *Pistil* glabrous, 3.2–6(7) mm long; ovary globose, or ovoid to nearly conical, gradually narrowed into the style or not, 0.8–2 × 0.6–1 mm, 2-celled; style slender, 2–4.5 mm long; stigma small, obscurely bilobed or capitate (in a single inflorescence). In each cell 6–10 ovules. *Fruit* orange, immature green or glaucous,

sometimes lenticellate, small, soft, ellipsoid, $14 \times 12 \times 12 - 17 \times 14 \times 14$ mm, 1-seeded, obliquely pedicellate, sometimes shortly stipitate within the calyx, with smooth skin, mat. Wall thin, about 0.3 mm thick. Pulp pale yellow. Seed ochraceous or pale brown, slightly flattened, ellipsoid, $8 \times 7 \times 5 - 13 \times 10 \times 7$ mm, densely pubescent, smooth. Testa thin, sticking to the pulp.

Distribution: West and Central Africa.

Ecology: Rain forests or secondary forests, often on river banks; alt. 0–800 m.

Sierra Leone: near Berria, Falaba (fr. Mar.) Scott Elliot 5431 (K, lectotype of *S. moloneyi*); sin. loc., Afzelius s.n. (UPS).

Liberia: near Duport, 15 km E. of Monrovia, Dinklage 3067 (K); ibid. (Sept.) Voorhoeve 453 (LIB, WAG); near Yoma, left bank Mahe R., 12 km NE. of Bomi Hills, Leeuwenberg 4863 (WAG); Bong Range, 32 km N. of Kakata, Leeuwenberg & Voorhoeve 4962 (WAG); Gbata Ck., 32 km SW. of Suakoko, Leeuwenberg & Voorhoeve 4588 (WAG); Nimba Mts. (fr. June) J.G. Adam 21620 (P).

Ivory Coast: between Tabou and Bériby (Aug.) Chevalier 19953 (K, LY, P, type of *S. littoralis*); Moréno, between Anoumaba and Sahoua (fr. Nov.) Chevalier 22426 (P); W. of Vridi Canal, Guillaumet 1212 bis (ABI, WAG); Port Bouët (fr. Hédin 1 Feb. (P); Abouabou Forest, J. de Wilde 475 (WAG), 997 (WAG); ibid. (fr. Feb.) J. de Wilde & Leeuwenberg 3441 (ABI, BR, K, P, S, WAG), 3444 (BR, K, WAG), 3445 (K, WAG); ibid. (fl. Aug., fr. Feb.) Herb. I.D.E.R.T. 1319 (ABI), 2244 (ABI); ibid. (June) Leeuwenberg 2407 (FHO, WAG), 3327 (K, WAG), 3328 (FHO, WAG), 4506 (WAG), 4979 (WAG); ibid. (fl. July, fr. Jan.) Oldeman 91 (WAG), 92 (WAG), 851 (WAG).

Ghana: near Bibiani (fr. Dec.) C.D. Adams 2096 (GC); Asuansi (July) H.E. Box 3245 (GC); Adeiso (fr. Mar.) Irvine 2412 (K); Mankrong, Kwahu (fr. Dec.) C.D. Adams 5074 (GC); Accra, Moloney anno 1883 (K, paratype of *S. moloneyi*).

Togo: near Lomé, Warnecke 369 (BM, EA, K, L, P).

Dahomey: Bopa (fr. Feb.) Aubréville 38D (P); Tohoué, between Porto Novo Lagoon and the sea (fr. Jan.) Chevalier 22776 (P).

Nigeria: Lagos (Aug.) Dalziel 1415 (E, K); Idanre, Ondo Province (fr. Jan.) Brenan & Keay 8652 (BM, FHI, FHO, K, P); Onitsha (?), Barter 1813 (GH, K, P, paratype of *S. moloneyi*); Akpaka For. Res., Onitsha Province, Onochie, Ladipo & Ibrahim FHI 21627 (K); ibid., Onochie FHI 34052 (FHI, K); SSW. of Etemi, Omo R. (fr. Mar.) Jones & Onochie FHI 16632 (FHI, FHO); Abakaliki-Obubra road (fr.) Kitson 5 Apr. 1909 (BM); Gangumi, Adamawa Province (fr. Dec.) Latilo & Daramola FHI 28849 (FHI, FHO, K).

Cameroun: left bank Sanaga R., near Nachtigal, Leeuwenberg 7030 (WAG); same bank, between Ebaka and Bélabo (fr. Dec.) Leeuwenberg 7381 (WAG).

Central African Republic: Yalinga Region, Le Testu 4755 (P, WAG).

Gabon: Bélinga, N. Hallé & Le Thomas 538 (P).

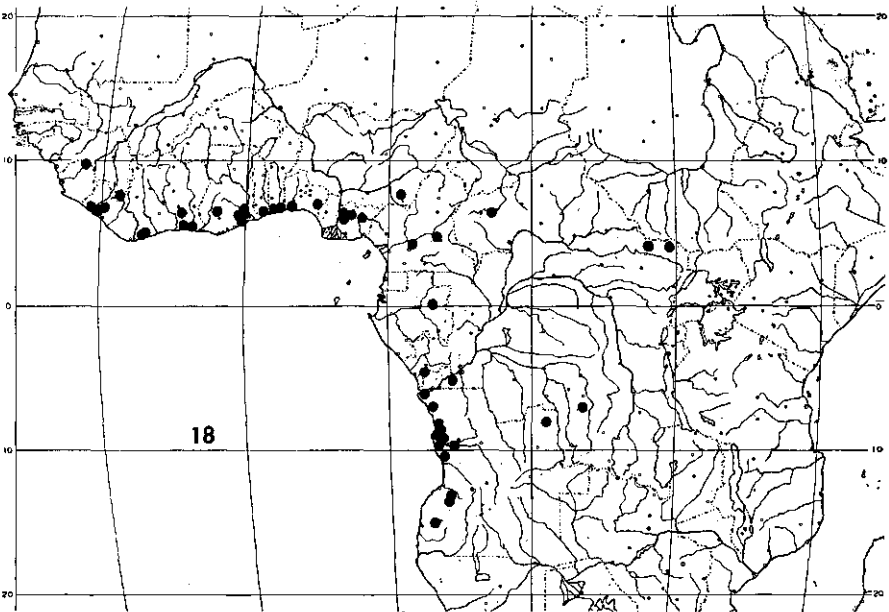
Congo (Kinshasa): Léopoldville: Mpioka R., Zundu, Compère 1256a (BR), 1677a (BR). Orientale: Kapili R., Monbuttu Land (Apr.) Schweinfurth 3558 (BM, K, P, S, type); Nagero, Dungu Territory, Troupin 748 (BR, K, WAG). Kasai: Thielen, Vanderyst 21911 (BR).

Angola: Cabinda: Belize (Mar.) Gossweiler 7886 (BM, BR, COI, K, LISJC, LISU). Zaire: Peco Stream, near Congo R., Gossweiler 8638 (BM, BR), 8638a (US). Luanda: Ambriz (fl.) Monteiro Oct. 1872 (K, type of *S. malifolia*); km 35 of Luanda-Catete road, Gossweiler 13103 (LISC); near Barra do Dande (Nov.) Welwitsch 1260 (BM, LISU); Dande R., Mabubas (fr. Mar.) Exell & Mendonça 41 (BM, COI, LISJC); Bana do Bengo (fr. Jan.) Welwitsch 6017, partly (BM, C, COI, K, LE, LISU, P, paratype of *S. welwitschii*; the other sheets, G, LISU, belong to *S. lucens*); between Quicuxe and Cacuaco, Welwitsch 4765 (BM, COI, G, K, LISU, P, type of *S. microcarpa*); Musseque Viana (fr. Mar.) Exell & Mendonça 20

(BM, COI, LISJC); *ibid.* (Nov.) Gossweiler 10517 (BM, COI, NLI), 10517 b (BM, COI, K, LISJC, NLI); near Cuanza and Bengo Rs., Gossweiler 10613 (COI, K, US); near Quicuxe (fr. May) Welwitsch 6018 (BM, C, COI, K, LE, LISU, P, lectotype of *S. welwitschii*, type of *S. subscandens*); Penedo, Gossweiler 1535a (COI); near Funda d'Ndelli (fr. Mar.) Welwitsch 4774 (BM, LISU); km 48 of railroad from Catete to Luanda (Nov.) Gossweiler 10456 (BM, COI), 10457 (BM, COI); Quiçama, J. C. Henriques 68 (NLI); coastal region, Gossweiler 493 (BM, K, P). Cuanza Norte: Cambembe, near Cuanza R. (Oct.) Gossweiler 9255 (COI, K, LISJC, US). Lunda: Dundo, near Luachimo R. (Oct.) Gossweiler 13661 (B, BM, BR, K, NLI, P, US, WAG); Luachimo R. (Jan.) Marques 273 (COI, LISU, type of *S. henriquesiana* Gilg, not Bak.). Moçamedes: Muçequê dos Neves, Gossweiler 1531 (BM). Huila: between Chongoroi and Cubal da Ganda (Nov.) Mendes 627 (LISC), 676 (LISC); Chongoroi For. Res., Senje (fr. Feb.) Teixeira 603 (NLI, WAG).
 Cult.: Adiopodoumé, Ivory Coast, Leeuwenberg 4574 (WAG, seedlings of herb. J. de Wilde & Leeuwenberg 3441).

Notes. *S. floribunda* is closely allied to *S. dale*. Both species can be distinguished as follows:

- Leaves with prominent reticulate venation on both sides or only beneath, usually larger than in the next species; mature flower buds and pistils 4–4.5 mm long. Cameroun, Gabon, Congo, Angola ***S. dale***
- Leaves with venation which is not or obscurely prominent beneath, not above; mature flower buds and pistils (4.5)5–6 mm long ***S. floribunda***



MAP 18. *S. floribunda*.

26. *S. gnetifolia* Gilg ex Onochie et Hepper, Kew Bull. 16: 385. 1962; (ex Klein & Herndlhofer, Oesterr. Bot. Zeitschr. 76: 95. 1927, nomen); Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 44. 1963.

Fig. 17, p. 119

Type: Cameroun: Bipindi, Zenker 2961 (K, holotype; isotypes: BM, BR, COI, E, G, GOET, GRO, HBG, L, LY, M, MO, P, PR, S, W, WAG, WU, Z).

Tree (?) or liana (?). *Branches* not lenticellate, medium to dark brown, sometimes umbellately branched; branchlets glabrous, dark brown and slightly sulcate when dry. Tendrils not seen. *Leaves*: petiole glabrous, 5–10 mm long; blade dull on both sides when dry, slightly paler beneath, coriaceous, elliptic or narrowly elliptic, $(1.5)2-3 \times$ as long as wide, $6-13 \times 2-6.5$ cm, acuminate at the apex, cuneate at the base and slightly decurrent into the petiole, glabrous on both sides; one pair of secondary veins from the base curved along the margin and sometimes a faint submarginal pair; tertiary venation obscure. *Inflorescence* axillary or occasionally terminal, small, few-flowered, much shorter than the leaves, congested. Peduncle conspicuous, 5–7 mm long, with 2 stripes of minute pubescence, with a pair of sepal-like bracts or bracteoles. Branches hairy as the peduncle or practically glabrous as the pedicels. Bracts smaller than the sepals (upper without colleters). *Flowers* 5-merous. *Sepals* connate at the very base, subequal, ovate or broadly ovate, about $1.2-1.6 \times$ as long as wide, $1.5-2 \times 1.2-1.6$ mm, rounded at the apex, glabrous on both sides, ciliate, without colleters. *Corolla* in the mature bud $2.2-2.6 \times$ as long as the calyx, 3.5–4.5 mm long, and rounded at the apex, white (?), glabrous outside, inside densely pilose except for the glabrous base of the tube and apices of the lobes; tube very short, half as long as the calyx, 0.7–1 mm long; lobes thick, oblong, $3-3.5 \times$ as long as wide, $2.8-3.5 \times 0.9-1$ mm, acute, slightly (?) spreading. *Stamens* exerted; filaments about $1.5 \times$ as long as the anthers, glabrous, inserted at the mouth of the corolla tube; anthers oblong, 0.8×0.5 mm, subcordate at the base, glabrous; cells parallel. *Pistil* glabrous, 3 mm long; ovary ovoid, 1.5×1.2 mm, 2-celled, gradually narrowed into the style; style 1.5 mm long; stigma capitate. In each cell about 9 ovules. *Fruit* unknown, supposed to be small and 1-seeded.

Distribution: only once collected in Nigeria and once in Cameroun.

Ecology: Rain forests; at low elevation.

Nigeria: Oban, Talbot 574 (BM, paratype).

Cameroun: Type, see above.

27. *S. gossweileri* Exell, Journ. Bot. 67. Suppl. 2: 102. 1929; Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 35, f. 13. 1952. Fig. 8, p. 71; Map 5, p. 73

Type: Angola: Zaire, Sumba Peco, near Zaire R., Gossweiler 9180 (BM, holotype; isotypes: BR, K, MO, US).

Heterotypic synonym: *S. caespitosa* Good, Journ. Bot. 67. Suppl. 2: 104. 1929. Type: Angola: Huila, Fte. Amelia, Vila da Ponte, Gossweiler 2033 (BM, holotype; isotype: COI).

Small fire resistant savanna shrub, 10–50 cm high, or climbing shrub or liana, 2–5 m high climbing and about 10–20 m long or more. Trunk in shrub very thin, about 0.5 cm in diam., in liana up to 12 cm in diam. Bark dark brown, shallowly fissured, with large tuberculate lenticels; wood pale yellow. *Branches* not lenticellate, dark brown and sulcate or not when dry; branchlets green, usually quadrangular, glabrous, greenish-brown to dark brown and not or hardly sulcate when dry. Tendrils in 1–3 pairs above each other. *Leaves*: petiole glabrous, 2–5 mm long; blade mat or slightly shining and dark green above, dull or slightly shining and paler and often glaucous beneath, drying dark brown to pale greenish-brown, in the sun coriaceous, in the shade subcoriaceous, elliptic, narrowly elliptic, obovate, or on the main axis (climbers) suborbicular, (1)1.5–5.5 × as long as wide, 2–7(11) × 1–4(5) cm, acute, apiculate, or shortly acuminate at the apex, cuneate or less often rounded at the base, glabrous on both sides; one pair of secondary veins from or from above the base curved along the margin and often a faint submarginal pair; costa impressed above; tertiary venation reticulate, often prominent on both sides. *Inflorescence* axillary, solitary, more or less congested, usually few-flowered, much shorter than the leaves, 1 × 1–1.5 × 1.5 cm, 1–2 × branched. Peduncle, branches, and pedicels usually short, glabrous. Bracts shovel-shaped or more or less sepal-like, rather large, about 2–3 × as long as the sepals. *Flowers* 4(–5)-merous. *Sepals* connate at the base, equal or subequal, suborbicular, 1.2 × as long as wide, 1.2–1.4 × 1–1.2 mm, obtuse or acutely obtuse at the apex, glabrous on both sides, often very minutely ciliate, without colleters. *Corolla* in the mature bud (3.5)4.5–5.5 × as long as the calyx, (5.2)5.7–6.7 mm long, slightly contracted somewhat under the throat, and tapering at the apex, white with often pale green tips at the lobes, outside glabrous or sometimes minutely papillose-pubescent, inside densely pilose to glabrous on the lobes and sometimes also in the tube; tube cylindrical or nearly so, (2)3–3.5 × as long as the calyx, (1.4)1.7–2 × as long as the lobes, (3)3.5–4.5 mm long, at the throat 1–1.4(2) mm wide; lobes oblong, 2.2–2.5 × 1–1.2 mm, acute, recurved. *Stamens* slightly exerted; filaments glabrous, usually short, 0.2–1 × as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, 0.7–1 × 0.3–0.7 mm, glabrous, cordate at the base; cells parallel. *Pistil* glabrous, (3.5)5–6 mm long; ovary ovoid, 1–1.5(2) × 0.7–1(1.2) mm, 2-celled; style slender, (1.5)4–5 mm long; stigma small, capitate or obscurely bilobed. In each cell 5–9 ovules. *Fruit* orange-yellow or yellowish, immature glaucous, small, soft, obovoid or ellipsoid, 1.5 × 1–2 × 1.5 cm, apiculate at the apex, often slightly obliquely pedicellate, 1-seeded, with smooth skin. Wall thin. *Seed* flattened, obliquely ellipsoid, 13 × 8 × 4–16 × 11 × 6 mm, at one side with a deep pit, at the other with a bulge surrounded by a shallow groove, seemingly papillose; false papillae simulated by curved hairs.

Distribution: Central Africa.

Ecology: Gallery forests, groves on granitic rocks, or woodlands; alt. 0–700 m.

Cameroun: Nkolbisson, 7 km W. of Yaoundé, Breteler 2992 (WAG, YA); *ibid.*, Leeuwenberg 5446 (WAG); 16 km S. of Djouo, 20 km E. of Somalomo, Dja R. (fl., fr. Feb.) Letouzey 4388 (P, WAG, YA), 4388 bis (P, WAG, YA).

Congo (Brazzaville): near Komono, Bouquet & Sitha 2391 (WAG).

Congo (Kinshasa): Léopoldville: Matadi (Mar.) Dacremont 194 (BR), 416 bis (BR, K, MO, P); *ibid.* (Mar.) Duvigneaud 412 (P); *ibid.*, Gombe, Callens 964 (BR).

Angola: Zaire: Sumba, Peco, near Congo R. (fl. Mar.-Apr., fr. Nov.) Gossweiler 8519 (BM), 8659 (BM, K, US, paratype), 8701 (BM, paratype), 9180 (BM, BR, K, MO, US, type); Muanda Stream, near Congo R., Gossweiler 8621 (BM, paratype). Huila: Dongo (fr. Aug.) Gossweiler 1814 (K, LISJC); Vila da Ponte (Sept.) Gossweiler 2033 (BM, COI, type of *S. caespitosa*), 4186 (BM, COI, LISJC, paratype of *S. caespitosa*).

Zambia: Kamwedzi, Mufumbwe, Dongwe, Kasempa District (fr. June) Holmes 1099 (FHO, K); Sikongo For. Res., Kalabo District, White 2080 (BM, BR, FHO, K, PRE); 16 km N. of Senanga (fr. July) Angus 3031 (FHO, K, SRGH), 3031 a (FHO); Kataba (fl. Oct., fr. July) Fanshawe 5792 (BR, FHO, SRGH), 5836 (BR, FHO, K, LISC); Samau, near Livingstone (?), J.D. Martin 738 (FHO).

Cult.: Kitwe, Zambia (seedling) Fanshawe 7627 (K).

Notes. *S. caespitosa* (the specimens cited above from Huila (Angola) and Zambia) is a shrub. Its stems are consumed by the annual bush fire. The base of the plant is almost completely subterranean and look rhizomatous, as is often seen in shrubs subject to burning. Shrubs having this habit are known in *S. cocculoides*, *S. pungens*, and *S. spinosa*. The latter three species are normally shrubs or trees occurring in woodlands. *S. gossweileri* is normally a tendrilled climbing shrub or liana growing in low gallery forests, groves on granitic rocks, or thickets on river banks in woodlands.

The flowers of the types of *S. gossweileri* and *S. caespitosa*, and of the other specimens examined, resemble each other strikingly in all details. The same is true for the branchlets, fruits, and seeds. The leaves on the branches of the climbers vary more or less the same way as those in the low shrubs.

It seems certain that the low shrubs become climbers, if not disturbed. Therefore, the present author proposes to reduce *S. caespitosa* to the synonymy of *S. gossweileri*.

The tendrils of *S. gossweileri* may be arranged in variously grouped pairs, which are often combined with inflorescences, e.g. in herb. Gossweiler 8701.

S. gossweileri is closely allied to *S. barteri* (q.v.). They resemble each other so much that the former might be a form of the latter. More material should be collected for evidence. The ecology of both species is very different and militates against reduction of *S. gossweileri* to a synonym of *S. barteri*. See also the notes under *S. penninervis*.

28. *S. henningsii* Gilg in Engler, Bot. Jahrb. 17: 569. 1893; T. R. Sim, Forests and Forest Flora Col. Cape Good Hope 273. 1907 (with *S. utilis* Sim as syn.);

Prain & Cummins in Fl. Cap. 4(1): 1052. 1909; Marloth, Fl. S. Afr. 3(1): 48. 1932; Verdoorn, Bothalia 3: 587–588, f. 1. 1939; E. A. Bruce, Kew Bull. 1955: 127. 1955; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 32. 1960; Verdoorn in Fl. S. Afr. 26: 140, f. 18. 3. 1963. **Fig. 18, p. 129; Map 19, p. 133**

Type: S. Africa: Cape Province, Pondoland, near Umnonono, Bachmann 1745 (E, lectotype).

Heterotypic synonyms: *S. holstii* Gilg in Engler, Abh. Preuss. Akad. Wiss. 36. 1894 and in Engler, Pflanzenw. Ost-Afr. C: 310. 1895; Baker in Fl. Trop. Afr. 4(1): 529. 1903; Duvigneaud, Bull. Séanc. Inst. Roy. Col. Belg. 20: 585. 1949. Types: Tanzania: E. Usambara Mts., Mashewa, Holst 8833a (holotype not seen, destroyed in B, no isotypes seen) & Pare District, S. Pare Mts. between Chome and Vudea, Greenway 6562 (K, neotype, designated by E. A. Bruce in 1955, l.c.; iso-neotype: EA).

S. sennensis Bak., Kew Bull. 1895: 97. 1895 and in Fl. Trop. Afr. 4(1): 529. 1903. Type: Moçambique: Valley of Zambesi R., opposite Senna, Kirk s.n. (K, holotype).

S. pauciflora Gilg in Engler, Bot. Jahrb. 28: 121. 1899; Prain & Cummins, l.c. p. 1053. Type: Moçambique: Lourenço Marques, Schlechter 11682 (holotype not seen, destroyed in B; lectotype: BM, other isotypes seen: G, K, Z).

S. procera Gilg et Busse in Engler, Bot. Jahrb. 36: 97, f. 1. 1905. Type: Tanzania: Lindi District, Island in Lake Lutamba, Busse 2506 (G, lectotype; isotypes: BM, BR, EA, G, HBG, WAG). Homotypic synonym: *S. holstii* var. *procera* (Gilg et Busse) Duvign., Bull. Inst. Roy. Col. Belg. 20: 587. 1949.

S. albersii Gilg et Busse, l.c. p. 99. Type: Tanzania: W. Usambara Mts., Kwai, Albers 380 (holotype not seen, destroyed in B; lectotype: EA, photograph in K, neg. 2346).

S. elliottii Gilg et Busse, l.c. Type: Kenya: near Nairobi, Guy S. Baker in coll. C. F. Elliot 176 (holotype not seen, destroyed in B; lectotype: K, other isotype seen: EA).

S. myrcioides S. Moore, Journ. Bot. 45: 52. 1907. Type: Uganda: Bonyoro District, Butiaba Plain, Bagshawe 841 (BM, holotype; isotypes: ENT, US).

S. reticulata Burtt-Davy et Honoré, Kew Bull. 1932: 270. 1932. Type: Kenya: sin. loc., Conservator of Forests 40 (K, holotype; isotypes: FHO, WAG). Homotypic synonym: *S. holstii* var. *reticulata* (Burtt-Davy et Honoré) Duvign., l.c. p. 587.

S. barbata Chiov., Fl. Somalia 2: 305, f. 178. 1932 (as *Strichmos*), not A. W. Hill (1909). Type: Somalia: Oltregiuba, Uama Ido, Senni 262 (FI, holotype).

S. ligustroides Gossw. et Mendonça, Cart. Fitogeogr. Angola 120. 1939, without latin descr.; Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 31. 1952. Type: Angola: Luanda, Musseque de Viana, Gossweiler 10327 (COI, lectotype; isotypes: A, BM, COI, K, NLI, WAG).

S. holstii var. *reticulata* forma *condensata* Duvign., Bull. Inst. Roy. Col. Belg. 20: 588. 1949. Type: Congo: Léopoldville, Lufu R. Valley, Vivi, opposite Matadi, Duvigneaud 418 (BR, lectotype).

S. holstii var. *reticulata* forma *laxiuscula* Duvign., l.c. Type: Congo: Katanga,

Lukafu, near Lubumbashi, Duvigneaud 1248 (BR, lectotype; isotype: WAG).

Shrub or small tree, 2–10(20) m high, with spreading rounded crown. Trunk 40–50 cm in diam. (more or less); bark pale grey or pale brown, rough. *Branches* pale grey or pale brown, sometimes shallowly fissured, not lenticellate; branchlets pale to medium brown or yellowish, conspicuously sulcate and often partially quadrangular when dry, glabrous. *Leaves*: petiole short, glabrous, 1–3 mm long; blade pale to dark green and shining above, less shining and paler beneath, coriaceous, very variable in shape and size even in a single branchlet, elliptic, oblong, narrowly elliptic, or ovate, (1.2)1.5–3(3.5) × as long as wide, (1.5)2–6(10) × (0.6)1–3(6) cm, rounded to acuminate at the apex, cuneate, rounded, or sometimes on main axis subcordate (and then comparatively wider); glabrous on both sides; one pair of secondary veins from or from above the base curved along the margin and one rarely two faint submarginal pairs; tertiary venation reticulate, prominent on both sides, especially in thick leaves. *Inflorescence* axillary and sometimes also terminal, much shorter than the leaves, 1 × 1–2 × 2 cm, congested, few- or many-flowered. Peduncle often very short, sparsely pubescent to glabrous like the branches and pedicels. Bracts small, upper sepal-like, lower larger, sparsely pubescent to glabrous beneath, often with colleters in the axils. *Flowers* fragrant, 5-merous, sessile or subsessile. *Sepals* pale green, connate at the base, broadly orbicular or nearly so, 1–1.4 × 1–1.4 mm, rounded or obtuse at the apex, minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 2.3–3 × as long as the calyx, 2.8–4 mm long, greenish-yellow, creamy, or white, subrotate and 4–5 mm in diam. when open, glabrous outside, inside pilose or villose at the base of the lobes or sometimes entirely glabrous; tube short, 0.7–1.2 × as long as the calyx, 0.8–1.5 mm long, wide; lobes thick, triangular to ovate, 1.7–2.5 × as long as the tube, 1.7–2 × as long as wide, 2–2.5 × 1–1.6 mm, acute, spreading. *Stamens* just exerted; filaments glabrous, 0.4–1 × as long as the anthers, inserted at the mouth of the corolla tube; anthers elliptic, 0.8–1 × 0.5–0.8 mm, deeply cordate at the base, glabrous; cells parallel. *Pistil* glabrous, 1.6–2.2(3) mm long; ovary globose, depressed-globose, or sometimes ovoid, 0.8–1.2(1.5) × 0.9–1.4 mm, rounded or sometimes acuminate at the apex, 2-celled; style 0.7–1 mm long; stigma capitate. In each cell 8–12 ovules. *Fruit* yellow, orange, or red, ellipsoid, 1 × 0.8–2 × 1.5 cm, one-seeded. Wall thin. *Seed* pale brown, ellipsoid, not flattened, 0.8 × 0.5 × 0.5–1.2 × 0.7 × 0.7 cm, glabrous, smooth, with a deep closed groove at one side (like coffee-bean), very minutely foveolate.

Distribution: Congo (Kinshasa), Angola, East and South Africa, and Madagascar.

Ecology: Woodlands or sometimes light forests; alt. 0–2000 m.

Sudan: Lorienatom, Dale S 319 (EA, K).

Ethiopia: Araro, Borana (Apr.) Cufodontis 370 (FI); Moyale, Borana (May) Cufodontis 736 (FI).

Somalia: Gan Libah, Golis Range, Glover & Gilliland 1203 (BM, EA, FHO, K), 1214



FIG. 18. 1-7. *S. decussata*: 1. branch, $\frac{1}{2} \times$; 2. flower, $2 \times$; 3. portion of corolla with stamen, $2 \times$; 4. corolla hair, $15 \times$; 5. fruit, $\frac{1}{2} \times$; 6. seed, $1 \times$; 7. leaves, $\frac{1}{2} \times$ (1-4. Rudatis 1226; 5. Bally 1939; 6. Hornby 2485; 7. Bally 1939, Ecklon & Zeyher 3368, Pole Evans c.s. 1635, Rudatis 1226); 8-14. *S. henningsii*: 8-10. branches and leaves, $\frac{1}{2} \times$; 11. flower, $3 \times$; 12. portion of corolla with stamen and filament, $3 \times$; 13. fruit, $\frac{1}{2} \times$; 14. seed, $2 \times$ (8. Busse 2511a; 9, 11-13. Flanagan 1102; 10. Greenway 6562; 14. Gossweiler 12608).

(BM, EA, FHO, K, PRE); Widaba, Edith Cole April 1895 (K); Oltregiuba, Uama Ido (July) Senni 262 (FI, type of *S. barbata* Chiov.).

Congo: Léopoldville: Matadi, Callens 1050 (BR); *ibid.* (Oct.) Dacremont 334 (BR, K), 360 (BR, P); Lufu R. Valley, Vivi, opposite Matadi (Mar.) Duvigneaud 418 (BR, lectotype of *S. holstii* var. *reticulata* forma *condensata*). Orientale: Nioka (June) Kaessner 931 (BM); Albert Lake, Aubréville 4 Nov. 1948 (P); *ibid.*, Van der Ben 1167 (BR, WAG). Katanga: Lofoi R. Valley, N. of Lukafu (July) Schmitz 1903 (BR); between Tenge and Kolwezi, Duvigneaud 1147 (BR, paratype of *S. holstii* var. *reticulata* forma *laxiuscula*); Lukafu, near Lubumbashi (July) Duvigneaud 1248 (BR, WAG, lectotype of *S. holstii* var. *reticulata* forma *laxiuscula*); Lubumbashi, Schmitz 2304 (PRE); 40 km SE. of Lubumbashi, Muhulu, Schmitz 6285 (BR); Musoshi, 50 km SE. of Lubumbashi, Schmitz 3552 (BR).

Angola: Luanda: Lifuni R., Ambriz, Gossweiler 4900 (BM, COI, K, NLI, paratype of *S. ligustroides*); between Viana and Calumbo (Nov.) Santos 319 (BM); Bengo Experimental Farm, Teixeira 3677 (NLI, WAG); Mabubas, Dandé R. (fr. Mar.) Exell & Mendonça 59 (BM, COI, LISJC), 66 (COI); Caixito, Gossweiler 12608 (BM, LISC, LISJC); Zonzo, Dandé R. Region, de Portugal Araújo 781 (NLI, WAG); 25 km from Luanda, Exell & Mendonça 19 (BM, COI, LISJC); Musseque Viana (fl. May, Nov., fr. June) Gossweiler 9228 (BM, COI, K, LISJC, US), 10078 (BM, BR, COI, K, LISJC, MO, US), 10327 (A, BM, COI, K, NLI, WAG, lectotype of *S. ligustroides*), 10327 bis (B, BM, US), 10327 E (BM, COI), 10327 h (COI, K, LISJC); *ibid.*, Teixeira 3804 (NLI, WAG); Catete (July) Gossweiler 9223 (BM, COI, K, LISJC, US), 9228 a (BM); km 48 of Catete Railroad (Nov.) Gossweiler 10327 C (BM, COI); km 25 of same railroad (Nov.) Gossweiler 10327 g (COI, K, LISJC, US, WAG); Quiçama, Caça Reserve, J. C. Henriques 33 (NLI). Cuanza Norte: Catete, near Bengo and Cuanza Rs. (fr. May) Gossweiler 9228 b (K, US), 9245 (BM, K). Cuanza Sul: Seles, near Cambongo and Cuvo Rs., Gossweiler 9352 (BM, COI, K, LISJC, US). Benguela: Dende, Ganda, V. de Almeida 687 (NLI). Moçamedes: Bare da Chela, Humba (fr. May) Carisso & Sousa 206 (BM, COI, LISJC); Vila Arriaga, Dekindt s.n. (LISC); Lungo, near Caluhundu R., Teixeira 673 (NLI, WAG), 1119 (NLI, WAG); Chela Mts., Gossweiler 4895 b (COI); Hibala, Cacanda, Mendes 4026 (LISC). Huila: Chongoroi (Nov.) Mendes 641 (LISC), 666 (LISC); *ibid.* (fr. Feb.) Teixeira 604 (NLI, WAG), 607 (NLI, WAG); Quilemba, Chela, Gossweiler 11027 (COI); Chela Mts. (fr.) Exell & Mendonça 17 May 1937 (BM, COI, LISJC).

Uganda: Karamoja District, Kalale R., J. Wilson 1673 (K, WAG); Karamoja (Mar.) J. Wilson 799 (EA, K); Cheburua, Karamoja District, Philip 700 (K); Moroto Mt., Karamoja (Mar.) J. Wilson 699 (EA, K), 1536 (BR, K, WAG); base of Moroto Mt. (May) Philip 570 (ENT, K); Napau Pass, Karamoja District, Dawkins 796 (EA, ENT, FHO); Butiaba Plain, Bonyoro District (Dec.) Bagshawe 841 (BM, ENT, US, type of *S. myrcioides*); near Butiaba (Oct.) E. M. Lind 3195 (EA); Lake Albert Flats, Bonyoro District, H. A. Lindeman 526 (BM, EA, K); *ibid.*, behind Butiaba, Myers 13651 (K); Butiaba Escarpment (May) Eggeling 1228 in F.D. 1331 (EA, K); Lwampanga, N. Mengo (fr. Sept.) Langdale-Brown 1247 (K); near Nakasongola, Mengo (July) Eggeling 3976 (ENT, K); Kakoge, Mengo, Langedale-Brown 1334 (K); Siavona Hill, S. E. Busoga, Dale U 137 (EA, ENT); *ibid.* (Mar.) G. H. S. Wood 667 (EA, ENT, K).

Kenya: Karasuk County, Karamoja District (fr. Apr.) Osmaston 4437 (EA, ENT, K); Mt. Kulal (Feb.) T. Adamson 4 (EA, K); Marsabit (June) T. Adamson 7 (EA, K); *ibid.* (fl., fr. Aug.) T. Adamson & Verdcourt 1827 (EA, K, UPS); *ibid.*, Dale K 788 (ENT, K); *ibid.* (fr. June) Oteke 33 (K); *ibid.*, F. S. Woodhouse 6 (EA); Moyale (July) J. B. Gillet 12914 (B, BR, EA, FI, K, LISC, P, PRE, S, W, WAG); 15 km N. of Kapenguria (Aug.) Pole Evans & Erens 1635 (E, K, PRE); Lorogi Plateau, above Maralal (fl., fr. June) Kerfoot 1078 (EA, K); *ibid.* (?), Rammell 824 (BR, EA, FHO, US); Mandasion, Matthews Range (Dec.) Kerfoot 2608 (EA); Wamba, Samburu District (Nov.) Newbould 3150 (EA, FI, K); Osenge Kadina, Nyanza Province, Davidson 252 (EA); near Boro, Central Nyanza, Trapnell 2293 (EA); Meru (fr. Feb.) Honoré 2762 (EA, FI, K); Telek R., SWS. of Narok, Bally 5334 (C, EA, K); Mara Bridge, Narok District, Glover, Gwynne & Samuel 558 (EA); Sirocho Range, E. of Lake Hannington, Trapnell & Birch 61/41 (EA); Kiambu, Bally 10583 (G, K); Ngong, van Someren AH 9519 (EA, FHO, K); Nairobi (Mar.) F. Thomas 106 (BM, E); *ibid.*, van Someren 423,

partly (EA); *ibid.*, Winkler 4173 (WRSL); *ibid.*, Guy S. Baker in coll. C. F. Elliot 176 (EA, K, type of *S. elliotii*); *ibid.*, Mearns 264 (BR), 976 (US), 982 (BR), 1049 (BM, BR); *ibid.*, Thika road (Oct.) Verdcourt 369 (EA, K, MO, NY, PRE); *ibid.*, Mbagathi road (May) van Someren C.M. 6260 (BR, EA, K); 8 km S. of Nairobi (Apr.) C. G. Rogers 631 (BR, EA, K, S); Machakos (Jan.) van Someren 1643 in C.M. 4785 (EA, K); Kalowani, Machakos District, Clayton 46 (EA, K); Yatta (Apr.) D. B. Thomas 674 (EA); Kitui, Yatta, Trapnell 2404 (EA, K); near Sultan Hamud, Bally 2591 (EA, K); Emali Hill, Masai (Mar.) van Someren 116 (K), 140 (FI, K, WAG), 208 (K); near Makindu, Trapnell 2349 (EA); Mutomo Mt., Rauh 820 (EA); Kurawa, 50 km S. of Garsen (Oct.) Polhill & Paulo 635 (BR, EA, K, P, S); Ngulia, Rammell 10 (EA); Mbenza Hill, Ngulia Hills, Rammell 1243 (FHO, PRE); 8 km E. of Mackinnon Road, Kwale District (Sept.) Drummond & Hemsley 4226 (B, BR, EA, FI, K, S); N. of Dakatcha, Kilifi District, Dale K 1051 (BR, EA, K, PRE); Mombasa, Boivin annis 1847-1852 (P); *sin. loc.*, Conservator of Forests 40 (FHO, K, WAG, type of *S. reticulata*).

Tanzania: Bukoba (Sept.) J. Ford 710 (K); Bologonjwa R., Musoma District (Aug.) Greenway 10753 (EA, K); Mara R. Guard Post, Musoma District (Oct.) Greenway 10222 (BR, EA, K, PRE); Nyarwigo, Mwanza District (Feb.) Tanner 1194 (BR, G, K, WAG); Mwanza (fr. July) Tanner 1588 (K); Mantini Hills, Shinyanga, Burt 3736 (EA, FHO, K); Komali Hill, near Shanwa, Maswa District (June) Burt 5201 (BM, K); Makuyuni District, Koritschoner 1245 (EA, K); between Lembeni and Kaili Mt., N. Pare, Peter 41606 (B); between Chome and Vudea, S. Pare Mts. (July) Greenway 6561 (EA, K), 6562 (EA, K, neotype of *S. holstii*); Kwai, W. Usambara Mts., Albers 380 (EA, type of *S. albersii*); Mazamba, W. Usambara Mts., Nicholson 13 (EA); Kwebao, W. Usambara Mts. (Aug.) G. R. Williams 498 (EA, FHO, K, PRE); Chamuhizi Hill, Uvinza, Burt 6563 (BM, BR, K); Handeni, Swynnerton 1111 (BM, K); Kingolwira, Morogoro, Burt 5165 (BM, BR, K); Majani, Braun 1241 (EA); Kimwera, Mbeya, Tanner 4 (EA); Kwa Sikumbi, between Mwera and Noto Plateau, Busse 2903 (EA, photograph in K, neg. 2343, paratype of *S. procera*); Island in Lutamba Lake, Busse 2506 (BM, BR, EA, G, HBG, WAG, lectotype of *S. procera*), 2511 (EA, paratype of *S. procera*), 2511a (BR, EA, HBG, photograph of EA sheet in K, neg. 2345, paratype of *S. procera*), 2516 (BR, EA, HBG, LY, photograph of EA sheet in K, neg. 2344, paratype of *S. procera*); Lutamba Lake, 40 km W. of Lindi (Oct.) Schlieben 5456 (B, BM, BR, F, G, M, P, S); Sudi, S. of Lindi, Gillman 1137 (EA, FHO, K); *sin. loc.*, Kisaka 8025 (EA). Zanzibar: Mandera, Saclaux 735 (P).

Zambia: Molwe, Abercorn District, Glover in coll. Bredo 6423 (BR, EA, K, LISC, P, WAG); Mofwe R., Fanshawe 4759 (FHO); Chingola (Dec.) Fanshawe 2405 (BR, EA, K), 2669 (BR, K, WAG); Kitiwe (fr. Mar.) Fanshawe 2123 (K); Broken Hill District, Fanshawe 8013 (K, LISC); Museshia (Oct.) Fanshawe 4881 (BR, FHO, K, SRGH).

Malawi: Tangazi R. Valley, Chiromo, Topham 692 (FHO).

Rhodesia: Mangazi R. Valley, Melsetter District (fr. Mar.) Goldsmith 82/62 (K, LISC, PRE, SRGH); Mtilikwe R., Bangara Falls, Fort Victoria District, H. Wild 4374 (K, LISC, MO, PRE, SRGH); Sabi R., Ndanga District, H. Hall 30 (NBG); Upungure, Chipinga District, Farrell 199 (PRE, SRGH); Upper Msaswi R., Chipinga District, Mowbray 22 (K, PRE, SRGH); near Chibilia Falls, Sabi R., Ndanga District, Chase 2350 (BM, BR, COI, K, LISC, SRGH); Sabi-Lundi Rs. Junction, Ndanga District, Chase 2259 (BM, COI, LISC, NY, PRE, SRGH); *ibid.*, H. Wild 3363 (BR, K, LISJC, PRE, S, UC); about 27 km N. of Bubi-Limpopo Rs. Junction, Nuanetsi District, Guy SRGH 85902 (SRGH).

Moçambique: Cabo Delgado: Bilibiza, Pedro & Pedragão 5060 (EA). Moçambique: Meconta, Torre 1017 (COI, LISC). Zambezia: Namagoa, Quelimane District (Sept.) Faulkner 55 (COI, EA, K, PRE); Zambesi R. Valley, opposite Sena, Kirk 10 April 1860 (K, type of *S. sennensis*). Manica e Sofala: between Inhamitanga, and Lacerdonia, Torre 4090 (LISC); Inhamitanga (July) Simão 62 (LISC), 1336 (K, PRE); Vila Machado, Mucuzi R., Garcia 939 (LISC); Chiluvo Mts., Vila Machado, Mendonça 3930 (LISC); Buzi (Nov.) Torre 3813 (LISC). Gaza: near Chidenguele (Aug.) Pedro & Pedragão 1818 (PRE). Lourenço Marques: Costa do Sol (Oct.) Balsinhas 642 (K, LISC); Lourenço Marques (Dec.) Schlechter 11682 (BM, G, GRA, K, Z, type of *S. pauciflora*); *ibid.*, T. R. Sim (?) 6332a (PRE); Inhaca Island, Mauve & Verdoorn 39 (K, PRE), 46 (PRE); *ibid.* (Sept.) Mogg 27208 (J, K, SRGH),

27431 (K), 27450 (K), 27696 (K), 29018 (BM, K), 28294 (K); Maputo (Sept.) Mendonça 3070 (LISC); *ibid.*, Salamanga (Nov.) Mendonça 3541 (LISC).

Swaziland: Hlatikulu Forest, Boocock PRF 5318 (PRF); Murray's Farm, Ubombo Mts., O. B. Miller 8/49 (BM, FHO).

South Africa: Transvaal: Woodbush Forest (Oct.) Botha PRF 2908 (PRF); Koedoeks Bush, 30 km from Elandshoek Station (fr. May) J. C. Johnstone PRF 1478 (PRF); Kruger Nat. Park, Tialbye (fr. Feb.) van der Schijff 4210 (B, K, LISC, MO) near Malelane, Kruger Nat. Park (fr. Feb.) Codd 5267 (K, SRGH). Natal: Ingwavuma, Ngwaliweni Forest (Nov.) Gerstner 3994 (K); *ibid.*, Lebombo Mts. (Nov.) Dutton & Tinley 17 (NH); Amanzimnyama Forest, Ingwavuma District, Tinley 57 (PRE); Mkuze Game Res., Ubombo District (Oct.) Ward 3610 (NH); Mkuze Poort, Ubombo District, Ward 4069 (WAG); Hluhluwe (Oct.) Platt NH 20346 (NH); Hlabisa, Gerstner 3849 (B, EA, G, K, L, SRGH, UPS); Hluhluwe Game Res., Hlabisa District (fr. Dec.) Ward 3927 (M, NH); E. of Monzi, Hlabisa District, Ward 4170 (NH, WAG); False Bay, Hlabisa District, Gerstner 4776 (K); *ibid.* (fl. Nov., fr. Apr.) Ward 2528 (K), 3836 (K, NH); Umgaloti Quadeni Forest, Entonjaneni District, D. Edwards 2657 (K); Intunzini (fr. Aug.) Lawn 1057 (NH); near Durban, Tugela R., Gerrard & M'Ken 1917 (BM, K, TCD); Umlaas (Nov.) J. Medley Wood 5427 (K, NH); Hawaan Bush, Inanda District, Moll 3093 (K), 3140 (K); near Durban, Humbert 17325 (P); near Durban (fl. Oct., fr. Mar.) Marriot 23045 (BM, K), 23190 (BM, K); *ibid.* (fl. Sept.-Oct., Dec., fr. Dec.) J. Medley Wood 6672 (K, NH), 7978 (E, F), 9944 (BM, G, L, P), 11998 (BOL); Umkomaas, M'Ken 10 (K, TCD); *sin. loc.*, Saunders rec. 1866 (K, TCD). Cape Province: Umtavuna R., Pondoland, Burt-Davy 15361 (FHO); Umtumengwana Forest, Wakeni (Feb.) Forest Dept. 7255 (K, PRF); Mvumengwana Forest (= *prec.*), Fegen PRF 5601 (PRE, PRF, Z); Mtumengane Forest, Lusikisiki District, Fegen PRF (= F.D.) 6880 (PRF); Umnonono, Mlotane Forest, Fegen PRF 2775 (PRF); near Umnonono, Pondoland, Bachman 1745 (E, lectotype); Kentani District (May) Pegler 1341 (PRE); near Kentani (Oct.) Pegler 1277 (BOL, GRA, NBG, PRE, Z); Komgha (fl., fr. Nov.-Dec.) Flanagan 1102 (A, BM, BOL, FHO, GRA, K, M, NBG, US); Kologha, Stutterheim, East London Division (fr. Jan.) Hutchins 2884 (K, NBG); Willowvale (Dec.) Acocks 12275 (PRE); Peri Forest, near King Williamstown, Galpin 5908 (PRE); *ibid.* (fr. June) F.D. 1902 (PRF), 7623 (PRF), 7639 (PRF), 8339 (PRF); *ibid.*, Scott Elliot 979 (K, was neotype designated by E. A. Bruce); East London (Nov.) T. R. Sim 2172 (BOL, PRE).

Madagascar: Diégo-Suarez (Sept.) Serv. For. 10660 (P, WAG); Ankara Plateau, Sakaramy, Diégo-Suarez Province (fr. Nov.) Homolle 239 (P); Antenampandrana Forest, Akarana Plateau, Diégo-Suarez Province (fr. Feb.) Cours & Humbert 5572 (P); Analamera Hills, Diégo-Suarez Province (Jan.) Humbert 19152 (P, WAG); Sahafary Forest, Saharenena R. Basin (Feb.) Capuron S.F. 24498 (P, WAG); Analafondro Forest, Lower Rodo R. (fr. Feb.) Capuron S.F. 24527 (P); Ankara, Diégo-Suarez, Serv. For. 6213 (P, WAG); Analandrafiya, Mananara, Serv. For. 1313 (P); N. of Mangabe, Maintirano (May) Serv. For. 10257 (P, WAG); Antsalova, Hamelin Res. Nat. 10192 (P, WAG); Antsingy Hills, near Ambodiriana, E. of Antsalova (fr. Dec.) Léandri, Capuron & Razafindrakoto 2136 (P, WAG); Analavelona Forest, Fiherenana R. Basin (Dec.) Humbert 19772 (P); km 47 of Tuléar-Tana road, Chauvet 270 (P, WAG); Middle Mandrare R. Valley, near Anadabolava (Dec.) Humbert 12435 (P), 12496 (P), 12674 (P, WAG); Vohitrandriana Mt., S. of Ranopiso, SW. of Fort-Dauphin (fr. Feb.) Humbert & Capuron 29139 (P, WAG).

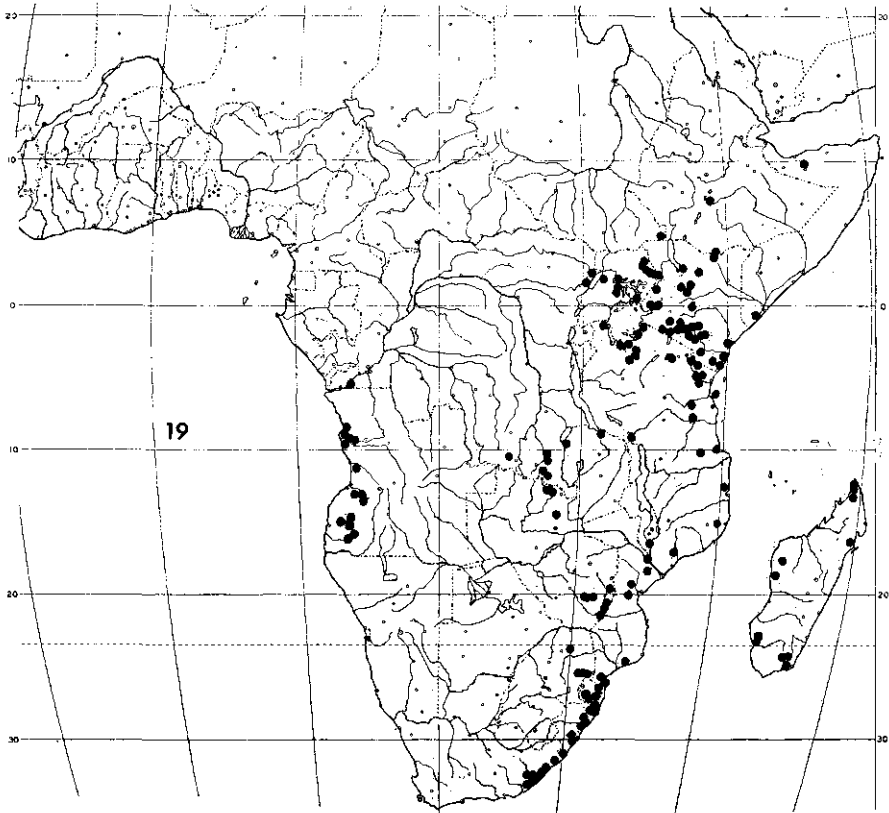
Cult.: Nairobi, Kenya (fr. Mar.) Greenway 8717 (EA, FHO, K, PRE); Chingola, Zambia, Fanshawe 3345 (K, seedlings).

Notes. The neotype designated by E. A. Bruce (1955) is rejected, because an iso-syntype was discovered in the Edinburgh herbarium.

S. henningsii is closely allied to *S. mitis* by the habit, leaves, inflorescences, and outside of flowers. They can be distinguished as follows:

Leaves reticulate; sepals glabrous on both sides, without colleters; anthers

glabrous; ovary usually globose; seed deeply grooved, not flattened. Woodland or sometimes light forest **S. henningsii**
 Leaves not reticulate; sepals often hairy outside, inside with colleters; anthers bearded; ovary ovoid; seed not grooved, often flattened. Rain forest or gallery forest **S. mitis**



MAP 19. *S. henningsii*.

29. *S. icaja* Baill., *Adansonia* 12: 368. 1879; Pellegrin, *Bull. Soc. Bot. Fr.* 58: 528, t. 48. 1911; Chevalier, *Rev. Bot. Appliq.* 27: 206–214, pl. 11. 1947; Duvigneaud, *Bull. Séanc. Inst. Roy, Col. Belg.* 19: 213. 1949 and *Bull. Soc. Roy. Bot. Belg.* 85: 30. 1952; Onochie & Leeuwenberg in *Fl. W. Trop. Afr.* 2nd ed. 2: 43. 1963.

Fig. 19, p. 135; Map 20, p. 137

Type: Gabon: Ile de Koniquet, Franquet anno 1853 (P, lectotype).

Heterotypic synonyms: *S. kipapa* Gilg, *Notizb. Bot. Gart. Berlin* 2: 256. 1899 and in Engler, *Bot. Jahrb.* 28: 118. 1899; Baker in *Fl. Trop. Afr.* 4(1): 521. 1903. Type: Congo: Katanga, near Mukenge, Pogge 539 (holotype not seen, de-

stroyed in B; no isotype seen, number in second reference of this specimen is 639).

S. dewevrei Gilg in Engler, Bot. Jahrb. 28: 119. 1899; De Wildeman, Ann. Mus. Congo Sér. 5. 1: 175. 1904. Type: Congo: Léopoldville: Stanley Pool District, Sabuka Region, Dewevre 845 (holotype not seen, destroyed in B; lectotype: BR).

? *S. brachyura* Gilg in Engler, Bot. Jahrb. 28: 119. 1899; Baker, l.c. Type: Cameroun: near Batanga, Dinklage 1133 (holotype not seen, destroyed in B; no isotype seen).

S. pusilliflora S. Moore in Cat. Talbot's Nig. Pl. 70. 1913; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 24. 1931. Type: Nigeria: Oban, Talbot 1256 (BM, holotype; isotypes: K, WAG, Z).

S. mildbraedii Gilg in Mildbraed, Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped. 1907-'08. 2: 531, t. 73 A-D. 1914. Type: Congo: Orientale, N. of Beni, Kwa Muera, Mildbraed 2181 (holotype not seen, destroyed in B; lectotype: PRE).

S. dundusanensis De Wild., Bull. Jard. Bot. Brux. 5: 48. 1915. Type: Congo: Equateur, Bumba Territory, Dundusana, Mortehan 1112 (BR, holotype; photograph in K, neg. 2515; isotype: BR).

S. venulosa Hutch. et M. B. Moss in Fl. W. Trop. Afr. 2: 24. 1931 and Kew Bull. 1937: 334. 1937, partly (as for the type). Type: Sierra Leone: Falaba, Aylmer 58 (K, holotype).

Liana, 20–40 m high climbing in trees, 20–100 m long. Trunk 4–15 cm in diam. Bark pale grey to dark brown, with large lenticels, rather thin; wood creamy. *Branches* often umbellately branched, lenticellate or not, dark brown and not sulcate when dry; branchlets glabrous, dark green, not lenticellate, terete, medium or dark brown and sulcate or not when dry. Tendrils solitary, usually on the branches where they are umbellately branched in 4 branches with right angles. *Leaves*: petiole glabrous, 4–12 mm long; blade more or less distinctly shining and dark green above, as shining or less and not or slightly paler beneath, usually with pale green main veins on both sides, coriaceous, or pergamentaceous in the sun, papyraceous or thinly coriaceous in the shade, also when living, elliptic, narrowly elliptic, narrowly ovate, or sometimes ovate, (1.2)1.5–3 × as long as wide, 5–15 × 2–7 cm, in the shade and in young plants (growing in the shade on the forest floor) up to 21 × 10 cm, acuminate, apiculate, or in the shade caudate at the apex, cuneate or rounded at the base, glabrous on both sides; one pair of secondary veins from or from above the base curved along the margin, reaching the apex and often a faint submarginal pair; tertiary venation reticulate, prominent on both sides in dry leaves. *Inflorescences* axillary, several together, lax, few- to many-flowered, 0.2–0.7 × as long as the leaves, 3–7 × 2–6 cm, 2–3 × branched. Peduncle and branches slender, glabrous as the pedicels. Bracts small, glabrous on both sides, approximately sepal-like, lower up to about 3 × as long as the sepals and often with colleters at the base above, upper without colleters. *Flowers* 4-merous. *Sepals* pale green, connate at the base for about two-fifths of their length, broadly ovate to sub-

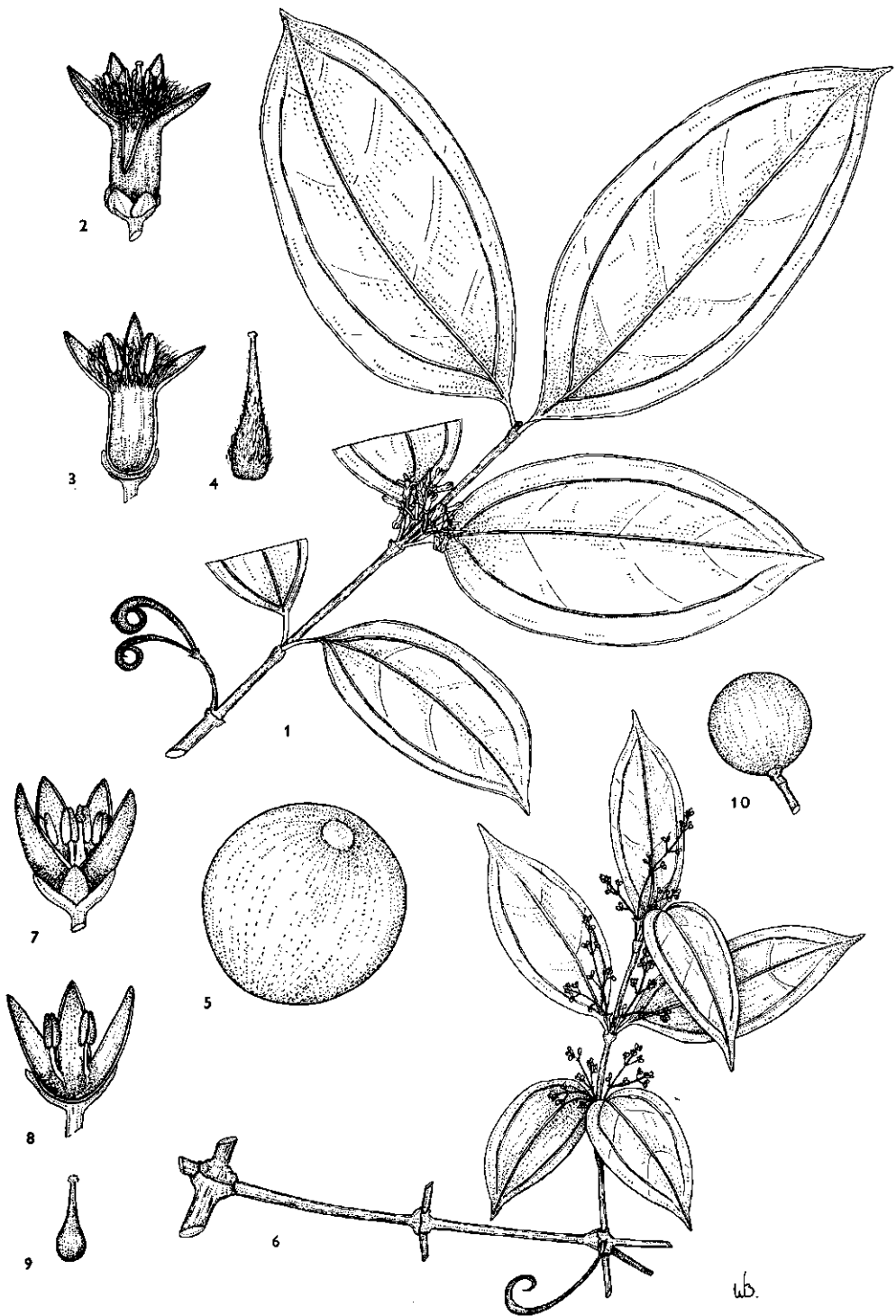


FIG. 19. 1-5. *S. densiflora*: 1. branch, $\frac{1}{2} \times$; 2. flower, $3 \times$; 3. opened flower, $3 \times$; 4. pistil, $3 \times$; 5. fruit, $\frac{1}{2} \times$ (1-4. Breteler 1434; 5. van Meer 403); 6-10. *S. icaja* (leaves mostly larger): 6. branch, $\frac{1}{2} \times$; 7. flower, $10 \times$; 8. opened flower, $10 \times$; 9. pistil, $10 \times$; 10. fruit, $\frac{1}{2} \times$ (6-9. J. de Wilde c.s. 3521; 10. Lecuwenberg 5349).

orbicular, as long as wide or nearly so, 0.4–1 × 0.4–1 mm, rounded, obtuse, or subtruncate at the apex, not or obscurely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 2.5–5 × as long as the calyx, 2.2–2.5 mm long, and rounded at the apex, greenish-yellow or yellowish-white, glabrous on both sides or inside pubescent at the base of the lobes; tube short, 0.6–1.4 × as long as the calyx, wide; lobes oblong to nearly ovate, 2.5 × as long as the tube, 1.5–1.8 × as long as wide, 1.6–1.8 × 1–1.2 mm, acute, spreading. *Stamens* coloured as the corolla, exerted; filaments short, 0.5–1 × as long as the anthers, inserted at the mouth of the corolla tube; anthers sub-orbicular, 0.4–0.6 × 0.3–0.5 mm, cordate at the base, glabrous; cells parallel. *Pistil* glabrous, 1–1.4 mm long; ovary globose, 0.5–0.6 mm long, 2-celled, abruptly narrowed into the style; style short, 0.4–0.8 mm long; stigma small, not or slightly thicker than the style, capitate. In each cell 3–9 ovules. *Fruit* dark yellow, immature dark green, small, soft, subglobose, 2.5–3 cm in diam. 1-seeded. Wall thin. *Seed* ellipsoid, 16 × 15 × 9–21 × 20 × 15 mm. Testa woolly, deciduous, sticking to the pulp.

Distribution: West and Central Africa.

Ecology: Rain forests and secondary forests; alt. 0–800 m.

Uses: Fish poison (Leeuwenberg 4519); bark of roots used as ordeal poison.

Guinea: Benna Plateaux, N. of Benty, Schnell 7681 (ABT); Nimba Mts., Schnell 1046 (IFAN, P), 1134 (IFAN), 1476 (IFAN), 3492 (IFAN, P).

Sierra Leone: Falaba (Apr.) Aylmer 58 (K, type of *S. venulosa*); sin. loc., Afzelius s.n. (UPS).

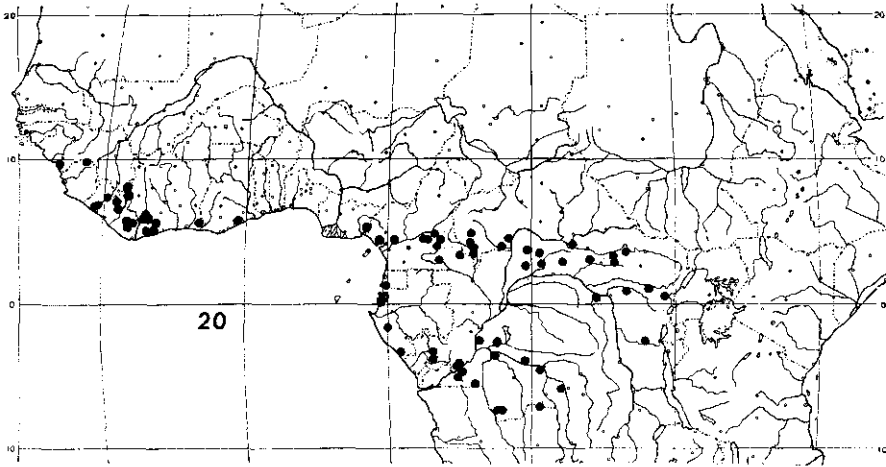
Liberia: Bong Range, 32 km N. of Kakata, Leeuwenberg & Voorhoeve 4918 (WAG), 4966 (WAG); Peatah (fr. Oct.) J. Bequaert in coll. Linder 1073, partly (K, paratype of *S. venulosa*); Ganta, Baldwin 14053 (K); Tappita area, Kwewon in coll. van Harten 19 (WAG); Nimba Mts., Leeuwenberg & Voorhoeve 4594 (WAG); Putu Range, W. of Penoken, Voorhoeve 1266 (WAG); near Kanweake, 70 km S. of Zwedru, J. de Wilde & Voorhoeve 3653 (WAG); Zwedru-Kanweake road (Feb.) van Meer 480 (WAG).

Ivory Coast: 7 km S. of Tai, J. de Wilde & Leeuwenberg 3576 (K, WAG); 7 km N. of crossing of Hana R. and Tai-Tabou road (Mar.) J. de Wilde & Leeuwenberg 3521 (ABI, BR, FHO, K, S, WAG); Buyo, Bouquet & Debray 295 (WAG); *ibid.*, Oldeman 2 (WAG), 3 (WAG); 10 km W. of Tapéguhé, right bank Sassandra R., 50 km NW. of Soubré, Leeuwenberg 4519 (WAG); 42 km N. of Néromer, Guillaumet 1344 (ABI, WAG); Monogaga, 40 km W. of Sassandra (fr. Nov.) Guillaumet 1605 (WAG); *ibid.*, Leeuwenberg 4044 (WAG); 20 km NW. of Sassandra, Leeuwenberg 4026 (WAG); 35 km SW. of Guéyo, Leeuwenberg 3732 (WAG); 15 km N. of Aboisso, Leeuwenberg 4501 (WAG).

Ghana: Simpa (= Winneba) (Mar.) Andoh in coll. Vigne 3255 (BM, FHO, MO, WAG).

Nigeria: Oban, Talbot 157 (BM, K, WAG, Z), 1256 (BM, K, WAG, Z, type of *S. pusilliflora*).

Cameroun: near Bimbia, 3 km S. of Victoria, Leeuwenberg 6998 (WAG); 10 km W. of Masok, Leeuwenberg 5349 (WAG); km 25 of Nanga Eboko-Bertoua road, Leeuwenberg 7448 (WAG); about 15 km W. of Minta, along road to Nanga Eboko, Leeuwenberg 5798 (WAG); 8 km SE. of Ebaka, 50 km NW. of Bertoua, Breteler 1419 (WAG, YA); between Ndjangané and Ndemba I, about 40 km NW. of Bertoua, Breteler 2937 (BR, K, P, S, WAG); 24 km NE. of Bertoua, along road to Bétaré Oya, Breteler, J. de Wilde & Leeuwenberg 2442 (K, P, WAG); near Toungrélo, 27 km SW. of Bertoua, Breteler c.s. 2402 (P, WAG), 2452 (WAG); near Dimako (nearly mature fr. July) Breteler 1713 (K, P, WAG, YA); 14 km E. of Dimako (nearly mat. fr. Feb.) Leeuwenberg 7780 (WAG); 9 km N. of Lomié, Leeuwenberg 6742 (WAG); 7 km W. of Yokadouma, Leeuwenberg 6092 (WAG).



MAP 20. *S. icaja*.

Central African Republic: Carnot, Sandberg Carnot 50 (Pharm. Stockh., WAG); Berberati, Sanberg Berberati 7 (Pharm. Stockh., WAG); 4 km N. of Bania, along road to Berberati, Leeuwenberg 7207 (WAG); Nola, Sandberg Nola 21 (Pharm. Stockh.), Nola 39 (Pharm. Stockh., WAG); *ibid.*, Ouzilleau 8 Oct. 1911 (LE, P); 27 km S. of Nola, along road to Salo, Leeuwenberg 7093 (WAG); Mbaïki Region, Tisserant 3694 (P); Maboké, near Mbaïki, Coll. indig. misit Resplandy 23 July 1964 (WAG); Boukoko, near Bangui (Dec.) Tisserant 529 (P, WAG).

Rio Muni: Kogo, Debeaux 11 July 1902 (P).

Gabon: Ile de Koniquet, Franquet anno 1853 (P, lectotype); 18 km from Libreville (Apr.) N. Hallé 1531 (P, WAG); near Libreville (Mar.) Klaine 27 (BR, P), 974 (B, P), 1280 (P), 2154 (BR, K, P, distributed as *S. lissophylla*), 3428 (B, BR, IFAN, K, P), 3455 (P); Libreville and Ogooué R., Jolly 188 (P); Agouma, P. Du Chaillu in Torrey Herb. s.n. (NY); Mayoumba, Dybowski 34 (P); *sin. loc.*, Aubry Lecomte anno 1854 (P, paratype); Ribourt anno 1879 (P); Vincent anno 1872 (P, paratype).

Congo (Brazzaville): Moukina, Komono-Moetché road, Bouquet 1097 (P); Malema Mabila, Sibiti-Komono road, Bouquet 1803 (P); between Renévile and Mbamou, Chevalier 27633 (P).

Congo (Kinshasa): Léopoldville: Kisantu, J. Gillet anno 1900 (BR); Stanley Pool District, Sabuka Region, Dewevre 845 (BR, type of *S. dewevrei*); Popokabaka Territory, Pauwels 837 (BR); Kisungu (Feb.) Callens 2453 (BM, BR); Panzi, Kwango, Kasongo Territory (fr. June) Devred 2006 (BR, K, PRE, WAG); Nioki, Flamigny 6285 (BR); Dima, Laurent 11 Dec. 1903 (BR); *ibid.*, Sapin April 1906 (BR); Ipamu, Vanderyst 10351 (BR). Equateur: Bombura, Gemena Territory, Evrard 912 (BR, WAG); Bobutu (fr. July) Evrard 1299 (BR, WAG); Budjala, Radna June 1937 (BR); Likimi, Lemaire 88 (BR); Dundusana, Bumba Territory, Mortehan 1112 (BR, type of *S. dundusanensis*). Orientale: Lower Uele R., De Wulf 182 (BR); Eke R. (fr. Oct.-Nov.) Michelson 197 (BR); Bambesa, Evrard 698 (BR); Bengé, Bondo Territory, Ghesquière anno 1934 (BR, WAG); Madabu, Zobia, Buta Territory, Gérard 2537 (BR, EA, K, PRE, WAG); Epulu, Marinos 1 (BR); Batama, near Kisangani, Claessens 289 (BR); Yangambi, Maudoux 1253 (BR); N. of Beni, Mildbraed 2181 (PRE, type of *S. mildbraedii*). Kivu: Lesse, near Semliki R., Bequaert 3170 (BR); between Nsogwameka and Madiwe, Beni Territory, P. Gille 135 (BR, K, P, PRE); Kingulube, Shabunda Territory, A. Léonard 3823 (BR, WAG). Kasai: Bienge, Callewaert 1 (BR); Miao R., Kazumba Territory, Liben 3410 (BR, WAG). *Sin. loc.*, Longueville rec. 1938 (BR); Van der Gucht 134 (BR).

Angola: Lunda: Dundo (fr. Dec.) Cavaco 1231 (P).

Cult.: Wageningen, from seeds collected by H.C.D. de Wit near Ganta, Liberia, Leeuwenberg 4993 (WAG).

Note. The type of *S. mildbraedii*, which is richly flowering, agrees in all characters with the other flowering specimens examined and identified as *S. icaja*.

30. *S. innocua* Del., Cent. Pl. Méroë 53. 1826 = in Calliaud, Voyage à Méroë 4: 343. 1827; Mérat & De Lens, Dict. Mat. Med. 6: 556. 1834; De Candolle, Prod. 9: 17. 1845; Baker in Fl. Trop. Afr. 4(1): 532. 1903; Bullock & Bruce, Kew Bull. 1938: 46. 1938, partly (excl. syn. *S. unguacha* var. *retusa* Chiov., *S. lokua* A. Rich., and syns. moved to *S. madagascariensis*); Chevalier, Rev. Bot. Appliq. 27: 360, pl. 15. 1947, partly (excl. syns., as in preceding reference); Aubréville, Fl. Soud.-Guin. 440, pl. 96. 5-7. 1950, partly (excl. syn. *S. burtonii*); Bruce & Lewis, Kew Bull. 1956: 270. 1956 and in Fl. Trop. E. Afr. Loganiaceae 25. 1960, partly (as for subsp. *innocua*); Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 496. 1963. Fig. 20, p. 139; Phot. 3, p. 141; Map 21, p. 143

Types: Ethiopia: Quamamyl, Calliaud s.n. (not seen, apparently not preserved); Ethiopia: Tigré, Tacazze R. Valley, Schimper 1817 (P, neotype: iso-neotypes: BM, BR, FI, G, GOET, HAL, K, L, LE, M, MO, P, S, UPS, W).

Heterotypic synonyms: *S. unguacha* A. Rich., Voy. Abyss. Bot. Atlas t. 73. 1847 and Tent. Fl. Abyss. 2: 52. 1851; Bentham, Journ. Linn. Soc. 1: 103. 1856; Gilg in Engler, Bot. Jahrb. 17: 562. 1893; Baker in Fl. Trop. Afr. 4(1): 534. 1903. The holotype of this name is the neotype of the preceding. Homotypic synonyms: *S. unguacha* var. *typica* Gilg, l.c. p. 563. *S. simiarum* (Hochst.) Gilg ex A. Chev., Rev. Bot. Appliq. 27: 362. 1947, in syn.

S. innocua var. *pubescens* Solered. in Engler, Bot. Jahrb. 17: 556. 1893; as var. of subsp. *innocua*: Bruce & Lewis, l.c. p. 271 and l.c. p. 26; Onochie & Leeuwenberg, l.c. p. 41. Type: Nigeria: Nupe, Barter 1160 (holotype not seen, destroyed in B; lectotype: K; other isotypes seen: GH, LE, NY, P, W). Homotypic synonyms: *S. unguacha* var. *pubescens* (Solered.) Gilg, l.c. p. 565. *S. triclisioides* Bak., Kew Bull. 1895: 98. 1895 and in Fl. Trop. Afr. 4(1): 533. 1903; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 22. 1931. The lectotype of the latter name chosen among the syntypes is the isotype of the preceding which becomes lectotype there.

S. unguacha var. *dschurica* Gilg, l.c. p. 565. Type: Sudan: Djurland, near Wau, Schweinfurth 1672 (holotype not seen, destroyed in B; lectotype: K; isotype: P). Homotypic synonyms: *S. dschurica* (Gilg) Gilg in Engler, Bot. Jahrb. 36: 92. 1905; Chevalier, Et. Fl. Afr. Centr. Fr. 1: 203. 1913 and Expl. Bot. Afr. Occ. Fr. 443. 1920 (as *dshurica*). *S. penduliflora* Bak. in Fl. Trop. Afr. 4(1): 531. 1903 (erroneously nr. 1072). The holotype of the latter name is the lectotype of the preceding. *S. edulis* Schweinf., Im Herzen von Afrika 1: 208. 1874. The lectotype of the latter name is also the lectotype of the preceding.

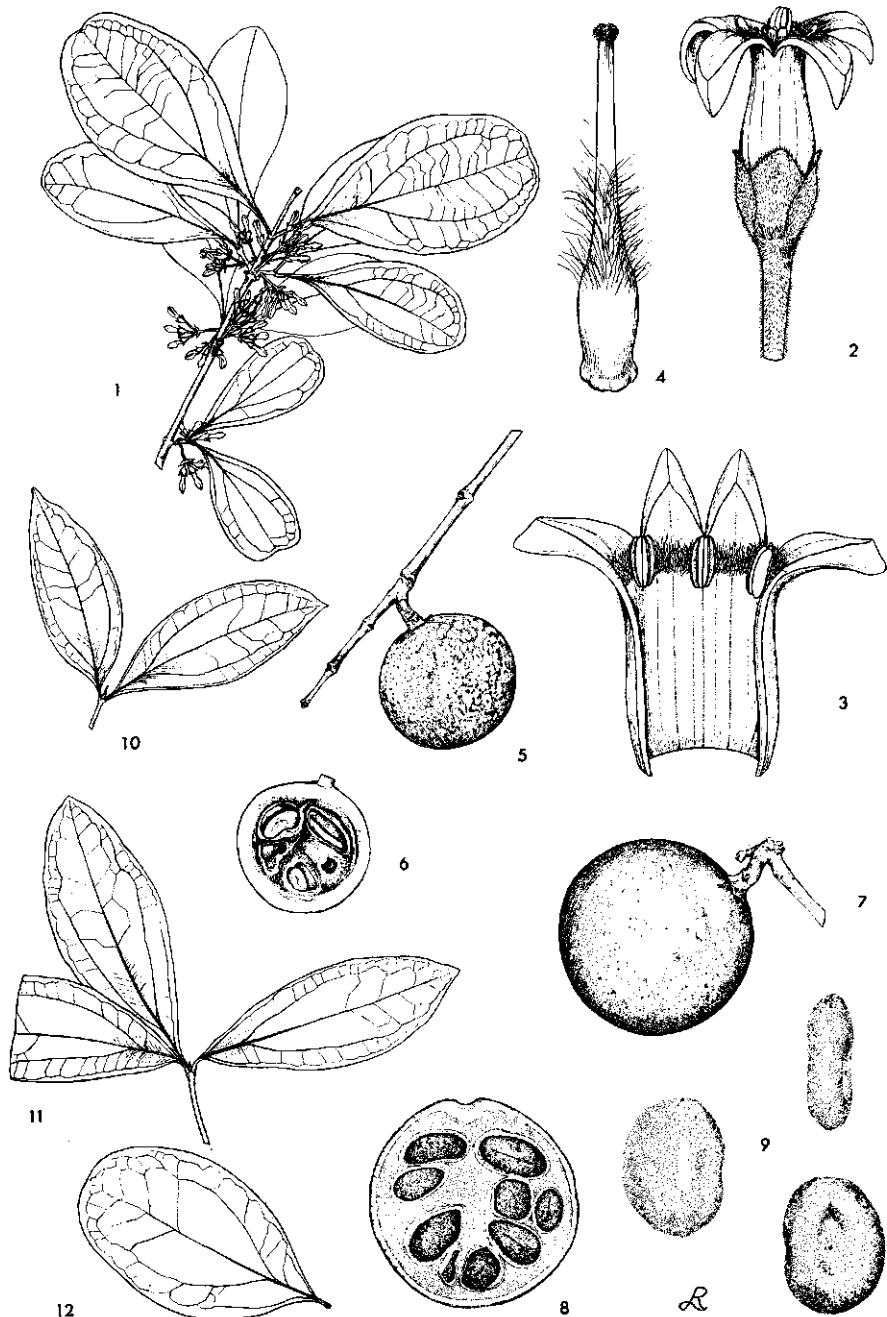


FIG. 20. *S. innocua*: 1. branch, $\frac{1}{2} \times$; 2. flower, $4 \times$; 3. opened corolla, $5 \times$; 4. pistil, $7 \times$; 5, 6. fruits, $\frac{1}{2} \times$; 7. section of nearly mature fruit 6, herbarium, $\frac{1}{2} \times$; 8. section of nearly mature fruit 7, spirit collection, $\frac{1}{2} \times$; 9. seeds, $1 \times$; 10-11. leaves of sucker shoots, $\frac{1}{2} \times$; 12. leaf of branchlet, $\frac{1}{2} \times$ (1-4, 7-9. Leeuwenberg 7482; 5-6. Leeuwenberg 7586; 10-12. Leeuwenberg 4400).

S. unguacha var. *grandifolia* Gilg in Engler, Bot. Jahrb. 17: 564. 1893. Type: Sudan: Equatoria Province, Djurland, Seriba, Kurshook Ali, Schweinfurth 1719 (K, lectotype; isotype: P). Homotypic synonym: *S. xerophila* Bak., Kew Bull. 1895: 98. 1895 and in Fl. Trop. Afr. 4(1): 534. 1903. The lectotype of this synonym is also the lectotype of the preceding.

S. unguacha var. *microcarpa* Gilg, l.c. p. 564. Type: Sudan: Bongoland, Seriba Ghattas, near Tondi, Addai, Schweinfurth 1432 (holotype not seen, destroyed in B; lectotype: K).

S. unguacha var. *steudneri* Gilg, l.c. p. 563. Type: Sudan: Bongoland, Seriba Gir, Schweinfurth 1412 (K, lectotype).

S. fischeri Gilg, l.c. p. 565; Baker in Fl. Trop. Afr. 4(1): 535. 1903. Type: Tanzania: Shinyanga District, Usule, Fischer 300 (holotype not seen, destroyed in B; no isotype seen).

S. alnifolia Bak., Kew Bull. 1895: 150. 1895 and l.c. p. 532. Type: Nigeria: Interior, Western Lagos, Rowland anno 1893 (K, holotype).

S. unguacha var. *polyantha* Gilg in Engler, Bot. Jahrb. 30: 374. 1901. Type: Tanzania: Mbeya District, near Kananda, Goetze 1436 (holotype not seen, destroyed in B; lectotype: G; other isotypes seen: A, BM, BR, L, P).

S. unguacha var. *obovata* De Wild., Ann. Mus. Congo Sér. 4. 1: 98, pl. 27. f. 6-7. 1903. Type: Congo: Katanga, Lukafu, Verdick 3 Aug. 1899 (BR, holotype).

S. huillensis Gilg et Busse in Engler, Bot. Jahrb. 36: 104. 1905. Type: Angola: Huila, Dekindt 6a (E, lectotype).

Deciduous shrub or small often much-branched tree, 2-12(18) m high. Trunk 7-40 cm in diam., branched from low down. Bark pale grey, grey-brown, or sometimes dark grey-brown, smooth, somewhat powdery, flaking in small rounded or square scales near base of trunk; wood hard, pale yellowish. *Branches* pale grey-brown, powdery or not, lenticellate or not, not sulcate, terete; branchlets glabrous or pubescent, pale grey-brown or grey-green, if lenticellate less so than the branches. *Leaves*: petiole often short, glabrous or pubescent, 2-7 mm long; blade mat or dull, glaucous, and with mostly pale green reticulate veins on both sides, beneath slightly paler, coriaceous (living and dry) or papyraceous (dry), elliptic, narrowly elliptic, obovate, or narrowly obovate, (1) 1.5-3(3.5) × as long as wide, (2) 4-10(20) × (1) 2-7(13.5) cm, rounded (or in sucker shoots often acute) at the apex, cuneate or less often rounded at the base, glabrous or pubescent on both sides; one or two pairs of distinct secondary veins from or from above the base curved along the margin and often a faint submarginal pair; tertiary venation reticulate and distinctly prominent on both sides. *Inflorescences* axillary or ramiflorous, usually several together, very short and nearly fasciculate, 1 × 1 - 1.5 × 1.5 cm, 1-2 × branched, few-flowered. Peduncle, branches, and pedicels short or very short, pubescent to nearly glabrous. Bracts small, sepal-like, above glabrous and sometimes with some large colleters at the base. *Flowers* 4-merous. *Sepals* pale green, free, subequal, the inner slightly smaller, ovate, broadly ovate, or suborbicular,



PHOT. 3. *S. imocua*: flowering branch and opened mature fruit (Leeuwenberg 7482).

0.8–1.5 × as long as wide, 1.7–3.5 × 1.5–2.5 mm, rounded at the apex, ciliate, glabrous or pubescent outside, glabrous inside, without colleters. *Corolla* in the mature bud 2.2–4 × as long as the calyx and (6)6.5–9(10.5) mm long, creamy or greenish-yellow, glabrous outside, inside with a brush-like ring of white lanate hairs in the throat and just on the base of the lobes; tube cylindrical or nearly so, 1.6–2.5 × as long as the calyx, 1–1.7 × as long as the lobes, (3)3.5–5.5(6) mm long, 1.5–2.5(3) mm wide at the throat; lobes thick, narrowly triangular, 1.7–2.3 × as long as wide, 3–4(4.5) × 1.3–2(2.3) mm, acute or subacute, spreading. *Stamens* hardly exerted; filaments extremely short, glabrous, inserted at the mouth of the corolla tube; anthers oblong, about twice as long as wide, 1.2–2 × 0.6–1 mm, glabrous, deeply cordate or sagittate at the base; cells parallel. *Pistil* hirtopilose in the middle, (4)5–7.5 mm long; ovary narrowly ovoid or oblong, 1.5–3 × 1–1.5 mm, hirtopilose at the very apex, further glabrous, often with a disk-like base, gradually narrowed into the style, 2-celled; style thick, (2)3–4.5 mm long, at the base hairy like the ovary at the apex; stigma capitate. In each cell (14) 18–30 ovules. *Fruit* orange or yellow, nearly mature bluish-green, large, hard, globose, (2.5)4–7.5(9.5) cm in diam., with (3)8–50 seeds, with somewhat granular skin, slightly shining. Wall thick, 2.5–5(6) mm thick, thicker above the pedicel, brittle in mature fruits, hard and not broken by hand when nearly mature and/or dry. Pulp orange, edible. *Seeds* pale ochraceous, flattened or not, often more or less plano-convex, obliquely ovate, elliptic, or tetrahedral, usually irregularly curved, 1–1.5 × as long as wide, 17–21 × 13–20 × 5–8 mm, with thick very short erect hairs, rather rough.

Distribution: Tropical Africa.

Ecology: Deciduous woodlands; alt. 0–1600 m.

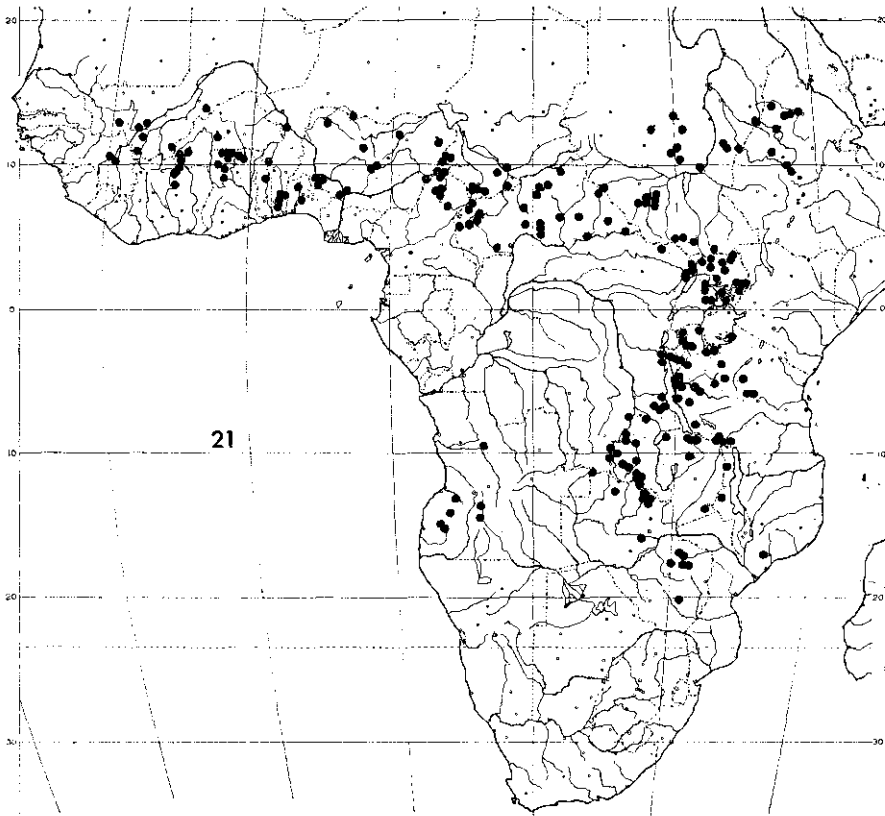
Guinea: Kouroussa, J.G. Adam 2878 (P); *ibid.* (?), Pobéguin 860 (K); Kankan, Chevalier 571 (P).

Mali: Kankombolé, Chevalier 24857 (P); Kita, R. Dubois 164 (P); Koulikoro, Vuillet 641 (P); near Bamako, Jaeger 15 Sept. 1954 (IFAN, WAG); between Bamako and Bougouni, Aubréville 3035 (P); between Ouassada and Dendéla (Mar.) Chevalier 623 (BR, K, P); between Bougouni and Sikasso, Aubréville 3034 (P).

Ivory Coast: Ouangolodougou (fr. May) Aubréville 1395 (P); 5 km N. of Ouangolodougou (few fl. June) Leeuwenberg 4433 (ABI, WAG); Forêt de Pallakas, Ferkéssédougou, Herb. I.D.E.R.T. 1284 (ABI); 16 km S. of Ferkéssédougou (fr. June) Leeuwenberg 4435 (ABI, WAG); Niangbo, 30 km S. of Tafiré, Leeuwenberg 4444 (WAG), 4448 (WAG).

Upper Volta: SW. of Godé, km 25 of road Koudougou-Boromo, Leeuwenberg 4400 (ABI, WAG); 32 km SW. of Bobo-Dioulasso, along road to Banfora, Leeuwenberg 4409 (WAG); near rock of Sindou, 50 km W. of Banfora, Leeuwenberg 4319 (WAG); 10 km NE. of Léraba R., km 60 of road Banfora-Ferkéssédougou, Leeuwenberg 4292 (ABI, WAG).

Ghana: between Pan and Bujan, Kitson 834 (K); between Passankwia and Bugiyenga (May) Kitson 664 (K); Tumu (Apr.) Vigne 3775 (FHO, WAG); 6 km SW. of Pina, D.W. Goodall 15408 (GC); km 50 of Navrongo-Tumu road (fr. Dec.) C.D. Adams & Akpabla GC 4359 (K); near Santejan (May) Kitson 775 (K); between Gurumbele and Bantala, Kitson 909 (K); Damongo Scarp., T. M. Harris Nov. 1958 (K); Tongo Hills, Zuarungu N.R. (Apr.) Morton A 3900 (WAG); Gambaga, C.D. Adams 707 (K); Gambaga Scarp., Morton 7321 (GC).



MAP 21. *S. innocua*.

Togo: Kongo, near Ngamtun, Kersting A 591 (A).

Dahomey: Atacora Mts., between Farfa and Tonkountouma (June) Chevalier 24052 (P); Abomey, Chevalier 23145 (P, WAG); Dassa Zoumé (fl., fr. May) Chevalier 23658 (P); near Edokomy, Poisson 6 Feb. 1902 (P); Notchi (?) Plateau, Poisson 250 (P); between Agouagou and Savé, Chevalier 23558 (P); Ady Agricultural Station, near Savé (May) Chevalier 23571 (P).

Niger: Gourma, Chevalier 24479 (P); Maradi, Gaillard, Rocher & Joubert July 1907 (P).

Nigeria: Shaki-Ago-Are road, Shaki District, Oyo Province, Latilo & Taylor FHI 43231 (K); Ago Are For. Res., White 8121 (FHO); *ibid.* (fr. June) Adebusuyi FHI 56166 (FHI); Ijaiye For. Res., Oyo Province, Keay FHI 21182 (K); Interior, Western Lagos, Rowland anno 1893 (K, type of *S. atnifolia*); Emiwo-ro-Share path, Ilorin District (fr. Feb.) Ejiofor FHI 19838 (B); Niger R. Valley, downstreams from Jebba, Kamphorst 178 (WAG); Shonga (Mar.) Mac Donald 1425/1935 (FHO); Sokoto (fl., fr. May) Lely 836 (K); Lokoja, Niger and Benue Rs. confluence, Dalton anno 1861 (K); Nupe, Barter 1160 (GH, K, LE, NY, P, W, lectotype of *S. triclisioides* and type of *S. innocua* var. *pubescens*); Anara For. Res. Zaria Province (May) Keay FHI 22965 (FHI, FHO, K, P); Kizaka For. Res., Zaria Province (Apr.) Latilo FHI 47773 (FHI, K, WAG); Jos Plateau, Batten-Poole 269 (K); *ibid.* (Aug.) Keay FHI 12713 (FHI, FHO); *ibid.* (Feb.) Lely P 115 (FHI, FHO, K); *ibid.*, Naraguta For. Res. (fl., fr. May) Olorunfemi FHI 55813 (FHI, K); Katagum District, Dalziel 421 (K); Yola (Apr.) Dalziel 197 (K); Maiduguri, Kennedy 2975 (FHO); *sin. loc.*, B. E. B. Shaw 45 (K); Vogel s.n. (K).

Cameroun: km 9 of Mokolo-Mogodé road (fr. Jan.) Leeuwenberg 7511 (WAG); km 5 of Mogodé-Mokolo road, Leeuwenberg 7551 (WAG); Mokolo, Vaillant 178 (P); Maroua, Vaillant 61 bis (P); between Guidder and Garoua (June) Jacques-Felix 3809 (P); km 20 of Garoua-Roumsiki road (fr. Jan.) Leeuwenberg 7586 (WAG); Garoua, S.R.F.K. 4416 (P, YA); km 122 of Garoua-Ngaoundéré road, NW. edge of Benoué Res. (fr. Jan.) Leeuwenberg 7611 (WAG); Sigari, 16 km SSW. of Poli, Raynal 13143 (P); 24 km N. of Mbé, km 104 of Ngaoundéré-Garoua road (fl., fr. Jan.) Leeuwenberg 7482 (WAG); about 5 km NE. of Ndigou, about 65 km E. of Ngaoundéré, W., J. & B. de Wilde 4765 (WAG).

Central African Republic: Dar ROUNGA, near Mamoun (Mar.) Chevalier 7749 (P); Dar Banda, Kaza, Balidja, Chevalier 6740 (P); Digangon, near Ndélé, Chevalier 6741 (P); Ndélé, Chevalier 6993 (P); between Ndélé and Kaza Bongolo (Jan.) Chevalier 7235 (BR, G, K, L, P); Baibokoum, Aubréville 683 (P); Bocaranga, Aubréville 656 (P); E. of Baboua, Mildbraed 9271a (K); km 22 of Bouar-Baboua road (Jan.) Descoings 12621 (P); Bouar (fr. Oct.) Bille 1723 (ALF); near Bozoum (May) Tessmann 2262 (K), 2439 (K); *ibid.* (Feb.) Tisserant 3024 (P); Boda, 83 km NW. of Mbaïki, Aubréville 612 (P); Gribingui, Ft. Crampel, Chevalier 6382 (P); Bandéro, SE. of Ft. Crampel, Chevalier 6316 (P); between Mpoko R. and Ungourra (fr. Nov.) Chevalier 6085 (P); Folo, 20 km SE. of Moroubas, Bambari region (Feb.) Tisserant 979 (P); Bambari (June) Tisserant 279 (P); Ebi, 45 km S. of Bambari (Jan.) Tisserant 903 (P); Bria, Yalinga region (Feb.) Le Testu 2417 (P), 2453 (P); Yalinga (Mar.) Le Testu 2528 (P); between Yalinga and Saïd Bundas (Feb.) Le Testu 3716 (P); Djemah (Jan.) Aubréville 524 (P); Obo (Jan.) Aubréville 535 (P); Rafai (Jan.) Aubréville 492 (BR, P); *sin. loc.*, Chevalier 10416 (P).

Tchad: Goro, Audru 215 (ALF); near Goundi (June) Chevalier 8591 (BR, K, P); Logone R., near Moundou (Mar.) Descoings 10541 (P); Bédi, near Moundou (fr. Aug.) Audru 841 (ALF), 874 (ALF); Dobéni II, Audru 1688 (ALF); Koumogo, SW. of Ft. Archambault, Audru 1910 (ALF).

Sudan: Abu KASHOLU, Kordofan, Wicken 774 (K); Gallabat (fl., fr. June) B. K. Cooke 45 (K), 62 (K); *ibid.*, Schweinfurth 1660 (BM, G, K, LE, P, paratype of *S. unguacha* var. *grandifolia*), 1661, partly (G); Jebel El Daier, E. Kordofan, Longe 79 (K); En Nahud, Kordofan, Wicken 514 (K); Ingessana Hills, Blue Nile Province, J.D. Lea 107 (K); Upper Nubia, Kordofan (fl.) Anonym. 21 Oct. 1936 (FI); Wisko Pass, Ingessana Hills, Aylmer 35 (FHO); Isbel Fazogli, Blue Nile, Muriel L 38 (K); Kadugli, S. Kordofan, Broun 1347 (K); Talodi, Nuba Mts., Kordofan Province, Simpson 7729 (K); Femecka, in Fashoda (May) Cienkowski 69 (LE); NW. of Saïd Bundas (Jan.) Hoyle 469 (FHO); N. of Wau-Meshra road, Hoyle 392 (BM, FHO); Pongo R., Broun 362 (K); Wau (May) Schweinfurth 1672 (K, P, type of *S. penduliflora*, lectotype of *S. edulis* and *S. unguacha* var. *dshurica*); Wau-Chak Chak road, Broun 8 Mar. 1902 (K); Ngwolima, SW. of Wau (Feb.) Hoyle 365 (BM, FHO), 568 (A, BM, FHO, K); Busseri, SW. of Wau, Turner 26 (K); Duniaka, Turner 17 (K); Seriba Kurshook Ali, Djurland, Schweinfurth 1719 (K, P, type of *S. xerophila*, lectotype of *S. unguacha* var. *grandifolia*); near Tondi Addai, Seriba Ghattas, Bongoland, Schweinfurth 1432 (K, type of *S. unguacha* var. *microcarpa*); Seriba Gir, Bongoland (Apr.) Schweinfurth 1412 (K, lectotype of *S. unguacha* var. *steudneri*); between Maridi and Amadi, Meyers 6913 (K); near Medi, Amadi District, Andrews 934 (K); Nargata, Juba District, Andrews A 1677 (K); Imatong Mts., Torit District, Andrews A 1805 (K).

Ethiopia: Between Bircutan and Sefré-hazei, Amhara-Uolcait (= Wolgait) (fr. Feb.) Pappi 8991 (FI), 9008 (FI); Tigré-Scire, Chioventa 540 (FI); Tacazze R. (fl.) Quartin Dillon & Petit Agr. 1839 (P); near Djeladjeranne, Tacazze R. (Apr.) Schimper 551 (FI), 1817 (BM, BR, FI, G, GOET, HAL, K, L, LE, M, MO, P, S, UPS, W, neotype, type of *S. unguacha*); Amhara-Tzellemti, Chioventa 664 (FI), 728 (FI); Gunidubbà Mt., near Tucür Dinghià, Gondar (fr. Jan.) Pichi-Sermolli 1280 (FI, K); Gojjam, Matakél District (Mar.) Kuls 233 (FR), 265 (FR); between Blue Nile, SE. of Debra-Markos, and Addis Ababa (fr. Feb.) Buscalioni 1291 (FI), 1420 (FI); about 50 km W. of Lekemti (Apr.) W. de Wilde c.s. 10717 (WAG).

Congo (Kinshasa): Orientale: Genze Mt., Dungu Territory, Gérard 842 (BR, WAG); near Mahagi Ishwa Lake (Apr.) De Craene 337 (BR, P, WAG); Mokambo-Mahagi road (fr. Apr.) Devillé 184 (BR, LISC, WAG); Mokambo, Mahagi Territory, Germain 4178 (BR, K);

Hawa Mt., Mahagi and Aru Territories boundary (Mar.) Smeyers 177 (BR, WAG), 244 (PRE). Kivu: Ruzizi R. Valley, Mabaye-Rutahana road, Germain 7184 (BR); Luberizi, Liegeois 164 (BR); between Sange and Luberizi (fr. Apr.) Hendrickx 7729 (BR); Nyamilembe, Uvira Territory, A. Léonard 4370 (BR, WAG); Tembwe, 50 km N. of Mobwa, Tanganyika Lake, Van Meel 1023 (BR). Kantanga: Albertville, Hecq anno 1899 (BR); between Albertville and Manono, Marlier 1663 (BR); Ferme Bertrand, Muhila (Oct.) Quarré 7076 (BR); Kiala, Manono Territory (Jan.) Thiebaud 438 (BR, EA, WAG); Kiambi, Huart 5 (BR); Upemba Nat. Park (Aug., Nov.) de Witte 4137 (BR), 4665 (BR, K, WAG); Lufira R., Lynes 3 Feb. 1934 (BR); between Mukana and Mumbola (Sept.) Robyns 3635 (BR); Mukulakulu (Sept.) De Troyer 147 (BR, WAG); km 7 of Lubudi-Mokabe Kasari road, Symoens 5652 (BR); Kiala, near Nguba (Aug.) Romieux 113 (BR, G); Kambove, near Likasi (fr. Aug.) Schmitz 3004 (BR); Lukafu (fl.) Verdick 3 Aug. 1899 (BR, type of *S. unguacha* var. *obovata*); Kapiri R. Valley (fr. Feb.) Homblé 1147 (BR); 12 km NW. of Lubumbashi, Gathy 2153 (PRE, SRGH); 6 km NE. of Lubumbashi (fl. Oct.-Nov., fr. May, July) Schmitz (obs. tree 389) 2383 (BR), 3629 (BR), (obs. tree 576) 4146 (BR), (obs. tree 78) 544 (BR), 791 (BR, PRE), 3626 (BR), (obs. tree 313) 670 (BR, PRE), 3668 (BR, WAG), (obs. tree 363) 896 (BR), 2204 (BR); Lubumbashi, Delvaux 77 (BR); *ibid.* (fl.) Hock Oct. 1911 (BR); *ibid.*, Ringoet in coll. Burtt-Davy 17786 (BM); *ibid.* (?) (Oct.) Ringoet 99 (K); *ibid.* (May, Oct.) Quarré 4718 (A, BR, G, K, US), 5436 (BR); *ibid.*, Snelleghem (Nov.) Quarré 1401 (BR); Keyberg, 8 km SW. of Lubumbashi, Schmitz (obs. tree 286) 2249 (BR); Mukuen, 10 km SSW. of Lubumbashi, Schmitz (obs. tree 213) 513 (BR), 769 (BR); Kombo (Oct.) Delvaux 817 (BR).

Angola: Malanje; near Malanje, J.J. d'Almeida anno 1903 (LISJC); *ibid.* (Aug.) Gossweiler 1121 (BM, K, P), 1123 (BM, K, P), 1127 (BM, P). Benguela: Ganda (Aug.) Teixeira & Andrade 6910 (LISC), 6919 (LISC); Quilengues, Mendes 736 (LISC). Bié: Chana Canona, near Cutato R., Menongue region, Gossweiler 3207 (BM, LISJC). Moçambique: Vila Arriaga (Dec.) Torre 8222 (LISC). Huila: km 33 of Vila Artur de Pavia-Cassinga road (fr. Jan.) Mendes 2116 (LISC); Huila, Dekindt 6a (E, lectotype of *S. huillensis*), 551 (MPU, paratype of *S. huillensis*); Mucha Mt., Dekindt 1089 (LISC, paratype of *S. huillensis*); Kamungua Mt., Dekindt 1138 (LISC, paratype of *S. huillensis*).

Rwanda: Akagera Nat. Park, Byumba Territory (Nov.) Troupin 14015 (BR); Hago Lake, Kibungo Territory, Troupin 3634 (BR).

Burundi: Bubanza Territory, Lewalle 1631 (WAG), 1633 (WAG); *ibid.*, Murambi, near Chivotoke, Christiaensen 2420 (BR); Mosso, Ruyigi (Sept.) Michel & Reed 385 (BR, PRE); Kininya, Mosso (Oct.) Michel & Reed 623 (BR, PRE, SRGH), 1520 (BR); Kimaro, Mosso, Michel & Reed 1449 (BR).

Uganda: Northern Province: Mt. Zulia, Karamoja (Apr.) Wilson 910 (EA); Pirre, Karamoja (Feb.) Brasnett 136 (ENT); Acholi, Dawe 830 (K); Amua, W. Madi (fl., fr. Dec.) Eggeling 904 (FH 1252) (EA, ENT, K); Abbia Ferry, Chua, Eggeling 1680 (E, EA, FHO); Ite Mt., Terego County, W. Nile, Eggeling 1515 (FH 1445) (EA, ENT, FHO, K); Awach, Paicho Gulu (Feb.) Eggeling 1667 (E, EA, FHO); Madi, W. Nile, Speke & Grant s.n. (K, paratype of *S. xerophila*, cited as Grant by BAKER); Adilang, Acholi District (Apr.) Greenway & Hummel 7339 (EA, K, PRE); Ngetta, Lango, Cree 43 (EA); Ngetta Rock, Lira, Lango (fr. Feb.) Dawkins 235 (ENT, FHO); *ibid.* (fl., fr. Jan.) A.W. Hill 13 (K); Napak, Karamoja (June) Philip 358 (ENT); *ibid.* (fr. Feb.) Sangster 411 (EA, K), 428 (EA, K); Kokumongole, Karamoja (Jan.) A.S. Thomas T.H. 2239 (EA, K); Karamen, Karasuk, Wilson 300 (EA). Western Province: Kiryandongo, Bunyoro, Purseplove 1346 (EA, K); Kafu R. Valley, Bagshawe 828 (BM). Eastern Province: Serere, Teso, Chandler 343 (EA, K); *ibid.* (fr. Dec.) Eggeling 753 (FH 1150) (ENT, K); between Muyembe and Ngenge, Sebei District, Styles 342 (FHO); Aruyatuny, about 11 km along Kadam-Moroto road (Mar.) Dyson-Hudson 349 (BR, K); Debasien Mt., Karamoja District (Jan.) Eggeling 2629 (BR, EA, K). Buganda Province: Bukomero Mt., Mubende, Eggeling 483 (FH 819) (EA, FHO, K); Lwamatuka, N. Mengo, Langdale-Brown 1297 (K); Budiope, Busoga, Snowden 216 (BM, K). Uganda (?): *sin. loc.* (Oct.) K.J. Cameron 168 (K).

Tanzania: Lake Province: Nshamba, Bukoba District (Feb.) Gillman 533 (EA, K); Mubunda, Bukoba District (Aug.) Proctor 682 (EA, K); near Maji, Musoma, Watkins 325

(FH 2987) (FHO); Keza, Bushubi, Ngara, Tanner 5610 (WAG), 5610 A (BR, K); Mukaliza, Ngara, Tanner 6027 (K, WAG); Biharamulo (fr. July) Watkins 293 (FH 2768) (FHO); Geita (June) Burt 6571 (BM, BR, K, P); Namhandi, Mwanza District (fr. Sept.) Tanner 456 (B, BR, K, S); Nghoyokoyo, Mwanza District (fr. May) Tanner 1476 (BR, K, WAG); Buyago For. Res., Watkins 49 (FH 2341) (EA, FHO); Shinyanga, Koritschoner 1659 (EA, K); Shinyanga District, Burt 3301 (BM, EA, K). Western Province: Between Gombe and Missonge, E. Shore Lake Tanganyika, Pirozynski 54 (K), 669 (K); Buyungu, Kibondo, Buha District, Maclean H 37/33/23 (EA), H 37/33/25 (EA); N. of Kigoma, M.M. Morris-Goodall 62 (EA); *ibid.*, J. Morris-Goodall EA 12514 (EA); N. of Ngonia R., Kigoma District, Treoor (?) 3 (EA); Kazuramimba, Kigoma District, Moreau 9078 (EA); Kasikati R. Basin, 80 km S. of Kigoma, Itani 58 (EA); Mahali Mts., Mpanda District (Sept.) Newbould & Jefford 2445 (K), 2620 (BR, K); Kungwe-Mahali Peninsula, Mpanda District, R.M. Harley 9128 (BR, EA, K), 9151 (BR, K); N. of Kasulu, Proctor 504 (EA, K); Kasulu-Uvinsa road, Proctor 281 (EA, FHO, K); Uvinsa (Aug.) Bullock 3235 (B, BR, K, S); Malgarassi, Uvinsa, Peter 35886 (B); Usinge, Kigoma District (Nov.) Michelmore 770 (BR, EA, K); Tabora (Oct.) Burrows 954 (FHO); *ibid.*, H.A. Lindeman 101 (BM), 432 (EA, K); Tabora District, Wallace 13 (K); Kakoma, S. Tabora District, Burt 214 (J); Kaliuwa, Tabora District (fr.) Shabani comm. Bullock 19 Oct. 1949 (K); Simbo Res., Tabora, Wigg FH 1080 (EA, FHO); Kabungu, Mpanda District, Semsei 36 (EA, FHO); Namwele (Feb.) Bullock 2577 (B, BR, K). Central Province: near Muwera, Singida District, Burt 1387 (EA, K); Kazikazi, Burt 4436 (A, FHO, US); S. of Itigi, Manyoni District (fr. Apr.) Greenway & Polhill 11634 (K). Southern Highlands Province: N. Lupa, J.S. Goome FH 2241 (EA, FHO); near Kananda, Mbeya District, Goetze 1436 (A, BM, BR, G, L, P, type of *S. unguacha* var. *polyantha*); Chimala (Jan.) Boaler 392 (EA, K); Mbosi, Mbeya District, Jessel 60 (EA, K); Kyimbila, Bulambya, Rungwe District (Dec.) Stolz 1735 (B, BM, C, G, K, L, MO, P, PR, PRE, S, U, UPS, Z). *Sin. loc.* (June) Kisaka 8019 (EA).

Zambia: N. of Mweru Lake, about 10 km from Pweto, Symoens 3918 (K); S. of Chiengi (fr. June) Michelmore 382 (K); Mbulu Island, Tanganyika Lake, Richards 1661 (K); Abercorn (Oct.) Siame 205 (BM); Nsisi, near Abercorn, R.E. Fries 1324 (UPS); Abercorn District (Nov.) Robertson 194 (EA, K); Ndundu-Kawimbe road, Abercorn District (Sept.) Richards 13267 (BR, K, SRGH); Chishimba Falls, Kasama District (Oct.) Robinson 3996 (K, M, SRGH); Zambesi R., 6 km N. of Kalene Hills Mission (Sept.) Holmes 897 (FHO, K); between Nyabisonga and R. Mombezi, Solwezi District, Milne-Redhead 792 (BR, K); Mufulira (fr. May) Eyles 8202 (BM, K, SRGH); Kitwe, Fanshawe Kitwe 4 (WAG); near Nkana, R.G. Miller 296 (FHO, NY); Ndola (Oct.) Duff 232/37 (FHO, K), 253/44 (FHO); *ibid.* (fl., fr. Nov.) R.G. Miller 205 (FHO), 298 (FHO, NY); *ibid.* (fl., fr. Sept.) Trapnell 1994 (BR, COI, EA, K, S, SRGH); Mpongwe, Ndola District (fr. Oct.) Trapnell 1977 (K); Luanshya, A.C.F. 390/32 (FHO); Chadiza (fl., fr. Nov.) Robson 765 (BM, K, LISC, PRE, SRGH); Nega Nega Hills, Burt-Davy 20788 (FHO).

Malawi: 30 km NE. of Rumpi, Langdale-Brown 97 (EA); Kasungu (fr. Aug.) Brass 17434 (K, MO, NY).

Rhodesia: Central Umvukwe Mts., Rodin 4430 (PRE); Msengesi Camp, Darwin District, Whellan 941 (LISC, PRE); Lomagundi, R.W. Jack 1243 (K, SRGH); *ibid.*, Eyles 5526 (SRGH), 5527 (SRGH); Lomagundi District, Thornevill 1200 (SRGH); Msengaisi (?), R.W. Jack 4032 (SRGH); Chipoli, Mazoe District, Moubray SRGH 89321 (BR, K, LISC, S, SRGH); Mrewa District (Dec.) E.J. Moll 590 (K, WAG); Victoria, C.F.H. Monro annis 1909-1912 (BM).

Moçambique: Zambezia: Namagoa Estate, Mocuba District (Nov.) Faulkner 214 (BR, EA, K, LD, LISJC, PRE, S, SRGH, UPS).

Cult.: Keyberg, near Lubumbashi, Congo, Schmitz 4779 (BR, seedlings of obs. tree 78), 4416 (BR, seedlings of obs. tree 389).

Notes. The type specimen of *S. innocua* apparently is not preserved. The description of *DELILE* leaves no room for doubt, and so it seems preferable to

adopt the widely distributed flowering specimen, Schimper 1817, as the neotype, although DELILE describes not the flowers, but the fruit. The fact that Schimper collected this specimen in the same country as the specimen described by DELILE supports this decision.

Schweinfurth 1672 is the only *Strychnos* specimen available which covers both the description and collecting locality of *S. edulis*. It is designated as the lectotype therefore.

S. innocua is restricted here to the type subspecies of this species. The varieties are not maintained, as they grade into each other. All other subspecies are considered as synonyms of *S. madagascariensis*. Therefore, the infraspecific epithets are omitted here.

Although the difference between *S. innocua* and *S. madagascariensis* is difficult to define, it is certainly not less important than that between several other pairs of species in this genus, e.g. *S. lucens* and *S. nigritana*, *S. kasengaensis* and *S. moandaensis*, *S. angolensis* and *S. malacoclados*. Except for a very few doubtful, mostly incomplete, specimens, about 300 specimens were identified as *S. innocua* and about 500 as *S. madagascariensis*.

31. *S. johnsonii* Hutch. et M. B. Moss in Fl. W. Trop. Afr. 2: 24. 1931 and Kew Bull. 1937: 335. 1937, partly (excl. Scott Elliot 4292); Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 44. 1963. **Fig. 21, p. 149; Map 22, p. 152**
Type: Ghana: Akropong, Johnson 802 (K, holotype).

Climbing shrub or liana, 5–20 m high climbing over shrubs or in trees, up to at least 30 m high. Trunk 3–8 cm in diam. Bark medium to dark brown, with large lenticels; wood creamy or pale yellow (paler than in *S. samba* Duvign.). Branches often quadrangular, medium to dark green, not lenticellate, often pale brown and not sulcate when dry, hollow or sometimes – if small – with an obscure terete pith; branchlets mostly quadrangular, glabrous, not lenticellate, medium to dark green, greenish-brown and sometimes slightly sulcate when dry. Tendrils paired. Leaves: petiole glabrous, 4–7 mm long; blade slightly shining and medium dark green above, paler beneath, coriaceous also when living, subcoriaceous in the shade, elliptic, narrowly elliptic, or on the main axis and at the bases of the branchlets suborbicular to nearly ovate, (1.1)1.5 × as long as wide, 3.5–10(14.5) × 1.7–5(8) cm, acuminate or acute at the apex, cuneate, rounded, or sometimes on the main axis subcordate at the base, glabrous on both sides; one pair of distinct secondary veins from just above the base curved along the margin and mostly a faint submarginal pair; costa impressed above; tertiary venation reticulate, not very conspicuous, in dry leaves prominent beneath. Inflorescence axillary, solitary, lax, about 0.2–0.8 × as long as the leaves, 1.5–4.5 × 1.5–3.5 cm, few- to many-flowered, 2–3 × branched. Peduncle and branches slender, puberulous or with two stripes of puberulence below the stipular line of the bracts. Pedicels puberulous or practically glabrous. Bracts narrowly triangular or sepal-like (those of a pair often connate at the base), without colleters, lower above often (?) pubescent at the base, upper glabrous

above. *Flowers* 5-merous. *Sepals* connate at the base, equal or subequal, ovate or orbicular, 1–1.5 × as long as wide, 0.7–1 × 0.7–1 mm, obtuse or subacute, ciliate, glabrous on both sides or occasionally with few hairs outside, without colleters. *Corolla* in the mature bud 4–6 × as long as the calyx, (3)3.5–5 mm long, and rounded at the apex, yellow or yellowish-white, outside sparsely and minutely pubescent to glabrous, inside pilose at the base of the lobes and often in the throat; tube short, 1.5–3 × as long as the calyx, 1.3–2.5 mm long, at the throat 1.5–2 mm wide; lobes 1–1.5 × as long as the tube, oblong, 2–2.5 × as long as wide, 2–2.5 × 0.9–1.2 mm, acute, reflexed from somewhat above the base. *Stamens* exerted; filaments glabrous, 1–1.5 × as long as the anthers, 0.7–1.5 mm long; inserted at the mouth of the corolla tube; anthers oblong, 0.7–1 × 0.4–0.5 mm, glabrous, deeply cordate at the base; cells parallel. *Pistil* glabrous (or sometimes minutely papillose-pubescent), (2.2)3–3.2 mm long; ovary globose or ovoid, 1 × 0.8–1 mm, usually abruptly narrowed into the style, 2-celled; style rather long, (1.2)2–2.2 mm long; stigma capitate or obscurely bilobed. In each cell 8–25 ovules. *Fruit* small, globose, about 15 mm in diam., when dry and immature stipitate. *Seed* ellipsoid, smooth, 11 × 10 × 9 mm; testa sticking to the pulp.

Distribution: West and Central Africa.

Ecology: Rain forests or secondary forests, often on river banks; alt. 0–750 m.

Guinea: Nimba Mts., Schnell 1121 (IFAN, P).

Sierra Leone: Rowal, Thomas 1188 (K); Madima (Sept.) P. Adames 74 (K).

Liberia: Mecca, Baldwin 10835 (K); Banga, Linder 1242 (A); Nimba Mts. (Oct.) P. Adames 683 (K, P, WAG).

Ivory Coast: Issia Rock, Leeuwenberg 4127 (WAG); Bouaflé Forest, 40 km E. of Daloa, Leeuwenberg 3909 (WAG); about 25 km SW. of Guéyo, Leeuwenberg 4106 (WAG); 10 km E. of Divo, along road to Ndouci, Leeuwenberg 3985 (WAG); Amitioro Forest, near Tiassalé, Aké Assi 4479 (WAG); Yapo (Oct.) Chevalier B 22370 (P, WAG); Adiopodoumé (?), 17 km W. of Abidjan (?), Herb. I.D.E.R.T. 1574 (ABI); Banco Forest, NW. of Abidjan (Sept.–Oct.) J. de Wilde 298 (K, P, WAG), 3198 (BR, K, WAG); *ibid.*, J. de Wilde & Leeuwenberg 3438 (ABI, BR, K, WAG); 15 km NE. of Bianouan, Leeuwenberg 3943 (WAG).

Ghana: Akropong (Oct.) W.H. Johnson 802 (K, type); Alavanyo For. Res., Hohoe District (Sept.) St. Clair-Thompson 3582 (FHO), 3591 (FHO).

Togo: Misahöhe (Nov.) Mildbraed 7336 (K, paratype).

Nigeria: Ijebu, Omo Res., Tamajong FHI 20739 (FHI, FHO, K); Sapoba, Kennedy 2195 (FHI, FHO).

Cameroun: 3 km S. of Victoria, near Bimbia, Leeuwenberg 6949 (WAG); Bipindi, Zenker 3585 (BM, BR, E, G, GOET, HBG, K, L, M, MO, S, US, W, WU), Dec. 1907 (F); Nkolbisson, 7 km W. of Yaoundé, Breteler, J. de Wilde & Leeuwenberg 2282 (BR, K, P, WAG, YA); *ibid.*, Leeuwenberg 6052 (WAG); Mt. Fèbé, 3 km NW. of Yaoundé, Breteler c.s. 2235 (WAG); 6 km E. of Bertoua, Breteler 1670 (WAG, YA); 24 km NE. of Bertoua, along road to Bétaré Oya, Breteler c.s. 2441 (WAG); km 27 of same road, near Gounté, Leeuwenberg 7347 (WAG); near Toungrélo, 27 km SW. of Bertoua, Breteler c.s. 2404 (WAG).

Congo (Brazzaville): near Pikounda, Sangha R. bank (Aug.) Bouquet 1708 (P, WAG); Niari R. Valley (Oct.) Koechlin 3161 (IRSC).

Congo (Kinshasa): Léopoldville: Kizulu, Songololo Territory, Compère 988 (BR). Orientale: Yangambi (obs. 'tree' B 883) Gilbert 7966 (BR); *ibid.*, A. Léonard 825 (BR,



FIG. 21. 1-6. *S. johnsonii*: 1. branch, $\frac{1}{2} \times$; 2. branch with tendril, $\frac{1}{2} \times$; 3. flower, $4 \times$; 4. opened corolla with stamens, $4 \times$; 5. stamen, $6 \times$; 6. pistil, $5 \times$ (1. J. de Wilde 3198; 2. J. de Wilde c.s. 3438; 3-6. P. Adames 683); 7-12. *S. samba*: 7. branch, $\frac{1}{2} \times$; 8. flower, $5 \times$; 9. opened corolla with stamens, $5 \times$; 10. pistil, $8 \times$; 11. fruit, $\frac{1}{2} \times$; 12. seed, $\frac{1}{2} \times$ (7-10. Leeuwenberg 5675; 11-12. Breteker 2051).

WAG); *ibid.* (Apr.-May, Aug.) Louis 1003 (B, BR, FHO, K, S, U, UC, US), 1851 (BM, BR, K, PRE), 8862 (BR, C, K, MO, distributed as *S. goniodes*), 10692 (BM, BR, C, K, MO, NY, P, US), 14455 (BR, F, MO, S), 15930 (BR, FHO, K, PRE, UC), 16406a (BR), 16457 (BR), 16909 (BR); *ibid.*, Madoux 444 (BR); Kurukwata, Faradja Territory, Germain 8834 (BR).

Angola: Zaire: Rio Munze, Gossweiler 6652 (BM, COI, K, LISJC, LISU). Luanda: Cazengo District, Gossweiler 753 (BM, K, P).

Uganda: Buvuma Island, Victoria Lake, Bagshawe 633 (BM).

Notes. Both *S. johnsonii* and *S. samba* have square branchlets and roots with a typical odour when living. The living leaves are very little different and so the plants are easily confused in the field, if vegetative only. They can be distinguished in the herbarium (and wood-collection) as follows:

Bark with large lenticels, thick; wood creamy or pale yellow (paler than in *S. samba*); branches and branchlets hollow, with a smooth-walled cylindrical cavity or, less often, not hollow and without distinct pith, pale greenish on section when dry; leaves drying pale greenish, veins not or hardly impressed above ***S. johnsonii***

Bark not or hardly lenticellate, thin; wood yellow; branches and branchlets with square pith, which may shrink and leave a cavity in dry, young, thick branches, dark yellow on section when dry; leaves drying dark brown, with impressed main secondary veins above; tertiary venation conspicuous

S. samba

32. *S. kasengaensis* De Wild., Bull. Jard. Bot. Brux. 5: 46. 1915; Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 27, f. 8C. 1952; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 30. 1960. Fig. 29, p. 195; Map 23, p. 152

Type: Congo: Katanga, Kasenga, Bequaert 237 (BR, holotype, photograph in K, neg. 2514).

Heterotypic synonym: *S. vanderysti* De Wild., l.c.; Duvigneaud, l.c. p. 24 (*as vanderystii*). Type: Congo: Léopoldville, Bas Congo, Vanderyst anno 1914 (BR, holotype, photograph in K, neg. 2311).

Climbing shrub or liana, at least up to 12 m long and 6 m high climbing. *Branches* not lenticellate, medium brown when dry, pubescent; branchlets brown-pubescent, pale brown, and like the branches not or hardly sulcate when dry. Tendrils paired. *Leaves*: petiole pubescent, 1–4 mm long; blade coriaceous, not or slightly shining when dry, elliptic, narrowly elliptic, ovate, or narrowly ovate, 1.5–3 × as long as wide, 2.5–9 × 1.5–4 cm, on main axis and at the bases of the branches comparatively wider and often smaller, acuminate at the apex, cuneate, rounded, or – if ovate – often subcordate at the base, minutely pubescent on main veins above, sparsely pubescent beneath, especially on the veins; one pair of secondary veins from or from somewhat above the base curved along the margin, and a faint submarginal pair; tertiary venation reticulate, prominent beneath. *Inflorescence* axillary, congested, 1 × 1 – 2.5 × 2 cm, 2–4 × branched, several- to many-flowered, mostly much shorter than the

leaves. Peduncle, branches, and pedicels pubescent. Bracts small, triangular to ovate, ciliate, pubescent beneath, lower above appressed-pubescent and with large colleters at the base, upper glabrous and without colleters. *Flowers* 5-merous. *Sepals* connate at the base, orbicular or nearly so, 1.2–1.5 mm long, obtuse or rarely acute at the apex, ciliate, mostly sparsely pubescent outside, glabrous inside, without colleters. *Corolla* in the mature bud (3.5)4.7–6 × as long as the calyx, (4)6–7 mm long, and more or less tapering at the apex, white, outside sparsely pubescent or glabrous, inside densely pilose in the tube, except for the glabrous base; tube (1.3)2.3–3.3 × as long as the calyx, (0.8)1–1.3 × as long as the lobes, (1.8)3–4 mm long, widely cylindrical; lobes oblong, 2.5–3 × as long as wide (2.4)3–4 × 1–1.2 mm, acute, spreading. *Stamens* well-exserted; filaments as long as the anthers or slightly longer, up to 1.5 mm long, glabrous, inserted at the mouth of the corolla tube; anthers oblong, 1.2–1.5 × 0.6–0.9 mm, deeply cordate and bearded with few pilose hairs at the base; cells parallel. *Pistil* pilose, (4)5–7 mm long; ovary ovoid, 2–2.5 × 1.2–1.5 mm, glabrous at the very base, 2-celled, gradually narrowed into the style; style (1.5)3–4.5 mm long, only at the base pilose; stigma capitate. In each cell 15–20 ovules. *Fruit* bright yellow, rather small, rather soft, subglobose, about 3 cm in diam., about 10–20-seeded, with somewhat granular skin, slightly shining. Wall 1 mm thick when dry. *Seed* pale brown, flattened, more or less plano-convex, obliquely ovate, elliptic, or trullate, usually irregularly curved, 12–14 × 10–11 × 4–5 mm, with thick very short erect hairs, rough.

Distribution: Congo (Kinshasa), Burundi, Tanzania, Zambia.

Ecology: Riverine forests or in crevices of granitic rocks in woodlands; alt. 0–1500 m.

Congo (Kinshasa): Léopoldville: Bas Congo, Vanderyst anno 1914 (BR, type of *S. vanderysti*). Equateur: Ikela, Germain 5052 (BR, M, PRE), 7445 (BR). Katanga: Upemba Nat. Park (Oct.-Nov.) G. F. de Witte 2985 (BR, WAG), 3216 (BR, K, P, WAG); Kasenga (Feb.) Bequaert 237 (BR, type).

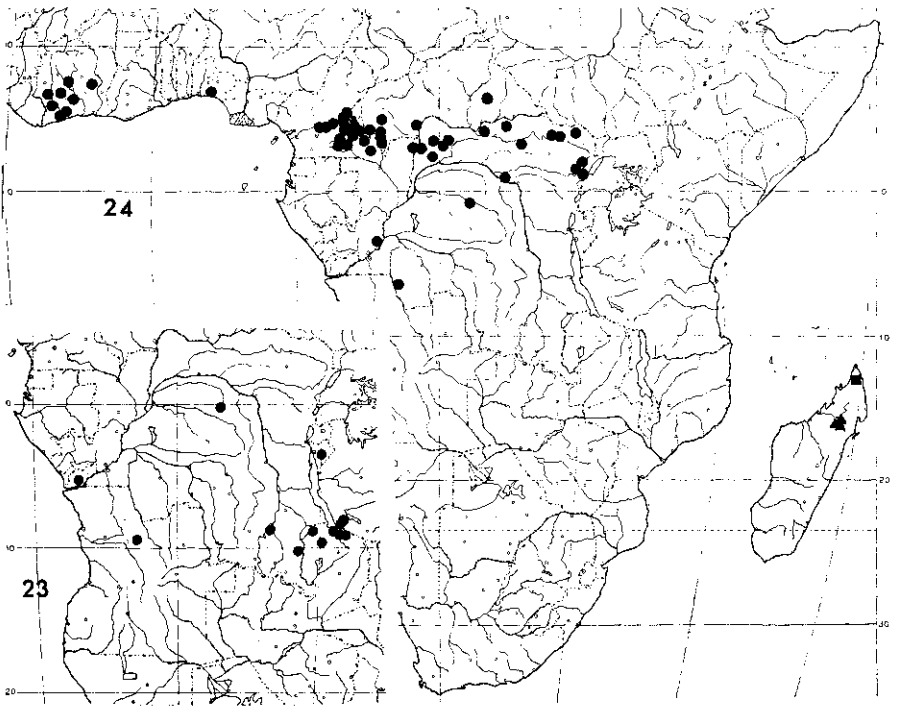
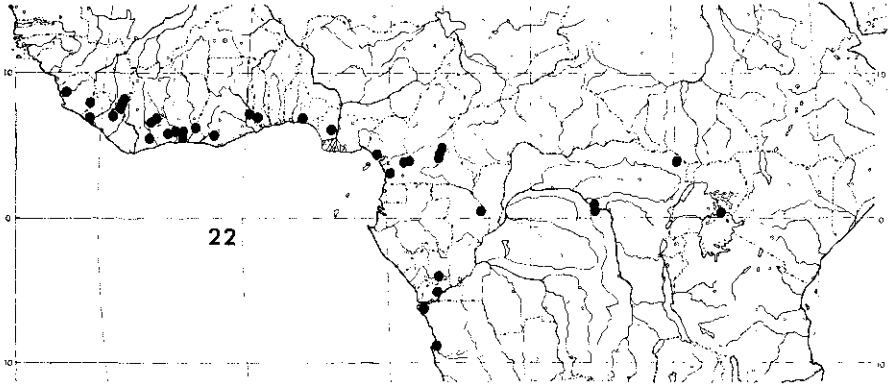
Angola: Malanje: Quela (Nov.) von Nolde 526 (BM).

Burundi: Kibimya, Mosso, Michel & Reed 1526 (BR); Nyamabuye, Mosso (fr. May) Michel & Reed 2323 (BR, PRE).

Tanzania: Ngolotivo, Sumbawanga District (fr. Dec.) Glover in coll. Bredo 6408 (BR); Kasanga (fl. Mar., fr. June, Nov.) H. M. Richards 10125 (K), 10167 (K), 11820 (K), 12299 (BR, EA, FI, K, LISC, S, SRGH).

Zambia: Puta (fr. Aug.) Fanshawe 4700 (K); W. of Mporokoso (fr. Apr.) Phipps & Vesey-Fitzgerald 3150 (K, SRGH); Abercorn District, Gerstner PRE 29240 (PRE); *ibid.*, Kalambo Gorges Escarpment, H. M. Richards 19655 (K, WAG); Kambole Escarpment, Abercorn District (Feb.) H. M. Richards 8252 B (K); between Abercorn and Mpulungu (fr. Sept.) Bullock 3335 (K); Inono R., Abercorn District (Feb.) H. M. Richards 4487 (K), 11090 (BR, K).

Notes. The types of *S. kasengaensis* and *S. vanderysti* differ from each other only slightly in a few characters. The sepals of the former are obtuse instead of acute and the branchlets and leaves are more hairy. Both the specimens collected by Germain are intermediate in these characters. Therefore, the present author prefers to unite both taxa.



MAP 22. *S. johnsonii*; Map 23. *S. kasengaensis*; Map 24. ● *S. longicaudata*, ▲ *S. mostueoides*, ■ *S. pentantha*.

S. kasengaensis is closely allied to *S. scheffleri* by the habit, leaves, inflorescences, the shape of the flowers, the fruits, and the seeds. They differ from each other as follows:

Branchlets pubescent; petiole pubescent; blade minutely *pubescent* on main veins above, sparsely pubescent beneath; corolla outside sparsely pubescent or sometimes glabrous; pistil (4)5.5–6.5 mm long ***S. kasengaensis***
Branchlets glabrous or sometimes sparsely pubescent; petiole sometimes pubescent; blade *glabrous* on both sides or sometimes beneath pubescent on the veins; corolla outside glabrous or occasionally with some hairs; pistil 6–9 mm long ***S. scheffleri***

The other closely allied species, *S. moandaensis*, usually has smaller flowers and always smooth instead of rough seeds.

33. ***S. longicaudata*** Gilg in Engler, Bot. Jahrb. 17: 570. 1893; Baker in Fl. Trop. Afr. 4(1): 527. 1903 (both as *longecaudata*); Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 44. 1963. **Fig. 22, p. 155; Map 24, p. 152**

Type: Congo: Orientale, Monbuttu, Bongwa, Schweinfurth 3610 (holotype not seen, destroyed in B; lectotype: K).

Heterotypic synonyms: *S. longecaudata* var. *niamniamensis* Gilg, l.c. p. 571. Type: Sudan: Niamniam, Assika R., Schweinfurth 3305 (holotype not seen, destroyed in B; lectotype: K). Homotypic synonym: *S. niamniamensis* (Gilg) Gilg in op. cit. 28: 120. 1899.

S. bequaerti De Wild., Rev. Zool. Afr. 10(1). Suppl. Bot. 5. 1922 (not 1915). Type: Congo: Orientale, Lesse, Semliki R., Bequaert 4119 (BR, holotype; isotype: US). Homotypic synonym: *S. nigrovillosa* De Wild., Pl. Bequaert. 2: 95. 1923.

S. brevicymosa De Wild., Rev. Zool. Afr. 10(1). Suppl. Bot. 6. 1922. Type: Congo: Orientale, Nandefa, Penge-Irumu, Ituri R., Bequaert 2579 (BR, holotype).

Climbing shrub or liana, 4–30 m high climbing over shrubs or in trees, 10–60 m long. Trunk 2.5–15 cm in diam. Bark dark brown, with large lenticels; wood pale dirty yellow or creamy. *Branches* not lenticellate, dark brown and not sulcate when dry; branchlets glabrous, with ranked hairs below the stipular line, or less often densely or sparsely pubescent, not lenticellate, terete, medium to dark green, dark brown when dry. Tendrils solitary, in the axils of ordinary leaves. *Leaves*: petiole pubescent or glabrous, 2–7 mm long; blade shining and dark green above, less shining to mat and paler beneath, papyraceous to subcoriaceous, also when living, thinner and often larger in the shade, elliptic, narrowly elliptic, narrowly ovate, or on the main axis often ovate, comparatively narrower towards the apices of the branchlets, (1.5)2–3 × as long as wide, 5.5–14(17.5) × 2–6(8) cm, acuminate to nearly caudate at the apex, the latter especially in the shade, cuneate or rounded at the base, glabrous on both sides or with some stiff brown hairs on the costa and main secondary veins beneath; one

pair of distinct secondary veins from or from above the base curved along the margin and a faint often submarginal pair; tertiary venation reticulate, not very conspicuous. *Inflorescence* axillary or occasionally terminal, solitary, more or less congested, $0.15-0.5 \times$ as long as the leaves, $1.5-4 \times 1.5-3.5$ cm, 2-4 \times branched. Peduncle and first branches not very short and as the other branches and pedicels pubescent with sometimes ranked hairs to glabrous. Bracts small, the lower often narrowly triangular, sometimes with small colleters at the base, beneath more or less and above occasionally pubescent, the other sepal-like, glabrous above and without colleters. *Flowers* 5-merous. *Sepals* pale green, connate at the base for one-third to two-fifths of their length, subequal, the inner often smaller, broadly orbicular to broadly obovate, $1-1.25 \times$ as wide as long, (1) $1.2-1.5 \times$ (1) $1.2-1.7$ mm, obtuse at the apex, ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud $2.6-4 \times$ as long as the calyx, 4(-5) mm long, and rounded at the apex, greenish-white, white, or outside pale green and inside white, campanulate or widely cylindrical, outside glabrous or sometimes sparsely pubescent (base glabrous), inside white-penicillate in the throat; tube $1.6-2.5 \times$ as long as the calyx, $1.3-1.7 \times$ as long as the lobes, $2.2-2.5(3)$ mm long, $2.2-2.8$ mm wide, not widened towards the throat, with a minute hole just above the insertion of the stamens; lobes thick, triangular, $1.1-1.5 \times$ as long as wide, $1.5-2 \times 1-1.5$ mm, acute, suberect. *Stamens* included; filaments very short, $0.3-0.7 \times$ as long as the anthers, glabrous, inserted at three-fifth from the base of the corolla tube; anthers cordate, $1-1.2 \times 0.7-0.8$ mm, deeply cordate at the base, ciliate with rather stiff hairs at the base and often outside; cells slightly divergent at the base. *Pistil* glabrous, $2.1-2.4$ mm long; ovary globose or nearly so, $0.9-1.2 \times 1-1.2$ mm, 2-celled; style short, thick, $1-1.4$ mm long; stigma capitate. In each cell 9-18 ovules. *Fruit* orange or yellow-green, small, soft when mature, ellipsoid, usually slightly longer than wide and often obscurely laterally compressed, $14-17 \times 11-17 \times 11-15$ mm, 1-seeded, with smooth skin, slightly shining. Wall thin, 1 mm thick. *Seed* dark brown, flattened, more or less plano-convex, elliptic to nearly ovate, not curved, $1.3-1.6 \times$ as long as wide, $11-15 \times 8-12 \times 3-5$ mm, very shortly pubescent, smooth.

Distribution: West and Central Africa.

Ecology: Moist places or river banks in rain forests or secondary forests; alt. 0-700 m.

Ivory Coast: 38 km E. of Duékoué, right bank Sassandra R. (Apr.) Leeuwenberg 3901 (ABI, WAG); between Daloa and Guiglo, Bernardi 8500 (K, P); 10 km W. of Tapéguhé, right bank Sassandra R., 50 km NW. of Soubré, Leeuwenberg 4512 (WAG); Zuénoula Forest, Aké Assi 6636 (WAG); 34 km N. of Sassandra, W. of Kokolopozo (Apr.) Leeuwenberg 4018 (WAG); 15 km NW. of Sassandra, Leeuwenberg 4014 (WAG); 7 km W. of Oumé, Leeuwenberg 4144 (WAG); Ananda-Mbayakro road (fl.) Bouquet 5 June 1962 (ABI, WAG).

Nigeria: Shasha For. Res., Ijebu District, Tamajong & Latilo FHI 16782 (FHI, FHO).

Cameroun: Nachtigal, left bank Sanaga R., about 20 km N. of Obala, Leeuwenberg 5999 (WAG); 29 km W. of Nanga Eboko, left bank Sélé R., near bridge in road to Yaoundé, Leeuwenberg 5986 (WAG), 5987 (WAG); km 25 of Nanga Eboko-Bertoua road, Leeuwen-

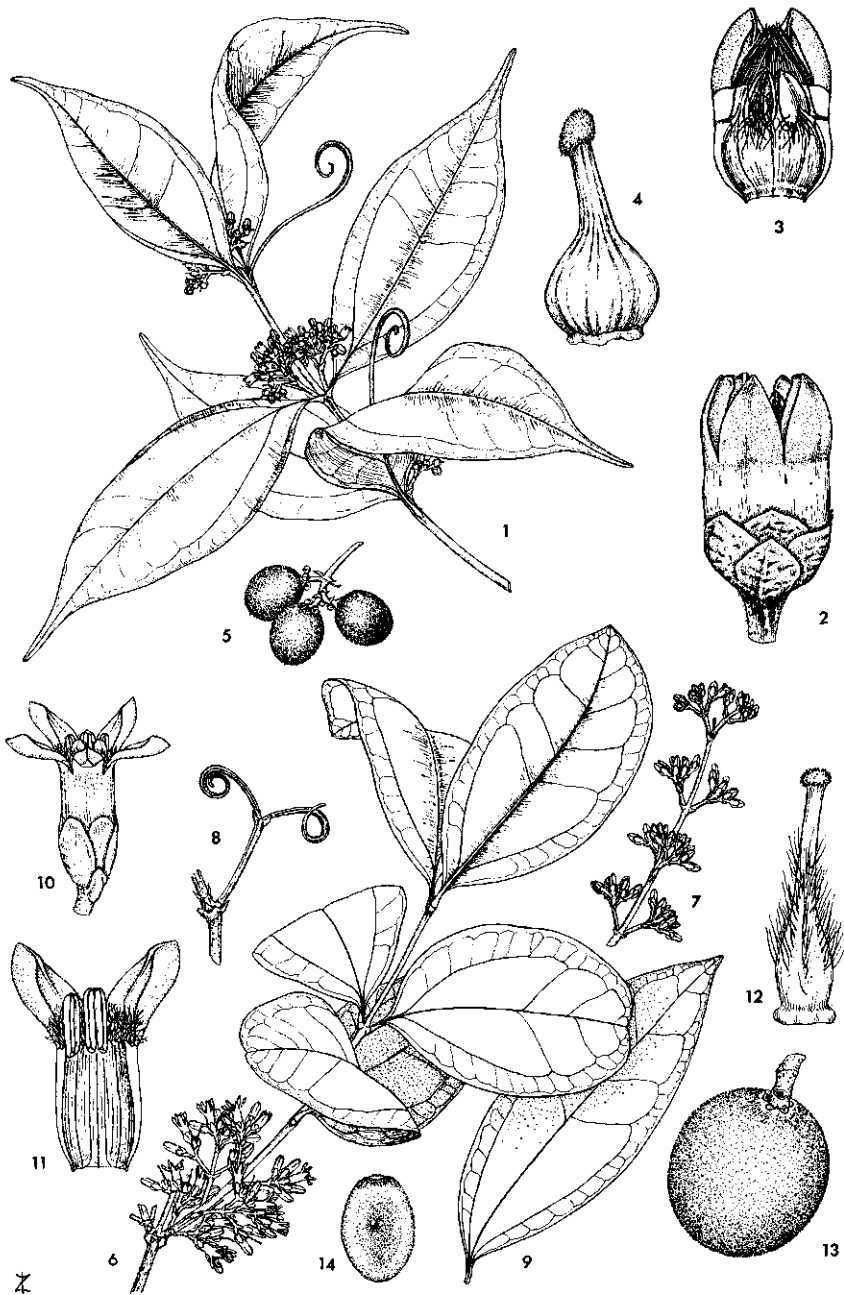


FIG. 22. 1-5. *S. longicaudata*: 1. branch, $\frac{1}{2} \times$; 2. flower, $7 \times$; 3. longitudinal section of corolla through holes above insertion of stamens, $7 \times$; 4. pistil, $14 \times$; 5. fruits, $\frac{1}{2} \times$ (1-4. Breteler 1327; 5. Breteler 2135). 6-14. *S. lucens*: 6. branch, $\frac{1}{2} \times$; 7. inflorescence, $\frac{1}{2} \times$; 8. tendrils, $\frac{1}{2} \times$; 9. leaf, $\frac{1}{2} \times$; 10. flower, $3 \times$; 11. portion of corolla with stamens, $5 \times$; 12. pistil, $6 \times$; 13. fruit, $\frac{1}{2} \times$; 14. seed, $1 \times$ (6-7, 10-12. Fanshawe 1620; 8. Farquhar 12/47; 9. Chase 4686; 13-14. Lindeman 733).

berg 7449 (WAG); 14 km S. of Djouo, 2 km E. of Somalomo, Dja R. (Feb.) Letouzey 4344 (P, WAG, YA), 4344 bis (P, WAG, YA); Asia, S. of Abong Mbang (Apr.) Letouzey 3906 (P, WAG, YA); N. of Lomié, Leeuwenberg 6616 (WAG), 6794 (WAG); near Djerem and Lom Rs. conjunction, N. of Goyoum (fr. Feb.) Mildbraed 8303 (K); Lom R., N. of Dengdeng, Mildbraed 8546 (K); 12 km N. of Ndemba II, about 40 km NW. of Bertoua, Leeuwenberg 5927 (WAG); km 17 of Doumé-Nguélémendouka road (fr. Nov.) Breteler 2135 (BR, K, P, WAG, YA); between Ndemba I and Ebaka, 44 km NW. of Bertoua (May) Breteler 2901 (BR, K, P, WAG, YA); 27 km NW. of Bertoua, near Yoko-Bétougou, Breteler 2624 (P, WAG, YA); 6 km E. of Bertoua (Apr.) Breteler 1308 (BR, K, P, WAG, YA), 1327 (BR, K, P, WAG, YA); *ibid.*, Leeuwenberg 5896 (WAG); km 27 of Bertoua-Bétaré Oya road, near Gounté, Breteler, J. de Wilde & Leeuwenberg 2373 (K, P, WAG); near Toungrélo, 27 km SW. of Bertoua, Breteler c.s. 2403 (P, WAG); *ibid.*, Breteler 2966 (BR, K, P, WAG, YA); right bank Kadeï R., 6 km W. of Batouri, near bridge in road to Bertoua (June) Leeuwenberg 5941 (WAG), 5955 (WAG); Doumé R. bank, near Bimbia, 40 km SW. of Batouri (Apr.) Breteler 2802a (WAG) = Letouzey 4759 (P, YA); Meloundou, 50 km SW. of Batouri (Apr.) Breteler 2832 (BR, K, P, WAG); near Batanga, 30 km SSE. of Batouri, Letouzey 4690 (P, WAG, YA); 20 km W. of Yokadouma, left bank la Ndjwé R., Leeuwenberg 6177 (WAG); *ibid.* (June) Letouzey 5371 (K, P, WAG, YA); Bangé, near Boumba R., Mildbraed 4400 (HBG).

Central African Republic: right bank Mambéré R., 2 km S. of Carnot, Leeuwenberg 7213 (WAG); *ibid.* (fr. July-Aug.) Sandberg Carnot 112 (Pharm. Stockh., WAG); left bank Kadeï R., 4 km from Gamboula, Leeuwenberg 7301 (WAG); left bank Mambéré R., near Bania, Leeuwenberg 7049 (WAG); Nola, Ouzilleau 2 (P); 27 km S. of Nola, along road to Salo, Leeuwenberg 7092 (WAG); Boukoko, N. of Bangui (fl. Mar.-Apr., fr. July-Sept.) Tisserant 1416 (K, P, WAG), 1440 (P, WAG), 1822 (P, WAG), 1871 (P, WAG), 2172 (P, WAG), 2417 (P, WAG), 2568 (P, WAG); Yalinga region, Le Testu 4614 (P, WAG).

Congo (Brazzaville): Batéké Plateau, Fulakari R. Falls (Jan.) Koechlin 615 (IRSC); Oubangui R., Bondjoland (Aug.) Chevalier 5164 (P).

Congo (Kinshasa): Léopoldville: Imbela, Kwango R. (fr. Feb.) Callens 3003 (BR, K); Imbela, Wamba R., Callens 4227 (BR). Equateur: Menge (Apr.) Claessens 561 (BR); Kutubongo (May) Evrard 1064 (BR), 1067 (BR); Bombura, Gemena Territory, Evrard 902 (BR, P, WAG); Karawa, Bangola District (Mar.) Goossens 4005 (BR); Gbo-Sassa (Mar.) Evrard 550 (BR); Ngelewa, Bokungu Territory, Evrard 3034 (BM, BR, WAG). Orientale: Lower Uele R. (Mar.) De Wulf 250 (BR), 719 (BR); Tukpwo, Ango Territory (Apr.) Gérard 2184 (BR, WAG), 4452 (BR, WAG); Bambesa, Buta Territory (fl. Mar.-Apr., fr. July-Aug.) Gérard 601 (BR), 1578 (BR), 3239 (BR), 5123 (BR, WAG), 5739 (BR, WAG); *ibid.*, Pittery 537 (BR), 538 (BR); Assika R., Niamniamland, Schweinfurth 3305 (K, type of *S. longicaudata* var. *niamniamensis*); Monbuttu, Bongwa (Apr.) Schweinfurth 3610 (K, type); Garamba Nat. Park (May) Troupin 1036 (BR, K, WAG); Ituri, Mildbraed 2913 (PRE); Nandefa, Penge-Irumu, Ituri R., Bequaert 2579 (BR, type of *S. brevicymosa*); Lesse, Semliki R. (May) Bequaert 4119 (BR, type of *S. bequaerti* (1922) and *S. nigrovillosa*); Yangambi (fr. June) Germain 4936 (BR, WAG); *ibid.* (fl. Dec., fr. June) Louis 4051 (BM, BR, C, EA, F, K, MO, P, US), 4055 bis (BR), 6825 (BM, BR, C, EA, K, MO, P, PRE), 6880 (BR, U, US).

Cult.: Yaoundé, Cameroun, Breteler 3002 (WAG, seedlings of herb. Breteler 2135).

Notes. The types of *S. longicaudata*, *S. longicaudata* var. *niamniamensis*, *S. nigrovillosa*, and *S. brevicymosa*, all collected near the eastern boundary of the area the species, resemble each other strikingly in all details. Therefore it was easy to recognize them as representing a single species.

When vegetative, *S. longicaudata* can be confused with several other species, especially when young. These species are e.g. *S. afzelii*, *S. boonei*, *S. floribunda*, *S. scheffleri*, *S. urceolata*, and *S. usambarensis*. In addition to other characters, *S. longicaudata* differs from all of them by the insertion of the stamens

in the tube, instead of at the mouth of the corolla, and by the inside penicillate corolla.

34. *S. lucens* Bak., Kew Bull. 1895: 97. 1895 and in Fl. Trop. Afr. 4(1): 524. 1903; E. A. Bruce, Kew Bull. 1956: 269. 1956; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 23, f. 4. 1-2 and 5. 1-3. 1960.

Fig. 22, p. 155; Map 25, p. 159

Type: Angola: Luanda, Welwitsch 6015 (BM, holotype; isotypes: C, COI, G, K, LE, LISU, P).

Heterotypic synonyms: *S. loandensis* Bak., l.c. and l.c. p. 523. Type: Angola: Luanda, Welwitsch 6016 (BM, holotype; isotypes: K, LISU).

S. milneredheadii Duvign. et Staquet, Bull. Soc. Roy. Bot. Belg. 84: 69. 1951. Type: Zambia: Matonchi R., Mwinilunga District, Milne-Redhead 2947 (BR, holotype not seen; isotypes seen: K, PRE).

Climbing shrub or liana, 3-20 m high climbing, up to at least 30 m long. Trunk 2-5 cm in diam., or more; bark dark grey, lenticellate. *Branches* lenticellate, pale grey-brown to black; branchlets glabrous or occasionally pubescent, lenticellate, especially at the base. Tendrils paired. *Leaves*: petiole glabrous or with scattered hairs, 2-7 mm long; blade shining and dark green above, paler and mat or slightly shining beneath, often thickly coriaceous (thinner in the shade) also when living, elliptic, narrowly elliptic, or narrowly ovate, 1.5-3 × as long as wide, extremely variable in size, (2)4-10(16) × (1)2.5-5(8.5) cm, acute, shortly acuminate, or sometimes rounded or subtruncate at the apex, rounded or cuneate at the base; glabrous or rarely with few hairs near the base beneath; one pair of secondary veins from above the base curved along the margin and often a faint submarginal pair; tertiary venation reticulate, prominent on both sides in dry leaves. *Inflorescence* axillary, 3-20-flowered, rather congested or lax, pubescent with brown hairs or sometimes glabrous, shortly pedunculate, 1.5-5 × 1.5-4 cm, 1-3 × branched. Bracts sepal-like, but smaller. *Flowers* 5-merous, sessile or shortly pedicellate. *Sepals* green, connate at the very base, usually subequal, ovate or broadly ovate, 1.2-1.5 × as long as wide, (1.7)2-3 × 1.5-2.2 mm, rounded or sometimes obtuse at the apex, ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 2.2-2.5 × as long as the calyx, 5.5-7.5 mm long, and rounded at the apex, pale green-yellow, glabrous outside, inside with a white densely sericeous-villose ring in the throat; tube nearly cylindrical, 1.2-1.4 × as long the calyx, 0.9-1.5 × as long as the lobes, at the base 1.5-1.8 mm, at the throat 1.5-2.5 mm wide; lobes thicker towards the apex, oblong, 2-3.3 × as long as wide, 2-4 × 1-1.2 mm, acute at the apex, spreading. *Stamens* slightly exerted; filaments glabrous, very short, inserted at the mouth of the corolla tube; anthers oblong, 1-2 × 0.5-0.6 mm, sagittate at the base, glabrous; cells parallel. *Pistil* pilose or hirto-pilose in the middle, 4.5-6 mm long; ovary ovoid, 1.5-2.5 × 1-1.5 mm, glabrous at the base, usually gradually narrowed into the

style, 2-celled; style glabrous at the apex, 3–4 mm long; stigma capitate. In each cell 15–25(30) ovules. *Fruit* orange or yellow, nearly mature glaucous, small or rather large, globose, 1.5–7 cm in diam., hard when not small, (1)10–30(45)-seeded. Wall 1–3 mm thick when dry. Pulp orange or yellow, slimy. *Seed* pale brown or ochraceous, obliquely elliptic, ovate, ellipsoid, or more or less tetrahedral, $11 \times 7.5 \times 4 - 21 \times 14 \times 5$ mm, mostly somewhat thickened at one side in the middle, rough, minutely scabrid-pubescent.

Distribution: Congo (Kinshasa), Angola, and East Africa.

Ecology: Riverine forests, gallery forests, or on rocky hills in bushlands or woodlands; alt. 0–1700 m.

Congo (Kinshasa): Kivu: Ruzizi R. Valley, Germain 7186 (B, BR, K); *ibid.*, Muniara R. (fr. May) Germain 7107 (BR, K, PRE). Kasai: Mwene-Ditu, Liben 3956 (BR, WAG). Katanga: Kundulungu Mts. base, near Lukafu, Schmitz 1883 (BR); 27 km NW. of Lubumbashi, Schmitz (obs. 1060) 6125 (BR).

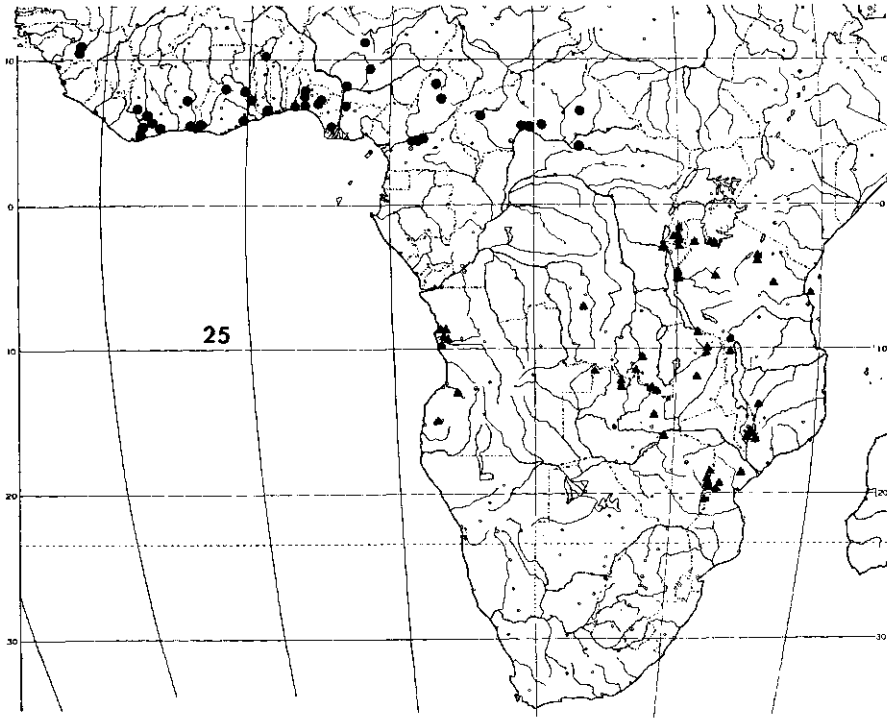
Angola: Luanda: Luanda (fl. Apr., Dec., fr. Apr.) Gossweiler 1523 (BM, COI), 1523 b (LISJC), 1523 c (LISJC), 1523 d (LISJC); Musseque de Viana (bud, fr. Dec.) Gossweiler 10545 (BM, COI, NLI), Dec. 1919 (LISJC, MO); Quiçama (fr. June) J. C. Henriques 32 (NLI, WAG); Calumbe (Jan.) Gossweiler 10519c, partly (US); Catete, near Calumbo (fr. Apr.) Monteiro, Santos & Murta 21 (LISC); *sin. loc.*, Gossweiler 260 (K, P), 299 (BM, K, P); Welwitsch 4766 (BM, LISU), 6015 (BM, C, COI, G, K, LE, LISU, P, type), 6016 (BM, K, LISU, type of *S. loandensis*), 6017, partly (BM, G, LISU). Benguela: Ganda (Aug.) Teixeira & Andrade 7070 (LISC), 7182 (LISC), 7185 (LISC). Moçamedes: Muçequê dos Neves (Apr.) Gossweiler 1530 (BM, COI).

Rwanda: near Mumuli, Byumba Territory (Oct.) Troupin 4820 (BR, EA, K, WAG), 4887 (BR, EA, K); Gabiro-Nyagatare road, Troupin 2859 (BR, EA, K); near Nyagatare, Byumba Territory (fl., fr. Sept.) Troupin 4160 (BR, EA, K); Nyagatare-Mutare (fr. Jan.) Michel 5050 (BR); Kiberizi, Nyanza Territory, Michel 4827 (BR, WAG); Muhogo-Mugesera, Kigali Territory (fr. Mar.) Becquet 472 (BR, WAG); Gabiro, Kigali Territory (fr. Dec.) Germain 2925 (BR, WAG); Mwendo, Liben 872 (ENT); Burubulura, Mugesera (Nov.) Liben 919 (BR, ENT, PRE); Mugesera region, Kigali Territory, Troupin 8385 (BR, WAG); *ibid.*, Biharago Hill (fl. Oct., fr. Sept.) Troupin 7050 (BR, K, WAG), 8136 (BR, K, NY), 8480 (BR, NY); same region, Mareba Hill (fr. Oct.) Troupin 8728 (BR).

Burundi: Mugesera R., Staner 2104 (BR); Kininya, Mosso, Michel 3893 (BR, PRE), 3893 bis (BR, WAG), Kanyinya (fl., fr. Dec.) Lewalle 2489 (WAG), 2490 (WAG); Bwinkwavu, Lewalle 2616 (WAG).

Tanzania: Ruiga R., Biharamulo District, Proctor 944 (EA); Ibondo, Geita District, Tanner 1557 (BR, K, WAG); Uzinza, W. Mwanza, Burt 6578 (BM, BR, K); Ilemera, Tanner 1901 (B, BR, FI, K, LISC, P, S, SRGH); Lake Manyara Nat. Park (Nov.) Dingle 149 (EA), 377 (K); *ibid.* (Nov.) Greenway & Kirrika 11022 (BR, EA, K); Gombe Stream Res., Pirozynski 253 (K), 311 (K); Kaboga Mts., Kigoma, Azuma 529 (EA); Ugala R., Tabora District, H. A. Lindeman 733 (BM, EA, K); Mpwapwa, Burt 4794 (EA, K); *ibid.*, Hornby 696 (EA); Rungwe District, Kymbila (fl., fr. Oct.) Stolz 923 (B, C, G, GRO, HBG, JE, K, L, LD, M, S, U, UPS, W, WAG, Z). Zanzibar: Pirani Kama (Sept.) Faulkner 2904 (BR, K); Pangajun, Vaughan 1332 (EA, K).

Zambia: Kawimbi, Abercorn District (Oct.) Richards 19200 (K, WAG); Mbesuma area, Luapula District, Astle 845 (K, SRGH); edge of Chambestic Flats, 120 km E. of Kasama (Oct.) Robinson 3939 (EA, K, M, SRGH); Matonchi R., Mwinilunga District (Oct.) Milne-Redhead 2947 (K, PRE, type of *S. milneredheadii*); Muchinga escarpment, Mpika District (Nov.) White 3786 (BM, BR, FHO, K); Solwezi, White 3221 a (FHO, K); Mutanda R., Solwezi District, Angus 462 (BM, BR, FHO, K); S. of Mutanda Bridge, Milne-Redhead 642 (BR, K); Mufulira For. Res., Holmes 263 (FHO, SRGH); Ndola (fl., fr. Oct.) Fanshawe 1575 (K),



MAP 25. ● *S. nigritana*, ▲ *S. lucens*.

1620 (BR, EA, K, LISC), 1641 (BR, EA, K, SRGH); *ibid.* (fl., fr. Dec.) Angus 912 (BM, BR, FHO, K); Chichele Bot. Res., Ndola District, Holmes 264 (FHO); *ibid.*, White 3823 (K); Broken Hill (fr. Sept.) Mutimushi 919 (K), 953 (K, P), 1028 (K); *ibid.*, Brenan & Greenway 7848 (BR, EA, FHO, K); Chibila R., Trapnell 1120 (K).

Malawi: Nyika Plateau (Jan.) Robinson 3094 (BR, K, M, PRE, SRGH); Mlanje Mt., Chapman 377 bis (FHO, K, MO); Mlanje and Mchese Mt. slopes, Chapman H/749 (K, PRE, SRGH).

Rhodesia: Chirundu Forest (Nov.) For. Dept. SRGH 48566 (K); Banti For. Res., Farquhar 12/47 (FHO, SRGH); Pungwe R. Valley, Inyanga District (Dec.) Th. C. E. Fries 3938 (LD); *ibid.* (fr. Nov.) Masterson 451 (WAG); *ibid.* (Nov.) H. Wild 5266 (K, PRE, SRGH); near Drumfad, Umtali District (Oct.-Nov.) Chase 4686 (BM, BR, COI, LISC, MO, PRE, SRGH, UPS), 5842 (BM, K, LISC, PRE, SRGH); near Umtali, Chase 318 (BM, SRGH); Melssetter District, H. Wild 3650 (SRGH); *ibid.*, Chisenga For. Res. (fl., fr. Dec.) Armitage 34/55 (K, SRGH), 174/55 (FHO, K, LISC, P, PRE, SRGH); Grampians Farm, Melssetter District, Williams SRGH 9993 (SRGH); Gungunyana For. Res., Chipinga District (Nov.) Goldsmith 49/63 (BM, BR, FHO, P, WAG); Inyamadzi R. Valley, Swynnerton 1075 (K, SRGH).

Moçambique: Niassa: *sin. loc.*, Hornby 4525 (PRE). Zambezia: Milange (fr. Jan.) Correia 454 (LISC). Manica e Sofala: Bárue, Serra de Choa, Torre 3005 (LISC); Vila Pery, Esselen PRE 29239 (PRE); Mavita (fr. Oct.) Mendonça 2582 (LISC).

Notes. *S. lucens* is most closely allied to *S. nigritana*, from which it is geographically separated. They resemble each other strikingly in habit, branches, leaves, flowers, and fruits. The most useful differential characters are:

Peduncle and pedicels pubescent or sometimes glabrous; sepals glabrous inside; mature bud 5.5–7.5 mm long; pistil 4.5–6 mm long. Central and East Africa ***S. lucens***

Peduncle and pedicels glabrous; sepals inside minutely appressed-pubescent at the base; mature bud 7.5–11 mm long; pistil 7–9 mm long. West and northern Central Africa ***S. nigritana***

35. *S. madagascariensis* Poir. in Lamarck, Enc. 8: 696. 1808; Dubuisson, extract of Du Petit-Thouars in Desvaux, Journ. Bot. Paris 1: 250. 1809; Sprengel, Syst. 1: 672. 1825 (cites Du Petit-Thouars); G. Don, Gen. Syst. 4: 65. 1838; Spach, Veg. Phan. 8: 488. 1839 (cites Poiret); De Candolle, Prod. 9: 16. 1845; Jumelle & Perrier, An. Mus. Col. Marseille Sér. 2. 5: 398. 1907.

Fig. 23, p. 163; Map 26, p. 165

Type: Madagascar: Foulpointe, Du Petit-Thouars s.n. (P, holotype, photographs in PRE and WAG).

Heterotypic synonyms: *S. dysophylla* Benth., Journ. Linn. Soc. 1: 103. 1856; Baker in Fl. Trop. Afr. 4(1): 533. 1903; Prain & Cummins in Fl. Cap. 4(1): 1054. 1909; Bruce & Lewis, l.c. p. 273 and l.c. p. 27. Type: Moçambique: Delagoa Bay, Forbes 62 (K, holotype; isotype: P). Homotypic synonyms: *S. randiaeformis* Baill., Bull. Mens. Soc. Linn. Paris 1: 246. 1880. The holotype of this synonym is the isotype of the preceding. *S. unguacha* var. *dysophylla* (Benth.) Gilg in Engler, Bot. Jahrb. 17: 564. 1893; Schinz, Mém. Herb. Boissier 10: 56. 1900 (as *ungascha*). *S. innocua* subsp. *dysophylla* (Benth.) Verdoorn, Bothalia 7: 12. 1958 and in Fl. S. Afr. 26: 145, f. 17. 1, f. 18. 1. 1963, partly (excl. Repton 1882).

S. vacacoua Baill., Bull. Mens. Soc. Linn. Paris 1: 275. 1880; Jumelle & Perrier, l.c. Type: Madagascar: Antsingui Mts., near Diégo-Suarez, Bernier 260 (P, lectotype).

S. baroni Bak., Journ. Linn. Soc. 22: 504. 1887. Type: Central Madagascar: sin. loc., Baron 4648 (K, holotype).

S. engleri Gilg in Engler, Bot. Jahrb. 17: 568. 1893 and 32: 177. 1902; Abh. Preuss. Akad. Wiss. 1894: 25, 34. 1894; in Engler, Pflanzenw. Ost-Afr. C: 310, t. 38 A. 1895; Baker, l.c. p. 532. Type: Tanzania: Usambara Mts., 'Nyika Steppe', Holst 2420 (HBG, lectotype; isotypes: K, WAG). Homotypic synonym: *S. dysophylla* subsp. *engleri* (Gilg) Bruce et Lewis, Kew Bull. 1956: 275. 1956 and in Fl. Trop. E. Afr. Loganiaceae 27. 1960.

S. quaqua Gilg in Engler, Bot. Jahrb. 17: 567. 1893 and 32: 176. 1902 and 36: 101. 1905; Baker, l.c. p. 531. Type: Moçambique: Quilimane, Stuhlmann 1041 (holotype not seen, destroyed in B, photographs seen in FHO and K; lectotype: HBG, photograph in K, neg. 2490).

S. unguacha var. *micrantha* Gilg in Engler, Bot. Jahrb. 17: 563. 1893. Type:

Tanzania: Pangani, Stuhlmann 76 (holotype not seen, destroyed in B; no isotype seen); this specimen is also paratype of *S. behrensiana* Gilg et Busse).

S. burtoni Bak., Kew Bull. 1895: 98. 1895 and in Fl. Trop. Afr. 4(1): 533. 1903. Type: Moçambique: Manica e Sofala, Chupanga, Kirk 368 (K, lectotype, designated by Bruce & Lewis). Homotypic synonym: *S. innocua* subsp. *burtonii* (Bak.) Bruce & Lewis, Kew Bull. 1956: 272. 1956 and in Fl. Trop. E. Afr. Loganiaceae 26. 1960; Verdoorn in Fl. S. Afr. 26: 145. 1963; Leeuwenberg, Act. Bot. Neerl. 14: 219. 1965.

S. wakefieldi Bak., Kew Bull. 1895: 98. 1895 and in Fl. Trop. Afr. 4(1): 532. 1903. Type: Kenya: Mombasa, Wakefield Nov. 1894 (K, holotype).

S. gerrardii N. E. Brown, Kew Bull. 1896: 162. 1896; Wood & Evans, Natal Pl. 1: 16, pl. 16. 1898 (as *gerrardi*, with syn. *mckenii*); Prain & Cummins in Fl. Cap. 4(1): 1053. 1909; Sim, Native Timbers S. Afr. 120. 1921 (with syn. *S. mckenii* Gerr.); Marloth, Fl. S. Afr. 3(1): 48. 1932 (as *gerrardi*). Type: S. Africa: Natal, Durban, Berea, J. Medley Wood 5624 (K, lectotype, designated by I. C. VERDOORN; isotypes: BM, F, US). Homotypic synonym: *S. innocua* subsp. *gerrardii* (N. E. Brown) Verdoorn, Bothalia 7: 12. 1958 and in Fl. S. Afr. 26: 147. 1963.

S. mocquerysi Aug. D.C., Bull. Herb. Boissier Sér. 2. 1: 577. 1901. Type: Madagascar: Maroa, near Antongil Bay, Mocquerys 360 (G, lectotype; isotype: Z).

S. behrensiana Gilg et Busse in Engler, Bot. Jahrb. 32: 175. 1902 and 36: 100. 1905; Baker in Fl. Trop. Afr. 4(1): 531. 1903; De Wildeman, Mem. Inst. Roy. Col. Belg. 8(13): 28. 1946 (as *belviensiana*). Type: Tanzania: Sachsenwald, near Dar-es-Salaam, Busse 15 (LY, lectotype; isotype: G).

S. leiocarpa Gilg et Busse in Engler, Bot. Jahrb. 36: 103. 1905. Type: Tanzania: Lindi District, near Mtange, Busse 2458 (LY, lectotype; isotypes: BR, EA).

S. melonicarpa Gilg et Busse, l.c. p. 101, f. 2 B. Type: Tanzania: Pangani District, near Mnyuzi, Busse 2266 (holotype not seen, destroyed in B; lectotype: LY; other isotypes seen: EA, P: fruit only).

S. pachyphylla Gilg et Busse, l.c. p. 96; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 35. 1960. Type: Tanzania: W. Usambara Mts., Kwai, Eick 332 (holotype not seen, destroyed in B; no isotype seen).

S. polyphylla Gilg et Busse, l.c. p. 104. Type: Tanzania: Kilwa District, Matumbi Mts., Busse 3058 (BM, lectotype; isotypes: BR, EA, G, HBG, LY).

S. stenoneura Gilg et Busse, l.c., p. 103. Type: Tanzania: Lindi District, near Mayanga, Busse 2537 (HBG, lectotype; isotypes: BM, BR, EA, LY, WAG; BRUCE & LEWIS designated the destroyed B sheet as lectotype).

S. innocua subsp. *burtonii* var. *glabra* Bruce et Lewis, Kew Bull. 1956: 273. 1956 and in Fl. Trop. E. Afr. Loganiaceae 26. 1960. Type: Tanzania: Tanga District, Kwamkembe-Pongwe, Greenway 4851 (EA, holotype; isotypes: FHO, K).

Often many-stemmed and much-branched shrub or small tree, 1.50–10(20) m high, deciduous. Trunk 7–60 cm in diam., mostly branched from low down. Bark mostly pale grey or greyish-white, smooth; wood whitish. Branches pale

grey to dark brown, powdery or not, lenticellate or not, smooth; branchlets – if lenticellate – then like the branches, glabrous or pubescent, terete. *Leaves*: petiole glabrous or pubescent, often short, 1–5 mm long; blade shining and dark green above, paler beneath, coriaceous or papyraceous, very variable in shape and size, suborbicular, elliptic, narrowly elliptic, obovate or narrowly obovate, (1)1.5–4(5) × as long as wide, 2–10(15.5) × 1–4(5.5) cm, rounded, or, especially in Madagascar and near the coast in Moçambique and Natal and furthermore elsewhere in shade branches acute or acuminate at the apex, cuneate or rounded at the base, glabrous or pubescent on both sides; one or two pairs of distinct secondary veins from or from above the base curved along the margin and often a faint submarginal pair; tertiary venation reticulate, not or slightly prominent above. *Inflorescences* axillary or ramiflorous, usually several together, very short and nearly fasciculate, 1 × 1–2 × 1.5 cm, 1–2 × branched, few-flowered. Peduncle, branches, and pedicels short or very short, pubescent or glabrous. Bracts small, sepal-like, above glabrous or with some minute hairs at the base, without colleters. *Flowers* 4-merous. *Sepals* pale green, free or nearly so, subequal, the inner slightly smaller, ovate, broadly ovate, or suborbicular, 1–1.6 × as long as wide, 1.7–2.5(3) × 1.5–2.2 mm, rounded or obtuse at the apex, ciliate, glabrous or pubescent outside, glabrous or with some minute appressed hairs at the base inside, without colleters. *Corolla* in the mature bud (1.8) 2.8–3.3(3.6) × as long as the calyx, (4.5)5–8 mm long, and tapering and obtuse at the apex, white or greenish-yellow, glabrous outside, inside with a brush-like ring of white lanate hairs in the throat and just on the base of the lobes; tube cylindrical or nearly so (1)1.2–1.8(2.2) × as long as the calyx, 0.7–1.7 × as long as the lobes, 2.5–4.5(5) mm long, 1.5–2.8 mm wide at the throat; lobes thick, narrowly triangular, 1.5–3 × as long as wide, 2–3.6 × 1–1.9 mm, acute or subacute, spreading. *Stamens* hardly exerted; filaments extremely short, inserted at the mouth of the corolla tube, glabrous; anthers oblong, about twice as long as wide, 1.2–1.8 × 0.6–0.8 mm, glabrous, deeply cordate or sagittate at the base; cells parallel. *Pistil* hirtopilose in the middle, (3.5)4–6 mm long; ovary narrowly ovoid or oblong, 1.5–3 × 0.8–1.5 mm, hirtopilose at the very apex, further glabrous, often with a disk-like base, gradually narrowed into the style, 2-celled; style thick (2)2.5–4 mm long, at the base hairy like the ovary at the apex; stigma capitate. In each cell 5–30 ovules. *Fruit* orange or yellow, nearly mature bluish-green, large or sometimes rather small, hard when not small, globose, 2–8(10) cm in diam., with about 5–50 seeds, with somewhat granular skin, slightly shining. Wall mostly thick, (1)2–4 mm thick, thicker above the pedicel, brittle like in *S. nigriflora* in mature fruits, hard and not broken by hand when nearly mature and/or dry. Pulp orange, slimy, edible. *Seeds* pale ochraceous, flattened or not, often more or less plano-convex, obliquely ovate, elliptic, or tetrahedral, usually irregularly curved, 1.4–1.8 × as long as wide, 11–25 × 6–18 × 5–8 mm, with thick very short erect hairs, rather rough.

Distribution: East and South Africa, and Madagascar.

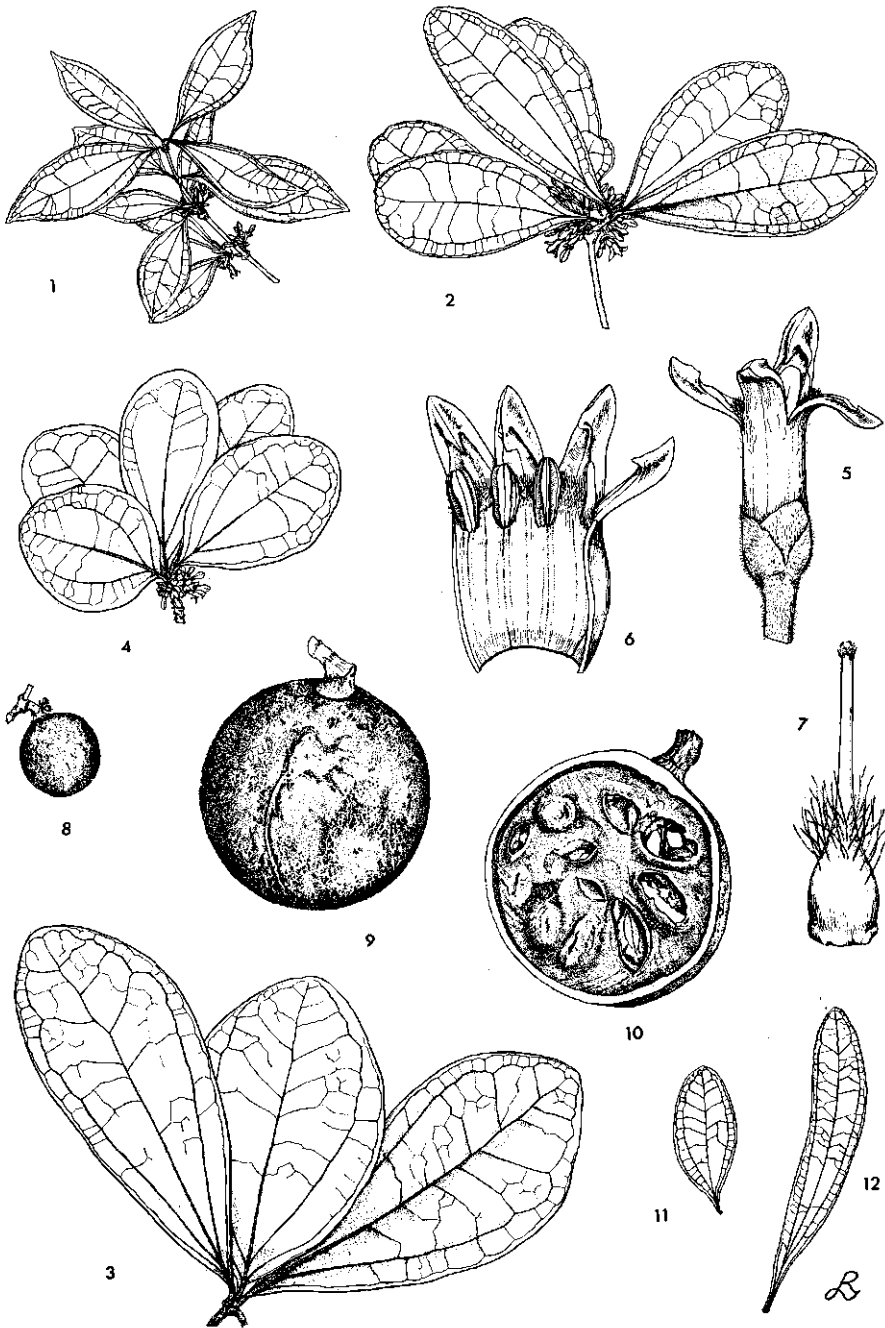


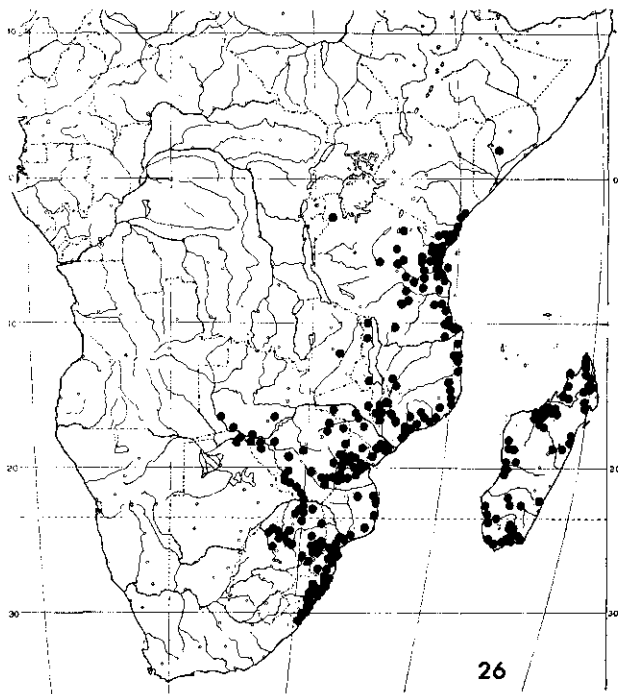
FIG. 23. *S. madagascariensis*: 1-4. branches, $\frac{1}{2} \times$; 5. flower, $4 \times$; 6. opened corolla with stamens, $5 \times$; 7. pistil, $8 \times$; 8-9. fruits, $\frac{1}{2} \times$; 10. dried slice of nearly mature fruit, testae sticking to the pulp, $\frac{1}{2} \times$; 11-12. leaves, $\frac{1}{2} \times$ (1. Capuron 892; 2. Barbosa 2596; 3. Ward 4046; 4-7. Mendonça 3048; 8. Peter 13345; 9. Haerdi 25; 10. Ward 4092; 11. Welch 414; 12. B. D. Burt 5366).

Ecology: Deciduous woodlands, gallery forests, or coastal forests; alt 0–1800 m.

Somalia: Fra Goriei e El Magu (fr. July) Paoli 637 (FI, e).

Kenya: Kipini Forest, Lamu District (fr. May) Bally 230 (EA, FI, K, PRE, eg); Kurawa, 50 km S. of Garsen, Polhill & Paulo 616 (BR, K, e); Kisigao Mt., Teita District, Joanna in coll. Greenway 8895 (EA, eg); Mackinnon Road, Kwale District, MacArthur B 228 (EA, e); between Samburu and Mackinnon Road (fr. Aug.) Drummond & Hemsley 4077 (B, BR, EA, K, LISC, S, be); Kipingoni, near Mwachi, Templer 1276 (BM, FHO, PRE, be); Rabai, Mombasa District (fr. Aug.) van Someren 331 (EA, e); Kayakauma, W. E. Taylor 11 Apr. 1886 (BM, b); Mowesa (Apr.) Graham 297 (EA, FHO, be); Fumbini, near Kilifi (fr. Sept.) Swynnerton K 19 (EA, e), K 47 (EA, e), 83 (K, e), 250 (K, eg); near Roka, Kilifi District (June) I. R. Dale K 3803 (BR, EA, K, be); Arabuko, Kilifi District (Mar.) Graham comm. H. M. Gardner 2292 (EA, FHO, K, P, e); *ibid.*, Graham 375 (FHO, e); Mombasa, Boivin annis 1847–1852 (P); *ibid.* (fl.) Wakefield Nov. 1894 (K, e, type of *S. wakefieldi*); 5 km S. of Diani (fr. July) M. E. Church 79 (BR, EA, K, bd); Nyali, Mombasa District, Birch 62/115 (EA, eg); Mtwaba, Mombasa District, Birch 62/206 (EA, b); Port Tudor, Mombasa, MacNaughtan K 2622 (EA, K, e); Kwale (fl., fr. Nov.) Graham 237 (EA, FHO, bd); Shinba Hills, km 16 of Kwale-Tanga road, Wilkinson 6 (EA, eg); Kwale District, Moomaw 1454 (EA, bg); Mchombe, Miss. Consolata 172 (FI, TOM, bg); *sin. loc.*, Barbe Baker anno 1926 (K, bd); Cons. of Forests (= Graham?) 237 (BM, MO, NY, PRE, be); Kenya (?), *sin. loc.*, A Whyte 17 (BM, be).

Tanzania: Lake Province: Kikoma Hill, Biharamulo District (Dec.) Proctor 1102 (EA, K, dg). Northern Province: Makuyuni District, Koritschoner 1387 (EA, e); near Makuyuni (fr. Feb.) Peter 15331 (B, e); *ibid.*, Koritschoner 1179 (EA, K, e). Tanga Province: Msala, Umba Savanna, Peter 13345 (B, e); Nyika Savanna, Usambara, Holst 2420 (HBG, K, lectotype of *S. engleri*); Lushoto District, Gillman 834 (EA, b); Kwasemaiko, E. Usambaras (fr. Oct.) Greenway 6035 (EA, FHO, K, bd); Bwiti, Maramba, E. Usambaras, Peter 20511 (B, bg); between Maneno Mbangu and Mukinduro, E. Usambaras (Dec.) Peter 22285 (B, bg); N. of Kiberaschi, Handeni District, Burt 4896 (EA, FHO, K, e); Kwediboma, N. Unguru, Busse 313 (G, b); 8 km SE. of Ngomeni, Tanga District (fr. Aug.) Drummond & Hemsley 3570 (BR, EA, FI, K, LISC, S, eg), 3611 (B, BR, EA, K, LISC, b); Amani, Claus 1658 (EA, d); between Makumba and Korogwe, E. Usambaras, Peter 12662 (B, bg); near Korogwe, Peter 18497 (B, bg); Kangata, Handeni District (Nov.) Semsei FH 2895 (EA, FHO, K, b); between Hale and Tanga, Peter 40450 (B, b); between Male and Mnyussi, Peter 8320 (B, bg); between Hale and Pangani R. Falls, Peter 8351 (B, bg); Msubugwe For. Res., Pangani District (fr. Sept.) Mgaza 70 (EA, K, eg); Masaiyika (fr. Jan.) Tanner 3927 (BR, K, bg); Karoti (Feb.) Tanner 3423 (BR, K, WAG, b); Mafui, Tanner 3710 (BR, K, b); Mkuzikataani, Tanner 2298 (K, b); Kipumbwi, Pangani District (fr. Sept.) Tanner 3698 (BR, K, be); Lutindi, Braun G 7687 (EA, bg); Kibuguni District (fr. Nov.) Greenway 4761 (EA, FHO, K, be); Ngole, Tanga District, Greenway 4935 (EA, FHO, K, PRE, e); near Amboni, Bally 167 (EA, b); *ibid.*, Burt 5366 (A, BM, BR, EA, FHO, K, P, b); *ibid.*, Holst 2711 (COI, HBG, K, e); *ibid.*, Peter 23922 (B, bg), 24014 (B, e); Mierami, near Tanga, Bally 165 (EA, b); Kigibweni (Feb.) Faulkner 1966 (BR, K, S, be); between Kwamkembe and Pongwe, Greenway 4851 (EA, FHO, K, b, type of *S. innocua* subsp. *burtonii* var. *glabra*); Tengeni, Greenway 1966 (EA, FHO, K, b); Machui, about 15 km S. of Tanga (fr. Nov.) Milne-Redhead and P. Taylor 7283 (B, BR, EA, K, LISC, e); Kigombe, Peter 39691 (B, b); near Mnyuzi, Pangani District (fr. Apr.) Busse 2266 (EA, LY, P: fr. only, b, type of *S. melonicarpa*). Central Province: Kondoa-Irangi, Burt 312 (K, bd); Mayoni District, 11 km E. of Itigi Station, Greenway & Polhill 11444 (K, dg); Meia Meia, N. of Dodoma (fr. Aug.) Greenway 798 (EA, FHO, K, d); Ugogo, Bahi-Kitalalo, Peter 33276 (B, bd); Mpwapwa, H. E. Hornby 428 (EA, K, d); Mlali, Kilosa Road to Mpwapwa, Burt 4754 (FHO, K, WAG, d). Southern Highlands Province: Iringa, Braun 1256 (EA, b). Eastern Province: Kilosa, Burt 5019 (EA, K, bd), 5088 (= 88) (BM, EA, K, bg); 13 km NE. of Kingolwira, Morogoro (Nov.) Welch 414 (EA, K, SRGH, e); Mtibwa For. Res., Morogoro District (Nov.) Semsei 1440 (EA, K, PRE, b); near Kwa-Medoë, W. Useguha (fr.



MAP 26. *S. madagascariensis*.

Sept.) Busse 321 (G, HBG, LY, P: fr. only, eg); between Sindeni and Kinamo, Useguha, Peter 7485 (B, e); between Bagamoyo and Mandera, Sacleux 531 (P, b); Bagamoyo, Sacleux 29 (P, bd); Bana For. Res., Bagamoyo District (Oct.) Mgaza 771 (K, b); Bagamoyo Road, Dar es Salaam (Nov.) Vaughan 2513 (BM, EA, e); Sachsenwald, near Dar es Salaam, Busse 15 (G, LY, b, lectotype of *S. behrensiana*); Kidongwe, Swynnerton 1106 (BM, bg); between Msenga and Mafisi, Usaromo, Busse 114 (G, bg); Mahenge, Ulanga Valley (Nov.) Schlieben 1501 (BR, Z, b); Ifakara, Haerdi 25 (EA, K, b). Southern Province: Matumbi Mts., near Kilwa, Busse 3058 (BM, BR, EA, G, HBG, LY, b, lectotype of *S. polyphylla*), 3063 (EA, bg, paratype of *S. polyphylla*), 3126 (EA, bd); Ngeregere, near Kilwa, Busse 3031 (EA, b); Noto-Plateau, Busse 2922 (EA, b), 2923 (EA, b), 2925 (EA, b); near Kipunga, Upper Namgaru R. Valley, Lindi District, Busse 2938 (EA, bg); Lutamba Lake, W. of Lindi, Busse 2520 (BR, EA, LY, b); ibid. (Oct.) Schlieben 5414 (B, BM, BR, G, M, P, S, Z, b); Muera Plateau, Busse 2616 (EA, b), 2877 (EA, b); Rondo Plateau (Nov.) Eggeling 6724 (EA, FHO, K, PRE, bd); near Mtange, Busse 2458 (BR, EA, LY, bg, lectotype of *S. leiocarpa*); Mayanga, Busse 2537 (BM, BR, EA, HBG, LY, b, lectotype of *S. stenoneura*), 2544 (EA, bg, paratype of *S. stenoneura*), 2545 (EA, b), 2552 (EA, b); Msamala, Nkunde, Tanner 72 (EA, bd); Mnima, Gillman 1287 (EA, K, b); Njonga, Gillman 1391 (EA, K, be); Newala, Gillman 1076 (EA, bd); near Mtwara (fr. Aug.) Wilkinson 81 (EA, be); S. of Gumbiro (Jan.) Milne-Redhead & P. Taylor 8552 (B, BR, EA, K, LISC, P, SRGH, bd). Zanzibar: Walezo Ridge (fl., fr. Feb.) Vaughan 1279 (K, b); Chwaka (Dec.) Vaughan 2181 (BM, FHO, PR, eg); Kama (Jan.) Faulkner 3149 (BR, K, P, S, b); Masingini Ridge, Greenway 1289 (EA, K, b); sin. loc., Burton anno 1859 (K, b, paratype of *S. burtoni*); Kirk 96 (K, b).

Zambia: Luangwa Game Res., Mpika District, Mitchell 2855 (K, e); 3 km N. of Nangweshi, Barotseland, Codd 7130 (K, PRE, d); Sesheke, White 1990 (BR, FHO, K, d); Katom-

bora, Livingstone District (Sept.) Morze 11 (FHO, d); near Livingstone (?), J. D. Martin 752 (FHO, d); near Victoria Falls, Hutchinson & Gillet 3494 (BM, K, d); Gwembe, Bainbridge 201/55 (FHO, K, d).

Malawi: Karonga District, G. Jackson 1259 (BR, FHO, K, bd); Rumpi District, G. Jackson 1336 (FHO, d); Rumpi, Trump 63 (EA, bd); Lake Coast, near Salima, Burt 6075 (BM, BR, K, bd); near Zomba, Clements 509 (FHO, d); between Nyenyezi Estate and Zomba, Burt-Davy 21834 (FHO, bd); Zomba District, Townsend 254 (FHO, bd); Shire Highlands (July) Buchanan 478 (E, K, bd); Shire R. Valley, H. Waller, comm. Kirk Dec. 1865 (K, bd, paratype of *S. burtoni*); Mlanje Mt., Chapman 379 (BM, BR, FHO, K, PRE, b); Likubula Gorge, Mlanje District, Brass 16373 (K, MO, NY, SRGH, US, bd); Chiromo, Burt-Davy 22256 B (FHO, b); sin. loc., Buchanan 93 (K, US, bd); Topham 83 (FHO, bd).

Rhodesia: Darwin, Chorley 6051 (SRGH, bd); Chipoli, Mazoe District (Nov.) Moubray SRGH 8777 A (K, LISC, PRE, SRGH, d), 8777 B (SRGH, bd); Suskwe R., Mtoko District (Dec.) Phelps 82 (K, MO, SRGH, d); Victoria Falls, Armitage 46/60 (SRGH, d); *ibid.*, T. R. Sim 19283, partly (PRE, d); Gwasi R., Wankie District, Armitage 83/60 (SRGH, d); Wankie, Rogers 13407 (K, d); Gwampa For. Res., Nkai District, Armitage 28/60 (SRGH, bd); Kariangwe, Sebungwe District (Nov.) Lovemore 193 (PRE, SRGH, d); Umniati R., Hartley District, Gowe, Whellan 429 (SRGH, d); Inyanga, McGregor A 42/39 (FHO, bd); Umtali District, Pardy 221/33 (FHO, b); *ibid.* (Dec.) Chase 6256 (K, PRE, SRGH, bd), 6260 (K, LISC, PRE, SRGH, bd); Umtali Commonage (Nov.) Chase PRE 29242 (PRE, bd); Buhera District (Nov.) Davies 626 (SRGH, bd); Odzi R. Valley, Munch 22 (PRE, bd); Hot Springs, Melsetter District (Nov.) Chase 4705 (BM, COI, LISC, MO, PRE, SRGH, d); Ndima Res., Melsetter District, Masterson 233 (WAG, b); Mchabezi R., Bulawayo District, Hopkins SRGH 8269 (K, SRGH, d); Matopos District, World's View, O. B. Miller B/811 (PRE, bd); Matobo (July) Hodgson 8/52 (K, MO, PRE, SRGH, bd); Matobo District (Nov.) O. B. Miller 1947 (SRGH, d); *ibid.*, O. West 2535 (SRGH, bd); Dianas Pool, Orpen 058/50 (SRGH, d); Ft. Victoria District, H. Wild 3016 (BR, K, PRE, S, d); Mtilikwe R., Ndanga District, Kirkham 47/51 (FHO, SRGH, d); *ibid.*, Mylne 28/51 (FHO, SRGH, d); *ibid.*, H. Wild 2775 (BR, K, SRGH, bd); Ndanga District, Armitage 102/55 (SRGH, be); Chiredzi R., Ndanga District, Gibson 61/51 (SRGH, d); Sabi R. Valley, Humbert 15648 (P, dg); *ibid.*, Mackintosh SRGH SRGH 23851 A (SRGH, bd); Chipinga District, Farrell 164 (SRGH, b); 80 km S. of Bulawayo, Rodin 4510 (F, K, MO, PRE, SRGH, UC, US, d); Doddieburn Ranch, Davison 55 (FHO, PRE, US, bd); Marangutzi Mts., Boughy 2874 (SRGH, d); Lundi R. area, Mullin 94/51 (SRGH, d); Lundi R., Nuanetsi District (Dec.) Davies 2263 (K, SRGH, bd); Beit Bridge (Nov.) Davies 2826 (K, SRGH, d), 2835 (SRGH, d), 2836 (K, PRE, SRGH, d).

Moçambique: Niassa: Amaramba (fr. Oct.) Mendonça 661 (LISC, d), 882 (LISC, d); sin. loc., Hornby 2544 (PRE, d). Cabo Delgado: Mocimboa da Praia Division, Gomes Pedro 5196 (EA, bd); km 28 of Pangiri-Macomia road, Balsinhas 68 (BM, b); between Quissanga and Ingoane, Barbosa 2050 (LISC, PRE, g); Quissanga (fl., fr. Oct.) Barbosa 2324 (LISC, bd); Mecufi, Barbosa 1830 (LISC, g). Moçambique: Erati, Namapa (fr. Oct.) Mendonça 1134 (LISC, b); Erati, Nacarua (fr. Oct.) Mendonça 1158 (LISC, b); between Namapulo and Namina (Oct.) Barbosa 2596 (LISC, bd); between Mogincual and Quixaxe, Gomes Pedro 4690 (EA, be); Nametil, Gomes Pedro 4443 (EA, b); Moma, Barbosa 1768 (LISC, b); *ibid.*, Gomes Pedro 4500 (EA, b). Tete: Zóbuê, Torre 5789 (LISC, b); Tete, Kirk Feb. 1859 (K, d); Sisitso, Zumbo District, Chase 2778 (BM, bd); Tete, along road to Chioco, Mendonça 476 (LISC, d); km 7 of Tete-Changara road, Torre & Correia 15303 (LISC, d). Zambézia: Milange, Torre 3421 (LISC, b); between Mocuba and Milange, Torre 4925 (LISC, b); Errego, 3 km from Ile Mt., Torre & Correia 14963 (LISC, bd); km 55 of Alto Molócuê-Gilé road (Oct.) Barbosa & Carvalho 4440 (K, SRGH, b); km 31 of Gilé-Namirroê road (Oct.) Barbosa & Carvalho 4349 (K, b); Mocubela (Oct.) Torre 4683 (LISC, b); km 9 of Muallama-Naburi road, Barbosa & Carvalho 4311 (K, bg); km 58 of Mocuba-Maganja da Costa road, Barbosa & Carvalho 4180 (K, b); between Mabala R. and Maganja da Costa, Barbosa & Carvalho 4233 (K, bd); Namacurra, Torre & Correia 14384 (LISC, bd); Quilimane, Stuhlmann 1041 (HBG, b, type of *S. quaqu*). Manica e Sofala: Bárue, Mengari, km 54 of road to Tambara (Dec.) Torre & Correia 13694 (LISC, d); Gorongosa Nat. Park, Torre & Paiva 9030 (LISC, bd); Cheringoma

Inhaminga, Torre 3069 (LISC, b); *ibid.*, Mendonça 4332 (LISC, b); Cheringoma, Inhamitanga (Sept.) Simão 13 (LISC, b); Chupanga (Jan.) Kirk 368 (K, lectotype of *S. burtoni*); Kongone, Zambesi R. mouth, Kirk 23 Nov. 1859 (K, b, paratype of *S. burtoni*), Jan. 1861 (K, b, paratype of *S. burtoni*); Chimoio, Garcia 132 (LISC, b), 160 (LISC, b); *ibid.*, Andrada 1240 (LISC, b); Garuso, near Chimoio, Gilliland 1836 (BM, FHO, K, PRE, b); Bandula, Chibuli, Honey 753 (K, PRE, bd); Chimoio, km 12 of Vila Pery-Vila Manica road (Nov.) Torre & Correia 13218 (LISC, b); Vila Pery, Surcouf 419 (P, b); Cheringoma, between Dondo and Inhaminga, Torre 4153 (LISC, bd); Mavita, Barbosa 862 (LISC, b), 1023 (LISC, bg), 1554 (LISC, bd); Dombe, Lucite R. (Oct.) Gomes Pedro 4434 (BR, K, PRE, b); Goonda (Oct.) Gomes Pedro 4318 (LISJC, PRE, bd); Madanda Forests, Swynnerton 1078 (K, bd); Matarara do Lucite, 10 km on the way to Muxanda (Oct.) Gomes Pedro 4264 (K, PRE, b); Gazaland, Earthy BOL 26398 (BOL); *ibid.*, Boka (Dec.) Swynnerton 1960 (BM, b); Lower Buzi R., Swynnerton 1077 (K, SRGH, b); *ibid.*, Chibava (Dec.) Swynnerton 1076 (K, b), 1961 (BM, b); Chirinda, Anonym. 413 (COI, bd); *ibid.*, Lower Buzi R., Swynnerton 1959 (BM, K, b); Chironde, Buzi, Simão 881 (K, b). Gaza: between Mabelane and Mabote, Barbosa & Lemos 8635 (K, LISC, PRE, bd); Caniçado, Gomes Pedro 1281 (PRE, bd); between Chongoene and Chibuto, Macedo & Balsinhas 1097 (K, d); *ibid.*, Gomes Pedro 1516 (PRE, d); Bilene, S. Martinho (Nov.) Gonçalves-Sanches 13 (LISC, bg). Inhambane: Bazaruto Island (Oct.) Mogg 28760 (K, d); between Vilanculos and Rio das Pedras (Nov.) Torre 3832 (LISC, bd); between Vilanculos and Mambone, Torre 2749 (LISC, bd); Vilanculos, 25 km from Mapinhane, road to Funhalouro (fr. Aug.) Mendonça 47 (LISC, gm); Massinga, Mendonça 1894 (LISC, b); *ibid.*, Torre 2686 (LISC, bd); km 6 of Panda-Mangorro road, Barbosa & de Lemos 8533 (K, LISC, d). Lourenço Marques: Manjacaze, Torre 2540 (LISC, bd); Manhiça, Pomba Guerra 316 (COI, bd); between Marracuene and Manhiça, Barbosa & de Lemos 8285 (K, d); between Lourenço Marques and Marracuene, Torre 1812 (LISC, bd); Marracuene, Barbosa 171 (COI, d); Lourenço Marques, Hornby 922 (LISC, bd); *ibid.*, Quintas 206 (COI, bd); *ibid.*, T. R. Sim (?) 6226 (PRE, bd); *ibid.*, T. R. Sim 20646 (PRE, b); *ibid.*, Watt & Brandwijk 1503 (PRE, bd); Katemba (Dec.) Schlechter 11615 (BM, BOL, BR, COI, E, EA, G, GRO, HBG, K, LE, P, PR, Z, d); Delagoa Bay, Forbes 62 (K, P, type of *S. dysophylla* and *S. randiaeformis*); *ibid.*, Junod 177 (BR, G, bd), 409 (LISC, PRE, bd), 426 (BR, P, d); Inhaca Island, Mogg 27202 (PRE, SRGH, bd); 30048 (K, d); Maputo (Dec.) Hornby 923 (LISC, bg); *ibid.*, Porto Henrique, Torre 2083 (LISC, bd); 2 km E. of Porto Henrique, Gomes e Sousa 3804 (COI, K, PRE, bg), 3888 (COI, K, PRE, e); Maputo, Goba (fl. Nov.-Dec., fr. Nov.) Mendonça 1613 (LISC, bd), 1653 (LISC, g), 3047 (LISC, d), 3048 (LISC, d), 3052 (LISC, bd), 3429 (LISC, bd), *ibid.* (Dec.-Jan.) Barbosa 39-A (PRE, d), 711 (LISC, g), 730 (LISC, dg); *ibid.* (Nov.) Torre 2033 (LISC, bd); *ibid.* (fr. July) Verdoorn PRE 29241 (PRE, d); between Goba and Catuane (Oct.) Torre 1860 (LISC, bd).

Botswana: near Kazungula, O. B. Miller B/109 (FHO); Chobe R., van Son TRV 28860 (BM, F, K, PRE, d).

Swaziland: Ngonini, Pigg's Peak District (Oct.) Compton 28212 (NBG, d); Hlatikula District (Oct.) Compton 28121 (K, NBG, bd).

S. Africa: Transvaal: Limpopo R., near Messina (Dec.) Hutchinson 2108 (BOL, K, d), 2126 (BOL, K, d); Soutpansberg, Smuts & M. C. Gillet 4084 (K, d); *ibid.*, For. Dept. PRF 615 (PRF, d); Makonde, 24 km NE. of Sibasa, Codd 6820 (K, SRGH, de); N. side of Wyllies Poort, Soutpansberg (Dec.) J. B. Gillet 3010 (BOL, d); *ibid.*, Story 5951 (PRE, WAG, d); 3 km S. of Wyllies Poort, Meeuse 10188 (BM, FHO, K, M, d); N. slopes of Soutpansberg, Obermeyer, Schweickert & Verdoorn 161 (PRE, dg); Munnik, Gerstner 5813 (PRE, d); Calais, Letaba District, Renny 115 (K, d); Krantzberg, Dyer & Verdoorn 4213 (PRE, bd); Spruytskloof, Waterberg District (Feb., Sept., Dec.) Theron 2006 (FHO, K, M, d), 2014 (FHO, K, M, PRE, bd), 2023 (BR, J, M, bd); W. of Blueberg and Hangklip Mts., T. Baines 4 Nov. 1871 (K, d); 6 km NE. of Nylstroom, Waterberg District, Marais 902 (K, d); between Nylstroom and Warmbad, Wedermann & Oberdieck 2014 (K, d); km 29 of Nylstroom-Pietersburg road, Story 5958 (K, d); Naboomspruit, Waterberg District, Galpin 8858 (A, P, bd); Pyramid Estate, near Potgietersrus, Galpin 8831 (PRE, d); Magonta R. Gorge, Potgietersrus District (Dec.) Galpin 11624 (BOL, K, PRE, d); Abel Erasmus Nat. Res., Pilgrimsrest, Strey &

Schlieben 8421 (K, SRGH, d); 26 km N. of Brits, Codd 6558 (PRE, d); Maloekse Kop, 6 km SW. of Dennilton, Groblersdal District, Codd 2724 (PRE, d); Loskop Dam, Mogg 35583 (J, d); Caroline Division, Rogers 18513 (Z, b); Nelspruit (Dec.) Rogers 23782 (Z, d), 24939 (Z, d); Barberton (Dec.) Rogers 29929 (G, dg); *ibid.*, Thorncroft 1053 (PRE, d); Pretorius Kop, Kruger Nat. Park, Kräusel 129 (M, bd); *ibid.* (fl., fr. Oct.) Marais 910 (K, PRE, bd); *ibid.*, Rodin 4143 (F, K, MO, S, UC, US, bd); *ibid.*, Story 3928 (GRA, K, d); 3 km S. of Pretorius Kop (Nov.) Codd 5656 (PRE, SRGH, bd); Malamala, near Skukuza, Pilgrimsrest District (fr. July) S. M. Johnson 476 (NBG, bd); Numbi Gate, Nelspruit District, Marais 905 (K, bd); near Momtrose Falls, along road to Machadodorp, Marais 904 (K, PRE, d); Malelane Camp, Crocodile R., Codd 4367 (K, SRGH, bd). Natal: Mabibi Forest, Ingwavuma District, D. Edwards 2601 (K, PRE, bg); Amanzimnyama For., Ingwavuma District, Tinley 58 (K, g); Pongolo Poort, Ward 4086 (WAG, g), 4092 (NH, WAG, bd), 4108 (WAG, eg), 4114 (NH, WAG, bd); Ubombo, Collins 1 (PRE, d); Mkuze Poort, Ubombo District, Ward 4068 (WAG, eg); Mkuzi Game Res., Ward 4079 (NH, WAG, d), 4080 (NH, WAG, d); Sordwana Bay, Vahrmeyer & Tölken 318 (K, g); Sibayi Lake, Ubombo District, Vahrmeyer 707 (PRE, m); Hluhluwe Game Res., Hlabisa District, Verdoorn 2465 (WAG, bd), 2466 (WAG, g); *ibid.* Ward 1743 (K, PRE, d), 1890 (BR, K, NH, PRE, bg), 2570 (NH, PRE, dg), 2572 (K, NH, PRE, bd), 3197 (K, d), 3198 (K, g), 4047 (NH, WAG, dg), 4048 (WAG, g), 4049 (NH, WAG, d), 4050 (NH, WAG, dg), 4051 (WAG, bd), 4052 (WAG, g); False Bay Park, Hlabisa District, Scott-Smith & Ward 19 (K, NH, bd); Black Umfolozi R., Nongoma District, Verdoorn 1705 (FHO, K, d); E. of Monzi, Ward 4171 (NH, WAG, bd); Ukhokho Ridge, Mahlabatini District, Ward 4058 (NH, WAG, d), 4059 (NH, WAG, d), 4060 (NH, WAG, d); Umfolozi Game Res., Ward 4057 (NH, WAG, d), 4062 (NH, WAG, bd), 4063 (WAG, d), 4064 (NH, WAG, d), 4065 (NH, WAG, bd); Hlabisa District, Hitchins 180 (WAG, d); *ibid.*, Gerstner 5063 (PRE, g); *ibid.*, Dukuduku Forest (fr. June) Boocock PRF 5729 (PRF, g); *ibid.*, Skinner & McGough 17 May 1949 (UC, US, g); St. Lucia Bridge, Verdoorn 2464 (WAG, bd); St. Lucia Estuary, Moll 790 (K, g); Cape Vidal, Hlabisa District, Codd & Verdoorn 10171 (WAG, bg); Middledrift, Nkandla District, D. Edwards 1414 (PRE, d); Kranskop-Nkandla road, Jameson's Drift, Bayer 845 (PRE, g); Tugela R. Valley, Kranskop District, Dyer 4347 (PRE, dg); Mhlatazi R. Valley, Mtonjaneni District, Ward 4042 (NH, WAG, bd), 4044 (NH, bd), 4045 (WAG, bd); km 13 of Empageni-Eshowe road, Lower Umfolozi District, Ward 4046 (NH, WAG, bd); Middle Drift area, Kranskop District, Ward 4039 (WAG, g); road to Middle Drift, Codd & Verdoorn 10202 (WAG, d), 10203 (WAG, dg); E. of Middle Drift, near Mambula R., Codd & Verdoorn 10204 (WAG, dg), 10205 (WAG, dg); Mambulu area, Ward 4041 (WAG, eg); Kranskop (Ntunjambili Mt.), Codd & Verdoorn 10201 (WAG, dm); Tugela R., Mapumulo District, below Maqumbi, Codd & Verdoorn 10186 (WAG, bd), 10187 (WAG, d); Otomati and Tugela Rs. confluence, Ward 4027 (NH, d); Mtunzini, Guy & Ward 61 (FHO, K, M, SRGH, d); Lower Tugela R., Nonoti, Gerrard & M'Ken 1421 (BM, K, S, TCD, gm, paratype of *S. gerrardii*); Tugela, Gerrard & M'Ken 1660 (BM, K, TCD, d); Umhlanga Rocks, Inanda District, Moll 1813 (K, g); Mariannahill, Marloth 5669 (PRE, d); Umbilo R., Rehmann 8148 (Z, g); Durban, Burt-Davy 2419 (BM, g); *ibid.*, Gerrard & M'Ken 726 (K, TCD, g); *ibid.*, Humbert 17375 (P, WAG, g); *ibid.*, Rehmann 8925 (Z, g), 8926 (Z, g), 8927 (Z, g); *ibid.*, T. R. Sim anno 1914 (FHO, g); *ibid.* (May, Nov.) J. M. Wood 1777 (K, g, paratype of *S. gerrardii*), 5624 (BM, F, K, US, lectotype of *S. gerrardii*), 6163 (BM, E, F, LE, M, MO, NBG, P, PRE, US, g); Uribebu (fl.) Wylie Dec. 1902 (LD, g); Isipingo beach, Ward 4127 (NH, WAG, g), 4128 (WAG, g), 4129 (NH, WAG, g); Amanzimtoti, Kotze PRF 6859 (PRF, g), 6868 (PRF, g); Umkomaas, near Durban, Gerrard & M'Ken 1422 (K, TCD, bg); Dumisa, Umzinto District (Jan.) Rudatis 588 (BM, E, K, PR, PRE, WRSL, g); Ifafa, Gerstner 6833 (BOL, g); Ngoya (June) Fernando PRF 787 (PRF, d); *ibid.*, Schnitt PRF 1377 (PRF, d); *sin. loc.*, Gerrard 174 (K, g); (fl.) Lehmann 18 Dec. 1946 (K, NY, d); Natal (?), Fernando PRF 758 (PRF, d).

Madagascar: near Diégo-Suarez, Bernier 261 (P, m); *ibid.*, Boivin 2452 (P, m, paratype of *S. vacacoua*); *ibid.*, Ursch 4 (P, m); Mt. de Français, Diégo-Suarez (fr. Aug.) Serv. For. 5534 (P, m); Sakarany Forest (fr. Apr.) Serv. For. 9876 (P, WAG, m); Antsingui Mts., Bernier 260 (P, m, lectotype of *S. vacacoua*); Analamera Mts. (Jan.) Humbert 19147 (P, m); Ile Nossibé

(Jan., Mar.) Pervillé 433 (K, P, m), 696 (K, P, m); *ibid.*, Boivin 2074 (P, m); Ankara Mts., Diégo-Suarez (fr. Jul.-Sept.) Serv. For. 5420 (P, g), 10422 (P, m), 10703 (P, m); Antsirabe, Vohémar (fr. June) Serv. For. 15957 (P, m); N. of Maromandia (fr. Aug.) Decary 14861 (P, m); between Doany and Anketsahely, Androranga R. Valley, Humbert 23198 (P, m); lower Androranga R., Mt. Anjenabe (fr. Nov.) Humbert & Capuron 24079 (P, m); Sambava, Serv. For. 2770 (P, m); *ibid.* (fl., fr. Nov.-Dec.) Humbert & Capuron 24376 (P, WAG, m); Bemarivo R. mouth, of NE., Sambava District (Dec.) Capuron Serv. For. 892 (P, WAG, m); Bora, Antsohiby (fr. Jan.) Serv. For. 15930 (P, m); Majunga, Possan 96 (P, m); near Bemikimbo (Nov.) Capuron Serv. For. 24336 (P, WAG, m); Tsaramandroso Canton, Ambato-Boéni District (Nov.) Ramamonjisoa Serv. For. 2075 = Res. Nat. 2075 (P, WAG, m), Serv. For. 2577 = Res. Nat. 2577 (P, m); *ibid.* (fr. Sept.) Tsilizy Serv. For. 2933 (P, bg), Res. Nat. 2973 (P, m); Tampikomy, Port Bergé District, Rabeson Res. Nat. 17 bis (P, m); Ambalavelona, Port Bergé District, Rabeson Res. Nat. 17 (P, m); Befandriana (fr. July) Decary 14466 (P, m); between Androtro and Andrafiabe, Befandriana District (fr. May) Serv. For. 19070 (P, WAG, m); Maroantsetra, Perrier de la Bâthie 8612 (P, m); Maroa, Antongil Bay, Mocquerys 360 (G, Z, m, lectotype of *S. mocquerysi*), 374 (G, Z, m, paratype of *S. mocquerysi*); Marovoay (fr. Sept.) Decary 15866 (P, m); *ibid.* (Sept.) Perrier de la Bâthie 11967 (P, m); Ankirikitra, Ambato-Boéni District (fr. Apr.) Serv. For. 14916 (P, m); Ampijoroa, Marovoay (fl. Dec., fr. Mar.) Serv. For. 8056 (P, WAG, m), 9855 (P, m); Ampijoroa, Mapinga (fr. Mar.) Serv. For. 5483 (P, gm); Betsiboka (Feb.) Perrier de la Bâthie 839 (P, m); Sambiravo-Soalala (fl. Jan., fr. Nov.) Serv. For. 3606 (P, m), 4318 (P, g); Ankarafantsika, Ambato-Boéni (fr. Aug.) Serv. For. 3 (P, m), 2273 (P, m); Itazoroa, Sokurabre (fr. Oct.) Serv. For. 3851 (P, g); Marofouoka, Maevatanana (fr. Apr.) Serv. For. 3587 (P, g); Boina, West, Perrier de la Bâthie 2247 (P, m); Maintirano Forest (Nov.) Serv. For. 12640 (P, WAG, m); Antsalova, Maintirano District (fr. Feb.) Botoalina Res. Nat. 11149 (P, m); *ibid.*, Serv. For. 14779 (P, g); Antsingy, E. of Antsalova (fr. Dec.) Léandri, Capuron & Razafindrakoto 2093 (P, m); *ibid.* (fr. Feb.) Léandri & Saboureau 2661 (P, WAG, m); Tsiandro (west) Behandrao Forest (Nov.) Léandri, Capuron & Razafindrakoto 1951 (P, WAG, m); Antsingy, near Bevary, Léandri & Saboureau 2960 (P, m); Bemarahe Plateau, near Tsiandro (Nov.) Capuron Serv. For. 6770 (P, m); Antanimena (Jan.) Perrier de la Bâthie 12338 (P, m); N.N. Azasimbi, between Tamatave and Tananarive, Meller 23 July 1862 (K, m); Foulpointe, Du Petit-Thouars s.n. (P, type); Tamatave, Perrier de la Bâthie 14271 (P, m); 55 km N. of Belo (S.), Tsiribihina R. (fr. Aug.) Serv. For. 19518 (P, m); Ankazomanga, Mandrivazo Canton, Serv. For. 15824 (P, m); Morondava, Grevé 48 (P, em); *ibid.*, Tanambao Forest, Serv. For. 12272 (P, m); Antanambao Forest, Morondava (fr. Feb.) Serv. For. 15547 (P, m); Malio R. Basin, near Ambalabe (fr. Nov.) Humbert 19377 (P, WAG, m); Ihosy District Ranohira Canton (fr. Mar.) Razafindrakoto Res. Nat. 10684 (P, m); Menarahaka, Ihosy (fr. Aug.) Serv. For. 9444 (P, m), 9706 (P, m); Sakoa Forest, Onilahy R. Basin, Humbert 20217 (P, dm); Maromandia, Antseva, Tuléar (fr. Feb.) Serv. For. 12820 (P, dg); Tsivonoa N., N. of Tuléar (fl., fr. Nov.) Peltier 1332 (P, WAG, m); Hazoroa, Tuléar, Serv. For. 3395 (P, bm); Anadabovallo Forest, Tuléar, Serv. For. 13065 (P, dm); near Isoanala (fr. Feb.) Serv. For. 313 (P, m); near Ampandrandava, between Bekily and Tsivory (fl. Oct., fr. July) Seyrig 27a (P, m), 27B (P, dm), 241 (P, m); *ibid.* (Oct.) herb. Jard. Bot. Tananarive 6002 (P, m); near Antanimora (Dec.) Bosser 13869 (P, WAG, dm); Angavo Mts., E. of Antanimora, Decary 4368 (P, dm); between Tsivory and Anadabolava, Mandrare R. (fr. Dec.) Humbert 12325 (P, m); Ambovombe, Mitsinjo (fr. May) Serv. For. 5745 (P, g); Ankiliroa, Ambovombe (fr. Jan.) Serv. For. 15537 (P, eg); Analamatahitra, Fort Dauphin, Serv. For. 4459 (P, dm); between Andohahela and Elakelaka, Mananara R. Basin, tributary of Mandrare R., Humbert 14096 bis (P, m); Beara Forest (fr. Sept.) Serv. For. 1531 (P, gm); Menarandra, Perrier de la Bâthie 8625 (P, em); near Ampanihy (fr. Sept.) Humbert & Swingle 5521 (P, em); Ambovombé, Bosser 10293 (P, m); *ibid.*, Decary 8321 (P, WAG, em); road Antanimora-Ambovombé-Androy (fr. June) Serv. For. 5332 (P, dg); near Fort Dauphin (fr. July) Decary 4542 (P, m); *ibid.* (fr. July) Serv. For. 10815 (P, dm); *sin. loc.*, Aubréville Res. Nat. 21 (P, m); Bernier anno 1840 (K, gm); Bernier s.n. (LE, m); Commerson s.n. (P, m); Goudot anno 1855 (G, m); Grevé 151 (P, m); Richard 277 (TCD, m), 340 (FL, m); Baron 2419 (K, P, m), 4648 (K, type of *S. baroni*); Perrier de la Bâthie rec. 1 Aug. 1908 (K, m).

Notes. *S. madagascariensis* Poir. was described by DU PETIT-THOUARS as 'Caniram de Madagascar' (Dict. Sci. Nat. 6: 427. 1806). POIRET published in Lamarck, Enc. 8: 696. 1808 an extract of the above cited publication which he provided with the Latin binomial. Only a few months afterwards, another extract of the same paper appeared in Desvaux, Journal de Botanique 1: 247. Jan. 1809. The latter is entitled: 'Notice historique sur le genre Caniram ou Strychnos de Linné, par A. Aubert Du Petit-Thouars, extrait par J. Dubuisson'. On p. 250 of this article, which is almost exactly the same text as the chapter on Caniram in DU PETIT-THOUARS's Dictionnaire, is added between brackets in italics after the name 'Caniram de Madagascar' the name *Strychnos madagascariensis* Desv. Mss. It is very fortunate that POIRET was earlier, as it is very unpractical to cite a long series of authors all more or less responsible for the same name.

The species *S. madagascariensis* is very variable, which is shown by the long list of synonyms. The plants may be glabrous to densely pubescent. The branches are lenticellate or not, pale brown, grey, or black, powdery or not. The leaves are very variable in shape and size and may nearly all be described as being shaped between orbicular and narrowly oblong. They are rounded to acuminate at the apex. The fruits are very variable in size, thin- or thick-walled, and few- or many-seeded.

S. madagascariensis is composed of 5 taxa which are indicated here with the following names: *S. burtoni*, *S. dysophylla*, *S. engleri*, *S. gerrardii*, and *S. madagascariensis*. The latter comprises the majority of collections of the species from Madagascar, while the four former are from continental Africa. They have been discussed in more recent papers as follows:

S. burtoni as *S. innocua* subsp. *burtonii* (Bak.) Bruce & Lewis (1956, 1960) with two varieties, *S. dysophylla* as *S. dysophylla* Benth. subsp. *dysophylla* (BRUCE & LEWIS, 1956, 1960) and *S. innocua* subsp. *dysophylla* (Benth.) Verdoorn (1958, 1963), *S. engleri* as *S. dysophylla* subsp. *engleri* (Gilg) Bruce & Lewis (1956, 1960), *S. gerrardii* as *S. innocua* subsp. *gerrardii* (N. E. Brown) Verdoorn (1958, 1963), and *S. madagascariensis* Poir. as a synonym of *S. spinosa* Lam. (BRUCE & LEWIS, 1955, 1960). The majority of the specimens from Madagascar, cited with the description given below as *S. madagascariensis* are glabrous and with lenticellate branches and acuminate leaves. Among the latter specimens are also the types of *S. vacacoua*, *S. baroni*, and *S. mocquerysi*, which resemble the type of *S. madagascariensis* so strikingly, that they doubtless belong to a single species. The types of the other synonyms cited were placed in the four other taxa by the three authors cited: BRUCE, LEWIS, and VERDOORN.

The variability of the species may be described as follows:

The leaves may be elliptic and acuminate (*S. madagascariensis*), acute in several specimens from the coastal region of Moçambique and Natal, and elsewhere on shade branches, sucker shoots, or specimens in gallery forests (*S. gerrardii*). They may be orbicular and rounded (*S. dysophylla*, *S. engleri*) or narrowly obovate and rounded (*S. burtoni*), both taxa occurring in continental Africa. *S. dysophylla* occurs mainly in Rhodesia and South Africa, *S. burtoni* in

Tanzania and Moçambique, and *S. engleri* especially in Kenya and Tanzania. The fruits are small (about 2–3 cm in diam.) in *S. engleri*, larger (2–5 cm) in *S. madagascariensis*, and large (5–10 cm) in *S. burtoni*, *S. dysophylla*, and *S. gerrardii*. The flowers vary slightly and independently from the other parts of the plants, but show a rather distinct variation in the number of ovules in each cell of the ovary. This is correlated with the size of the fruits. *S. engleri* has 6–10(15) ovules in each cell of the ovary, *S. madagascariensis* 5–14, and the three other taxa (18)20–30. The lenticellate branches as they occur in all taxa are usually glabrous. *S. engleri*, *S. gerrardii*, and *S. madagascariensis* are always glabrous. The two other taxa, *S. burtoni* and *S. dysophylla*, can be glabrous. Powdery branches are considered as typical for *S. burtoni* and black branches are more or less typical for *S. dysophylla*. The latter character is mostly useless, as branches which were powdery might be blackened by fire. After having studied some dozens of specimens from East Africa and some from outside this part of the continent, BRUCE and LEWIS could only refer a part of the specimens of this complex to the taxa they adopted. The same is true for the elaborate studies of Miss VERDOORN of the South African material. The present author found several specimens which might belong in any of the 4 taxa they distinguished and several as intermediate between the 6 possible pairs of them. Moreover, evident intermediates between *S. dysophylla* and *S. madagascariensis* were found too. The number of intermediates is more or less dependent from the delimitation of the taxa involved, as e.g. *S. gerrardii* is more or less intermediate between *S. burtoni* and *S. madagascariensis*, and also between *S. dysophylla* and *S. madagascariensis*. Furthermore if a small-fruited specimen has some acute leaves it could be considered as intermediate between *S. engleri* and *S. gerrardii* or between *S. engleri* and *S. madagascariensis*.

As it is difficult to conceive that all specimens cited above belong to one single species, especially as only a few specimens are at hand in most herbaria, the forms are indicated here with the specimens. After the symbols of the herbaria appear the letters b for *S. burtoni*, d for *S. dysophylla*, e for *S. engleri*, g for *S. gerrardii*, m for *S. madagascariensis*, bd for intermediate between the two first taxa, be for intermediate between the first and the third, etc.

The variation is in part dependent on the ecology, as can be seen from the many specimens collected by Ward in Natal. Trees growing in groves or gallery forests are exactly like *S. gerrardii* and those growing as isolated specimens in woodland are like *S. dysophylla*. The specimens at the edges of groves are intermediate.

36. *S. malacoclados* C. H. Wright in Fl. Trop. Afr. 4(1): 523. 1903; Duvigneaud, *Lejeunia* 11: 61. 1947 and Bull. Soc. Roy. Bot. Belg. 85: 30. 1952; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 43. 1963.

Fig. 4, p. 58; Map 27, p. 173

Type: Cameroun: Mabam, Nkomo R., Bates 502 (K, holotype; isotypes: BM, BR, G, L, P, Z).

Heterotypic synonym: *S. limbogeton* Winkler in Engler, Bot. Jahrb. 41: 284. 1908. Type: Cameroun: Victoria, Limbe R., Hanke (Winkler) 527 (holotype not seen, destroyed in B; lectotype: G, other isotypes seen: L, MO, WAG, Z).

S. pansa S. Moore in Cat. Talbot's Nig. Pl. 68. 1913; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2:24. 1931. Type: Nigeria: Oban, Talbot 1661 (BM, holotype; isotype: K).

Liana 10m high or more climbing in trees, 10–25 m long or more. Trunk 1–2 cm in diam. or more. Bark pale grey, thin, smooth, powdery, not or slightly lenticellate; wood creamy. *Branches* not lenticellate, pale grey or brown, dry usually darker and not or obscurely sulcate; branchlets ochraceous-pubescent, green, not lenticellate, terete, medium brown and not sulcate when dry. Tendrils solitary. *Leaves*: petiole ochraceous-pubescent, short, 1–3(5) mm long, mostly transversely rugose beneath; blade shining or mat and medium to dark green above, paler and often with dark reticulate venation beneath, thinly coriaceous or less often coriaceous, also when living, thinner in the shade, elliptic or narrowly elliptic, or on the main axis and at the bases of the branchlets ovate, broadly ovate, or sometimes orbicular, (1)2–3(4) × as long as wide, variable in size, 1.5–10 × 1.3–5 cm, up to 17.5 × 7.5 cm in the shade, acuminate, sometimes some obtuse or acute at the apex, cuneate, rounded, or sometimes especially on the main axis, subcordate at the base, usually sparsely pubescent on the costa on both sides and on the main secondary veins beneath; one or two pairs of secondary veins from or from above the base curved along the margin and mostly a faint submarginal pair; costa impressed above and as the veins prominent beneath; tertiary venation reticulate. *Inflorescence* axillary and sometimes also terminal, solitary, lax, up to about half as long as the leaves, few-flowered, 1–3 × 0.6–2 cm, 2 × branched. Peduncle and branches slender, pubescent like the very short pedicels. Bracts triangular or sepal-like, lower often (?) with large colleters at the base. *Flowers* 5-merous. *Sepals* green, connate at the base up to one-third of their length, equal or subequal, ovate or broadly ovate, 1–1.3 × as long as wide, 0.5–0.8 × 0.5–0.8 mm, subacute at the apex, ciliate, sparsely pubescent outside, inside glabrous, without colleters. *Corolla* in the mature bud 3–4 × as long as the calyx, 2–2.5(2.8) mm long, and rounded or slightly tapering at the apex, yellow, sparsely pubescent outside, except for the glabrous base, inside pilose on the lobes, especially at the base; tube short, 0.8–1.6 × as long as the calyx, 0.6–0.8 mm long; lobes 1.5–3.5 × as long as the tube, ovate, 1.5 × as long as wide, 1.2–2.2 × 0.8–1.4 mm, acute, spreading. *Stamens* just exerted; filaments glabrous, about as long as the anthers, inserted at the mouth of the corolla tube; anthers suborbicular, 0.5–0.8 × 0.3–0.8 mm, deeply cordate at the base, glabrous; cells parallel. *Pistil* glabrous, or with some minute hairs, 1.2–1.6 mm long; ovary ovoid or globose, 0.6–1 × 0.6–0.9 mm, glabrous, abruptly narrowed into the style or not, 2-celled; style 0.5–0.6 mm long, glabrous or with some minute hairs; stigma capitate. In each cell 5 ovules. *Fruit* orange, small, soft, ellipsoid, 18 × 16 × 15–27 × 18 × 18 mm, 1-seeded, with smooth skin, slightly shining, somewhat obliquely pedicellate.

Wall thin, about 1 mm thick. *Seed* dark brown, slightly flattened, ellipsoid, $10 \times 9 \times 6$ – $12 \times 10 \times 8$ mm, shallowly dented at one side, smooth, glabrous; testa very thin and easily rubbed off.

Distribution: West Africa, Cameroun, and Gabon.

Ecology: Moist places in rain forests or old secondary forests; alt. 0–900 m.

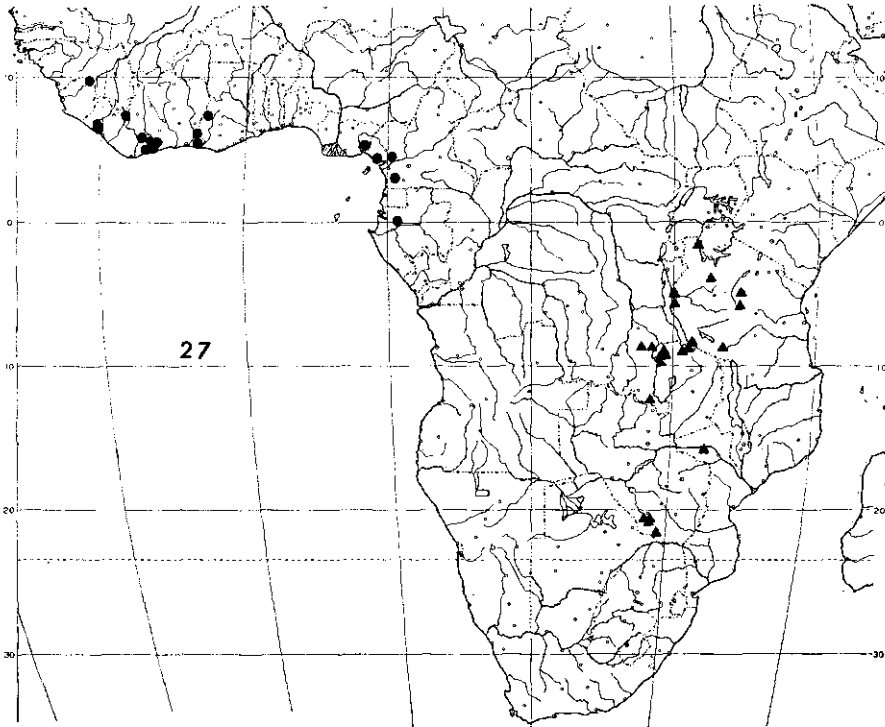
Guinea: *sin. loc.*, Schnell 5342 (ABT).

Sierra Leone: Falaba, near Berria (fr. Mar.) Scott Elliot 5418 (K).

Liberia: Monrovia (Oct.) Dinklage 2771 (B), 2913 (A, P, Z); Bong Range, 32 km N. of Kakata, Leeuwenberg & Voorhoeve 4933 (WAG); Nimba Mts., Leeuwenberg & Voorhoeve 4608 (WAG).

Ivory Coast: right bank Hana R., near ferry in Tai-Tabou road (fr. Mar.) J. de Wilde & Leeuwenberg 3613 (ABI, BR, FHO, K, S, WAG); 25 km N. of Néromer, Guillaumet 1283 (ABI, WAG); Dakpadou, 49 km N. of Sassandra, right bank Davo R., Leeuwenberg 2864 (WAG); 25 km SW. of Guéyo, Leeuwenberg 3728 (WAG), 4114 (WAG); 56 km N. of Sassandra, E. of Béyo, Leeuwenberg 3994 (WAG); 66 km WNW. of Sassandra, 5 km E. of Toro R., Leeuwenberg 4040 (WAG); 20 km NW. of Sassandra, Leeuwenberg 4032 (WAG); 15 km NW. of Sassandra, Leeuwenberg 4013 (WAG); near Sassandra, Mangenot 4921 (WAG); E. of Krinjabo, S. of Aboisso, Leeuwenberg 4486 (WAG); 15 km NE. of Bianouan, Leeuwenberg 3938 (WAG).

Ghana: Pamu, Berekum Res. (Sept.) Vigne 2515 (FHO, GC, NY).



MAP 27. ● *S. malacoclados*, ▲ *S. matopensis*.

Nigeria: Oban, Talbot 1661 (BM, K, type of *S. pansa*).

Cameroon: Victoria, Limbe R. (Oct.) Hanke (Winkler) 527 (G, L, MO, WAG, Z, type of *S. limbogeton*, distributed as *S. hankii*); 3 km E. of Km 21 of Yabassi-Douala road, Leeuwenberg 6396 (WAG); Bipindi, Zenker 4571 (BM, BR, COL, E, FHO, G, GOET, HBG, K, L, LE, LY, M, MO, P, PR, PRE, S, W, WU, Z); Lokoundjé R., Zenker 117 (BR, FI, G, GH, MO, P); Bipindi, Lokoundjé R. bank, Zenker Apr. 1906 (F).

Gabon: Mabam, Nkomo R. (July) Bates 502 (BM, BR, G, K, L, P, Z, type).

Cult.: Wageningen, Leeuwenberg 4992 (WAG, seedling of herb. J. de Wilde & Leeuwenberg 3613); Adiopodoumé, 17 km W. of Abidjan, Ivory Coast, Aké Assi 5957 (WAG, originating from Téké Forest); *ibid.* (O.R.S.T.O.M. garden 204) Leeuwenberg 4568 (WAG); *ibid.*, Leeuwenberg 4578 (WAG, seedling of herb. J. de Wilde & Leeuwenberg 3613).

Notes. *S. malacoclados* is closely allied to *S. angolensis* by the indumentum and colour of the plant, the rugose petioles, the shape and size of the flowers, the shape of fruit and seed, and the rose-like galls. The inflorescences are sometimes transformed into these characteristic galls like roses, occasionally seen in other species, e.g. in *S. longicaudata* (Leeuwenberg 6794).

The differences between the two related species can be defined as follows:
Leaves sharply acuminate; sepals pubescent outside; corolla pubescent outside, except glabrous base ***S. malacoclados***
Leaves obtuse or nearly so, never sharply acuminate; sepals glabrous outside; corolla glabrous or minutely papillose-pubescent outside . . . ***S. angolensis***

Young plants with shade-leaves only, growing in the understory of the forest may flower. The flowering specimens collected by Zenker, nos. 117 and 4571 and the fruiting specimen herb. Leeuwenberg 6396, have shade-leaves, like several vegetative specimen collected in the Ivory Coast by the present author. The flowering specimens collected in West Africa have sun-leaves.

37. ***S. malchairii*** De Wild., Bull. Jard. Bot. Brux. 5: 44. 1915; Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 30, f. 10 B. 1952 (both as *malchairi*).

Type: Congo: Equateur: Likimi, Malchair 506 (BR, holotype; photograph in K, neg. 2513). **Fig. 24, p. 175; Map 28, p. 176**

Large liana, 8–18 m high climbing in trees. Trunk 1–8 cm in diam.; bark pale brown, with some lenticels; wood pale brownish. *Branches* mostly pale brown when dry, slightly lenticellate, not sulcate; branchlets glabrous, not lenticellate, mostly pale greenish-brown when dry, terete, not sulcate. Tendrils solitary. *Leaves*: petiole glabrous, 2–7 mm long; blade shining above, dull and paler beneath, coriaceous or thinly coriaceous also when living, elliptic, narrowly elliptic, or narrowly ovate, 1.5–3 × as long as wide, 4–13 × 1.5–6(8) cm, acuminate at the apex, cuneate or rounded at the base, glabrous on both sides; one pair of secondary veins from or from above the base curved along the margin and often a faint submarginal pair; tertiary venation reticulate, prominent on both sides. *Inflorescence* axillary and occasionally also terminal, 0.1–0.5 × as long as the leaves, 1–3 × 1–1.5 cm, few-flowered, 2–3 × branched, rather congested, but usually with a distinct peduncle. Peduncle, branches, and pedicels

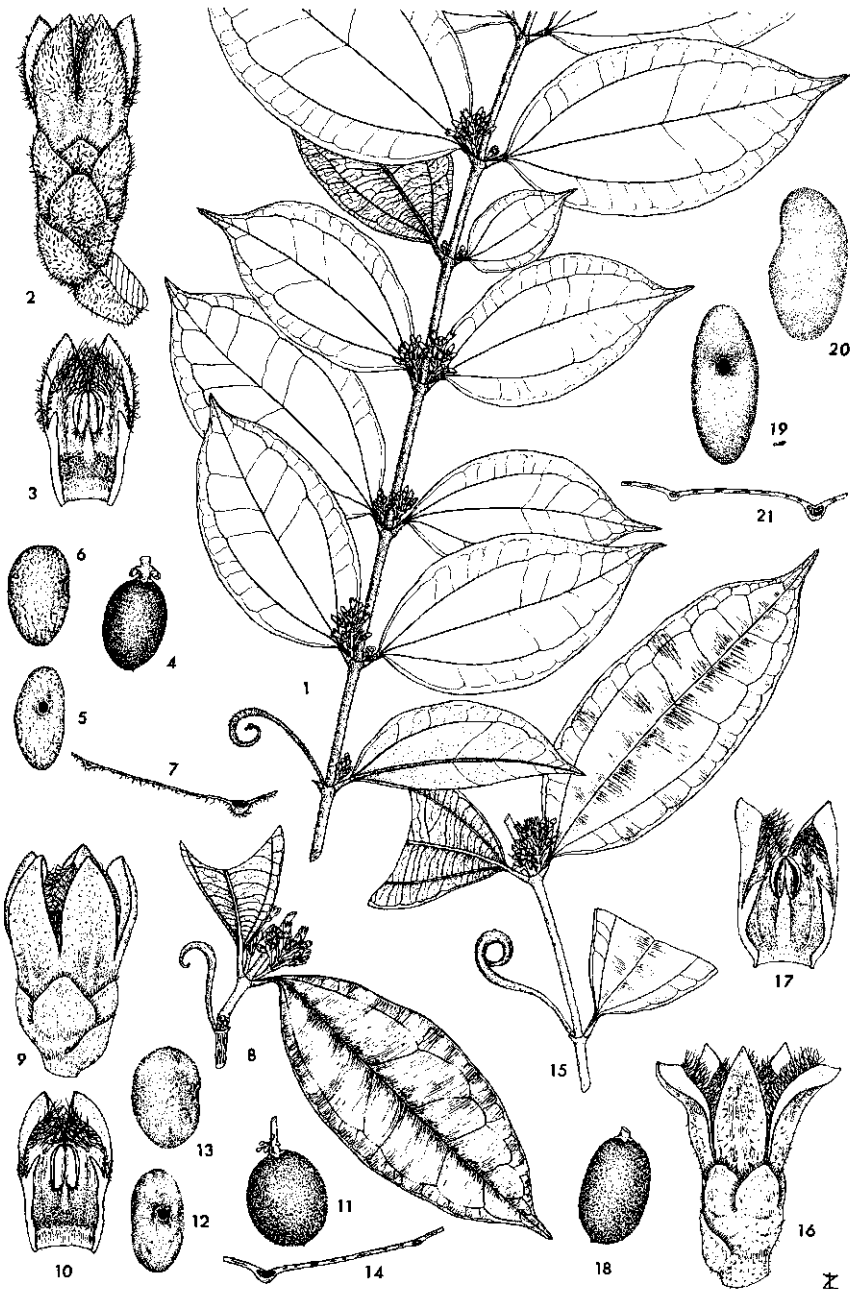


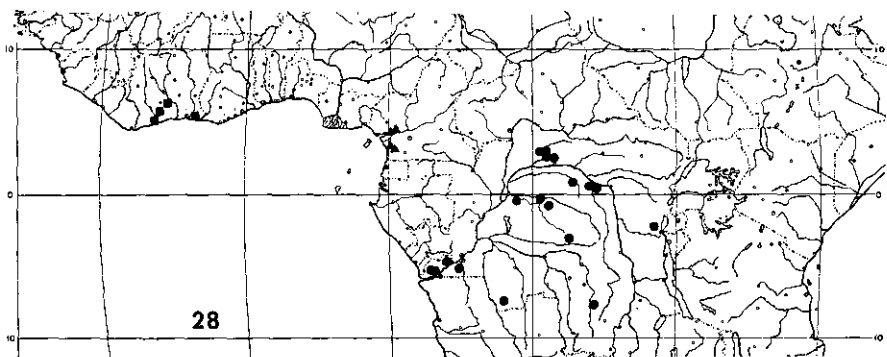
FIG. 24. 1-7. *S. campicola*: 1. branch, $\frac{1}{2} \times$; 2. flower, $7 \times$; 3. portion of corolla with stamen, $7 \times$; 4. fruit, $\frac{1}{2} \times$; 5-6. seeds, $1 \times$; 7. transverse section of leaf, $3 \times$ (1-3, 7. Leeuwenberg 5447; 4. Tisserant 2265; 5-6. Tisserant 1850). 8-14. *S. malchairii*: 8. branch, $\frac{1}{2} \times$; 9. flower, $7 \times$; 10. portion of corolla with stamen, $7 \times$; 11. fruit, $\frac{1}{2} \times$; 12-13. seeds, $1 \times$; 14. transverse section of leaf, $3 \times$ (8-10, 14. A. Léonard 699; 11-13. Léontovitch 112). 15-21. *S. mimfiensis*: 15. branch, $\frac{1}{2} \times$; 16. flower, $7 \times$; 17. portion of corolla with stamen, $7 \times$; 18. fruit, $\frac{1}{2} \times$; 19-20. seeds, $1 \times$; 21. transverse section of leaf, $3 \times$ (15. Leeuwenberg 5550, 6821; 16-17. Leeuwenberg 6821; 18-20. Leeuwenberg 6316; 21. Leeuwenberg 5550).

glabrous or sparsely pubescent as the approximately sepal-like bracts. Bracts with colleters above. *Flowers* 4–5-merous, even in a single inflorescence, often sessile. *Sepals* yellow-green, up to half-way connate, equal, ovate or broadly ovate, 1–1.5 × as long as wide, 1–1.2 × 0.8–1.2 mm, acute or obtuse at the apex, glabrous on both sides or minutely pubescent outside, with or without colleters inside at the edges of the base only. *Corolla* in the mature bud 2.5–3 × as long as the calyx, 2.8–3 mm long, and obtuse at the apex, white, pale yellow, or orange, distinctly thicker towards the apex, outside glabrous or minutely puberulous, inside with recurved brushes of white hairs at the apices of the lobes, further glabrous or minutely puberulous (when outside so); tube about as long as the calyx, 0.8–1 mm long, wide; lobes thick, narrowly triangular, 1.8–2.5 × as long as the tube, 1.8–2.2 × 0.8–1 mm, acute, suberect. *Stamens* exerted; filaments glabrous, about as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, 0.7–1 × 0.6–0.8 mm, sagittate at the base, glabrous or with few small hairs at the base; cells slightly divergent. *Pistil* glabrous, 1.6–2 mm long; ovary ovoid, 1 × 0.7–1 mm, 2-celled, rather abruptly narrowed into the style; style short, 0.6–1 mm long; stigma obscurely bilobed or capitate. In each cell 5 ovules. *Fruit* orange, small, subglobose or ellipsoid, 14 × 10–21 × 16 mm, one-seeded. Wall thin. *Seed* ellipsoid, 12 × 9.5 × 8.5–15 × 11 × 10 mm, smooth, not dented. Testa very thin, sticking to the pulp.

Distribution: Congo (Kinshasa).

Ecology: Rain forests or gallery forests; alt. 0–1000 m.

Congo (Kinshasa): Léopoldville: Luki, Toussaint 2236 (BR); *ibid.*, Nkula R. Valley (fr. Dec.) Toussaint 71 (BR, PRE); between Nkula and Minkudu Rs. (Jan.) Toussaint 125 (BR, PRE); Luki, Minkudi R. Valley, Compère 67 (BR); Luki, Kinkoko R. Valley (June) Donis 1863 (BR), 1977 (BR); Luki, Luki R. Valley, Donis 2457 (BR); Luki, near Ntosi R. (June) Wagemans 2931 (BR, WAG); Mukenia Padi, Luki (fr. Oct.) Wagemans 685 (BR, WAG); E. of Kimbuya, Luki, Wagemans 1590 (BR, WAG); Luki Res. (fr. Aug.) Wagemans 1625 (BR); Temvo (Feb.) Vermoesen 1499 (BR), 1711 (BR); Mayombe (fr.) Herb. Brux. Sept. 1893 (BR); Kiyaka, Madimba Territory (fr. Nov.) Devred 2777 (BR, K, PRE, WAG); Panzi,



MAP 28. ■ *S. millepunctata*, ▲ *S. mimfiensis*, ● *S. malchairii*.

Vanderyst 16142 (BR). Equateur: Bongabo (fr. Oct.) Gilbert 1859 (BR); Popolo, Mongala R. (fr. Aug.) Evrard 1575 (BR); Likimi (Jan.) Malchair 506 (BR, type); Lisala Territory (fr. Oct.) Léontovitch 112 (BR); *ibid.*, Ngale (fr. Nov.) Léontovitch 127 (BR); Boketa (Mar.) Evrard 516 (BR); Busanga, Gorbatoff 205 (BR). Orientale: Simba-Yahuma road (Feb.) Evrard 5786 (BR, K, WAG); Yaboando-Yaboila road (May) A. Léonard 699 (BR); Yoko R., Isangi Territory (Feb.) Germain 206 (BR, WAG); Yangambi, Bamps 631 (BR, K, WAG); *ibid.* (fl. Dec., fr. Aug., Dec.) Louis 2486 (BR), 3015 (BR, K, MO), 8029 (BR, P, PRE); *ibid.*, Menavanza 76 (BR, WAG). Kivu: Irangi, Kalehe Territory (Aug.) Pierlot 796 (BR); *ibid.* (Sept.) Troupin 4400 (BR, K); Bunyakiri, Kalehe Territory, A. Léonard 2963 (BR, WAG); *ibid.* (fr. Apr.-May) Gutzwiller 1826 (BR, EA, WAG), 1835 (BR). Kasai: Dimoye, Lodja Territory, Germain 7599 (BR). Katanga: Kaniama, Haut Lomani (Nov.) Mullenders 1574 (BR), 2268 (BR).

Notes. *S. malchairii* is closely allied to *S. campicola* and *S. mimfiensis* (see notes to those species). It also resembles two other species, from which it differs as follows:

Tendrils solitary; corolla larger than in both the other species, penicillate on lobes; stamens included, inserted in tube; anthers bearded ***S. longicaudata***
 Tendrils solitary; recurved brushes on apices of lobes; stamens at mouth; lobes thick; anthers glabrous or nearly so ***S. malchairii***
 Tendrils paired; corolla inside pilose or nearly glabrous; stamens at mouth; lobes thin; anthers glabrous ***S. cuminodora***

38. *S. matopensis* S. Moore, Journ. Bot. 43: 48. 1905; Duvigneaud, Lejeunia 11: 77. 1947 and Bull. Soc. Roy. Bot. Belg. 85: 30. 1952; E. A. Bruce, Kew Bull. 1956: 156. 1956; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 21. 1960.

Fig. 25, p. 179; Map 27, p. 173

Type: Rhodesia: Matobo Hills, Eyles 1182 (BM, holotype; isotype: SRGH).

Climber or scandent shrub, about 4 m high, forming a dense tangle. *Branches* brown or grey-brown, more or less terete, not sulcate when dry, not or hardly lenticellate, often hairy like the branchlets; branchlets pale grey- or brown-appressed-pubescent. Tendrils solitary in the axils of ordinary leaves. *Leaves*: petiole appressed-pubescent, short, 1-3(4) mm long; blade shining and dark green above, paler and less shining beneath, coriaceous, ovate, orbicular, or sometimes elliptic, 1-2(3) × as long as wide, 1.8-5(7) × 1-3(5) cm, subacuminate, acute, or rarely rounded and mucronulate at the apex, rounded to cuneate at the base, above glabrous or sparingly appressed-pubescent on the impressed costa, beneath with some appressed-pubescent hairs on the base of the costa or less often also glabrous, often minutely ciliate; one or two pairs of secondary veins from or from above the base curved along the margin and often a faint submarginal pair; tertiary venation inconspicuous. *Inflorescence* terminal (and occasionally also axillary) congested, many-flowered, 0.7 × 1 - 2 × 2.5 cm, 2-3 × branched. Peduncle and branches appressed-pubescent. Bracts small, without colleters, lower narrowly triangular, appressed-pubescent on both sides, upper sepal-like, appressed-pubescent beneath, glabrous above. *Flowers* 5-merous, sessile. *Sepals* one-third connate, equal or subequal, ovate or broadly

ovate, 1.3–1.8 × 1–1.4 mm, acute at the apex, ciliate, outside appressed-pubescent, especially at the base, inside glabrous, without colleters. *Corolla* in the mature bud 2.4–2.5 × as long as the calyx, 3.3–4.2 mm long, and obtuse at the apex, white or pale yellow, campanulate, outside glabrous or puberulous, inside white-penicillate in the throat; tube wide, 1.3–1.5 × as long as the calyx, 1–1.5 × as long as the lobes, 2–2.2 × 2–3 mm; lobes triangular, 1.3–1.7 × as long as wide, 1.3–2 × 1–1.2 mm, thick, acute, suberect. *Stamens* included; filaments very short, 0.7 × as long as the anthers, glabrous, inserted at one-half to two-thirds from the base of the corolla tube; anthers nearly cordate, 0.9–1.2 × 0.6–0.8 mm, bearded at the deeply cordate base; cells often slightly divergent at the base. *Pistil* glabrous, 2–2.8 mm long; ovary broadly ovoid, 0.8–1.2 × as long as wide, 1–1.2 × 1–1.2 mm, 2-celled, not much narrowed into the style; style 1–1.8 mm long, rather thick; stigma capitate. In each cell 9–12 ovules. *Fruit* orange or yellow, soft, ellipsoid, slightly longer than wide, 12 × 9–15 × 12 mm, 1(–2)-seeded, with smooth skin, slightly shining. Wall thin. *Seed* dark brown, flattened, more or less plano-convex, elliptic, 9–10 × 7–9 × 2 mm, with thick very short erect hairs, rather rough.

Distribution: East Africa.

Ecology: Semi-evergreen bushland or *Brachystegia*-woodland, on rocky hills and termite-mounds, and gallery forest; alt. 900–1600 m.

Congo (Kinshasa): Katanga: Kifinga, Schmitz 6634 (BR); Chiamfubu R., 7 km from Pweto, Symoens 3832 (BR); 10 km SE. of Tera, 35 km E. of Mokambo, Lubumbashi-Sakania road (fr. Aug.) Schmitz 6145 (BR, K).

Tanzania: Bukoba road (Nov.) J. Ford 821 (K); Kahama District (Nov.) Glover 159 (K), 239 (J); Singidia, near Maw Hills, Burt 5227 (A, BM, BR, EA, FHO, K, P, S); near Kondoa road, Singidia, Burt 5283 (BM, BR, K); Kigoma area, Azuma 1038 (EA); Kasikati R. Basin, 80 km S. of Kigoma, Itani 13 (EA), 133 (EA); Manyoni, Burt 3337 (EA, K); 32 km S. of Itigi Station, Manyoni District (fr. Apr.) Greenway & Polhill 11593 (K); Kasanga, Hornby 1018 (EA); base of Igila Hill, Chunya Region (fr. Mar.) Richards 19806 (K).

Zambia: Puta, Fanshawe 4698 (FHO, K); Kalambo Gorge, Abercorn District (Feb.) Richards 19660 (K, WAG); Kambole Escarpment, Abercorn District, Richards 18870 (BR, K); Lake Mweru (fr. Aug.) Fanshawe 4652 (K); Kangiri, Mweru, Whellan 1372 (K, SRGH); Kafulwe Mission, Lake Mweru, White 3603 (FHO, K); Kawambwa (Nov.) Fanshawe 4058 (BR, FHO, K); Museshia (Oct.) Fanshawe 4885 (BR, FHO, K); sin. loc., Rogers rec. 10 Mar. 1910 (K).

Rhodesia: sin. loc., McGregor C 4/38 (FHO); Matopos District: (Oct.) O. B. Miller 1403 (K, SRGH), 1819 (K); (Nov.) Plowers 1321 (NY, PRE, SRGH); Matopos (Dec.) Armitage 184/55 (K, SRGH); *ibid.*, Eyles 976 (BM, K, SRGH); *ibid.*, Hodgson 17/48 (FHO); *ibid.*, Kelly-Edwards 22/33 (FHO); near World's View (fr. Apr.) Kolbe 4346 (BOL, K); between World's View and Silozwe (fr. Apr.) Exell, Mendonça & Wild 1506 (BM, LISC, SRGH); Matobo Hills (Nov.) Eyles 1182 (BM, SRGH, type); *ibid.*, Rogers 5678 (BM, BOL, G, GRA, K, NBG, PRE), 8790 (K, PRE, Z); Gordon Park, Cuthbertson K SRGH 27228 (SRGH); Mchabezi R. Valley (fr. May) Meara 59 (SRGH). Umzingwane District (Oct.) Davies 2587 (M, SRGH).

Moçambique: Tete: Chicoo, Songa Mts. (Dec.) Torre & Correia 13972 (LISC).

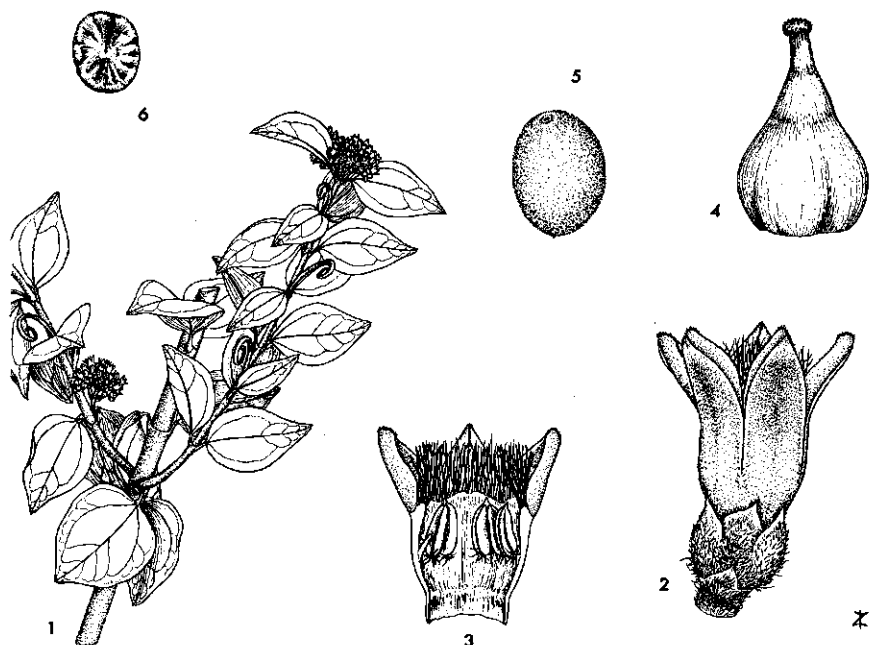


FIG. 25. *S. matopensis*: 1. branch, $\frac{1}{2} \times$; 2. flower, $8 \times$; 3. portion of corolla with stamens, $8 \times$; 4. pistil, $16 \times$; 5. fruit, $1 \times$; 6. seed, $1 \times$ (1-4, 6. Davies 2587; 5. O. B. Miller 1403).

39. *S. melastomatoides* Gilg in Engler, Bot. Jahrb. 23: 201. 1896; Baker in Fl. Trop. Afr. 4(1): 527. 1903; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 43. 1963. **Fig. 15, p. 109; Map 29, p. 181**

Type: Sierra Leone: sin. loc., Afzelius s.n. (UPS, holotype, annotated by Gilg; isotype: BM).

Heterotypic synonym: *S. syringiflora* A. Chev., Mem. Soc. Bot. Fr. 2: 8: 48. 1908; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 24. 1931; Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 33. 1952. Type: Guinea: Kaba R. Valley, Farana, Chevalier 13181 (P, lectotype; isotypes: K, LY, P).

Climber. *Branches* not lenticellate, pale to dark brown and not sulcate when dry; branchlets glabrous, terete, pale to dark brown and not or sometimes sulcate when dry. *Tendrils* in 1-3 pairs. *Leaves*: petiole glabrous, 6-10 mm long; blade dark green and shining above, paler and dull beneath, coriaceous, elliptic, narrowly elliptic, or narrowly ovate, comparatively narrower towards the apices of the branchlets, (1.2)1.5-2.5 \times as long as wide, (4.5)8-19 \times (1.5)4-7.5 cm, distinctly and acutely acuminate at the apex, cuneate or rounded at the base, glabrous on both sides; two pairs of distinct secondary veins curved along the margin, the first from the base and the second from about 1 cm

above the base; tertiary venation reticulate, not very conspicuous, slightly prominent on both sides or only above. *Inflorescence* axillary (sometimes in the axils of small bracts) and sometimes at the same time terminal, solitary, lax, several-flowered, about half as long as the leaves, $3-6 \times 2.5-3$ cm, $2-3 \times$ branched. Peduncle, branches, and pedicels glabrous or with some hairs near the stipular line between the bracts. Bracts narrowly triangular (and slightly shovel-shaped) or sepal-like, at least the upper glabrous above and without colleters. *Flowers* 4-merous. *Sepals* free, equal or subequal, broadly ovate to orbicular, $1-1.5 \times$ as long as wide, $1.2-2 \times 1-1.5$ mm, obtuse at the apex, ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud $4-5 \times$ as long as the calyx, 5.5–8 mm long, and approximately rounded at the apex, white, outside glabrous, inside densely pilose except for the glabrous base of the tube; tube $1.7-2 \times$ as long as the calyx, 2.5–3.5 mm long, nearly cylindrical, gradually widened towards the throat, 1.2–2 mm wide at the throat; lobes $1.2-1.3 \times$ as long as the tube, rather thick, narrowly triangular, $2.5-3 \times$ as long as wide, $3-4.5 \times 1.2-1.5$ mm, acute, recurved. *Stamens* exerted; filaments glabrous, $1-1.5 \times$ as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, glabrous, $1-1.2 \times 0.4-0.5$ mm, cordate at the base; cells parallel. *Pistil* glabrous, 5.5–7 mm long; ovary ovoid, about $1.5 \times$ as long as wide, $1-1.5 \times 0.7-1$ mm, 2-celled; style slender, 4–6 mm long; stigma small, capitate or obscurely bilobed. In each cell 10 ovules. *Fruit* orange (?), rather small, soft, ellipsoid (?), about 3 cm in diam., with 1–3 (?) seeds, with smooth skin, mat. Wall thin, dry about 0.5 mm thick. *Seed* flattened, obliquely elliptic, $18 \times 14 \times 5$ mm, at one side with a deep pit, at the other with a bulge surrounded by a shallow groove, seemingly papillose; false papillae simulated by curved hairs.

Distribution: Guinea, Sierra Leone.

Ecology: River banks in rain forests or in gallery forests; at low elevations.

Guinea: Conakry, Maclaud rec. 20 Sept. 1897 (P); near Kindia, Jacques-Felix 75 (P, WAG); Kaba R. Valley, Farana (Apr.-May) Chevalier 13181 (K, LY, P, type of *S. syringiflora*), 13191 bis (P).

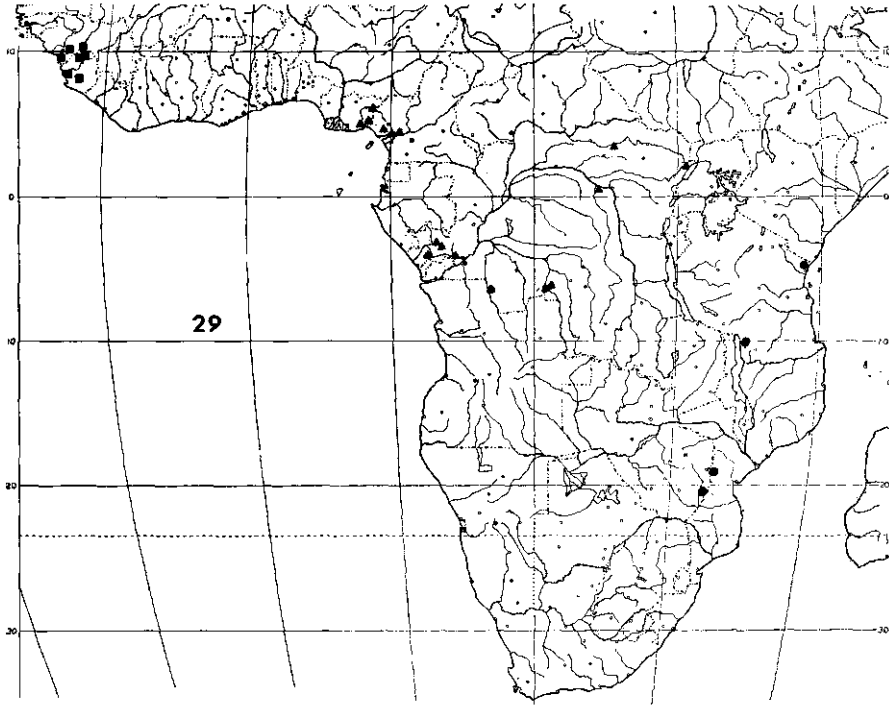
Sierra Leone: near Bayabaya, Scarcies R. (fr. Feb.) Scott Elliot 4292, partly (GH); Kahreni, Limba (Apr.) Scott Elliot 5592 (BM, K); Konnoh Country, Burbidge 485 (K); near Taiama (Mar.) Deighton 2556 (K), 3375 (BR, K, P); sin. loc., Afzelius s.n. (BM, UPS, type).

40. *S. melodora* S. Moore, Journ. Linn. Soc. 40: 147. 1911; Bruce & Lewis in Fl. Trop. E. Afr., Loganiaceae 23. 1960.

Type: Rhodesia: Chirinda Forest, Swynnerton 101 (BM, holotype; isotypes: K, NBG, SRGH, US, Z).

Fig. 26, p. 183; Map 29, p. 181

Heterotypic synonym: *Gaertnera zimmermannii* Krause et Gilg in Engler, Bot. Jahrb. 48: 430. 1912; Petit, Bull. Jard. Bot. Brux. 29: 41. 1959. Type: Tanzania: East Usambara Mts., Kwamkuyo, Zimmermann 2926 (holotype not seen, destroyed in B; lectotype: EA, photograph in BR, K neg. 3027).



MAP 29. ■ *S. melastomatoides*, ▲ *S. memecyloides*, ● *S. mellodora*.

Tree, 20–35 m high. Trunk 45 cm in diam. (more or less). Bark thin. *Branches* not or obscurely lenticellate, medium to dark brown and not sulcate when dry; branchlets glabrous, not lenticellate, pale greenish-brown to dark brown and usually slightly sulcate when dry, mostly darker than in *S. mitis*. A distinct stipular line present which is often torn. Stipules 2 mm long, soon deciduous, narrowly elliptic, glabrous. *Leaves*: petioles glabrous, 3–8 mm long, those of a pair joined at the base by a distinct stipular line; blade dull, drying pale greenish-brown with dark brown, paler beneath, coriaceous, elliptic or narrowly elliptic, 2–3.5 × as long as wide, 5–12 × 2–5 cm, acuminate at the apex, cuneate at the base, glabrous on both sides; secondary veins 5–8 on each side; costa and veins prominent beneath; tertiary venation not very conspicuous, slightly prominent on both sides. *Inflorescence* axillary, usually also in the axils of the apical leaves and therefore seemingly terminal, lax, many-flowered, shorter or longer than the leaves, 3–11 × 2.5–8 cm, 3–4 × branched. Peduncle, especially towards the apex, branches, and pedicels sparsely pubescent. Bracts small, sparsely pubescent beneath, lower narrowly elliptic, about 3–5 mm long, upper triangular, approximately sepal-like, and without colleters. *Flowers* 4-merous. *Sepals* free, equal, broadly ovate, about 1–1.5 × as long as wide, 0.7–1.2 × 0.7–1 mm, rounded at the apex, ciliate, outside glabrous or nearly so, inside glabrous,

without colleters. *Corolla* in the mature bud 2.5–4.5 × as long as the calyx, 2.5–3 mm long, and rounded at the apex, white, outside glabrous, inside densely pilose on the lobes (of which the apex sometimes glabrous); tube very short, 0.5–0.7 × as long as the calyx, 0.5–0.7 mm long; lobes oblong, 4–5 × as long as the tube, 1.7–2 × as long as wide, 2–2.5 × 1.1–1.5 mm, acute, spreading. *Stamens* exerted; filaments glabrous, about 1–1.5 × as long as the anthers, inserted at the mouth of the corolla tube; anthers orbicular or nearly so, 0.5–0.6 × 0.5 mm, subcordate at the base, glabrous; cells parallel. *Pistil* glabrous, 1.1–1.2 mm long; ovary depressed-globose or -ovoid, 0.7 × 0.7 mm, 1-celled, gradually narrowed into the style; style short, 0.4–0.5 mm long; stigma capitate. One basal placenta with 2–9 ovules. *Fruit* small, globose or nearly so, 12 × 10 – 18 × 18 mm, one-seeded. Wall thin. *Seed* flattened, ellipsoid, 8–9 × 6–7 × 3 mm, pubescent (?). Testa thin, sticking to the pulp.

Distribution: Tanzania, Rhodesia, Moçambique.

Ecology: Montane rain forests; alt. 800–1200 m.

Tanzania: Derema, E. Usambara Mts. (Nov.) Greenway 6053 (BR, EA); Kwamkuyo, E. Usambara Mts. (Nov.) Zimmermann 2926 (EA, type of *Gaertnera zimmermannii*); Kingori, E. of Ngurdota Crater (July) Willan 259 (EA).

Rhodesia: Chirinda Forest (Oct.) Swynnerton 101 (BM, K, NBG, SRGH, US, Z, type), 533 (K, SRGH), 537 (SRGH); *ibid.*, Chase 417 (BM, SRGH); *ibid.* (Oct.) Hack 4 (FHO, WAG); *ibid.*, Chorley 6742 (SRGH); *ibid.* (fl., fr. Oct.) H. Wild 2209 (BR, K, SRGH); Mt. Selinda (fr. Jan.) McGregor 37/39 (FHO), 14/48 (FHO, SRGH); *ibid.*, Wiltshire 2/57 (K, SRGH).

Moçambique: Manica e Sofala: Chimoio, Garuzo (Nov.) Simão 637 (LISC).

Notes. *S. mellodora* is closely allied to *S. mitis* by the habit, leaf-venation, and size of flowers. They differ from each other as follows:

Branchlets glabrous; leaves drying dark brown with pale greenish-brown; flowers 4-merous; calyx not subtended by bracteoles; corolla in the mature bud 2.5–4.5 × as long as the calyx; tube 0.5–0.7 × as long as the calyx; lobes 4–5 × as long as the tube; anthers glabrous; ovary 1-celled; no colleters in the axils of the sepals ***S. mellodora***

Branchlets often partially pubescent; leaves drying pale greenish-brown; flowers 4–5-merous; calyx subtended by 1 or 2 sepal-like bracteoles; corolla in the mature bud 2–2.7 × as long as the calyx; tube 0.9–1.3(1.5) × as long as the calyx and 0.6–1.2 × as long as the lobes; anthers bearded at the base; ovary 2-celled; colleters in the axils of the sepals ***S. mitis***

S. mellodora is also closely allied to *S. xylophylla* (see notes to that species).

41. ***S. memecyloides*** S. Moore in Cat. Talbot's Nig. Pl. 69. 1913; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 24. 1931, partly (excl. syn. *S. talbotiae* S. Moore, Chevalier 17994, and Talbot 2077); not Chevalier, Expl. Bot. Afr. Occ. Fr. 1: 443. 1920. **Fig. 27, p. 185; Map 29, p. 181**

Type: Nigeria: Oban, Calabar Province, Talbot 2078 (BM, holotype; isotypes: K, MO, Z).



FIG. 26. 1-7. *S. mellodora*: 1-2. branches, $\frac{1}{2} \times$; 3. leaf, $\frac{1}{2} \times$; 4. flower, $3 \times$; 5. portion of corolla with stamen, $3 \times$; 6. hair of corolla, $15 \times$; 7. fruits, $\frac{1}{2} \times$ (1, 4-6. Swynnerton 101; 2-3. Greenway 6053; 7. McGregor 14/48). 8-14. *S. mitis*: 8. branch, $\frac{1}{2} \times$; 9. leaves, $\frac{1}{2} \times$; 10. flower, $4 \times$; 11. portion of corolla with stamen, $4 \times$; 12. calyx above, $5 \times$; 13. anther, $8 \times$; 14. fruit, $\frac{1}{2} \times$ (8, 10-13. Eggeing 6482; 9. Barbosa 742, Fegen PRF 2944, Gossweiler 13083, Swynnerton 17; 14. Swynnerton 17).

Heterotypic synonym: *S. memecyloides* var. *effusior* S. Moore, l.c. p. 70.
Type: Nigeria: Oban, Calabar Province, Talbot 2079 (BM, holotype; isotypes: K, WAG, Z).

Liana, at least 10–40 m long and 5–20 m high climbing in trees. Trunk 3–10 cm in diam.; bark pale brown, with large lenticels, thin; wood pale ochraceous. *Branches* not lenticellate, pale to dark brown when dry; branchlets brown-pubescent, dark brown and not or hardly sulcate when dry. Tendrils paired. *Leaves*: petiole short, brown-pubescent, 2–3 mm long; blade slightly shining and dark green above, much paler beneath when living, not when dry, coriaceous or especially in the shade papyraceous, elliptic, narrowly elliptic or narrowly ovate, comparatively narrower towards the apices of the branchlets, 2–4 × as long as wide, (7.5)12–22 × 3.5–10 cm, sometimes some smaller, distinctly acuminate at the apex, cuneate or rounded at the base, glabrous above, sparsely pubescent on the costa and main secondary veins beneath; one pair of secondary veins from above the base curved along the margin and often a faint submarginal pair; costa and mostly main secondary veins at least at the base impressed above; tertiary venation reticulate, prominent beneath. *Inflorescence* axillary or terminal or both, congested or lax, short, 0.1–0.5 × as long as the leaves, 1.5–8 × 1.5–3 cm, in fruit often much longer and up to 9 × 4 cm, many-flowered, 3–4 × branched. Peduncle, branches, and pedicels very pale green, brown-pubescent. Bracts oblong, up to 3 × as long as the sepals and like those, sparsely pubescent, without colleters. *Flowers* 5-merous. *Sepals* very pale green, connate at the base, ovate to suborbicular, 1–1.3 × as long as wide, 1.2 × 1.2 – 2 × 1.5 mm, obtuse or rounded at the apex, minutely ciliate, glabrous or sparsely pubescent outside, glabrous or appressed-pubescent at the base inside, without colleters. *Corolla* in the mature bud 2–2.5 × as long as the calyx, 3–4 mm long, and rounded at the apex, very pale green and sparsely pubescent to glabrous outside, inside white and with a pilose ring in the throat; tube 0.7–1 × as long as the calyx, 1.2–1.5 mm long; lobes 1.6–1.7 × as long as the tube, narrowly triangular, 1.6–2.8 × as long as wide, 2–2.5 × 0.9–1.2 mm, acute, spreading. *Stamens* hardly exerted; filaments short, about 0.2–1 × as long as the anthers, inserted at the mouth of the corolla tube; anthers ovate or nearly so, 0.6 × 0.4 – 1 × 0.7 mm, bearded with some pilose hairs at the subcordate base; cells slightly divergent. *Pistil* pilose, 2–2.2 mm long; ovary entirely glabrous or only at the very base, broadly ovoid, 1–1.2 × 0.8–1.2 mm, 2-celled, attenuate into the style; style pilose, short, 1–1.2 mm long; stigma capitate. In each cell 10–12 ovules. *Fruit* small, ellipsoid, laterally compressed, 2 × 1.8 × 1.5 – 3 × 2.5 × 2 cm, one-seeded. Wall thin. *Seed* flattened, more or less plano-convex, obliquely elliptic, 22 × 14 × 5 – 23 × 16 × 6 mm, very shortly and densely pubescent, rather smooth.

Distribution: S. Nigeria, Cameroun, Congo (both).

Ecology: Rain forests and secondary forests, often on river banks; alt. 0–500 m.

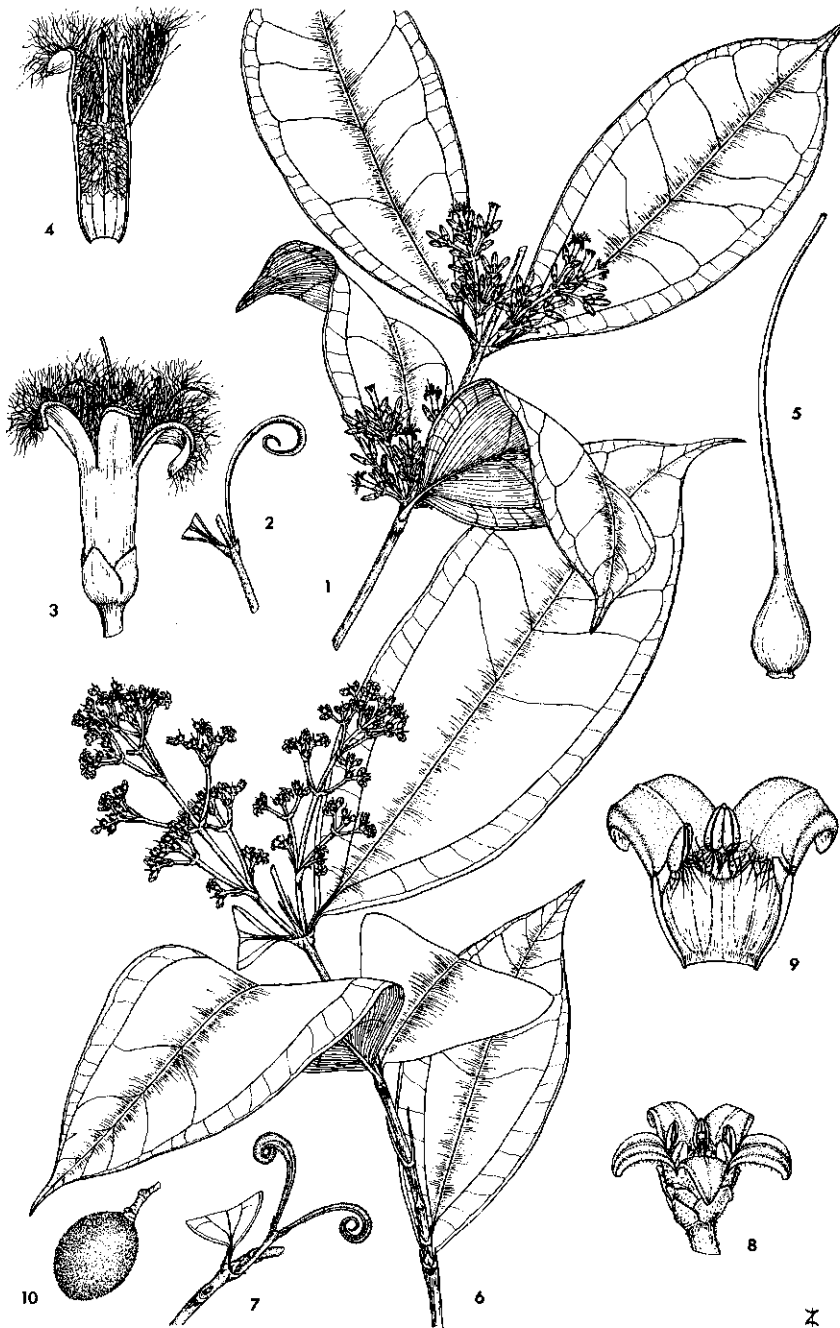


FIG. 27. 1-5. *S. ndengensis*: 1. branch, $\frac{1}{2} \times$; 2. tendril, $\frac{1}{2} \times$; 3. flower, $5 \times$; 4. portion of corolla with stamens, $5 \times$; 5. pistil, $10 \times$ (1-5. Le Testu 1752). 6-10. *S. memecyloides*: 6. branch, $\frac{1}{2} \times$; 7. tendril, $\frac{1}{2} \times$; 8. flower, $5 \times$; 9. portion of corolla with stamens, $10 \times$; 10. fruit, $\frac{1}{2} \times$ (6, 8-9. Leeuwenberg 5331; 7. Leeuwenberg 6324; 10. FHI 31806).

Nigeria: N. boundary of Stubbs Creek For. Res., Eket District, Calabar Province, Onochie FHI 32910 (FHI, K); Oban, Calabar Province, Talbot 2078 (BM, K, MO, Z, type), 2079 (BM, K, WAG, Z, type of *S. memecyloides* var. *effusior*); Boje Afi For. Res., Ikom District, Ogoja Province, Latilo FHI 31806 (FHI, K).

Cameroun: Mombo, S. Bakosi, Kumba District, Olorunfemi FHI 30563 (K); 25 km NE. of Douala, along road to Edéa, Leeuwenberg 6324 (WAG); 1 km W. of Masok, right bank Oum R., right bank Sanaga R. (Apr.) Leeuwenberg 5196 (WAG), 5331 (WAG).

Congo (Brazzaville): Komono, Bouquet 947 (P); near Mouyabi, Bouquet & Sitha 2258 (WAG); Sibiti Region (fr. Jan.) Koechlin 525 (IRSC), 1433 (IRSC); Ndoumou Mts., near Isiélé, Bouquet 1770 (P); Bouénza Forest, near Mboumou (Nov.) Bouquet 761 (P, WAG).

Congo (Kinshasa): Léopoldville: Kasongo Lunda, Duvigneaud 802 (BR, cited as *S. cordatifolia*). Orientale: Yangambi (fr. June) Louis 4256 (BR), 8039 (BR, WAG); Bambesa, Buta Territory, Gérard 5721 (BR, WAG); Nioka, Duvigneaud 917a (BR, cited as *S. cordatifolia*). Kasai: Tshikapa, Duvigneaud 1086 (BR); 160 km S. of Luebo, along road to Tshikapa, Germain 7961 (BR, WAG).

42. *S. millepunctata* Leeuwenberg, Act. Bot. Neerl. 14: 221, f.l. 1–6. 1965, partly (excl. Chevalier 13128 and Thomas 5032). Type: Ivory Coast: Abouabou Forest, between Abidjan and Grand Bassam, Leeuwenberg 2662 (WAG, holotype; isotypes: A, B, BR, COI, FHO, G, K, M, MO, P, PRE, S, U, Z).

Fig. 28, p. 187; Map 28, p. 176

Liana at least 20–25 m long and 5 m high climbing in trees. Trunk 3 cm in diam. or more. Bark pale and dark grey-brown-spotted, not lenticellate, thin, smooth; wood pale yellow. Branches pale to medium brown, not lenticellate, not sulcate when dry; branchlets glabrous, green, terete, pale greenish-brown and often slightly sulcate when dry. Leaves: petiole glabrous, 4–10 mm long; blade slightly or hardly shining, above medium to dark green, paler beneath, coriaceous in the sun, thinly coriaceous or papyraceous in the shade, elliptic or ovate, 1.4–2 × as long as wide, 4–10(14) × 2–7(8) cm, apiculate or acuminate at the apex, cuneate or rounded at the base, glabrous on both sides, above with minute translucent dots; one pair of secondary veins from or from above the base curved along the margin and a faint submarginal pair; tertiary venation reticulate, not very distinct, prominent beneath. Inflorescence axillary, solitary, rather congested, few-flowered, short, 1–1.5 × 1 cm, 2 × branched. Peduncle, branches, and pedicels short, glabrous. Bracts small, sepal-like, glabrous above, without colleters. Flowers 5-merous. Sepals connate at the base, equal or subequal, broadly ovate or suborbicular, about as long as wide, 1.2–1.3 × 1.2 mm, obtuse or rounded, ciliate, glabrous on both sides, without colleters. Corolla in the mature bud about 3.5 × as long as the calyx, and about 4.5 mm long, white (?), outside pubescent; tube about 3 mm long; lobes about 1.5 mm long (only incomplete in herb. Nozeran 6 Sept. 1950). Pistil glabrous, 4.5 mm long; ovary ovoid, 1.5 × 1 mm, gradually narrowed into the style, 2-celled; style slender, 3 mm long; stigma capitate. In each cell about 6 ovules. Fruit orange, nearly mature dark green, small, soft, globose, 1–2 cm in diam., 1-seeded, with smooth skin, hardly shining, slightly obliquely pedicellate. Wall thin, about 1 mm thick. Pulp orange. Seed pale brown, slightly flattened, ellipsoid, 8 × 7 × 6–11 × 9 × 7 mm, densely pubescent, smooth; testa thin, sticking to the pulp.

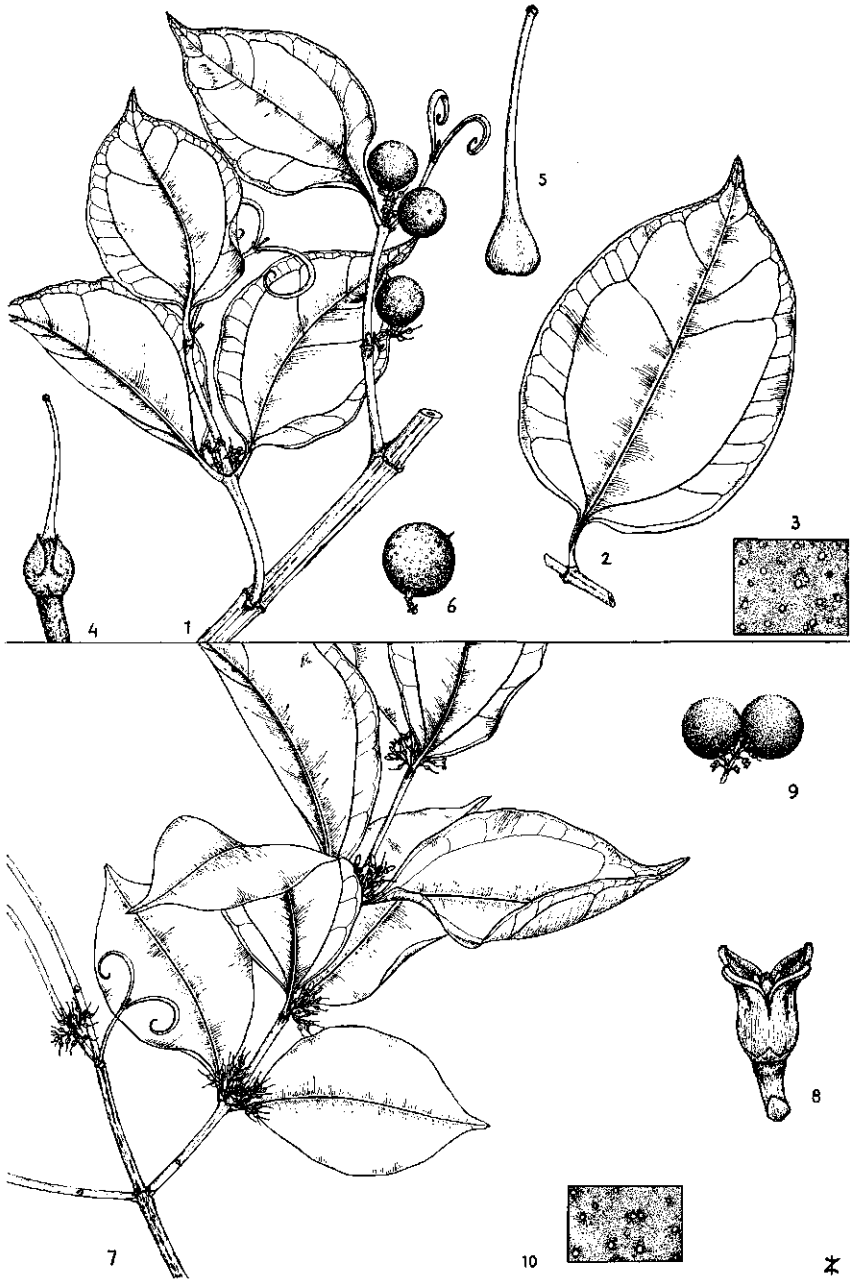


FIG. 28. 1-6. *S. millepunctata*: 1. fruiting branch, $\frac{1}{2} \times$; 2. leaf, $\frac{1}{2} \times$; 3. leaf portion above, $15 \times$; 4. calyx with pistil, $5 \times$; 5. pistil, $7 \times$; 6. fruit, $\frac{1}{2} \times$ (1-3. Leeuwenberg 2662; 4-5. Nozeran 6 Sept. 1950; 6. J. de Wilde & Leeuwenberg 3447). 7-10. *S. cuminodora*: 7. flowering branch, $\frac{1}{2} \times$; 8. flower, $5 \times$; 9. immature fruits, $\frac{1}{2} \times$; 10. leaf portion above, $15 \times$ (7, 8 and 10. Leeuwenberg & Brader 3737; 9. Guillaumet 1604).

Distribution: Ivory Coast.

Ecology: Rain forests or secondary forests, usually on river banks; alt. 0–200 m.

Ivory Coast: 15 km E. of Soubré, left bank Bo R., Leeuwenberg 4098 (ABI, WAG); 20 km NW. of Sassandra, Leeuwenberg 4030 (WAG); 7 km W. of Oumé, Leeuwenberg 4145 (WAG); Abouabou Forest, between Abidjan and Grand Bassam (fr. Feb.) J. de Wilde & Leeuwenberg 3447 (ABI, BR, K, WAG); *ibid.* (fr. Feb.) Leeuwenberg 2662 (herbaria see above, type); *ibid.* (fl. just over) Nozeran 6 Sept. 1950 (MPU); *ibid.*, Oldeman 94 (WAG).

Cult.: Wageningen, seedling of herb. J. de Wilde & Leeuwenberg 3447: Leeuwenberg 7819 (WAG).

Notes. The paratype, Thomas 5032, has shorter pistils than the Ivory Coast collections cited above. It is identified as *S. cuminodora* here, although the leaves are rather thick for that species. The other Sierra Leone specimens of the latter species have also rather thick leaves. The identity of the vegetative specimen, Chevalier 13128, is therefore somewhat doubtful.

S. millepunctata resembles *S. floribunda* by the leaves, calyx, pistil, and size of the fruits. It differs from it as follows:

Tendrils paired; leaves minutely punctate; branches not lenticellate, dark green, turning brown; fruits globose	<i>S. millepunctata</i>
Tendrils solitary; leaves not punctate; branches lenticellate, nearly black; fruits ellipsoid	<i>S. floribunda</i>

Furthermore, it resembles *S. cuminodora* by the paired tendrils, the not lenticellate branches, and the minutely punctate leaves, but it differs from the latter in the following characters:

Pistil 4.5 mm long; branchlets not grooved; leaves coriaceous or nearly so in the sun	<i>S. millepunctata</i>
Pistil 2–2.4 mm long; branchlets grooved below the stipular line; leaves thinly coriaceous or papyraceous also in the sun	<i>S. cuminodora</i>

43. *S. mimfiensis* Gilg ex Leeuwenberg, sp. nov. (Gilg ex Duvign., Bull. Soc. Roy. Bot. Belg. 85: 31. 1952, nomen). **Fig. 24, p. 175; Map 28, p. 176**

Liana magna silvae densae cirrhis solitariis profulta. Folia glabra laminis papyraceis ellipticis apice acuminatis vel caudatis conspicue venosis. Inflorescentia axillaris parva pauciflora pedunculis pedicellisque glabris. Flores plerumque pentameri parvi. Sepala ovata subacuta ciliata utrinque glabra. Corolla pallide flava extus glabra intus lobis suberectis crassis apice pilis incurvatis profulta. Stamina corollae fauce inserta filamentis brevibus antherisque glabris basi cordatis. Pistillum glabrum ovario biloculari styloque brevi. Fructus pallide viridis parvus ellipsoideus monospermus. Semen ellipsoideum laeve testa tenuissima.

Type: Cameroun: 24 km NE. of Douala, along road to Edéa, Leeuwenberg

6821 (WAG, holotype; isotypes: A, BR, C, COI, E, FHO, G, K, LISC, M, P, PRE, S, U, UC, YA, Z).

Large liana, 50–80 m long and up to 40 m high climbing in trees. Trunk 4–8 cm in diam.; bark pale brown, with some lenticels; wood pale brownish. *Branches* pale grey or pale brown, slightly lenticellate, terete; branchlets glabrous, not lenticellate, medium green, dark brown when dry. *Leaves*: petiole glabrous, 3–7 mm long; blade more or less shining on both sides, hardly paler beneath, papyraceous or when living sometimes thinly coriaceous, elliptic, $2-3 \times$ as long as wide, $5-11 \times 2-5$ cm, in the shade thinner and up to 15.5×6 cm, distinctly acuminate to caudate at the apex, cuneate or rounded at the base, glabrous on both sides; one pair of secondary veins from or from above the base curved along the margin, which are impressed above like the costa; tertiary venation reticulate, prominent on both sides in dry leaves, in living leaves only beneath. *Inflorescence* axillary, small, $0.1-0.2 \times$ as long as the leaves, rather congested, but with usually distinct peduncle, few-flowered, 1–1.5 cm long and wide, $2-3 \times$ branched. Peduncle, branches, and pedicels glabrous. Bracts approximately sepal-like, glabrous on both sides, without colleters. *Flowers* (4–)5-merous, often sessile. *Sepals* pale green, connate at the base up to one-third of their length, equal, ovate, $1-1.5 \times$ as long as wide, $1.2-1.4 \times 0.8-1$ mm (inside 1 mm long), obtusely acute, ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud $2-3 \times$ as long as the calyx, 2.5–3 mm long, and obtuse at the apex, pale yellow, thin at the base, distinctly thicker towards the apex, outside glabrous, inside with recurved brushes of white hairs at the apices of the lobes; tube $0.8-1.5 \times$ as long as the calyx inside, 0.8–1.5 mm long, wide; lobes narrowly triangular, $1-2 \times$ as long as the tube, $1.5-1.7 \times 0.8$ mm, thick, acute, erect. *Stamens* hardly exerted; filaments glabrous, short, $0.7-1 \times$ as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, $0.6-0.8 \times 0.6$ mm, deeply cordate at the base, glabrous. *Pistil* glabrous, 1.4–1.8 mm long; ovary ovoid, $1 \times 0.8-1$ mm, 2-celled, rather abruptly narrowed into the style; style short, 0.4–0.8 mm long; stigma obscurely bilobed or capitate. In each cell 5 ovules. *Fruit* small, ellipsoid, mature pale green, $23 \times 15 - 25 \times 17$ mm, thin-walled, 1-seeded. *Seed* ellipsoid or nearly so, smooth, $16 \times 10 \times 6 - 20 \times 10 \times 7$ mm. Testa thin, sticking to the pulp.

Distribution: Western part of East Cameroun.

Ecology: Rain forests and secondary forests with *Lophira alata* Banks ex Gaertn. f.; alt. 0–100 m.

Cameroun: 24 km NE. of Douala, along road to Edéa (Oct.) Leeuwenberg 6316 (WAG), 6821 (type, herbaria see above), 6823 (WAG, seedlings of 6821); 17 km E. of Koponga, along road to Masok, right bank Bolobo R., Leeuwenberg 6292 (WAG); 60 km S. of Edéa, S. of Mboké, Leeuwenberg 5550 (WAG); Bipindi (Mar.) Zenker 3341 (BM, E, G, K, US, WU), 4877 (BR, G, K, LE, MO, W); *ibid.*, Mimfia, Zenker 521 (number in pencil, Mar. 1914: B, BOL, BREM, C, F, FI, G, GH, JE, LY, MO, NY, P, U, UC, US, WAG), June 1911 (F).

Notes. *S. mimfiensis* was used for the first time as a manuscript name by GILG on the labels of three numbers collected by Zenker, nos. 521 and 3341, cited above, and 4270 which is *S. boonei*. DUVIGNEAUD (1952) published it as a nomen nudum.

This species is closely allied to *S. malchairii* by the arrangement of the tendrils, the flowers, fruits, and seeds. It differs in the following characters: the leaves are thinner, shining instead of dull and hardly paler beneath, and darker when dry. The secondary veins deviate from the costa at a right angle instead of a rather small angle.

44. *S. mitis* S. Moore, Journ. Linn. Soc. 40: 146. 1911; Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 23. 1952 and 86: 106. 1953; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 21. 1960; Verdoorn in Fl. S. Afr. 26: 141, f. 17. 2: 1963; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 43. 1963, partly (excl. Scott Elliot 5418). **Fig. 26, p. 183; Map 30, p. 191**

Type: Rhodesia: Chirinda Forest, Swynnerton 17a (BM, lectotype; isotypes: K, Z).

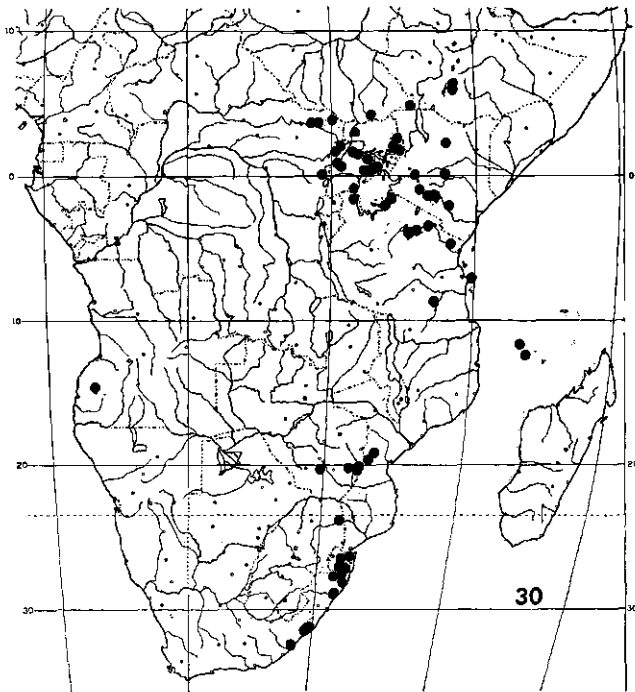
Heterotypic synonym: *S. adolphi-frederici* Gilg in Mildbraed, Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped. 1907-'08. 2: 531, t. 73 F-J. 1914. Type: Congo: Orientale, Semliki R. Valley, Mildbraed 1997 (holotype not seen, destroyed in B; lectotype: PRE).

Evergreen tree with rounded crown, 6–35(40) m high (rarely shorter). Trunk 20–100 cm in diam.; bark smooth, grey, grey-green, or grey-brown; wood whitish, hard. *Branches* pale grey or buff, mostly paler than in *S. mellodora*, lenticellate, ascending, with fissured bark; branchlets glabrous or sometimes pubescent, pale grey or pale to medium brown, not lenticellate, sulcate when dry. *Stipules* none. *Leaves*: petiole short, glabrous or sometimes (if branchlets hairy) pubescent, 2–5 mm long, smooth; blade shining and dark green above, paler beneath, coriaceous (not thick), narrowly elliptic, oblong, or sometimes ovate or narrowly ovate, 1.7–3.5 × as long as wide, 4–11.5 × 1.5–5 cm, usually comparatively narrower towards the apices of the branchlets, mostly acuminate, more rarely acute or obtuse at the apex, cuneate or rounded at the base or decurrent into the petiole, glabrous or sometimes pubescent on both sides; one pair of distinct secondary veins from about 1 cm above the base and a faint submarginal pair from the base; tertiary venation spreading, not very prominent. *Inflorescence* axillary and terminal, dense or rather so, much shorter than the leaves, 1–3(4) × 1–2.5 cm. Peduncle, branches, and bracts beneath pubescent. Peduncle usually short. Bracts without colleters. *Flowers* 4–5-merous, even in a single inflorescence, sessile. *Sepals* pale green, connate at the very base, broadly ovate or orbicular, about as long as wide, 1.5–1.8 × 1.5–1.8 mm, obtusely acute at the apex, ciliate, pubescent to glabrous outside, glabrous and with colleters at the base inside. *Corolla* in the mature bud 2–2.7 × as long as the calyx, 3.5–4 mm long, and rounded at the apex, creamy, yellow, or greenish,

outside glabrous, inside densely villose at the base of the lobes; tube campanulate, $0.9-1.3(1.5) \times$ as long as the calyx, $0.6-1.2 \times$ as long as the lobes, $1.5-2.2$ mm long; lobes thick at the apex, triangular to ovate, $1.1-1.7 \times$ as long as wide, $1.5-2.5 \times 1.1-1.8$ mm, acute at the apex, often slightly widened above the base, spreading or sometimes recurved. *Stamens* just exerted; filaments glabrous, short, $0.2-1 \times$ as long as the anthers, inserted at two-thirds from the base of the corolla tube; anthers cordate-orbicular when young, becoming oblong after the pollen is shed, $1-1.2 \times 0.6-0.7$ mm, bearded at the deeply cordate base; cells parallel. *Pistil* glabrous, $2.3-3$ mm long; ovary ovoid or ovoid-conical, about $1.5 \times$ as long as wide, $1-2 \times 0.7-1.3$ mm, 2-celled, gradually narrowed into the style; style $0.8-1.5$ mm long; stigma capitate. In each cell about 10-15 ovules. *Fruit* yellow or orange, small, subglobose, $1-2$ cm in diam. Wall thin. *Seeds* 1 (-2), pale ochraceous, subellipsoid, usually flattened at one side, $1-1.2 \times 0.8-1 \times 0.5-0.6$ cm, smooth, glabrous, not grooved, very minutely foveolate; hilum in the middle of the mostly flattened side. Testa thin.

Distribution: Angola, East Africa from Sudan and Ethiopia to Kentani in South Africa, and Comoro Islands.

Ecology: Upland and lowland rain forests and gallery forests; alt. 0-2100 m.



MAP 30. *S. mitis*.

Sudan: Gilo, Imatong Mts., Torit District, J. K. Jackson 313 (FHO); N. Lorienatom, I. R. Dale S 320 (EA).

Ethiopia: Dilla, Marchetti 84 (FI); Galla Sidamo, Uaba Forest, Giordano 2462 (FI); Dembi, Humbi Forest, Giugliarelli 561 (FI).

Congo (Kinshasa): Orientale: between Dungu and Faradje, De Schipper 207 (BR), 400 (BR); Kurukwata, Faradje Territory (Jan.) Gérard 3590 (BR), 3653 (BR, EA, K, WAG), 3705 (BR, WAG); *ibid.* (fr. Mar.) Gilbert 2201 (BR); *ibid.*, Hoyle 777 (FHO); Ishwa, S. Mahagi, Bredo 1495 (BR); between Djambi and Djugu (June) Devillé 493 (BR, K, LISC, P, WAG). Kivu: Semliki R. Valley, Mildbraed 1997 (PRE, type of *S. adolphi-frederici*).

Angola: Moçamedes: Serra da Chela, Vila Arriaga (Aug.) Gossweiler 13083 (LISC, NLI), 13083c (LISC).

Uganda: Northern Province: Zoka Forest, E. Madi, Eggeling 1253 (1349) (K); *ibid.* (fr. Jan.) Leggat 64 (BM, EA, ENT, FHO); Moroto, Lia R. (fr. Nov.) J. Wilson 1589 (EA, K); Napak, Karamoja District (July) Philip 185 (EA); *ibid.*, Sangster 425-6 (EA, K); Mt. Debasien, Karamoja (Oct.) I. R. Dale U 460 (ENT). Western Province: Budongo Forest, Bunyoro (fl. May, fr. Nov.) Eggeling 3344 (B, BR, ENT, K), 3449 (K), 5322 (EA, ENT); Kidongo, Bwamba (fr. Aug.) Eggeling 3378 (B, BR, ENT, K, P); Ntungu, Toro District (Nov.) St. Clair-Thompson 1724 (ENT, K). Buganda Province: Mabwi, E. Mengo, Kigundu 67/110 (ENT); Mabwi Forest, Cahusu (?) 113 (ENT); Entebbe, Dawe 996 (K); Mabiri Forest, Mengo District, Dawkins 612 (ENT, K); *ibid.* (fr. Mar.) Ussher 14 (BM, K); Mulange Forest (June-July) Dümmer 4194 (BM, MO); Namalala Forest, Fyffe 1 (K).

Kenya: Marsabit, Oteke 32 (K); *ibid.* (fl., fr. Jan.) Polhill 341 (BR, EA, K, PRE); *ibid.* (Feb.) Williams & Adamson EAH 11028 (EA, FI, K, PRE); *ibid.*, Woodhouse 20 (EA); Lare, Nyiro District, E. A. Lewis B 201 (EA, FI); Bartolimo Forest, Baringo District (fr. Apr.) Wimbush 1220 (EA, FHO); Mara R., Narok District (fr. Apr.) Glover, Gwynne & Samuel 367 (EA); Ngong, van Someren June 1936 (EA); Nairobi (fl. June) Bally 893 (K); *ibid.* (May) H. M. Gardner 3453 (BR, EA, K); *ibid.* (May) Linton 154 (K); *ibid.* (June) Mearns 291 (BR, US); *ibid.*, van Someren 424 (EA), 423, partly (EA, G, K); *ibid.* (?) (fr. Jan.) van Someren 497 (EA); Kibwezi Plains, above Intabe, Bally 108 (EA, K).

Tanzania: Mingiso For. Res., Bukoba, Watkins 514 (FH 3253) (EA); Bologonja R., Musoma District (fr. Aug.) Greenway 10759 (EA, K); Iramba, E. side Lake Victoria, Watkins 332 (FH 2994) (EA, FHO); Karatu, Mbulu District (fr. Dec.) R. L. Willan 86 (EA, K), 87 (EA); Lake Manyara Nat. Park (fr. June) Greenway & Kanuri 11867 (BR, K, WAG); N. Crater Nat. Park, Arusha District, Greenway & Kanuri 13433 (K); between Meru region and Baibal Lake, Uhlig 499 (EA); Arusha (July) Matalu 3153 (EA, K); Tenguru, near Arusha (Jan.) Eggeling 6482 (B, BR, EA, K); *ibid.*, Ivens 636 (EA); *ibid.* (June) Matalu 3149 (EA, K); *ibid.* (Jan.) Watkins 616 (EA); Kifua, near Arusha, Royland comm. Bhattissa H 94/53 (EA, FHO, K); Lushoto-Mombo road (June) Drummond & Hemsley 2919 (B, BR, EA, K, LISC, S, SRGH); Magombera For. Res., Ulanga District, Semsei 3386 (EA, K); Mafia Island, Greenway 5083 (EA, K).

Rhodesia: Wedza Mt., H. Wild 6563 (FHO, K); Benga, Bikita District (Feb.) O. West 6327 (WAG); Chirinda Forest, Chipinga District, Goldsmith 1/65 (WAG); *ibid.*, R. W. Jack SRGH 6353 (SRGH); *ibid.* (fl. Jan., fr. Oct.) Swynnerton 17 (BM, K, NBG, US, Z, paratype), 17a (BM, K, Z, lectotype); Mt. Selinda, McGregor 23/39 (FHO, J), 35/39 (FHO); *ibid.* (Dec.) Obermeyer 2328 (PRE); *ibid.*, Whellan 213 (SRGH).

Moçambique: Manica e Sofala: crossing of Mavita-Vila Pery and Dombe roads (fr. Sept.) Mendonça 142 (LISC); km 15 of Mavita-Vila Pery road (fr. June) Torre 4348 (LISC). Lourenço Marques: Maputo, Goba (fl., fr. Dec.) Barbosa 742 (LISC).

Swaziland: Ubombo Mts., 6 km S. of Stegi, Keith July 1953 (K); Hlatikulu Forest, Boocock 25 (PRE, PRF).

South Africa: Transvaal: Cyprus Kloof, Letaba District (Jan.) Renny 197 (PRE); Mtataspruit-Kloof, Letaba District, Scheepers 1249 (WAG). Natal: Gwaloweni Forest, Lebombo Mts. (Jan.) D. Edwards 2929 (K), 2934 (K, PRE); *ibid.* (fr. Aug.) Tinley 464 (K, NH, PRE); Ingwavuma, Gerstner 3771 (NH); Ngome, Gerstner 5206 (PRE, erroneously cited as 5204 by VERDOORN); Hluhluwe Game Res., Hlabisa District, Codd 9624 (K); *ibid.*, Ward

2674 (NH); Eshowe, Kotze 27 (PRF), 26 Jan. 1927 (FHO, MO). Cape Province: Lusikisiki (Jan.) J. W. Pont 1090 (Z); *ibid.*, Ntsubane Forest (Jan.) Fraser PRF 2349 (PRE, PRF), 2405 (PRE, PRF); Mlotane Forest, Lusikisiki (fl. Jan., fr. June, Aug.) Fegen PRF 2743 (PRE, PRF), 2774 (PRF), 2944 (A, PRE, PRF); Mzwane Forest, Lusikisiki District (Jan.) Fegen PRF 6993 (PRF); Mzwane Forest, near Port St. Johns (Dec., Mar.) Fegen 2956 (FHO, K, PRE, PRF, WAG), 5530 (PRF), 5602 (NBG, PRF); Ismentone Forest, Port St. Johns, Forrester PRF 1973 (PRF); Manubi Forest, Kentani District, van der Merwe 7 in PRF 8357 (PRF).

Comoro Islands: Grande Comore: Nioumbadjou Forest (fl., fr. Feb.) Serv. For. 16592 (P); *sin. loc.*, Goettel June 1936 (P). Anjouan: Dindi, Ouani Canton, Serv. For. 16677 (P).

Cult.: Lourenço Marques, Moçambique, Gomes e Sousa 3454 (COI, EA, K, P, PRE, SRGH).

Notes. *S. mitis* resembles *S. henningsii*. They can be distinguished as indicated under the latter species.

45. *S. moandaensis* De Wild., Ann. Mus. Congo. Sér. 5. 3: 249. 1910; Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 26, f. 8A. 1952.

Fig. 29, p. 195; Map 31, p. 197

Type: Congo (Kinshasa): Léopoldville: Moanda, Gillet 4013 (BR, holotype).

Heterotypic synonym: *S. decorsei* A. Chev., Rev. Bot. Appliq. 27: 374, pl. 19 B. 1947 (and Et. Fl. Afr. Centr. Fr. 1: 203. 1913, nomen). Type: Congo (Brazzaville): Bondjoland, Oubangui R., Chevalier 5153 (P, holotype).

Climber. *Branches* lenticellate or not, dark brown when dry; branchlets pubescent to glabrous, not lenticellate, often slightly sulcate and brown when dry. Tendrils paired. *Leaves*: petiole short, sparsely pubescent or rarely glabrous, 1–3 mm long; blade shining above, paler and less shining beneath, coriaceous, elliptic, narrowly elliptic, ovate, or narrowly ovate, 1.5–3 × as long as wide, 2–7 × 1–3 cm, acute or sometimes acuminate at the apex, cuneate, rounded or – if ovate – often subcordate at the base, glabrous or sparsely pubescent on the costa on both sides; one pair of rather faint secondary veins from the base curved along the margin; sometimes an additional fainter submarginal pair; tertiary venation reticulate, prominent on both sides or only beneath. *In-florescence* axillary and at the same time terminal, congested or not, many-flowered, about as long as the leaves, 2 × 2–5 × 4 cm. Peduncle, branches, and pedicels sparsely pubescent. Bracts small, narrowly ovate or nearly linear, sparsely pubescent beneath. *Flowers* 5-merous. *Sepals* connate at the base, ovate, 1 × 0.8 mm, acute at the apex, ciliate, sparsely pubescent outside, glabrous inside, without colleters. *Corolla* in the mature bud 3.5–4 mm long, and rounded at the apex, white, obconical, outside glabrous or sometimes with a single hair, inside pilose in the throat, tube 1.2–2 mm long, gradually widened towards the throat; lobes 1–2 × as long as the tube, narrowly ovate, 2–3 × as long as wide, 2–2.5 × 0.8–1.2 mm, acute, spreading. *Stamens* well-exserted; filaments shorter than the anthers, 1 mm long, glabrous, inserted at the mouth

of the corolla tube; anthers oblong, $1.3-1.4 \times 0.5-0.7$ mm, deeply cordate and bearded with some pilose hairs at the base; cells parallel. *Pistil* 2.8–4 mm long, pilose; ovary ovoid, $1-1.5 \times 0.8-1$ mm, pilose, except for the glabrous very base, 2-celled, gradually narrowed into the style; style 1.8–2.5 mm long, pilose, except for the glabrous very apex; stigma capitate. In each cell 8 ovules. *Fruit* orange-yellow, small, soft, subglobose, about 13–15 mm in diam., 1–2(5)-seeded, slightly shining. Wall thin. *Seeds* medium brown, smooth, puberulous, elliptic, or – if more than 2 – trullate, flattened, $9 \times 5 \times 4 - 12 \times 9 \times 5$ mm, more or less plano-convex, acute at one end. Testa rather thick.

Distribution: Congo (both), Angola.

Ecology: Rain forests, on river banks, at low elevations.

Congo (Brazzaville): Bondjoland, Oubangui R. (fr. Aug.) Chevalier 5153 (P, type of *S. decorsei*); Foulakari Falls (Oct.) Sitha 1861 (WAG).

Congo (Kinshasa): Léopoldville: Moanda (fr. June) Donis 1789 (BR); *ibid.*, Gillet 4013 (BR, type); Wombe, Thysville Territory (fr. Jan.) Compère 1365 (BR, K).

Angola: Luanda: Museque de Viana, Exell & Mendonça 23 (COI, LISJC); *ibid.* (fl. Mar., Nov.-Dec., fr. Oct.) Gossweiler 10519 (BM, COI), 10519 C, partly (NLI), 10544 (BM, COI), 11344 (COI, LISJC), March 1938 (K, LISJC); Luanda, near Bengo R. (fl., fr. May) Gossweiler 9244 (BM, COI, K, LISJC, US); km 28 of Catete Railway, Gossweiler 10445 (BM, COI); Catete, Gossweiler 9224 (BM, COI, K, US); Quiçama, Caça Res. (June) J. C. Henriques 40 (NLI). Lunda: Dundo, near Luachimo R., Gossweiler 13779 (B, BM, K, NLI, US, WAG, aberrant by large leaves and large flowers).

Notes. *S. moandaensis* is closely allied to *S. kasengaensis* (q.v.). One specimen, Gossweiler 13779, identified here as *S. moandaensis* on the ground of its inflorescence and fruit characters, is aberrant. The flowers are too large for the species, as far as is known. Flowers of this size occur in *S. kasengaensis*. The leaves are shining and large, $6-12 \times 2.5-6.5$ mm.

The flowers, fruits, and seeds of the type of *S. decorsei* agree with those of the type of *S. moandaensis* and of the other specimens examined. Only the leaves of the former are not shining beneath. This character is not important enough to keep the species apart, according to the present author.

46. *S. mostueoides* Leeuwenberg, sp. nov. Fig. 30, p. 198; Map 24, p. 152

Frutex ramis inermibus saepe bifurcatis. Folia petiolis brevibus pubescentibus laminisque subcoriaceis forma magnitudineque variabilissima ovatis, anguste ovatis vell ellipticis apice saepe longe acuminatis basi rotundatis vel cuneatis utrinque glabris vel costa sparse pubescentibus. Inflorescentia terminalis laxa pauciflora pedunculo pedicellis glabris vel sparse pubescentibus pilis saepe seriatis. Flores pentameri parvi. Sepala fere triangularia apice acuta ciliata extus glabra vel pilis paucis profulta. Corolla extus glabra intus basi loborum subreceptorum penicillata. Stamina inclusa filamentis antheris oblongis base cordatis pilis perpaucis barbatis aequilongis. Pistillum glabrum brevissimum ovario biloculari. Fructus minimus mono- vel bispermus. Semen ellipticum disciforme scabridum.

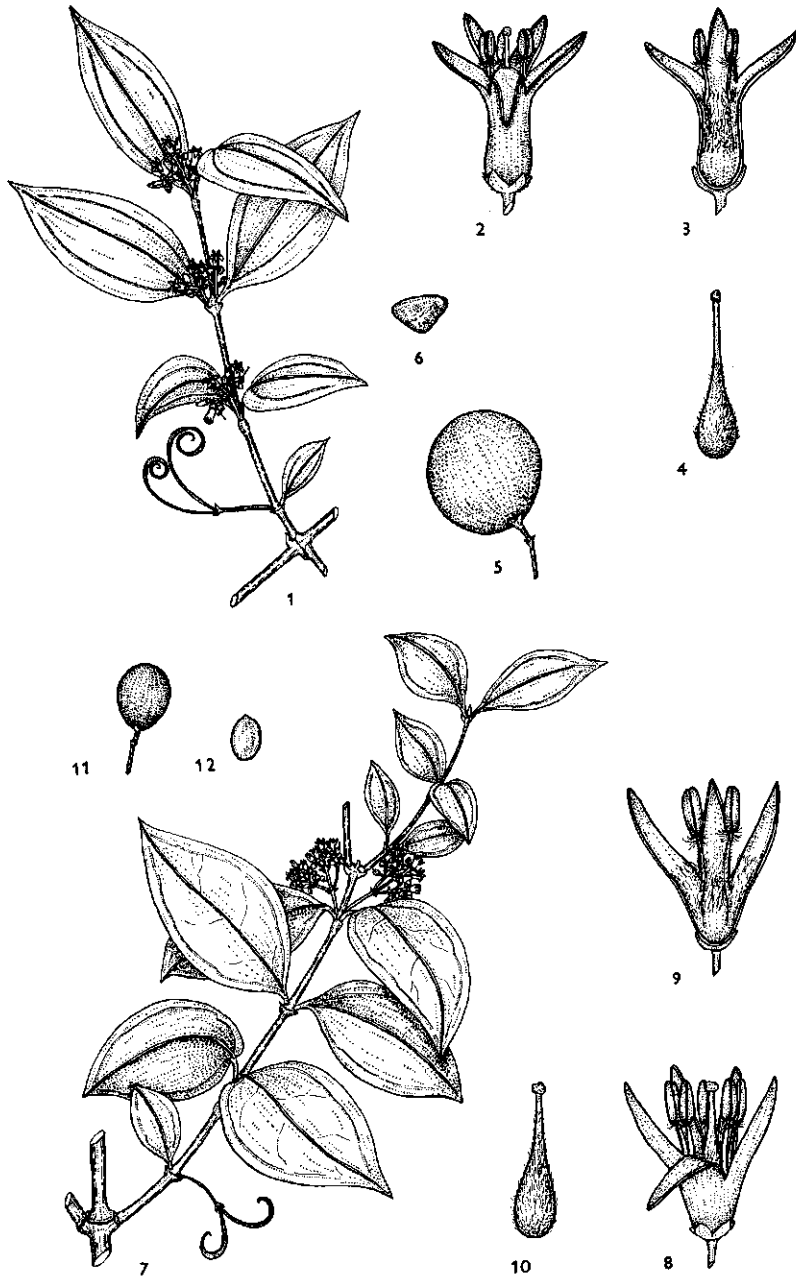


FIG. 29. 1-6. *S. kasengaensis*: 1. branch, $\frac{1}{2} \times$; 2. flower, $4 \times$; 3. opened flower, $4 \times$; 4. pistil, $4 \times$; 5. fruit, $\frac{1}{2} \times$; 6. seed, $\frac{1}{2} \times$ (1-4. de Witte 3216; 5-6. Glover in Bredo 6408); 7-12. *S. moandaensis*: 7. branch, $\frac{1}{2} \times$; 8. flower, $6 \times$; 9. opened flower, $6 \times$; 10. pistil, $6 \times$; 11. fruit, $\frac{1}{2} \times$; 12. seed, $\frac{1}{2} \times$ (7-10. Gossweiler 10544; 11-12. Gossweiler 11344).

Type: Madagascar: Sambirano R. Valley, Perrier de la Bâthie 15504 (P, holotype; isotype: WAG).

Shrub, 2–3 m high. *Branches* not lenticellate, often dichotomously branched; branchlets sparsely pubescent with often ranked hairs or glabrous, not lenticellate. *Leaves*: petiole short, pubescent or glabrous, 0.5–2 mm long; blade shining or mat on both sides, paler beneath, subcoriaceous, very variable in shape and size, ovate, narrowly ovate, or elliptic, 1.5–4 × as long as wide, 20–70 × 9–30 mm or smaller, often long-acuminate, with a mostly obtuse apex, rounded or cuneate at the base, glabrous or sparingly pubescent on the costa on both sides or only beneath; one pair of rather distinct secondary veins from or from above the base curved along the margin and a faint submarginal pair; tertiary venation reticulate, slightly prominent on both sides. *Inflorescence* terminal, lax, few-flowered, 1 × 1 – 2 × 2 cm, 2 – 3 × branched. Peduncle, branches, and pedicels glabrous or sparsely pubescent with often ranked hairs. Bracts small, narrowly triangular or sepal-like. *Flowers* 5-merous. *Sepals* connate at the base, equal or subequal, the inner often slightly smaller, nearly triangular, 1–1.2 × 1 mm, acute at the apex, ciliate, outside glabrous or with a single hair, inside glabrous, without colleters. *Corolla* in the mature bud 4 × as long as the calyx, 4.8 mm long, cylindrical, white, outside glabrous, inside penicillate on the base of each lobe; tube 2 × as long as the calyx, as long as the lobes, 2.4 × 1.2 mm; lobes oblong, 2.4 × 0.8 mm, acute, entire, suberect. *Stamens* included; filaments short, about as long as the anthers, glabrous, inserted on the middle of the corolla tube; anthers oblong, 0.8 × 0.4 mm, with a single hair at the deeply cordate base; cells parallel. *Pistil* glabrous, very short, 1 mm long; ovary ovoid, 1 × 0.5 mm, 2-celled; stigma sessile, capitate. In each cell 2–3 ovules. *Fruit* small, 1–2-seeded, flattened when dry, 6–8 mm in diam. *Seed* elliptic, disk-like, 6 × 5 × 2 – 8 × 7 × 2 mm, rough, scabrid-pubescent. Testa rather thick.

Distribution: Madagascar and perhaps also in Congo (Kasai).

Ecology: Low forest near river banks; alt. 0–500 m.

Madagascar: Ifasy R. Valley, below Anaborano, Ambilobe District (fr. Mar.) Humbert & Capuron 25876 (P, WAG); Sambirano R. Valley (Jan.) Perrier de la Bâthie 15504 (P, WAG, type); Upper Sambirano R., Sambirano Mt. (bud. Dec.) Perrier de la Bâthie 2066 (P, WAG); Upper Mananjeba R., Sambirano R. (fr. July) Perrier de la Bâthie 2232 (P, WAG).

Notes. The following specimen which is more hairy, and which has a more congested inflorescences and outside hairy sepals may belong to this species:

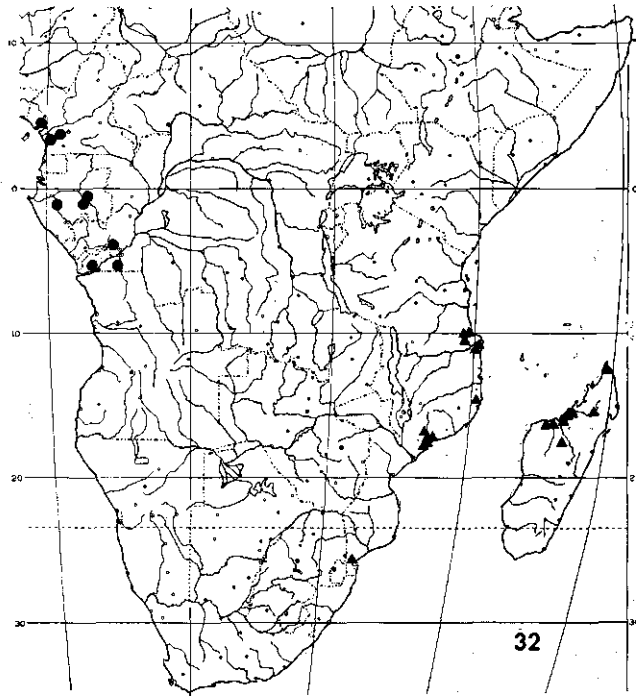
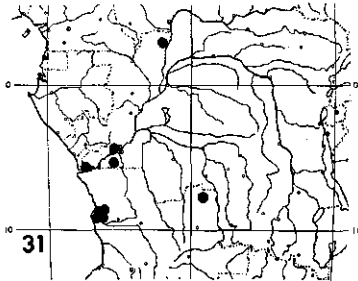
Congo (Kinshasa): Kasai: Dibaya Territory (fl. just over, Jan.) Liben 2164 (BR, WAG).

S. mostueoides is related to *S. myrtooides* by the shape of the leaves, the disposition of the inflorescence, the very small fruits, and the disk-like seeds. The differences between them are as follows:

Leaves 2–7 cm long, often long-acuminate, mostly glabrous above and often also beneath; sepals nearly free **S. mostueoides**
 Leaves 1.2–3(3.3) cm long, rounded to acute or broadly and bluntly acuminate, hairy beneath and often also above; sepals up to one-third connate
S. myrtooides

It is also related to *S. bifurcata* (q.v.).

The plant resembles *Mostuea surinamensis* Benth. by the habit, the inflorescence, calyx, and number of ovules. Hence the specific epithet is derived from the name *Mostuea*.



MAP 31. *S. moandaensis*; Map 32. ● *S. ngouniensis*, ▲ *S. myrtooides*.

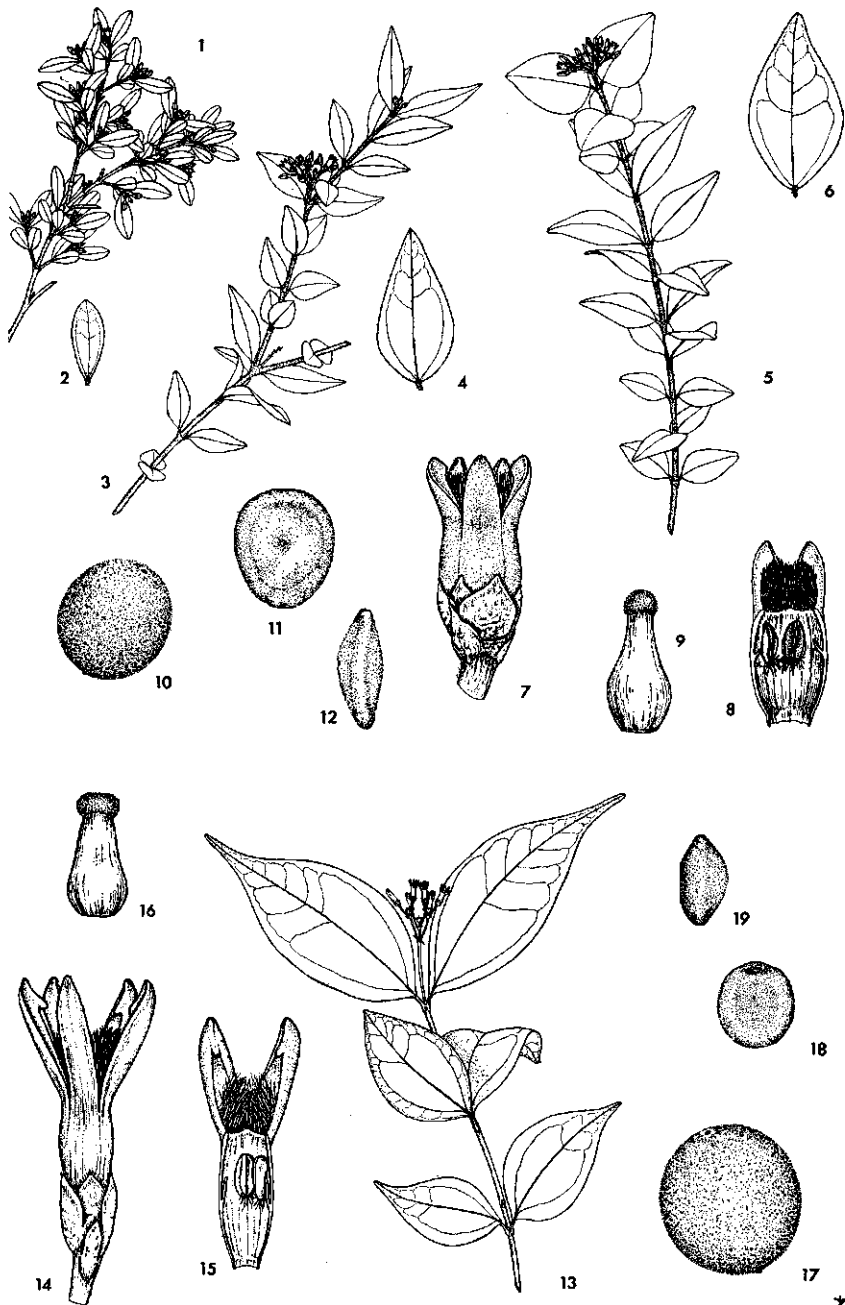


FIG. 30. 1-12. *S. myrtaoides*: 1, 3, 5. branches, $\frac{1}{2} \times$; 2, 4, 6. leaves, $1 \times$; 7. flower, $6 \times$; 8. portion of corolla with stamens, $6 \times$; 9. pistil, $12 \times$; 10. fruit, $2 \times$; 11-12. seed, two sides, $2 \times$ (1-2. Busse 1108; 3-4, 10-12. Torre 5712; 5-9. Perrier de la Bâthie 472). 13-19. *S. mostueoides*: 13. branch, $\frac{1}{2} \times$; 14. flower, $6 \times$; 15. portion of corolla with stamens, $6 \times$; 16. pistil, $12 \times$; 17. fruit, $2 \times$; 18-19. seed, two sides, $2 \times$ (13-16. Perrier de la Bâthie 15504; 17-19. Perrier de la Bâthie 2232).

47. *S. myrtooides* Gilg et Busse in Engler, Bot. Jahrb. 32: 178. 1902 with fig. (hairs in bristles, not as in C) and 36: 100. 1905; Baker in Fl. Trop. Afr. 4(1): 531. 1903; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 15. 1960.

Fig. 30, p. 198; Map 32, p. 197

Type: Tanzania: Newala District, Mpatila (Makondi) Plateau, near Nyangao, Busse 1108 (holotype not seen, destroyed in B; lectotype: G, other isotype seen: EA).

Much branched densely leafy shrub or small tree, 1–5 m high. Trunk 15 cm in diam. (teste Serv. For. Madag. 38). *Branches* pale brown, not lenticellate, with bark peeling off, not sulcate, often dichotomously branched; branchlets slender, pubescent with ascending brown hairs, pale brown, terete or nearly so, not sulcate when dry. *Leaves*: small or very small, subsessile or shortly petiolate; petiole pubescent with brown ascending hairs, 0.2–1(2) mm long; blade paler beneath, subcoriaceous, very variable in shape and size, ovate, narrowly ovate, elliptic, narrowly elliptic, obovate, or sometimes suborbicular, (1)1.5–4(5) × as long as wide, (4)6–20(27) × 3–8(11) mm in the continent and 12–30(33) × 6–14(19) mm in Madagascar, rounded to acute or broadly and bluntly acuminate at the apex, cuneate or rounded at the base, glabrous or with ranked appressed short hairs on the costa above, beneath sparsely pubescent or with some hairs at the base and often also on the costa, often minutely ciliate above; one pair of not very conspicuous secondary veins from or from above the base curved along the margin and often a faint submarginal pair; margin more or less revolute, especially in old leaves. *Inflorescence* terminal (and occasionally also axillary), lax or rather lax, few (sometimes 1)-flowered, 5 × 3 – 15 × 10 mm (up to 20 × 15 mm in Madagascar), 0–2 × branched. Peduncle and branches pubescent with brown ascending hairs, especially at the base. Pedicels glabrous or nearly so. Lower bracts often leafy, other small, approximately sepal-like, glabrous above, without colleters. *Flowers* (4–)5-merous. *Sepals* connate at the base up to one-third of their length, equal or subequal, broadly ovate to suborbicular, 1–1.2 × as long as wide, 0.8–1.2 × 0.8–1.2 mm, obtuse to acute at the apex, distinctly ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 2.8–3.3 × as long as the calyx, 2.2–4 mm long, and rounded at the apex, white, outside glabrous or minutely papillose-pubescent, inside white-penicillate in the throat; tube campanulate to nearly cylindrical, 1.2–1.9 × as long as the calyx, 0.8–1.4 × as long as the lobes, at the throat 1.2–1.5 mm wide; lobes narrowly triangular, 1.5–2 × as long as wide, 1.2–1.8 × 0.8–1 mm, acute, erect or suberect. *Stamens* included; filaments very short, 0.3–0.5 × as long as the anthers, glabrous, inserted on the middle of the corolla tube; anthers orbicular or oblong, 0.5–0.9 × 0.5–0.7 mm, ciliate at the deeply cordate base or sometimes all around; cells parallel. *Pistil* glabrous, very short, 0.9–1.4 mm long; ovary ovoid, 0.8–1 × 0.6 mm, 2-celled, gradually narrowed towards the apex; style very short, up to 0.6 mm long, or none; stigma capitate. In each cell 2–10 ovules. *Fruit* red or orange, small, soft, globose or laterally compressed (?), about 8–9 mm in diam., 1-seeded, with somewhat granular

skin, slightly shining. Wall thin. Pulp red or orange. *Seed* ochraceous-brown, flattened, disk-like, elliptic, $8 \times 7 \times 1.5$ mm, rough, with thick very short erect hairs, slightly dented at one side.

Distribution: South-eastern Tanzania, Moçambique, and Madagascar.

Ecology: *Brachystegia*-woodlands or light forests; alt. 0–600 m.

Tanzania: Njonga, Lindi District, Gillman 1388 (EA, K); between Liho R. and Nkalakatcha (fr. June) Busse 2857 (BM, BR, EA, G, HBG, LY); Mpatila (Makondi) Plateau, near Nyangao, Newala District (Mar.) Busse 1108 (EA, G, type).

Moçambique: Cabo Delgado: Palma, Gomes Pedro 5418 (EA); *ibid.* (Apr.) Torre & Paiva 12086 (LISC); Tungue, near Palma (fr. Sept.) Barbosa 2147 (LISC); between Palma and Mocimboa da Praia, Gomes Pedro 5436 (EA). Moçambique: Nacala, Barbosa 2421 (LISC). Zambesia: Vila Maganja da Costa (fl., fr. Feb.) Torre & Correia 14493 (LISC); km 30 of Régulo Morla-Maganja da Costa road (fr. Sept.) Barbosa & Carvalho 4212 (K); between Mocuba and Namacurra (Aug.) Barbosa & Carvalho 3824 (K, SRGH); Namacurra, Barbosa & Carvalho 3873 (K); *ibid.* (fr. July) Torre 5712 (LISC); km 9 of Nicuadala-Namacurra road (Feb.) Torre & Correia 14290 (LISC); km 28 of Niacuadala-Campo road, near Namacurra (fl., fr. Feb.) Torre & Correia 14347 (LISC); km 30 of Namacurra-Maganja da Costa road (Mar.) Torre 4988 (LISC). Lourenço Marques: Lourenço Marques, T. R. Sim 20934 (PRE).

Madagascar: Saharaina R. Basin, Sahafary Forest (fr. Apr.) Capuron Serv. For. 22707 (P); between Ankorika and Bedo, Serv. For. 38 (P, WAG); Andranomatana Forest, Andrimbavontsona Canton (fr. May) Serv. For. 19113 (P, WAG); Bevazandambo (Feb.) Saboureau 19 (P, WAG); Ambongo (Feb.) Perrier de la Bâthie 6913 (P, WAG); Tsaramandroso Canton, Ambato-Boéni District, Namamonjisa Res. Nat. 1869 (P); Firingalava (fl., fr. Jan.) Perrier de la Bâthie 472 (P, WAG).

Notes. *S. myrtooides* is closely allied to *S. mostueioides* (q.v.).

None of the other *Strychnos* species in continental Africa has as small leaves as *S. myrtooides*.

48. *S. ndengensis* Pellegr., Bull. Mus. Hist. Nat. Paris 33: 267. 1927; Mém. Soc. Linn. Norm. n. sér. 1: 37. 1928; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 44. 1963, partly (excl. syn. and specimens cited); Leeuwenberg, Act. Bot. Neerl. 14: 219. 1965. **Fig. 27, p. 185**

Type: Gabon: Nyanga R. region, Ndenga, Le Testu 1752 (P, holotype; isotypes: B, IFAN, K, L, P).

Climber. *Branches* lenticellate, pale to dark brown and not or obscurely sulcate when dry; branchlets glabrous, slightly lenticellate, especially at the base, pale to dark brown and often slightly sulcate when dry. Tendrils solitary. *Leaves:* petiole glabrous, 5–10 mm long; blade shining above, somewhat paler and less shining beneath, coriaceous, elliptic or narrowly elliptic, $1.9\text{--}3 \times$ as long as wide, $6\text{--}12 \times 3\text{--}6$ cm, shortly acuminate at the apex, cuneate at the base, glabrous on both sides; one pair of secondary veins from the base curved along the margin, but not reaching the apex, and a faint submarginal pair; costa at the base often slightly impressed, but further like the main secondary veins

prominent above; tertiary venation reticulate, not very conspicuous. *Inflorescences* axillary, several together, lax or rather congested, much shorter than the leaves, 1.5–3 × 1.5–2 cm, 1–2 × branched. Peduncle, branches, and pedicels glabrous. Bracts small, approximately sepal-like. *Flowers* 4-merous. *Sepals* connate at the base up to one-quarter of their length, subequal, suborbicular, as long as wide, 1–1.2 mm long, obtuse or rounded at the apex, minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 4.5–5.5 × as long as the calyx, 5.2–6 mm long, and tapering at the apex, white, outside glabrous, inside densely pilose except for the glabrous base of the tube; tube 1.7–2.5 × as long as the calyx, 2–3 mm long, gradually widened towards the throat, where 1–2 mm wide; lobes 1–1.6 × as long as the tube, oblong, 2.5–3.3 × as long as wide, 3–3.3 × 1–1.2 mm, acute, recurved. *Stamens* well-exserted; filaments glabrous, 1–1.5 × as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, 0.6–1.2 × 0.25–0.6 mm, glabrous, often obscurely cordate at the base; cells parallel. *Pistil* glabrous, 4.5–6 mm long; ovary ovoid, 1 × 0.6–0.9 mm, 2-celled; style slender, 3.5–5 mm long; stigma small, capitate, not thicker than the style. In each cell 5–6 ovules. *Fruit* unknown, supposed to be small and like that of *S. floribunda*.

Distribution: Gabon, Congo (Kinshasa).
Ecology: Rain forests; at low elevations.

Gabon: Ndenga, Nyanga R. region (May) Le Testu 1752 (B, IFAN, K, L, P, type).

Congo (Kinshasa): Léopoldville: Patambalu, Kutu Territory (Apr.) Tailfer 63 (BR, WAG).

Notes. As the flowers of both species resemble each other strikingly, the present author confused *S. ndengensis* and *S. tricalysioides* with each other when he revised the genus for the Flora of W. Tropical Africa. They differ from each other as follows:

Branches lenticellate; leaves shortly acuminate, often much shining when dry; costa and main secondary veins prominent above, only base of costa impressed; seeds unknown **S. ndengensis**
 Branches not lenticellate; leaves caudate, dull when dry; costa and main secondary veins impressed above, these veins reaching the leaf-apex; seeds deeply dented and with curved hairs **S. tricalysioides**

The tree *S. elaeocarpa* resembles *S. ndengensis* by the flowers, but differs by the larger and thicker leaves.

Tailfer noted: tree with trunk up to 50 cm in diam. As the specimen agrees in all details with the liana, herb. Le Testu 1752, the present author supposes that he made an error. Moreover, the former collector describes fruits on the label, while the specimen bears only flowers, which are not mentioned.

49. *S. ngouniensis* Pellegr., Bull. Mus. Hist. Nat. Paris 32: 394. 1926; Mém. Soc. Linn. Norm. n. sér. 1: 37, f. 8: 1928 (as *ngounyensis*); Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 43. 1963, partly (excl. both syns. and all specimens cited); Leeuwenberg, Act. Bot. Neerl. 14: 218. 1965.

Fig. 31, p. 203; Map 32, p. 197

Type: Gabon: Ngounyé Region, Sindara, Le Testu 2303 (P, lectotype; isotypes: A, B, FHO, IFAN, P, WAG).

Liana at least up to 20 m high climbing in trees and 30 m long. Trunk 3 cm in diam. or more; bark dark brown, lenticellate; wood brownish-creamy. Branches not lenticellate, dark when dry, terete; brachlets pubescent or glabrous, often sulcate when dry. Tendrils paired. Leaves: petiole short, often sparingly pubescent, 1–2 mm long; blade often slightly shining above, paler and hardly shining beneath, thinly coriaceous or papyraceous when dry, narrowly ovate, elliptic, narrowly elliptic, or oblong, near the base of the branchlets and on the main axis usually ovate, smaller, and comparatively wider, or reduced to small bracts, (1)1.5–3 × as long as wide, (2)3.5–11 × 1.6–5.5 cm, in the shade up to 14 × 5.5 cm, acuminate and apiculate at the apex, rarely obtuse near the base of the branchlets, rounded, subcordate, or sometimes – at the apices of the branchlets – cuneate at the base, glabrous or with some hairs on the costa above, pubescent on the costa and main secondary veins or glabrous beneath; costa impressed above, especially near the base; one pair of secondary veins from the base curved along the margin and also a faint submarginal pair; tertiary venation reticulate, especially beneath. Inflorescence axillary, about 0.2–0.3 × as long as the leaves, few- to many-flowered, 2–4 × branched, congested or not, 1–3 cm long and wide. Peduncle, branches, and pedicels short or rather so, sparsely pubescent. Bracts approximately sepal-like, sparsely pubescent. Peduncle up to 1 cm long, mostly shorter. Flowers 5-merous. Sepals connate at the base up to one-third of their length, orbicular or nearly so, as long as wide, 0.8–1.5 mm long, rounded at the apex or nearly so, minutely ciliate, outside shortly pubescent, inside glabrous and with some dark longitudinal stripes, without colleters. Corolla in the mature bud 5–8 × as long as the calyx, 6–7.5 (8.5) mm long, and rounded or nearly so at the apex, white, outside sparsely and often minutely pubescent, especially on the tube, inside with a wide densely pilose ring in the throat, lobes and base of tube glabrous; tube 2–4 × as long as the calyx, 0.6–1 × as long as the lobes, 2.5–4 mm long, gradually widened towards the throat and there about 2.5 mm wide; lobes narrowly triangular, 2–3 × as long as wide, 3.5–4(4.5) × 1.5–1.8 mm, recurved. Stamens well-exserted; filaments glabrous, 1.1–1.7 × as long as the anthers, inserted at the mouth of the corolla tube; anthers 1.2–2 × 0.6–1 mm, deeply cordate at the base, ventrally at the base usually with long stiff erect hairs; cells parallel. Pistil 6.5–7(9) mm long, hirto-pubescent (very base sometimes glabrous, but then on a much shorter portion than in *S. soubrensis*), 1.5–2 × 1 mm, 2-celled, gradually narrowed into the style; style hirto-pubescent at the base, glabrous at the apex, 5–5.5(7.5) mm long; stigma capitate. In each cell about 10 ovules. Fruit

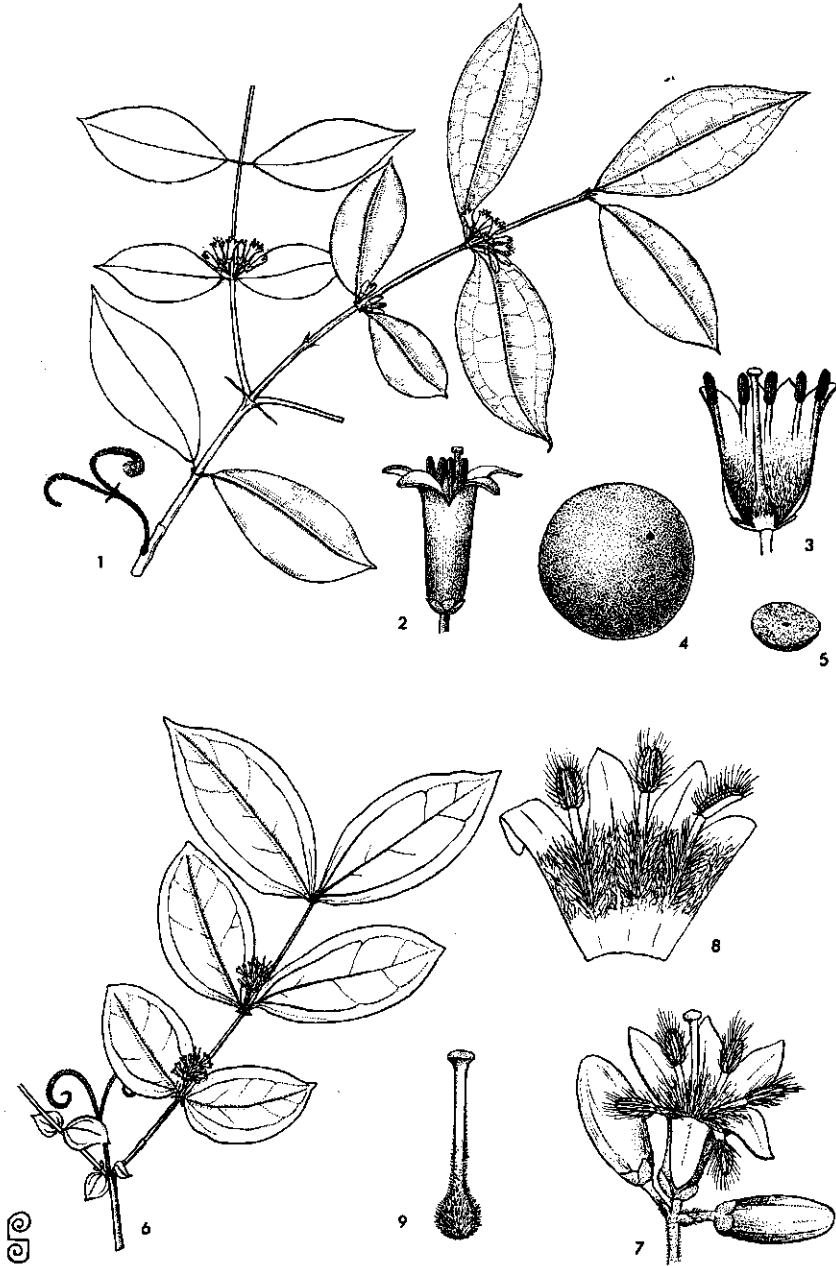


FIG. 31. 1-5. *S. soubrensis*: 1. branch, $\frac{1}{2} \times$; 2. flower, $2 \times$; 3. opened flower, $2 \times$; 4. fruit, $1\frac{1}{2} \times$; 5. seed, $\frac{2}{3} \times$ (1. Leeuwenberg 4146; 2-3. J. de Wilde c.s. 3589; 4-5. Leeuwenberg c.s. 4589); 6-9. *S. ngouniensis*: 6. branch, $\frac{1}{2} \times$; 7. flower and buds, $6 \times$; 8. portion of corolla with stamens, $7 \times$; 9. pistil, $6 \times$ (6. Le Testu 7970; 7-9. Le Testu 2303).

subglobose, about 3 cm in diam., about 10-seeded. Wall about 2 mm thick. Seed flat, ellipsoid, rough.

Distribution: Cameroun, Gabon, Congo (both).

Ecology: Rain forests or secondary forests, often on river banks; alt. about 0–200 m.

Cameroun: Nyoke (July) Schlechter 15792 (BR, PRE, cited as *S. phaeopoda*); 20 km W. of Victoria, Cameroun Mt. base, Leeuwenberg 6921 (WAG); 4 km E. of km 65 of Edéa-Kribi road, Leeuwenberg 5635 (WAG); left bank Kélé R., 29 km N. of Eséka, Leeuwenberg 6028 (WAG).

Gabon: Ngounyé R. region, Le Testu 2251 (BR, K, P, WAG, paratype); *ibid.*, Sindara (Jan.) Le Testu 2303 (A, B, FHO, IFAN, P, WAG, lectotype); Lastourville (Mar.) Le Testu 7970 (P, WAG); Lastourville Region (May) Le Testu 7351 (P, WAG); *ibid.*, Koulamotou (Apr.) Le Testu 8747 (P, WAG).

Congo (Brazzaville): Bangou Forest, Kindamba Region (fl., fr. Feb.) Sitha 250 (WAG).

Congo (Kinshasa): Léopoldville: Temvo (Mar.) Vermoesen 1746 (BR); Mvuazi, Ntava R. (Oct.) Devred 813 (BR, PRE).

Notes. *S. ngouniensis* was erroneously united with *S. soubrensis* by the present author in the Flora of W. Tropical Africa. He separated them again in 1965 after having seen more material. These closely allied species can be distinguished as follows:

Leaves often subcordate, rarely cuneate at base; pistil at very base usually not glabrous, hirto-pubescent; anthers with stiff erect hairs, if hairy

S. ngouniensis

Leaves cuneate at base, occasionally subcordate; pistil glabrous at base, further pubescent; anthers with pilose hairs, if hairy

S. soubrensis

The other species related to *S. ngouniensis* have thicker leaves. One of them, *S. scheffleri*, resembles it by the shape of the leaves and flowers. The latter species however, is mostly glabrous in the vegetative parts. The corolla may occasionally bear a single hair outside, but is never pubescent.

50. *S. nigritana* Bak., Kew Bull. 1895: 97. 1895 and in Fl. Trop. Afr. 4(1): 523. 1903; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 24. 1931; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 43. 1963; Leeuwenberg, Act. Bot. Neerl. 14: 219. 1965.

Fig. 6, p. 66; Map 25, p. 159

Type: S. Nigeria: Eppah, Barter 3249 (K, lectotype; isotype: P).

Heterotypic synonyms: *S. vogelii* Bak., Kew Bull. l.c. p. 96 and in Fl. Trop. Afr. l.c. p. 523. Type: S. Nigeria: Idah (R. Quorra at Attah), Vogel 49 (K, holotype).

S. ciliicalyx Gilg in Schlechter, Westafr. Kautschuk-Exped. 304. 1900, nomen; Gilg & Busse in Engler, Bot. Jahrb. 36: 95. 1905. Type: Ghana: Kwamikrum,

Schlechter 12957 (holotype not seen, destroyed in B; lectotype: Z, other isotype seen: BM).

S. togoensis Gilg et Busse in Engler, Bot. Jahrb. 36: 96. 1905. Type: Togo: Sokodé, Kersting 691 (holotype not seen, destroyed in B, no isotype seen).

Climbing shrub or liana up to at least 30 m long, 5–15 m high climbing in trees. Trunk 4–13 cm in diam. Bark pale grey or pale to dark brown, lenticellate; wood creamy. *Branches* grey-brown, lenticellate, often slightly sulcate when dry; branchlets glabrous, lenticellate or not, green, when dry dark brown. Tendrils paired. *Leaves*: petiole glabrous, 2–7 mm long; blade shining or mat on both sides, medium to dark green above, paler and with dark green veins beneath, in the sun coriaceous, in the shade papyraceous, elliptic or narrowly elliptic, 1.5–3 × as long as wide, (3)6–11(14.5) × (1.6)2.5–7(8.5) cm, apiculate or acuminate at the apex, cuneate or rounded at the base, glabrous on both sides; one pair of secondary veins from or from above the base curved along the margin and mostly a faint submarginal pair; tertiary venation reticulate, when leaves dry prominent on both sides or only beneath; margin revolute, especially in sun-leaves. *Inflorescences* axillary or sometimes terminal, usually several together, lax, usually few-flowered, mostly much shorter than the leaves, 2 × 2 – 8 × 4 cm, 1–3 × branched. Peduncle, branches, and pedicels glabrous. Bracts small, approximately sepal-like, glabrous beneath, above minutely appressed-pubescent at the base, without colleters. *Flowers* 5-merous. *Sepals* pale green, connate at the base, equal or unequal, the inner up to 1.5 × as long as the others, orbicular or ovate, 1–1.25 × as long as wide, 2.5–5 × 2–5 mm, rounded at the apex, outside glabrous, inside minutely appressed-pubescent at the base, without colleters, ciliate. *Corolla* in the mature bud 2.2–4 × as long as the calyx, 7.5–11 mm long, slightly contracted somewhat under the throat, and tapering at the apex, creamy, yellow, or pale green, often with inside purplish-tipped lobes, outside glabrous, inside with a brush-like ring of white lanate hairs in the throat and just on the base of the lobes; tube cylindrical or nearly so, 1.2–2 × as long as the calyx, 1–1.3 × as long as the lobes, 4–6.5 mm long, at the throat 2–4 mm wide; lobes narrowly triangular, 2.2–3 × as long as wide, 4–5 × 1.3–2 mm, thick, especially at the apex, acute, spreading. *Stamens* slightly exerted; filaments very short, about 0.2–0.5 × as long as the anthers, glabrous, inserted at the mouth of the corolla tube; anthers oblong, 2–2.2 × 0.6–0.8 mm, glabrous, deeply cordate at the base; cells often slightly divergent at the base. *Pistil* pilose in the middle, 7–9 mm long; ovary ovoid or oblong, 3–4 × 1.5–2 mm, pilose at the apex, 2-celled, gradually narrowed into the style; style thick, pilose at the very base, 4–6 mm long; stigma capitate. In each cell about 50 ovules. *Fruit* orange or yellow, immature bluish-green, large, hard, globose or nearly so, 4 × 4.8 – 6.5 × 6.7 cm, with 8–45 seeds, with somewhat granular skin, slightly shining. Wall thick, 1.5–3 mm thick, thicker above pedicel, brittle in mature fresh fruits, hard when dry and/or immature. Pulp pale orange. *Seed* ochraceous, flattened, more or less plano-convex, obliquely ovate, elliptic, or trullate, usually irregularly curved, (1)1.2–

1.5 × as long as wide, 16–25 × 12–21 × 5–8 mm, with thick very short erect hairs, rather rough.

Distribution: West and northern Central Africa.

Ecology: Rain forests or secondary forests, usually on periodically inundated river banks, or in gallery forests; alt. 0–1100 m.

Guinea: Fouta Djallon, near Ditinn, Chevalier 18539 (P); Dalaba Plateau, Diaguissa (fr. Sept.-Oct.) Chevalier 18862 (P).

Ivory Coast: left bank Cavally R., near Troiya, 32 km S. of Tai, J. de Wilde & Leeuwenberg 3554 (WAG); 7 km N. of crossing Hana R. with Tai-Tabou road, J. de Wilde & Leeuwenberg 3527 (K, WAG); left bank Hana R., near ferry in Tai-Tabou road (fl., fr. Mar.) J. de Wilde & Leeuwenberg 3602 (ABI, BR, K, S, WAG); Cavally R. bank, between Prolo and Bliéron, Chevalier 19888 (P, cited as *S. fleuryana*); 10 km W. of Tapéguhé, 50 km NW. of Soubré, right bank Sassandra R., Leeuwenberg 4528 (WAG); 7 km WNW. of Soubré, right bank Sassandra R. (nearly mature fr. Nov.) J. de Wilde 3301 (WAG); 34 km N. of Sassandra, left bank Davo R., Leeuwenberg 4020 (WAG); Ananda-Mbayakro road, Bouquet 5 June 1962 (ABI, WAG); Saint Bernard (Mar.) Herb. I.D.E.R.T. 3832 (ABI); Abouabou Forest, between Abidjan and Grand Bassam, Bouquet Feb. 1958 (ABI, WAG); *ibid.*, J. de Wilde & Leeuwenberg 3448 (ABI, BR, K, WAG), 3450 (BR, K, WAG); *ibid.* (Dec.) Herb. I.D.E.R.T. 1764 (ABI); Ahinta, Sanvi R. (fl., fr. Mar.) Chevalier 17754 (K, LY, P, WAG, cited as *S. fleuryana*).

Ghana: Kintampo (Mar.) Dalziel 19 (C, E, K); 15 km from Accra, on Old Nsawam Road (May) Irvine 2766 (E, GC); Shiare, Buem-Krachi District, J. B. Hall 1368 (GC, K); Kwamikrum (Mar.) Schlechter 12957 (BM, Z, type of *S. ciliicalyx*).

Togo: see cult.

Dahomey: Atacora Mts., between Kouba and Farfa, Chevalier 24039 bis (P).

Nigeria: Lagos, Barter 2232 (K, paratype); *ibid.* (Apr.) Dalziel 1154 (E, K); Eppah, Barter 3249 (K, P, lectotype); 3 km SSW. of Etemi, Omo R., Jones & Onochie FHI 16629 (FHO); Ijaiye For. Res., Ibadan District (Apr.) Onochie FHI 21957 (FHI, FHO, K); Ondo District, Jones FHI 3542 (FHO); 2 km NE. of Onda, Omo and Shasa For. Res., Jones & Onochie FHI 16969 (FHO); Warri (Mar.) Freeman 319 (BM); Idah, R. Quorra at Attah, Vogel 49 (K, type of *S. vogelii*); Nupe, Barter anno 1859 (K, P); Anara For. Res., Zaria Province (May) Keay FHI 20121 (K), 22909 (FHO, K); Nimbria For. Res., Zaria Province, Latilo FHI 47122 (FHI, K).

Cameroun: Poli, Aubréville 887 (P); Wakwa, 10 km S. of Ngaoundéré (Jan.) Leeuwenberg 7659 (P, WAG, YA); 7 km N. of Olembe, left bank Sanaga R., 60 km N. of Yaoundé, Leeuwenberg 5479 (WAG); left bank Sanaga R., near Nachtigal, about 20 km N. of Obala (fl., nearly mature fr. June) W. de Wilde 2664 A (WAG, YA), 2664 B (WAG, YA); *ibid.*, Leeuwenberg 6012 (WAG); left bank Sélé R., near bridge in Nanga Eboko-Yaoundé road, Leeuwenberg 5989 (WAG).

Central African Republic: Bozoum (Mar.) Tessmann 2275 (K); Krébedjé, Fort Sibut Chevalier 5660 (P, cited as *S. martreti*); Fort de Possel (fr. Dec.) Chevalier 10551 (P, cited as *S. martreti*), 10629 (cited as *S. martreti*); Bambari Region (Mar.) Tisserant 1039 (IFAN, L, P); Yalinga Region, Le Testu 4562 (P, WAG).

Congo (Kinshasa): Orientale: Lower Uélé R., De Wulf 656 (BR).

Cult.: Bogor, Indonesia, introduced from Africa, Hort. Bot. Bogor 83 (K, cited as *S. imbricata*); Adiopodoumé, 17 km W. of Abidjan, Ivory Coast, Leeuwenberg 4575 (WAG, seedlings of herb. J. de Wilde & Leeuwenberg 3602); Kew, raised from seeds from Little Popo (= Anécho), Togo (fl.) A. Cole 3 July 1901 (K).

Note. *S. nigritana* can be confused with *S. lucens* (q.v.).

51. *S. odorata* A. Chev., Expl. Bot. Afr. Occ. Fr. 1: 443. 1920, nomen; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 24. 1931, nomen; Chevalier, Rev. Bot. Appliq. 27: 372, pl. 18 A. 2 and 5-8 (8 is two seeds stucked together). 1947, all three partly (as for Chevalier 15435, the type); Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 44. 1963, partly (as for Chevalier's collections); Leeuwenberg, Act. Bot. Neerl. 14: 219. 1965.

Fig. 32, p. 209; Map 33, p. 211

Type: Ivory Coast: Abidjan, Chevalier 15435 (P, holotype; isotypes: LY, P, WAG; photograph of one P sheet in K, neg. 4479).

Liana. *Branches* not lenticellate; branchlets glabrous, dark brown when dry, not with longitudinal grooves below the stipular line. Tendrils in one or two pairs. *Leaves*: petiole glabrous, 5-7 mm long; blade slightly or hardly shining above, paler and mat beneath, thinly coriaceous or papyraceous, narrowly elliptic, 3-3.6 × as long as wide, 7-12 × 2-4 cm, distinctly acuminate to caudate at the apex (acumen 10-15 mm long, narrow), cuneate at the base, glabrous on both sides; one pair of secondary veins from above the base curved along the margin and a faint submarginal pair. *Inflorescence* axillary, congested, short, 0.1-0.2 × as long as the leaves, 1-1.2 × 1-1.2 cm, many-flowered. Peduncle, branches, and pedicels short, glabrous. Bracts narrowly triangular or sepal-like, glabrous beneath. *Flowers* 4-5-merous. *Sepals* connate at the base, equal, broadly ovate, about as long as wide, 1-1.2 × 1-1.2 mm, obtuse at the apex, minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 2.5-4 × as long as the calyx, 2.8-3 mm long, and rounded at the apex, pale yellow (?), outside glabrous and minutely papillose-pubescent at the margin of the lobes, inside pilose except for the glabrous apices of the lobes and base of the tube; tube short, 1-1.7 × as long as the calyx, about 1.2 mm long; lobes 1.3-1.5 × as long as the tube, oblong, 1.6-1.8 × 0.8 mm, acute, spreading (?). *Stamens* slightly exserted; filaments glabrous, about as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, 0.6 × 0.3-0.4 mm, deeply cordate at the base, glabrous; cells parallel. *Pistil* glabrous, 2.4 mm long; ovary broadly ovoid or globose, 0.7 × 0.7 mm, 2-celled; style 1.7 mm long; stigma capitate. In each cell about 5 ovules. *Fruit* small, soft, ellipsoid, 24 × 16 mm, 1-3-seeded. Wall thin, about 1 mm thick. *Seed* flattened, ellipsoid, 16 × 10 × 7 mm, at one side with a deep pit, at the other with a bulge surrounded by a shallow groove, seemingly papillose; false papillae simulated by short curved hairs.

Distribution: only twice collected in eastern Ivory Coast.

Ecology: Moist places in rain forests, often on river banks; at low elevations.

Ivory Coast: Abidjan (fr.) Chevalier 15435 (LY, P, WAG, type); Aboisso, Sanvi R. (Apr.) Chevalier 17824 (P, WAG).

Notes. The branchlets, tendrils, fruits, and seeds of *S. odorata* are exactly like those of *S. barteri*. The flowers on the only flowering specimen of *S. odorata*

available are just opening and therefore perhaps not yet completely developed. The leaves of *S. odorata* resemble very much some shade leaves of *S. barteri* which has a large range of variation in leaf-shapes. It may therefore be that *S. odorata* should be united with *S. barteri*. More collections of both taxa involved are required to be certain about the range of their variation. A fact in favour of uniting them is that the present author never found *S. odorata* in the field, while he collected several vegetative specimens of *S. barteri* in the same area where *S. odorata* was collected.

On the other hand, *S. odorata* also shows resemblance to *S. tricalysioides* by the branchlets, tendrils, seeds, and the thin caudate leaves, but the latter has the main veins impressed above.

52. *S. panganensis* Gilg in Engler, Pflanzenw. Ost-Afr. C: 311. 1895 and in Engler, Bot. Jahrb. 36: 94. 1905; Baker in Fl. Trop. Afr. 4(1): 526. 1903; E. A. Bruce, Kew Bull. 1956: 154. 1956; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 28. 1960. **Fig. 32, p. 209; Map 33, p. 211**

Type: Tanzania: Pangani, Mukenge, Stuhlmann 596 (holotype not seen, destroyed in B; lectotype: HBG, of which photograph in K, neg. 2493).

S. guerkeana Gilg, l.c. and l.c.; Baker, l.c. p. 521 (as *guerkeana*); Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 27. 1952. Type: Tanzania: Bagamoyo District, Rossako (Ruseko), Stuhlmann 8053 (holotype not seen, destroyed in B; lectotype: K).

S. bicirrifera Dunkley, Kew Bull. 1935: 263. 1935; Duvigneaud, l.c. p. 27, f. 8 B. Type: Kenya: Kilifi District, Arabuko, R. M. Graham 2290 (K, holotype; isotypes: EA, FHO, FI, P).

Scandent or scrambling evergreen shrub or liana, 3–20 m high climbing over shrubs and in trees. Branches lenticellate, twining (testibus Drummond & Hemsley 3572), terete, pale to dark brown and not sulcate when dry; branchlets hirtio-pubescent, or only in Madagascar glabrous, not or only at the base lenticellate, terete, ochraceous to dark brown and often slightly sulcate when dry. Tendrils paired. Leaves sessile or shortly petiolate; petiole hirtio-pubescent, or only in Madagascar glabrous, up to 3 mm long; blade shining and dark green above, paler beneath, coriaceous also when living, variable in shape and size, ovate, narrowly ovate, elliptic, narrowly elliptic, cordate, or sub-orbicular, comparatively wider on the main axis and at the bases of the branchlets, $0.75\text{--}3 \times$ as long as wide, $8\text{--}50(67) \times 6\text{--}30$ mm, acute, or shortly acuminate, often apiculate, rarely obtuse at the apex, cordate, rounded, or cuneate at the base, glabrous, except for a few hairs on the costa beneath and sometimes above in continental specimens; one or two pairs of secondary veins from or from just above the base curved along the margin, outer usually fainter; tertiary venation not very conspicuous, prominent on both sides in dry leaves; costa impressed above. Inflorescence terminal and at the same time axillary, rather lax, few- to many-flowered, $1.5 \times 1.5\text{--}3 \times 3$ cm, 2–3 \times branched.

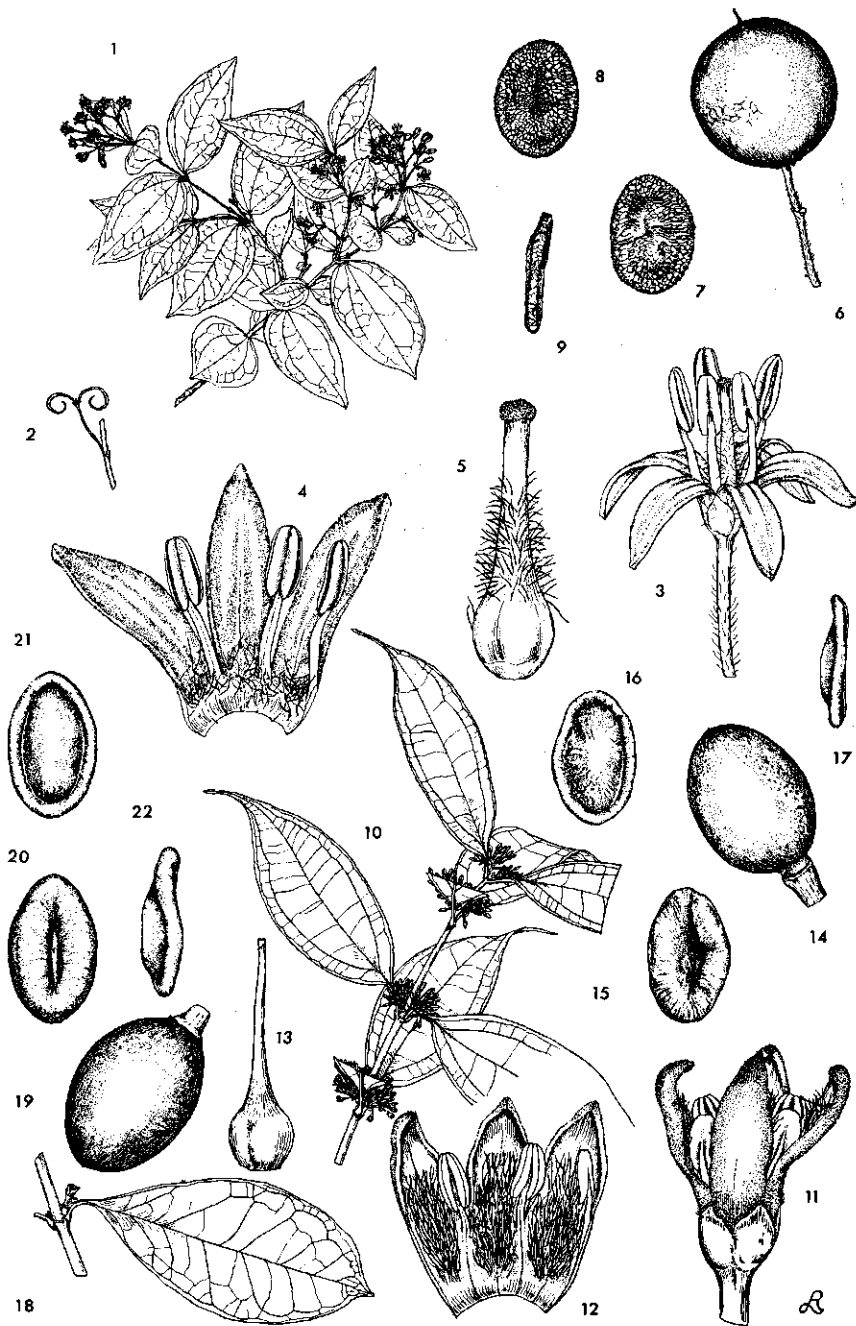


FIG. 32. 1-9. *S. panganensis*: 1. branch, $\frac{1}{2} \times$; 2. tendrils, $\frac{1}{2} \times$; 3. flower, $6 \times$; 4. portion of corolla with stamens, $8 \times$; 5. pistil, $12 \times$; 6. fruit, $1 \times$; 7-9. seed, 3 sides, $2 \times$ (1-5. Verdcourt 1189; 6-9. H. Wild c.s. 5188); 10-17. *S. odorata*: 10. branch, $\frac{1}{2} \times$; 11. flower, $10 \times$; 12. portion of corolla with stamens, $10 \times$; 13. pistil, $12 \times$; 14. fruit, $1 \times$; 15-17. seed, 3 sides, $1 \times$ (10-13. Chevalier 17824; 14-17. Chevalier 15435); 18-22. *S. penninervis*: 18. branch with empty fruit-calyx, $\frac{1}{2} \times$; 19. fruit, $1 \times$; 20-22. seed, 3 sides, $1 \times$ (18-22. Chevalier 27760).

Peduncle, branches, and pedicels slender, hirt-pubescent. Pedicels 2–4 mm long. Lower bracts leafy, other small, narrowly triangular, acute, sparsely hirt-pubescent beneath, glabrous above, without colleters. *Flowers* 5-merous. *Sepals* subequal, connate at the base, ovate or broadly ovate, 1–1.5 × as long as wide, 1–1.5 × (0.6)0.8–1 mm, obtuse at the apex, ciliate, glabrous on both sides (or outside at the base occasionally with a single minute hair), without colleters. *Corolla* in the mature bud 3–4 × as long as the calyx, 3.5–5 mm long, and rounded or subtruncate at the apex, white, greenish, or creamy, outside glabrous, inside pilose in the throat and at the base of the lobes; tube campanulate, short, 0.8–1.2 × as long as the calyx, 1–1.7 mm long; lobes thick, 2–3 × as long as the tube, oblong, 2.3–3 × as long as wide, 2.5–3.5 × 1–1.4 mm, acute, recurved. *Stamens* well-exserted; filaments glabrous, 1–1.3 × as long as the anthers, 1.2–2 mm long, inserted at the mouth of the corolla tube; anthers oblong, 1.2–1.5 × 0.6–0.9 mm, glabrous or bearded with a single pilose hair at the cordate base; cells parallel. *Pistil* pilose in the middle, 3.5–4 mm long; ovary ovoid, pilose at the apex, 1–1.5 × 0.9–1 mm, gradually narrowed into the style, 2-celled; style thick, glabrous at the very apex, 2.3–3 mm long; stigma capitate. In each cell 10–12 ovules. *Fruit* yellow, small, soft, subglobose, 8–18 mm in diam., with (1)3–6 seeds, with a smooth skin, slightly shining, often mucronate by the style. Wall thin. *Seed* pale brown or pale ochraceous, flattened, more or less plano-convex, obliquely elliptic or subtetrahedral, about 1.2 × as long as wide, 7 × 5 × 1.5 – 10 × 7 × 3 mm, rough, with scabrid short hairs. Testa not sticking to the pulp.

Distribution: East Africa and Madagascar.

Ecology: Lowland rain forests, gallery forests, or thickets in coastal evergreen bushland; alt. 0–500 m.

Kenya: Lake Jilori, near Malindi, Kilifi District (Dec.) Verdcourt 1189 (EA, K, MO, PRE); Gede, near Malindi, Swynnerton 288 (K); Arabuko (Mar.) R. M. Graham 374 (FHO), 1854 (EA, FHO, K, paratype of *S. bicirrifera*), 2290 (EA, FHO, FI, K, P, type of *S. bicirrifera*); Arabuko For. Res., Greenway 10825 (EA, K); between Bamba and Sokoke (Dec.) I. R. Dale K 2027 (BR, EA, FHO, K, WAG); Kilifi, Gisan 138 (EA); *ibid.* (Nov.) Jeffery K 417 (EA, K); *ibid.* (fl. Nov., fr. Aug.) Moggridge 145 (EA, K), 503 (EA, K), H 15/37 (EA, K); *ibid.*, Swynnerton 56 (K); Mida Forest, Malindi-Kilifi road, Swynnerton 199 (K); Kibarani, Swynnerton 9 (K), 18 (K); between Mambui and Mariakani, Swynnerton 375 (K); Rabai (fr. Apr.) Verdcourt 3608 (EA, K); *ibid.*, W. E. Taylor July–Nov. 1885 (BM); Kwale (Nov.) R. M. Graham 1581 (EA, FHO, FI, K); Mazaras, Kwale District, Anonym. (Herb. Kew) 503 (EA).

Tanzania: Daluni-Mashewa, E. Usambaras (Oct.) Greenway 4135 (EA, K); near Ngomeni, Tanga (fr. June) Faulkner 1656 (K); 8 km SE. of Ngomeni, Drummond & Hemsley 3572 (B, BR, EA, K, S, SRGH); Mwele-Gombero, Tanga District, Peter 25096 (B); near Amboni (Apr.) Peter 39484 (B); Msumbugwe For. Res., Pangani District, Proctor 2794 (K); Pangani, Mukenge (bud Dec.) Stuhlmann 596 (HBG, type); Madanga, Pangani (fr. Mar.) Tanner 3442 (BR, K); Bagamoyo, Sacleux 59 (P); Rossako (Ruseko), Bagamoyo District (fr.) Stuhlmann 8053 (K, type of *S. guerkeana*); Kikoka For. Res., Bagamoyo District, Semsei 3841 (EA); Dar es Salaam, Peter 44777 (B); Sachsenwald, near Dar es Salaam, Busse 3149 (EA); *ibid.*, Holtz 871 (EA); Bagamoyo road, Msassani (Nov.) Vaughan 2528 (BM, EA, K); near Msorwa, Kisarawe District, Semkiwa 116 (EA, K); Matumbi Mts., Busse 3073 (EA); Lindi, Lutamba Lake (Dec.) Schlieben 5696 (B, BM, BR, G, HBG, K, LISC, M, MO, P, PRE, S, WAG, Z,

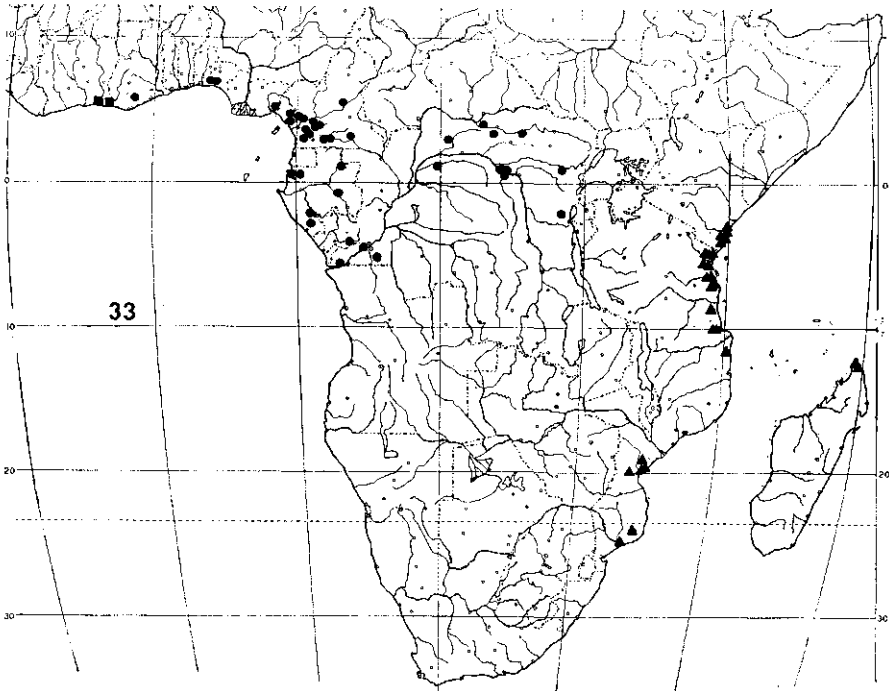
distributed as *S. corymbifera*); Kwa-Sikumbi, between Muera (= Rondo) and Noto Plateaux, Lindi District, Busse 2909 (BR, EA, LY); sin. loc., Warnecke G 7686 (EA). Tanzania (?): sin. loc. (Nov.) Sacleux 687 (P). Zanzibar: sin. loc., comm. Kirk Apr. 1870 (K).

Moçambique: Cabo Delgado: 10 km from Msalo R., near Mocimboa da Praia, Gomes Pedro 5188 (EA). Zambezia: Gobene Forest, 45 km from Maganja da Costa, Torre & Correia 14626 (LISC). Manica e Sofala: Cheringoma, Durundi Hills, Torre 4200 (LISC); Beira, Dondo, Mendonça 2472 (LISC); Macuti, 6 km from Beira (fr. Mar.) H. Wild & Leech 5188 (K, PRE, SRGH); Madanda Forests, Gazaland (Dec.) Swynnerton 1073 (BM, K). Inhambane: Panda (fr. Feb.) Exell, Mendonça & H. Wild 610 (BM, LISC, SRGH). Lourenço Marques: Manjacaze (fr. Mar.) Torre 2546 (LISC), 7515 (LISC).

Madagascar: Orangea Forest, E. of Diégo-Suarez (Jan.) Serv. For. 24433 (P, WAG); near Antsoha, W. of Rigny Bay (fr. Jan.) Capuron Serv. For. 24481 (P, WAG).

Notes. *S. panganensis* was known only from East Africa until Capuron discovered it at the northernmost point of Madagascar, as late as in January 1966. The continental specimens are at least partly hairy. Those from Madagascar are entirely glabrous.

The species can be recognized by the slender pedicels and the rather small thin leaves of which usually some are cordate at the base.



MAP 33. ■ *S. odorata*, ● *S. phaeotricha*, ▲ *S. panganensis*.

53. *S. penninervis* A. Chev., Rev. Bot. Appliq. 27: 374, pl. 18 B. 1947.

Type: Congo (Brazzaville): Gompaka (fr. Aug.) Chevalier 27760 (P, holotype; isotype: WAG). Fig. 32, p. 209

Climber. *Branches* not lenticellate, dark brown and not sulcate when dry; branchlets like branches, glabrous. Tendrils in 1–2 pairs. *Leaves*: petiole glabrous, 3–5 mm long; blade slightly shining above, dull and greyish beneath, elliptic, or narrowly obovate, 1.5–2.7 × as long as wide, 5–7 × 2.5–3.5 cm, apiculate at the apex, cuneate at the base, glabrous on both sides; 4 pairs of secondary veins, basal not longer than the other; tertiary venation reticulate, prominent on both sides. *Inflorescence* axillary, 1–2 × 1–2 cm. Peduncle, branches, and pedicels glabrous. Bracts small, approximately sepal-like. *Flowers* 4-merous. *Sepals* ovate, about 1.5 × 1 mm, acute at the apex, glabrous outside. *Pistil* glabrous, at least 2.5 mm long. Fruit orange (?), small, soft, ellipsoid, 25 × 17 – 28 × 20 mm, 1-seeded, slightly shining. Wall thin. Seed 19 × 11.5 × 5.5 mm, further exactly like that of *S. barteri*.

Distribution: Only once collected in Congo (Brazzaville).

Note. *S. penninervis* differs from its nearest relative, *S. barteri*, as follows:
Basal secondary veins curved along the leaf-margin, more conspicuous than the other **S. barteri**
Four subequal pairs of secondary veins **S. penninervis**

On the basis of the only specimen of *S. penninervis* known it is impossible to be certain, if the species should be united with *S. barteri*. It is quite possible that *S. barteri* may turn out to be a widely distributed species with a large range of variation in ecology. In that case it may comprise *S. gossweileri*, *S. odorata*, and *S. penninervis*, or one or two of them.

54. *S. pentantha* Leeuwenberg, sp. nov. Fig. 33, p. 213; Map 24, p. 152

Liana ramis inermibus lenticellatis cirrhisque solitariis. Folia parva glabra vel fere glabra breviter petiolata laminis subcoriaceis ellipticis vel orbicularibus apice rotundatis vel emarginatis basi cuneatis vel rotundatis nervis infimis curvatis. Inflorescentia terminalis parva laxa 3- vel 5-flora. Flores pentameri parvi. Sepala ovata apice acuta minute ciliata utrinque glabra. Corolla alba extus glabra intus fauce penicillata lobis triangularibus tubum fere aequantibus. Stamina inclusa tubo corollae inserta filamentis glabris antheras oblongas basi cordata barbatae aequantibus. Pistillum glabrum ovario biloculari styloque crasso. Fructus ignotus verisimiliter parvus monospermus.

Type: Madagascar: Analamera Mts., Diégo-Suarez Province, Humbert 19154 (P, holotype; isotype: WAG).

Climber. *Branches* lenticellate, dark brown, often partially greyish, not sulcate

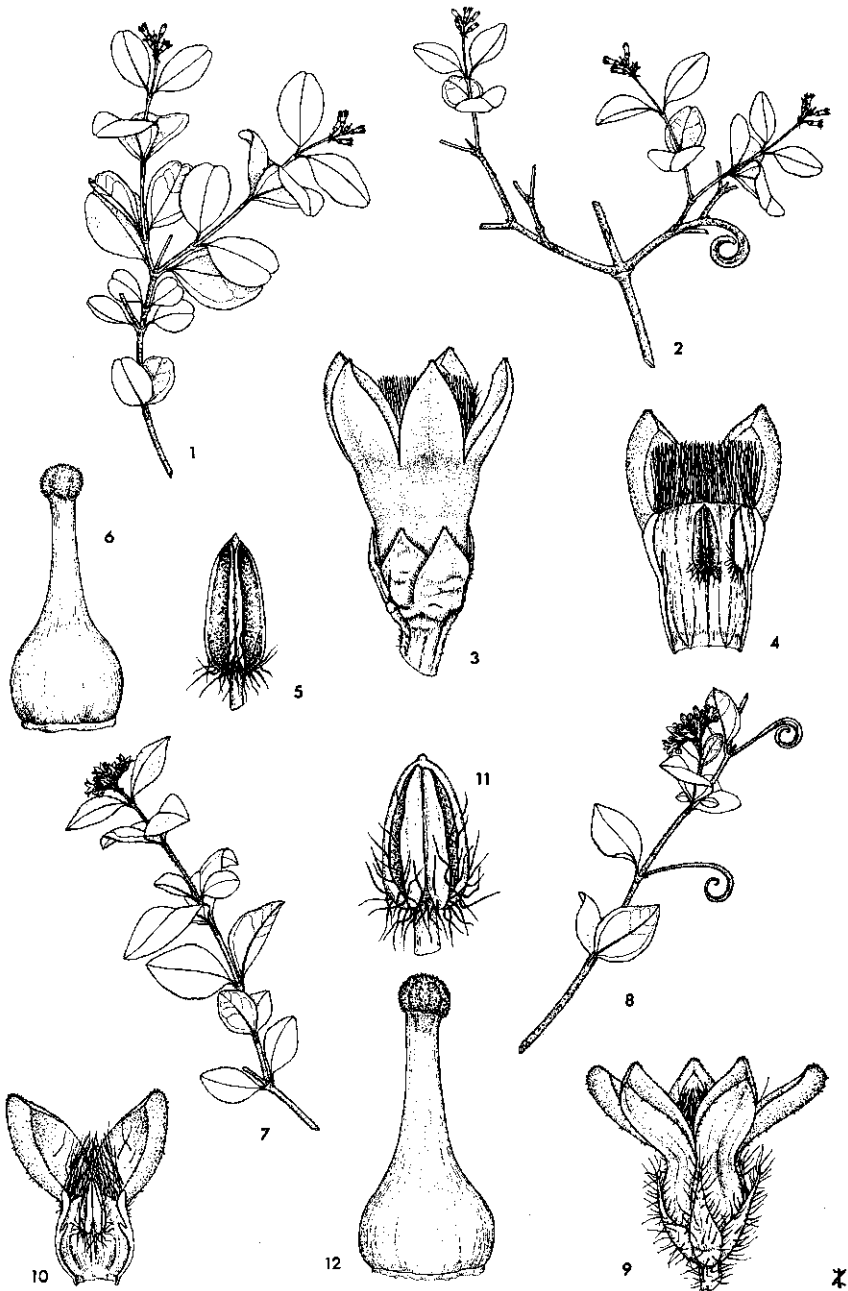


FIG. 33. 1-6. *S. pentantha* (Humbert 19154): 1-2. branches, $\frac{1}{2} \times$; 3. flower, $10 \times$; 4. portion of corolla with stamens, $10 \times$; 5. anther, $20 \times$; 6. pistil, $20 \times$. 7-12. *S. trichoneura* (Perrier de la Bâthie 8028): 7-8. branches, $\frac{1}{2} \times$; 9. flower, $7 \times$; 10. portion of corolla with stamen, $7 \times$; 11. anther, $20 \times$; 12. pistil, $20 \times$.

when dry; branchlets with ranked hairs below the stipular line or glabrous, lenticellate or not, pale brown and not sulcate when dry. Tendrils solitary. *Leaves* small, shortly petiolate; petiole glabrous or nearly so, 0.5–2 mm long; blade mat on both sides, pale green, paler beneath, glaucous and thinly coriaceous when dry, elliptic or orbicular, comparatively narrower towards the apices of the branchlets, 1–2 × as long as wide, 10–22 × 5–17 mm, rounded or emarginate at the apex, cuneate or rounded at the base, glabrous on both sides or with some hairs at the base beneath; one pair of secondary veins from the base curved along the margin and often a faint submarginal pair; tertiary venation reticulate, not very conspicuous. *Inflorescence* terminal, small, lax, 3- or 5-flowered, 1 × 0.6 – 1.5 × 0.8 cm, 1 × branched. Bracts small, triangular, glabrous on both sides or pubescent above the base, without colleters. *Flowers* 5-merous. *Sepals* connate at the base for one-third of their length, subequal, the inner slightly smaller, ovate, 1.2 × as long as wide, 1–1.2 × 0.8–1 mm, acute at the apex, minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 2.7–3 × as long as the calyx, 3.2–3.5 mm long, and rounded at the apex, white, outside glabrous, inside white-penicillate in the throat; tube 1.5 × as long as the calyx, 1–1.2 × as long as the lobes, 1.7–1.8 mm long, at the throat 1.2–1.5 mm wide; lobes triangular, 1.5–1.7 × 1 mm, thick, acute, sub-erect. *Stamens* included; filaments short, 0.5–1 × as long as the anthers, glabrous, inserted at one-half to two-thirds from the base of the corolla tube; anthers oblong, 0.9 × 0.4 mm, bearded at the deeply cordate base; cells parallel. *Pistil* glabrous, 1.6–1.8 mm long; ovary depressed-globose to broadly ovoid, 0.7–0.8 × 0.8–0.9 mm, rather abruptly narrowed into the style, 2-celled; style 0.9–1 mm long; stigma capitate. In each cell about 5–12 ovules. *Fruit* unknown, supposed to be small and 1-seeded.

Distribution: Only twice collected in the same locality in northern Madagascar.

Ecology: Calcareous hills; alt. 50–400 m.

Madagascar: Analamera Hills, Diégo-Suarez Province (Jan.) Humbert 19131 (P, WAG), 19154 (P, WAG, type).

Notes. *S. pentantha* resembles strikingly *S. benthamii* C. B. Clarke var. *parvifolia* (Benth.) A. W. Hill from Ceylon in habit, branches, leaves, inflorescence, and flowers. The only clearcut differential characters are in the indumentum in the corolla and the insertion of the stamens. In *S. benthamii* there is a narrow bristle approximately on the middle of the corolla lobes and the stamens are inserted at the mouth. In *S. pentantha* there is a ring of stiff hairs in the throat and the stamens are inserted in the tube.

55. *S. phaeotricha* Gilg in Engler, Bot. Jahrb. 36: 105, f. 3. 1905; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2: 41. 1963.

Fig. 34, p. 217; Map 33, p. 211

Type: Cameroun: Bipindi, Zenker 2868 (holotype not seen, destroyed in B; lectotype: G; other isotypes seen: BM, BR, E, GOET, GRO, K, L, LY, M, MO, P, S, W, WU, Z).

Heterotypic synonym: *S. thyrsiflora* Gilg in Mildbraed, Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped. 1907-'08. 2: 532, t. 74. 1914. Type: Congo: Orientale, Ituri, between Mawambi and Awakubi, near Njiapanda, Mildbraed 3192 (holotype not seen, destroyed in B; lectotype: UPS).

Liana, at least 35–50 m long, 4–40 m high climbing in trees. Trunk 2–7 cm in diam. or more. Bark (in branches rather thin) pale grey, lenticellate. Branches lenticellate or not, pale grey-brown to dark brown and slightly fissured when dry, paler than the branchlets which are brown-hirsute, often with a double indumentum, and not lenticellate. Tendrils paired. Leaves: petiole short, brown-setose, 2–4 mm long, with some large colleters at the base (at edges); blade shining or mat and dark green above, paler beneath, papyraceous also when living (young membranaceous when dry), narrowly obovate, narrowly elliptic, or sometimes narrowly ovate or on the main axis ovate, comparatively wider on the main axis and at the bases of the branchlets, $(1.5)2-3.3 \times$ as long as wide, $(2.5) 5-16.5 \times (1.4) 2.5-8$ cm, in the shade up to 22×8 cm and often herbaceous, acuminate at the apex, cordate or subcordate at the base, brown-setose on both sides, especially or only on the costa; one pair of secondary veins from or from above the base curved along the margin and often a faint submarginal pair; tertiary venation forming characteristic mussel shell markings beneath. Inflorescence terminal, partially monochasial near apex of branchings, lax, many-flowered, about as long as the leaves, $5 \times 5 - 8 \times 8$ cm, 3–5 × branched. Peduncle and branches slender, brown-hirsute as the pedicels. Lower bracts leafy, other small, sepal-like, with several large colleters at the edges of the axils. Flowers 5-merous, sessile or subsessile. Calyx often with 1–2 large colleters at the mouth; sepals green, connate at the base, subequal, linear or nearly so, $3-15 \times$ as long as wide, $1.8-3 \times 0.2-0.6$ mm, subulate, brown-hirsute outside, glabrous inside, not ciliate. Corolla in the mature bud $1.2-2 \times$ as long as the calyx, 2.8–4 mm long, somewhat contracted below the middle (insertion of the glands), and subtruncate at the apex, white, creamy, or yellow, outside brown-hirsute on the lobes or sometimes entirely glabrous, inside with a pubescent gland with thick hairs just above the base of the lobes; tube urceolate, very short, $0.2-0.4 \times$ as long as the calyx, 0.5–0.8 mm long; limb 6.5–7.5 mm in diam.; lobes narrowly oblong, with largest width just above the base, there with the gland, and from that point reflexed, $3.3-5 \times$ as long as the tube, $2.6-4$ (in bud $2.3-3.2$) \times as long as wide, $2.6-4 \times 0.7-1$ mm (in bud $2.3-3.2 \times 0.7-1$ mm), acute. Stamens well-exserted; filaments ventrally near the base with a bilobed pubescent gland with the same thick hairs as on the corolla lobes and there curved, glabrous in other parts, 2–2.5 mm long, elongate at anthesis,

widened from above the gland towards the insertion, inserted at the mouth of the corolla tube; anthers suborbicular, 0.4–0.5 × 0.3–0.5 mm, glabrous or with some minute stiff hairs at the base, cordate at the base; cells parallel. *Pistil* somewhat pilose in the middle or entirely glabrous, 3(2.8–3.2) mm long; ovary ovoid, about 1.5–2 × as long as wide, 1–1.5 × 0.6–1 mm, with some minute hairs at the apex, or glabrous, (often with a disk-like base), gradually narrowed into the style; style at anthesis curved at the apex, later straight, 1.5–2 mm long, with some minute hairs near the base or glabrous; stigma capitate. In each cell 5–6 ovules. *Fruit* orange (?), ellipsoid, rather large, soft, 25 × 18 × 18 – 30 × 27 × 25 mm, with about 3–7 seeds, glabrous, immature brown-setose. Wall thin, about 1 mm thick when dry, brittle. *Seeds* ochraceous, flattened, more or less plano-convex, obliquely ovate or elliptic, usually irregularly curved, 15 × 10 × 3 – 23 × 15 × 6 mm, smooth. Testa very thin, sticking to the pulp.

Distribution: West and Central Africa.

Ecology: Rainforests, secondary forests, or gallery forests; alt. 0–700 m.

Ghana: Foso, Assin Cocoa Station (Oct.) West-Skin 45 (K).

Nigeria: Sapoba For. Res., Benin Province (Mar.) Erniwogbon FHI 45344 (FHI, K, WAG); Usonigbe For. Res., Benin, Onochie FHI 35670 (FHI, K); Calabar-Manfe road, Ejiofor FHI 21871 (FHI, K).

Cameroon: 3 km S. of Victoria, near Bimbia, Leeuwenberg 6959 (WAG); Barombi Lake, Kumba District, Daramola FHI 41018 (K); 3 km E. of km 21 of Yabassi-Douala road, Leeuwenberg 6413 (WAG); 3 km E. of Kopongo, along road to Masok, Leeuwenberg 5238 (WAG); 60 km SW. of Eséka, S. of Nyong R., Leeuwenberg 5048 (WAG); Bipindi, Zenker 2868 (BM, BR, E, G, GOET, GRO, HBG, K, L, LY, M, MO, P, S, W, WU, Z, type), 3772 (BM, BR, E, G, GOET, HBG, K, L, LY, M, MO, P, S, US, W, WRSL, WU, Z, distributed as *S. scaberrima*), 4924 (BM, BR, COI, E, G, GOET, HBG, K, L, LE, M, MO, P, PR, S, W, Z, distributed as *S. scaberrima*), April 1904 (F, perhaps 2868), Mar. 1908 (F, UC, perhaps 3772), s.n. (F, perhaps 4924); Lokoundjé R. (fl.) Zenker 20 Mar. 1920 (BM, BR, COI, F); right bank Kélé R., 30 km N. of Eséka, Leeuwenberg 7471 (WAG); about 40 km NW. of Yaoundé, Leeuwenberg 5441 (WAG); km 27 of Sangmélina-Yaoundé road, Bretelet 2688 (K, P, WAG, YA); Bitye, near Dja R., about 60 km ENE. of Sangmélina, Bates 1760 (FI, K); Yaoundé, Mollez Nov. 1964 (P); about 20 km NW. of Yaoundé, Leeuwenberg 7481 (WAG); Djerem and Lom Rs. Junction, N. of Goyoum (Feb.) Mildbraed 8183 (K); 8 km E. of Lomié, along road to Eschienbot, Leeuwenberg 6722 (WAG).

Gabon: Cristal Mts., N. Hallé & Villiers 5230 (P); near Libreville (Oct.) Klaine 1695 (BR, K, P), 1773 (BR, P), 2098 (K, P); Bélinga, N. Hallé 2947 (P); *ibid.*, N. Hallé & Le Thomas 537 (P); Tchibanga, Nyanga R. region (Nov.) Le Testu 1855 (B, IFAN, L, P); Upper Ngounyé R., Le Testu 6351 (P, WAG); Lastourville Region, Le Testu 7699 (P, WAG), 8329 (P, WAG).

Congo (Brazzaville): Bouenza R. Falls, Bouquet 1727 (P, WAG); Foulakari Falls, Bouquet 2169 (WAG).

Congo (Kinshasa): Léopoldville: Luki, Lukulu Territory, Wagemans 2431 (BR, WAG); Mpesse, Nsele R., Callens 2159 (BR). Equateur: Basankusu-Bokakata road (Sept.) Evrard 4797 (BM, BR, K, WAG); Bongabo, Evrard 1130 (BR). Orientale: Lower Uélé R., De Wulf 95 (BR); Kulu (Apr.) Van den Branden 511 (BR); Bambesa, Buta Territory (Feb., Apr.) Gérard 3517 (BR), 4848 (BR, WAG), 4923 (BR, WAG), 5240 (BR, K, LISC, WAG), 5536 (BR, WAG); Yangambi, Bolema 914 (BR); *ibid.*, A. Léonard 1021 (BR, IFAN, K, L, WAG); *ibid.* (Mar., Aug.) Louis 2485 (BR, EA, K, P, WAG), 3634 (BR, K, LISC, WAG), 3741 (BR, WAG), 3932 (BR, EA, K, P, WAG), 4090 (BR, WAG), 5733 (BR, EA, MO, P), 12031 (BR), 14369 (BR, C, K, MO, P, PRE), 14414 (BM, BR, C, K, MO, P, US), 15562 (BR, C, K),

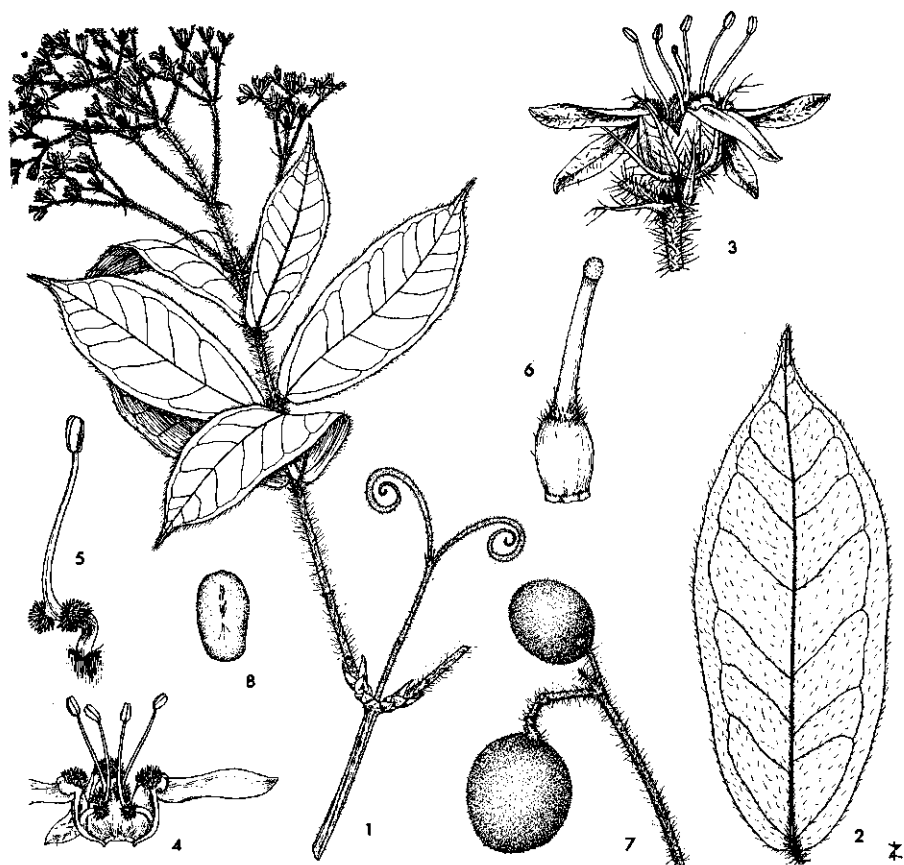


FIG. 34. *S. phaeotricha*: 1. branch, $\frac{1}{2} \times$; 2. leaf above, $\frac{1}{2} \times$; 3. flower, $5 \times$; 4. portion of corolla with stamens, $5 \times$; 5. stamen, $10 \times$; 6. pistil, $10 \times$; 7. fruits, $\frac{1}{2} \times$; 8. seed, $\frac{1}{2} \times$ (1, 3-6. Le Testu 1855; 2. Louis 3932; 7-8. Louis 5733).

15757 (BR), 16454 (BR); Ituri, between Mawambi and Awakubi, near Njiapanda, Mildbraed 3192 (UPS, type of *S. thyrsoiflora*). Kivu: Irangi, near km 110 of Kavumu-Walikale road, Troupin 4404 (BR, K); Shabunda, Kalehe Territory, Pierlot 1103 (BR); Bunyakiri, Kalehe Territory, A. Léonard 2946 (BR, WAG); Tubalaka-Bunyakiri road (Sept.) Gutzwiller 1397 (BR, WAG).

Notes. The size of the flowers in GILG's description of *S. thyrsoiflora* does not agree with that of the isotype, Mildbraed 3192, which is here designated lectotype. The latter specimen covers in all other respects both the description and the figure in MILDBRAED's book. This specimen belongs in *S. phaeotricha*, as was concluded after comparison of all the specimens cited. The flowers differ from all other species of the genus by the characteristic glands on the corolla lobes and on the filaments.

The branchlets and leaves may be less hairy to nearly glabrous, as is demon-

strated by three specimens collected in the same locality (Klaine 1695, 1773, 2098). They agree in all other respects exactly with the present delimitation of the species.

56. *S. potatorum* L. f., Suppl. 148. 1781; Gaertner, Fruct. 2: 477. 1791; Lamarck, Illustr. 2: 38. 1794 (as *potatoria*); Roxburgh, Pl. Coast Coromandel 1: 9, pl. 5. 1795; Willdenow, Sp. Pl. 1: 1052. 1797; Du Petit-Thouars in Dict. Sc. Nat. 6: 426. 1806 and Not. Hist. Genre Caniram ou Strychnos 6. 1806 which has nearly the same text; Dubuisson & Du Petit-Thouars in Desvieux, Journ. Bot. Paris 1: 249. 1809, again nearly the same text; Poiret in Lamarck, Enc. 8: 696. 1808; Roxburgh, Fl. Ind. 1: 576. 1832; Mérat & De Lens, Dict. Mat. Med. 6: 563. 1834; Bojer, Hort. Maurit. 205. 1837; G. Don, Gen. Syst. 4: 65. 1838; Spach, Veg. Phan. 8: 487. 1839; De Candolle, Prod. 9: 15. 1845; Wight, Illustr. 2: t. 156. 1850; Bentham, Journ. Linn. Soc. 1: 103. 1856; Dalziel & Gibbs, Bombay Fl. 156. 1861; Thwaites, Enum. Pl. Zeyl. 425. 1864; Brandis, Forest Fl. India 317. 1874; Kurz, Forest Fl. Br. Burma 2: 167. 1877; C. B. Clarke in J. D. Hooker, Fl. Br. Ind. 4: 90. 1883; Lanessan, Pl. Ut. Col. Fr. Paris 636. 1886; Sagot & Raoul, Man. Prat. Cult. Trop. Paris 297. 1893; Trimen, Fl. Ceylon 3: 176. 1895; Cooke, Fl. Bombay 2: 186. 1904; Brandis, Indian Trees 474. 1906; Bourdillon, Forest Trees Travancore 270. 1908; Dop, Bull. Soc. Bot. Fr. Mém. 19: 18. 1910; A. W. Hill, Kew Bull. 1917: 154. 1917; J. S. Gamble, Fl. Madras 868. 1921; H. H. Haines, Botany Bihar and Orissa 2: 572. 1922 (in reprint 1961, p. 592).

Fig. 35, p. 219; Map 34, p. 221

Type: India: Madras, in mountains, Koenig anno 1876 (S, lectotype).

Heterotypic synonyms: *S. tetankotta* Retz., Obs. 2: 12. 1781; J. F. Gmelin, Syst. 2: 387. 1791 (as *telankotta*); Jackson, Index Kew. 2: 1010. 1895 (as *tettankotta*). Type: India, Koenig s.n. in herb. Retzius (LD, holotype).

? *S. titou-cote* Gaertn., Fruct. 2: 477, t. 179. 1791. Type not seen, destroyed.

S. stuhlmannii Gilg in Engler, Bot. Jahrb. 17: 570. 1893; Baker in Fl. Trop. Afr. 4(1): 529. 1903; Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 33. 1952 and 86: 108. 1953; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 33. 1960; Verdoorn in Fl. S. Afr. 26: 143, f. 17. 3. 1963. Type: Moçambique: Tete Province, Zambesi R., opposite Chiramba (cited as Shinamba), Kirk July 1859 (K, lectotype).

S. heterodoxa Gilg in Engler, Bot. Jahrb. 28: 118. 1899; Baker, l.c. p. 530. Type: Tanzania: Uhehe, Makinde Steppen, between Iringa and Njombe, Goetze 519 (holotype not seen, destroyed in B; lectotype: BM, other isotypes seen: BR, K).

Deciduous much branched small or medium sized tree or sometimes shrub, (2)4–18 m high. Trunk 20–100 cm d.b.h. Bark pale grey or grey-brown, smooth, lenticellate, thin, on section outer green and inner orange or buff; wood pale yellowish-brown, with bark-islets. Branches often several times dichotomously branched, pale to very dark brown, distinctly lenticellate, terete, not or slightly

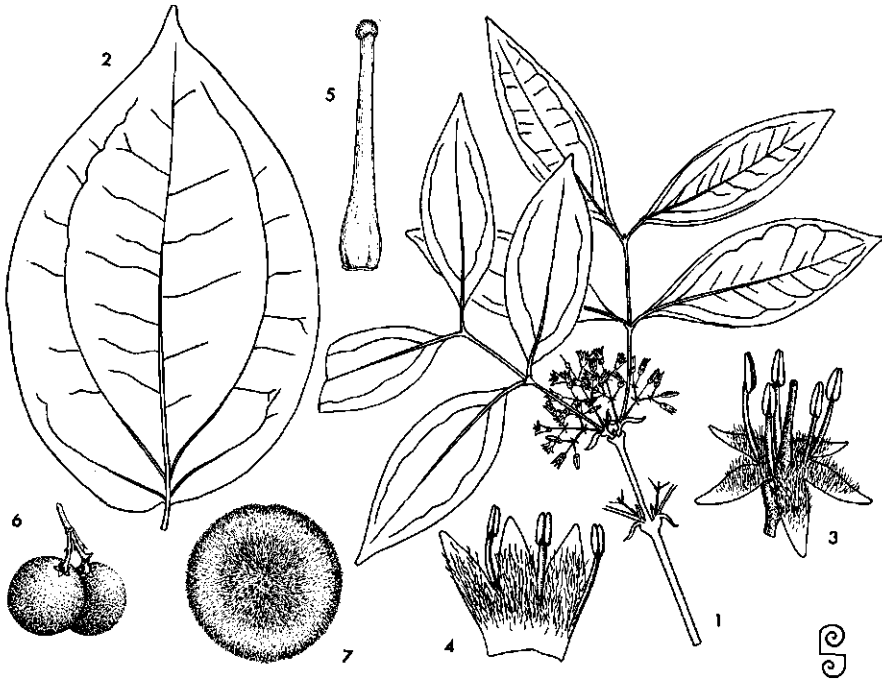


FIG. 35. *S. potatorum*: 1. branch, $\frac{1}{2} \times$; 2. leaf, $\frac{1}{2} \times$; 3. flower, $3 \times$; 4. portion of corolla with stamens, $3 \times$; 5. pistil, $6 \times$; 6. fruits, $\frac{1}{2} \times$; 7. seed, $2 \times$ (1-5. English 3/50; 6-7. Robertson & Elffers 58; 5-7. drawn by Miss H. G. D. Zewald).

sulcate when dry, with protruding persistent cup-like petiole-bases; branchlets glabrous, when leaves mature lenticellate and coloured like the branches, otherwise not lenticellate, pale to dark brown, and often sulcate when dry. Apex of branchlet modified into a spine-like, 1-3 mm long tip. *Leaves*: petiole short, glabrous, 1-7 mm long; blade dark green above, mat or dull and paler beneath, papyraceous or thinly coriaceous, when young membranaceous (in flowering branches), variable in shape and size, elliptic, narrowly elliptic, ovate, or narrowly ovate, 1.5-3(3.5) \times as long as wide, 6-15 \times 3-9 cm, in the shade up to 19.5 \times 11 cm, acute, acuminate, or sometimes apiculate or obtuse at the apex, cuneate, rounded, or sometimes, especially in young shoots, subcordate at the base, glabrous on both sides; two pairs of distinct mostly pale green secondary veins from or from above the base curved along the margin, not reaching the apex; tertiary venation mostly pale green, reticulate. *Inflorescence* in the axils of small scales at the bases of the branchlets, solitary, lax or rather congested, 1.5-2.5 \times 1-2 cm, 1-2 \times branched. Peduncle, branches, and pedicels slender, glabrous. Bracts small, very narrowly triangular to narrowly triangular, slightly longer than the sepals, glabrous on both sides, at least upper without colleters. *Flowers* (4-)5-merous, variable in shape and size, appearing before or with the young leaves. *Sepals* dark green, connate at the base (up to

halfway in Armitage 181/59), subequal, variable in shape and size, ovate, broadly ovate, or sometimes oblong (1)1.3–2 × as long as wide, 1–2.2(2.5) × 0.7–1.5 mm, acute or less often acuminate at the apex, not ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud (3)3.5–5(6) × as long as the calyx, (4)4.5–7.5 mm long, and tapering at the apex, white, creamy, or yellow, outside glabrous, inside pilose with white hairs on the base of the lobes and often also in the throat; tube very variable in length and width, (0.8)1–2.5 (3.2) × as long as the calyx, 1–3.5 mm long, at the throat 1.5–3 mm wide; lobes 1–3 × as long as the tube, oblong, 2–4.3 × as long as wide, 3–4.5 × (0.8) 1–2.2 mm, acute, spreading. *Stamens* exerted; filaments glabrous, longer in flowers with shorter corolla tube (like in *S. decussata*), 0.5–1.7 × as long as the anthers, 1–2.5 mm long, inserted at the mouth of the corolla tube; anthers oblong, mostly about twice as long as wide, 1.1–2 × (0.3)0.6–1 mm, deeply cordate at the base, glabrous; cells parallel. *Pistil* glabrous, (3.5)4.4–6 mm long; ovary ovoid or conical, 1.2–1.5 × as long as wide, 1–2 × 0.8–1.4 mm, mostly gradually narrowed into the style, 2-celled; style rather thick, (2.5)2.7–4.3 mm long; stigma often small, capitate or occasionally obscurely bilobed. In each cell 5–13 ovules. *Fruit* blue-black, small, cherry-like, soft, globose, (10)15–25 mm in diam., 1-seeded, with smooth skin, shining. Wall thin, dry about 0.3 mm thick. Pulp purplish. *Seed* slightly glossy, pale brown, depressed-globose or ellipsoid, 10 × 9 × 6 – 13 × 12.5 × 9 mm, with an obscurely angular line all around, densely sericeous, smooth.

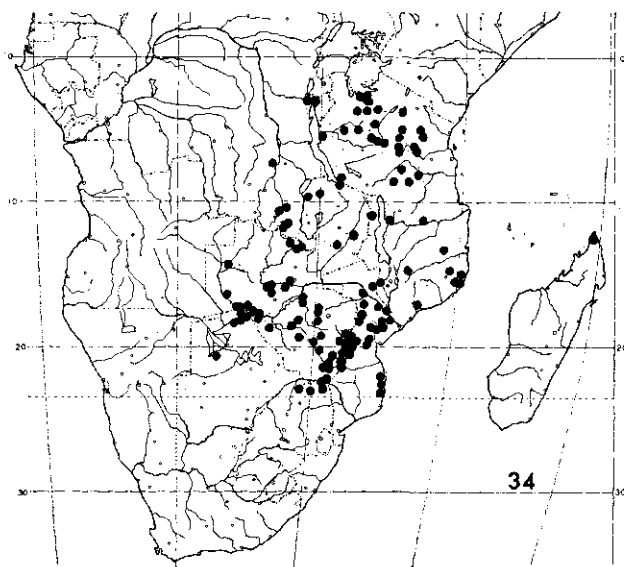
Distribution: East and northern South Africa; and Asia: India, Ceylon, and Burma.

Ecology: In gallery forest, in *Brachystegia*-woodland, semi-evergreen bushland, often on river banks, on banks of dry riverbeds, or on termitaries; alt. 0–1600 m.

Congo (Kinshasa): Kivu: Kahanda, Uvira Territory (fr. May) A. Léonard 4385 (BR, K, WAG); Luberizi, Liegeois 157 (BR); between Sange and Luberizi (fr. Mar.-Apr.) Hendrickx 7588 (BR), 7743 (BR, WAG); Ruzizi R. Valley, Germain 5623 (B, BR, C); *ibid.*, Sange R. (fr. May) Germain 5822 (BR, K, PRE), 6972 (B, BR, K, PRE). Katanga: Kiala, Manono Territory (fr. Jan.) Thiébaud 136 (BR, EA, K, P, WAG); Mwadingusha, Poncelet 26 (BR); 20 km N. of Lukafu (fr. July) Schmitz 1859 (BR); 5 km NE. of Lubumbashi (Dec.) Schmitz (obs. 302) 677 (BR), 6097 (BR, K); 8 km SW. of Lubumbashi (fl. Nov., fr. June) (obs. 453) Schmitz 2708 (BR, PRE), 3228 (BR); 10 km SW. of Lubumbashi (obs. 191) Schmitz 455 (BR).

Burundi: Ruzizi R. Valley, Cibitoke Territory, Lewalle 2874 (WAG).

Tanzania: Lake Province: near Mwanza (fr. June) Watkins F.H. 2373 (EA, FHO); *ibid.*, Kissesa, Tanner 388 (BR, K); Ngudu (Nov.) Pitt-Schenkel 281 (EA, FHO); Shinyanga, Burt 5598 (BM, BR, FHO, K); *ibid.*, Koritschoner 1809 (EA, FHO, K); *ibid.*, Mwanghosha, Kemp 28 (BM); *sin. loc.*, Kisaka 8010 (EA). Northern Province: Mbulu District, Greenway & Kanuri 12074 (K); Mbangala, Masai District (fr. Aug.) Semsei & Fraser F.H. 2100 (EA, FHO); Kijungu, Masai District, Leippert 5968 (K, WAG). Western Province: Kahama District, Glover 251 (J); Wembere Escarpment, Nzega District (Oct.) Richards 13442 (K); near Malagarassi, Uvinsa District, Peter 35881 (B); Kaliuwa, Tabora District (Oct.) Shabani 51 (K); Simbo Res., Tabora, Wigg F.H. 1136 (FHO); between Malongwe and Tura, Ngulu District, Peter 34799 (B); Kasanga, Kawa R. Valley, Ufipa District,



MAP 34. *S. potatorum*.

Richards 10154 A (K). Central Province: Simbo Hills, Kondoa-Irangi (Dec.) Burt 5311 (K); Kundusi, Kondoa-Irangi (Dec.) Burt 5353 (K); Kondoa District (Jan.) Burt 864 (K); *ibid.*, Simbo Hills (Jan.) Burt 1036 (K), 1885 (K); Farkwa, Newman 22 (K); between Itigi and Bangayeha, Turu District, Peter 33745 (B); Chaya (as Tschaya), Peter 34411 (B); between Baki and Kitalabo Steppe, Ugogo District (Dec.) Peter 33281 (B); Inagi For. Res., Dodoma District (Nov.) Semsei 3414 (BR, EA, K); Mtanara, Kongwa, Mpwapwa District, W. Bond 57 (EA); Mpwapwa (Dec.) Hornby 433 (EA, K), 573 (EA, K). Eastern Province: Kiberege, Culwick 11 (K); Ulanga R. Valley, Culwick 33 (K); Mukindi Steppe, Uhehe, between Iringa and Njombe (Jan.) Goetze 519 (BM, BR, K, type of *S. heterodoxa*). Southern Highlands Province: W. of Kalenga Road, about 6 km from Iringa, Mathias & D. Taylor A 22 (EA). Southern Province: Lukoma, Lake Nyassa, Bellingham Aug. 1887 (BM); Tendaguru, Migeod 775 (BM); Rovuma R., Kirk 28 Mar. 1861 (K).

Zambia: Kalambo Falls, Abercorn District, Phipps & Vesey-Fitzgerald 3075 (SRGH); Kawambwa (Nov.) Fanshawe 3882 (BR, K); Mporokoso, Phipps & Vesey-Fitzgerald 3264 (SRGH); Kitwe, Fanshawe Kitwe 5 (WAG); Lundazi District, Feedy 117 (K); Luanshya (July) Fanshawe 1397 (BR, FHO, K); Ndola (Dec.) Fanshawe 561 (BR, FHO, K); Luangwa Game Res., Mpika District, Mitchell 2811 (K); Kabompo R., Kabompo District (Nov.) Holmes 1022 (BR, FHO, K); Nangweshi, Barotseland, Codd 7126 (K, PRE); near Namwala, Trapnell 1884 (EA); km 138 of Choma-Namwala road, Namwala District, White 2976 (FHO, K); Mapanza, Choma (Nov.) Robinson 2918 (EA, K, M, SRGH); Kabanda Hill, Mazabuka District, Bainbridge 14/53 (FHO, K); Chilanga District, C. Sandwith 21 (K); Mt. Makulu Research Station, 18 km S. of Lusaka, Angus 1286 (FHO, K); New Sesheke, Barotseland, Zambesi R. bank, Codd 7088 (K, PRE); Sesheke Boma, White 1989 (BR, FHO); N. of Machili, Livingstone District, Angus 959 A (FHO); Bombwe, Livingstone, J. D. Martin 669 (FHO, K); Nawa, near Livingstone (?), J. D. Martin 252 (FHO); Mvumbili (?), near Livingstone (?), J. D. Martin 753 (FHO); *ibid.* (?), J. D. Martin 754 (BM, FHO); 1.6 km above Victoria Falls, Hutchinson & J. B. Gillet 3421 (BM, K, SRGH); Sichifula For. Res., Livingstone District, Angus 1091 (BR, FHO, K); Katombora, Greenway & Trapnell 7952 (BR, EA, FHO, K, PRE); *ibid.*, O. West 2901 (SRGH); Livingstone Island, S. of Zambesi R., Burt-Davy 20486 (FHO).

Malawi: near Rumpi Boma, White 2542 (FHO, K); Muea, Burt-Davy 21718 (FHO); sin loc., Smuts 2087 (PRE).

Rhodesia: Kariba, Urungwe District (Nov.) Mullin 97/56 (PRE, SRGH); Msuku R. (fr. May) Lovemore 52 (SRGH); Chuware R. (Dec.) Lovemore 329 (MO, PRE, SRGH); Ruwe R., Urungwe District, Phelps 120 (K, PRE, SRGH); Victoria Falls, Wankie District, Armitage 292/59 (SRGH); *ibid.*, Flanagan 3175 (BOL); *ibid.*, H. Wild 3091 (BR, K, SRGH); Livingstone District (Nov.) Armitage 181/59 (SRGH); Dett Valley, Pole Evans 3077 (K); Kana Ridge, Mafungabusi, Jeffrey 23/48 (FHO); Hutusadona Range, Gokwe District, Hiddleton-Stokes 62 (SRGH); Sinoia, Rodin 4373 (K, PRE, UC); Lomagundi District, R. W. Jack SRGH 6896 (SRGH); Hartley, Herb. Dept. Agric. 1362 (K; leg. R. W. Jack (?)); Odzi Wier, Umtali District (Dec.) English 3/50 (SRGH); Matabeleland, Pardy SRGH 5027 (SRGH); 10 km from Selukwe (Dec.) Biegel 1542 (WAG); Umvuma Dam, Wright 3/47 (FHO, SRGH); Buhera District (Nov.) Davies 596 (MO, PRE, SRGH), 601 (K, MO, PRE), 625 (PRE, SRGH); *ibid.*, Mukumbango, Masterson 14 (SRGH); above railroad to Beira, Umtali District, Chase 554 (BM, BR, K, S, SRGH); Sabi R. (fl., fr. Nov.) Swynnerton 1079 (BM); Hot Springs, Melsester District, Chase 709 (BM, K, SRGH), 1457 (BM, COI, LISC); Birchenough Bridge, Lower Sabi R., Chase 475 (BM, SRGH); *ibid.*, O. West 3302 (SRGH); Binga Hill, Sebungwe District (Nov.) Phipps 1417 (BR, K, PRE, SRGH); Ndanga District, Farrell 14 (SRGH); *ibid.*, Chipinda Pools (Oct.) Gibson 67/51 (SRGH); *ibid.* (Oct.) J. H. Goodier 21 (K, LISC, PRE, SRGH); *ibid.* (Dec.) R. Goodier 688 (K, LISC, SRGH); *ibid.* (Oct.) Seymour-Hall 54/51 (FHO, SRGH); Changadzi R., Sabi R. Valley, McGregor M 113/39 (BR, FHO); Chipinga District (Nov.) Swynnerton 44 (BM); *ibid.*, Chipanpayi, Soane 306 (FHO, M, SRGH); E. Sabi, Sangwe Crossing, Phipps 51 (BR, COI, K, LISC, SRGH); Sabi-Tangada estate (Nov.) R. Goodier 647 (K, M, PRE, SRGH); Sabi R. Valley, Chipinga District, Soane 175 (BR, M, SRGH); Nuanetsi District, Carter 26/53 (SRGH); *ibid.*, Gonakudzingwa (fr. July) O. West 3999 (LISC, M, SRGH); Lundi R. (Dec.) Davies 2264 (K, SRGH); Nuanetsi R. (Nov.) Davies 583 (MO, M, SRGH), 585 (MO, SRGH), 1647 (K, SRGH); S. of Shirugwe Hill, Loveridge SRGH 85911 (COI, EA, SRGH); Lower Sabi R., Chibuwe R., H. Wild 2328 (BR, K, S, SRGH); Sabi-Lundi Rs. Junction (fr. June) H. Wild 3390 (BR, K, SRGH, UC).

Moçambique: Niassa: Ngami Valleys, A. J. W. Hornby 2556 (PRE); Cuamba, Gomes Pedro 3382 (EA). Cabo Delgado: km 3 of Montepuez-Nantulo road, Torre & Paiva 9775 (LISC), 11700 (LISC). Moçambique: km 8 of Imala-Mocuburi road, Torre & Paiva 9996 (LISC); Monapo, Torre & Paiva 9371 (LISC); Liupo, Gomes Pedro 4653 (EA); km 5 of Liupo-Mogincual road, Torre & Paiva 11462 (LISC). Zambézia: between Mocuba and Maganja da Costa, Torre & Correia 14480 (LISC). Tete: Zóbuè (Dec.) Menyharth 793 (K, WU, Z); Tete, Mendonça 4307 (LISC); km 6 of Tete-Changara road, Torre & Correia 15246 (LISC); Zambesi R., opposite Chiramba (fr.) Kirk July 1859 (K, lectotype). Manica e Sofala: Chemba, de Lemos & Macuácuá 111 (BM, K, LISC, PRE, WAG); km 36 of Mutarara Velha-Sinjal road, Barbosa & M. F. de Carvalho 3138 (K, SRGH); Bárue, on km 23 from crossing of Vila Gouveia-Tete road with road to Macossa (Dec.) Torre & Correia 13565 (LISC); Bárue, km 100 of Vila Gouveia-Changara road (Dec.) Torre & Correia 13740 (LISC); Gorongosa (Nov.) Torre & Paiva 9181 (LISC); Inhামিতanga, Beira District (fr. Aug.) Gomes e Sousa 4252 (LD, PRE, SRGH); Condué, Beira District (Oct.) Gomes e Sousa 4438 (G, K, LISC); Cheringoma, Simão 1225 (PRE); Chupanga, between Tete and the sea coast, Kirk 31 Mar. 1860 (K, LE); km 15 of Mavita-Vila Pery road, Torre 4346 (LISC); Vila Machado, Mendonça 3934 (LISC); Madanda Forests, Swynnerton 548 (BM). Inhambane: Vilanculos, between Mapinhane and Rio das Pedras (fl., fr. Nov.) Torre 3835 (LISC); Vilanculos District (fr. May) R. M. Hornby 2709 (K, SRGH); Massinga, km 20 of Funhaleira-Vilanelos road, Torre 2714 (LISC); Massinga, Macarringa, Mendonça 1892 A (LISC); Inhachengo, Exell, Mendonça & H. Wild 637 (BM, LISC, SRGH).

South West Africa: Mpilila Island, Zambesi R., E. Caprivi Strip, Killick & Leistner 3400 (G, K, SRGH).

Botswana: Chobe R., 13 km N. of Kachikau (fr. July) Erens 362 (K, PRE); Mukusi, O. B. Miller B 137 (FHO); Kabulabula, Chobe R., van Son TRV 28996 (F, K); Serondela, Chobe R. (fr. July) Robertson & Elffers 58 (K, PRE, SRGH); near Kazungula, O. B. Miller

B 11 (FHO); Ngamiland (Dec.) Curson 109 (PRE), 139 (A).

South Africa: Transvaal: Tete Vondo Forest Station, Soutpansberg, B. B. O. PRF 12135 (PRF); Masisi, Louis Trichardt District, van der Schijff 5245 (PRE); S. bank of Pafuri R., Codd 5397 (PRE); 15 km NW. of Punda Maria, near Levubu R., Codd 5381 (BM, MO); Punda Maria, Codd & de Winter 5525 (K) and of same tree: (Dec.) M. R. Jones 37 (K).

Madagascar: Ambongoaba Mts., between Diégo-Suarez and Courrier Bays (fr. Apr.) Capuron Serv. For. 24647 (P, WAG); Montagne des Français, Diégo-Suarez (fr. Apr.) Serv. For. 9878 (P, WAG).

India: herb. N. Hoffmann Bang s.n. (C); herb. Horneman, dedit Wallich 909 (C); Lawson Sept. 1886 (OXF); comm. Lindley anno 1826 (OXF); herb. Roxburgh s.n. (BR); herb. M. Vahl s.n. (C); Kämpfhovener, herb. Wallich 1043 (C); Courtallum, Wight s.n. (OXF); Upper Suar R., herb. J. D. Hooker & Thomson 418 (K); Sittandirudi, herb. Rottler 256 (K, S); East Bengal, herb. Griffith 3725 (K). Maharashtra: Ramtek Hill, Nagpur, Haines 2396 (K). Andhra Pradesh: Cuddapah District, Gamble 11232 (K); *ibid.*, Nigadi Hills (July) Gamble 15219 (K); Mandeopur Res. (fl.) F. C. Edwards 30 May 1904 (K); Kondagutta, Karimnagar District, Subbarao 25683 (WAG); Polavaram, Papikonda, Raju 499 (WAG); Marrisakala, E. Godavari (May) Subbarao 27420 (WAG); Kadimakonda, Godavari District, Bourne 3541 (K); Salur-Joypur road, Srikakulam, Balakrishnam 1066 (WAG). Orissa: Sonaballa, Gamble 9322 (K); Sambalpur (Feb.) Haines 5733 (K); Kalahandi State (May) Haines 4872 (K). Mysore: North Hills, Belgaum District (Feb.) Ritchie 1119 (K); Kanara and Mysore, Law s.n. (K); *ibid.*, G. Thomson s.n. (BR, K, P). Madras: Koenig anno 1776 (S, lectotype), s.n. in herb. Retzius (LD, type of *S. tetankotta*), in herb. Banks (LINN 250.1), comm. J. E. Smith in herb. Thunberg 5279 (UPS); Wight 1814 (C, K, S, WAG), 1816 (P), s.n. (K, OXF); Pondicherry, Commerson 1415 (P); Singanallur, Bourne 13 Nov. 1899 (K); Nilgiris (Apr.) Clarke 11548 A (BM, K); *ibid.*, Wight s.n. (OXF).

Ceylon: Koenig s.n. (BM); Kolavil, Simpson 8279 (BM); Mullaitivu Road, Simpson 9290 (BM); Trincomalee, Thwaites (Glenie) C.P. 3719 (BM, BR, K, P).

Burma: Prome, Ile (?) 1585 (K); Pegu, Prome, Kurz 2320 (K).

Cult.: Ndola, Zambia, Fanshawe 1324 (K, seedlings); Botanic Garden, Calcutta, herb. Pierre anno 1864 (P); *ibid.*, Wallich 1585 (BM, K).

Notes. *S. potatorum* was collected in India by KOENIG, who presented an elaborate description to LINNAEUS f. The latter published it and cited the collector. There are two specimens collected by KOENIG which bear his name and belong to this species, one in the ALSTROEMER herbarium in Stockholm and one in the RETZIUS herbarium in Lund. As ALSTROEMER was a scholar of LINNAEUS, he had met LINNAEUS f. and they knew each other's collections. It is not certain, if LINNAEUS f. saw RETZIUS's herbarium. The present author therefore feels obliged to adopt the specimen in the ALSTROEMER herbarium as the lectotype of the species, although it is less complete than that in the RETZIUS herbarium.

There are two other specimen which were probably also collected by KOENIG, one in the BANKS herbarium in the Linnean Society of London and one in the THUNBERG herbarium in Uppsala. The latter was communicated by SMITH and may therefore originate from the BANKS or the LINNEAN herbarium. As the origin of the specimen in the THUNBERG herbarium is very uncertain and as it is improbable that LINNAEUS f. saw the BANKS herbarium, the excellent specimen in the latter and the less complete in the former cannot be adopted as type.

After comparison of the types of *S. potatorum* and *S. stuhlmannii* and of the other specimens cited, it was evident that they all belong to a single species

which has one character, the blue-black cherry-like fruits by which it is distinguished from all other *Strychnos* species. The species is furthermore easily recognized by the dichotomously branched branches, the leaves, and the arrangement of the inflorescences.

It has been generally assumed that none of the *Strychnos* species occur both in Africa and Asia. It appeared that *S. potatorum* occurs in both continents when the extra-African *Strychnos*-specimens of several herbaria were examined. According to the present author *S. potatorum* is without doubt indigenous in Africa, as it occurs there in the original vegetation and is widely distributed.

The use of the plant in Africa is occasional and not very important. The pounded fruits are sometimes used as fish-poison. The pulp is sometimes eaten. The root bark has medicinal value. None of these uses proves to be so important that the species is planted or cultivated in order to harvest a considerable amount of material to be employed.

In Asia the seeds are used to clear muddy water. For this reason it has often been planted there, especially in India, where it is known to have been in cultivation for a long time. In Burma it may have been introduced fairly recently, according to A. W. HILL (1917).

Taking into account the facts that the species is indigenous in Africa and that it is often planted in Asia the present author presumes that it was introduced in Asia by Arabic traders a long time before the first Europeans arrived in the the Indian Ocean. These facts are also known of the useful species *Tamarindus indica* L., which the present author collected in Upper Volta where it is indigenous.

57. *S. pungens* Solered. in Engler & Prantl, Nat. Pflanzenf. 4(2): 40. 1892 and in Engler, Bot. Jahrb. 17: 554. 1893; Hiern in Cat. Welw. Afr. Pl. 3: 704. 1898; Gilg in Engler, Bot. Jahrb. 32: 176. 1902; Baker in Fl. Trop. Afr. 4(1): 530. 1903; Prain & Cummins in Fl. Cap. 4(1): 1051. 1909; E. A. Bruce, Kew Bull. 1956: 268. 1956; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 24. 1960; Verdoorn in Fl. S. Afr. 26: 144. 1963. **Fig. 36, p. 225; Map 35, p. 227**

Type: Tanzania: Dodoma District, Saranda, Fischer 374 (K, lectotype; isotypes: BM, BR, LE, P).

Heterotypic synonyms: *S. occidentalis* Solered., l.c. and as syn. l.c. Type not cited; united with above in SOLEREDER's second reference. Lectotype: Angola: Huila, Monino (Jan.) Welwitsch 4778 (BM, lectotype; isotypes: COI, G, K, LISU, P).

S. henriquesiana Bak., Bol. Soc. Brot. 11: 86. 1893 and in Fl. Trop. Afr. 4(1): 528. 1903; Gilg & Busse in Engler, Bot. Jahrb. 36: 92. 1905 (with *S. mucronata* Bolus in syn.). Type: Angola: Malanje Province (Aug.) Marques 13 (K, holotype).

S. sapini De Wild., Comp. d. Kasai 382. 1910. Type: Congo (Kinshasa): Kasai, Bienge, Sapin D 23, Oct. 1907 (BR, holotype; isotypes: BR, K, LY).

Deciduous tree or shrub (0.30)2–8(16) m high. Trunk 10–20 cm in diam. or

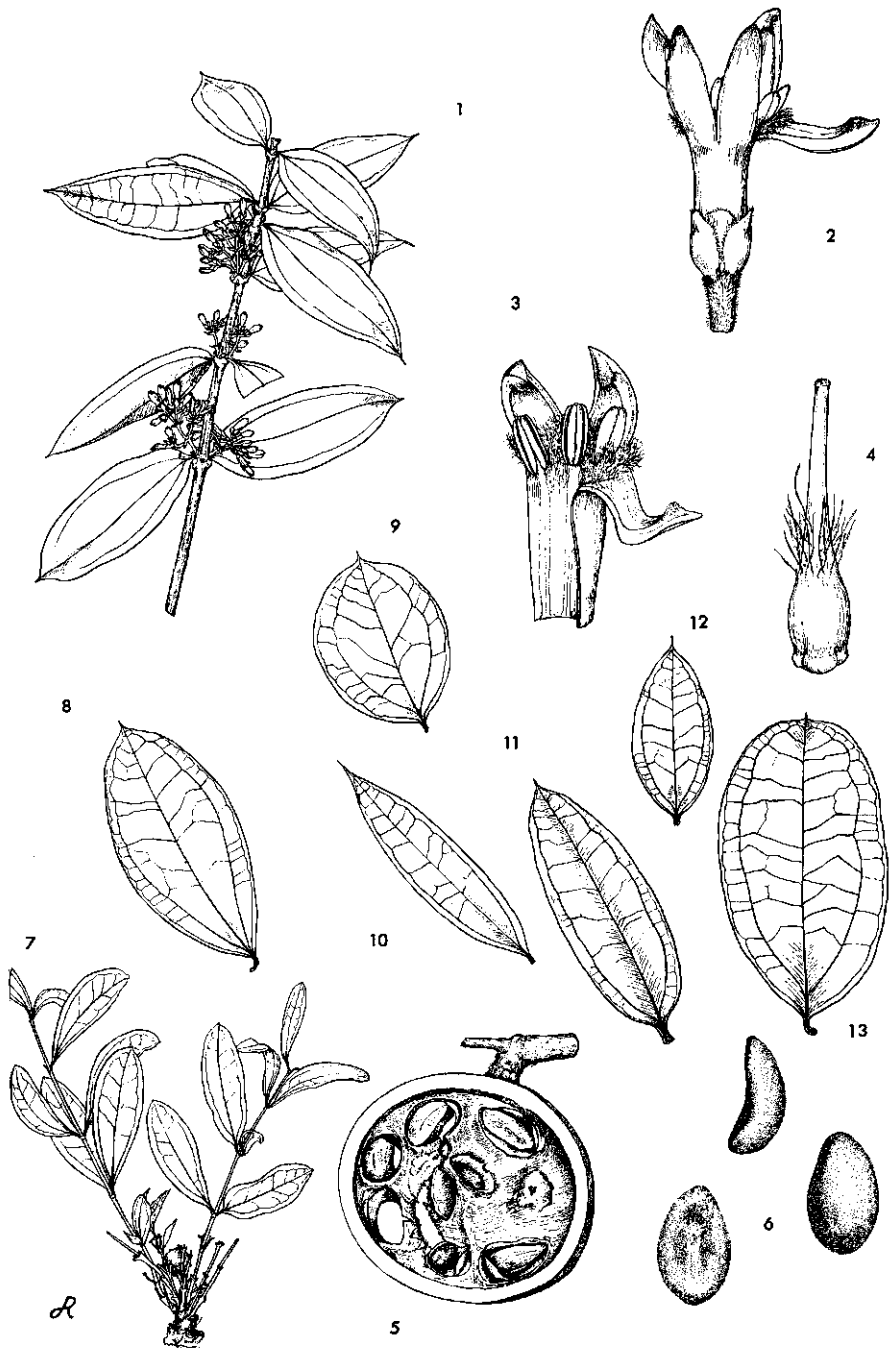
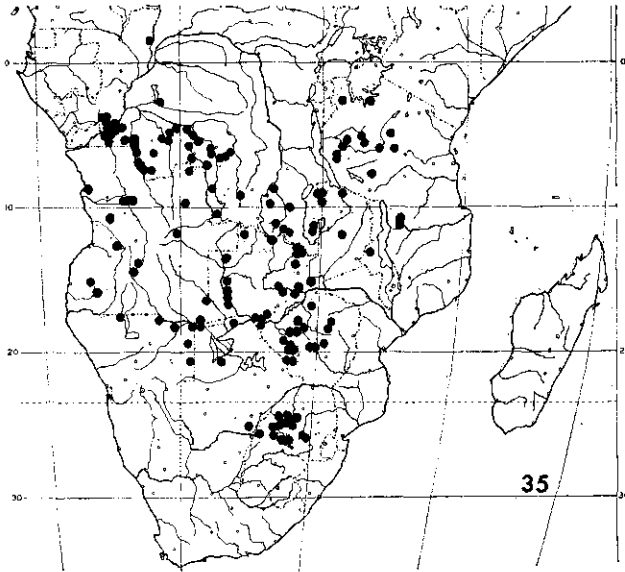


FIG. 36. *S. pungens*: 1. branch of tree, $\frac{1}{2} \times$; 2. flower, $4 \times$; 3. opened corolla with stamens, $5 \times$; 4. pistil, $7 \times$; 5. dried slice of nearly mature fruit, $\frac{1}{2} \times$; 6. seeds, $\frac{1}{2} \times$; 7. fire-cut form with immature fruit, $\frac{1}{2} \times$; 8-13. leaves, $\frac{1}{2} \times$ (1. Guy SRGH 98865; 2-4, 12. Brain 6447; 5, 9. Gilges 138; 6, 11. Brass 17432; 7. Callens 2117; 8. Liben 3304; 10. Carnochan 67; 13. Compère 1439).

more. Bark grey or brown, rough, closely and shallowly reticulate, not corky, smooth and grey higher up or in young trees; inner bark yellow; wood yellowish, with large bark-islets. *Branches* pale to dark brown, conspicuously and densely lenticellate, not sulcate; branchlets glabrous or occasionally with few hairs, lenticellate or when young not, pale to dark brown when dry, not sulcate. *Leaves*: petiole short, glabrous, 1–4 mm long; blade shining and dark green above, hardly or not paler and less shining beneath, coriaceous, rigid, elliptic, narrowly elliptic, obovate, or occasionally orbicular, (1)2–4(5) × as long as wide, (2)3–8(10) × 1–3.5(4.5) cm, acute or rounded and sharply pointed at the apex, cuneate or rounded at the base, glabrous on both sides or occasionally partly pubescent beneath; one pair of secondary veins from or from above the base curved along the margin and often a faint submarginal pair; costa conspicuously impressed above; tertiary venation reticulate. *Inflorescences* axillary or ramiflorous, mostly several together, usually very short and about 0.25 × as long as the leaves, 1 × 1 – 2 × 2(5 × 4) cm, usually congested and subsessile, rarely lax. Peduncle, branches, and the very short pedicels pubescent. Bracts small, sepal-like, beneath glabrous, above minutely appressed-pubescent at the base or glabrous, sometimes with some large colleters. *Flowers* 5-merous. *Sepals* green, nearly free, subequal, the inner slightly smaller, ovate, broadly ovate, or sometimes orbicular, 1–1.5 × as long as wide, 2–4 × 2–3 mm, acute, obtuse, or rounded at the mostly slightly keeled apex, conspicuously ciliate, glabrous on both sides or inside minutely appressed-pubescent at the base, without colleters. *Corolla* in the mature bud 2.4–3.2 × as long as the calyx, 7–9.5 mm long, and tapering and obtuse at the apex, greenish-creamy, or -yellow, glabrous outside, inside with a brush-like ring of white lanate hairs in the throat and just on the base of the lobes; tube cylindrical or nearly so, 1.4–2 × as long as the calyx, 1–1.7 × as long as the lobes, 4–5.5 mm long, 1.5–3 mm wide at the base, 2–3.5 mm at the throat; lobes thick, narrowly triangular, 2–2.7 × as long as wide, 3–4 × 1.3–2 mm, acute, spreading. *Stamens* slightly exerted; filaments 0.1–0.2 × as long as the anthers, inserted at the mouth of the corolla tube, glabrous; anthers oblong, 1–2 × 0.5–1 mm, glabrous, deeply cordate at the base; cells parallel. *Pistil* pilose in the middle, 5–7.5 mm long; ovary ovoid or oblong, 1–3 × 0.7–2 mm, 2-celled, gradually narrowed into the style, apically pilose, often with a disk-like base; style thick, 2.5–4.5 mm long, at the base hairy like the ovary at the apex; stigma capitate. In each cell 25–60 ovules. *Fruit* orange or yellow, nearly mature bluish-green, large, hard, globose, 5–12(15) cm in diam., with about 20–100 seeds, with somewhat granular skin, slightly shining. Wall thick, (2)4–6 mm thick, thicker above pedicel, woody when dry. Pulp sweet-tasting. *Seeds* ochraceous, flattened, more or less plano-convex, obliquely ovate, elliptic, or trullate, usually irregularly curved, 20–24 × 12–17 × 5–10 mm, with thick very short erect hairs, rather rough.

Distribution: Central, East, and northern South Africa.

Ecology: Woodland, often with *Brachystegia*; alt. 0–2000 m.



MAP 35. *S. pungens*.

About 270 specimens examined of which some are cited:

Congo (Brazzaville): near Brazzaville (May) de Néré 1209 (WAG), 1210 (WAG), 1212 (WAG); Chevalier 4014 (P), 4019 (P), 4136 (P, distributed and cited as *S. brazzavillensis*).

Congo (Kinshasa): Léopoldville: Kimuenza (Nov.) Evrard 6465 (BR), 6466 (BR); Kisantu (Nov.) Vanderyst 5842 (BR), 13893 (BR); near Popokabaka (Apr.) Germain 2193 (BR, WAG). Kasai: Lulua, Sapin 5 Jan. 1907 (BR); Dibaya Territory, Liben 3143 (BR WAG). Katanga: Kapanga (Aug.) Overlaet 569 (BR); near Lubumbashi (Oct.) Schmitz (obs. tree 332) 813 (BR), 2156 (BR), 2483 (BR).

Angola: Luanda: Luanda (fr. Dec.) Cavaco 1403 (P, WAG). Malanje: Gossweiler 1120 (BM, K, P), 1122 (K, P), 1125 (BM, P); J. J. de Almeida anno 1903 (LISJC); Malanje (Aug.) Marques 9 (COI, LISU), 10, partly (BR, COI), 13 (K, type of *S. henriquesiana*). Lunda: Dundo, Cavaco 1320 (P). Cuanza Sul: Mussuanda Quibala (Sept.) Murta 293 (LISC). Huambo: Huambo Plateau, Gossweiler 61 (NLI). Bié: Cuchi (fr. Nov.) Gossweiler 3826 (BM, COI, K). Moxico: Vila Luso, Câmeira 6 (NLI). Huila: Huila, Dekindt 491 (LISC, MPU), 1032, partly (LISC), 3085 (LISC, P). Cuando-Cubango: Santa Cruz, Teixeira 152 (NLI).

Tanzania: Tabora District (Oct.) Shabani 26 (K); Mpanda (Sept.) Proctor 1946 (EA, K); Singidia District, Burt 1385 (BM, FHO, K).

Zambia: Abercorn (Sept.) Bullock 1091 (BR, EA, K, S); near Bangweulo (Oct.) R. E. Fries 873 (UPS, Z); Mwinilunga District (fl., fr. Sept.) White 3355 (BM, BR, FHO, K); E. of Lusaka (Nov.) Robinson 5807 (EA, K).

Malawi: Kasunga, Brass 17432 (K, MO, NY, SRGH, US).

Rhodesia: near Victoria Falls, Kirk July 1860 (K); Sebungwe District (Oct.) Davies 1565 (COL, SRGH); Umyuma-Mtao (Oct.) Brain 6446 (MO), 6447 (SRGH), 6674 (SRGH).

South West Africa: near Oshikango, Ovamboland (Nov.) Rodin 2663 (BOL, K, MO, UC); Okavango Territory, de Winter 3758 (K, M), 3868 (PRE), 4203 (K, M, PRE).

Botswana: Ngamiland, O. B. Miller B/420 (PRE); Kanye District, Yalala 171 (K, WAG).

South Africa: Transvaal: Rustenburg District (Nov.) F. A. S. Turner 26 (PRE); Water-

berg District (fr. Feb.) Mogg 17556 (NY); Magaliesbergen (Sept.) McLea BOL 5710 (BM, BOL, K, NBG, Z, distributed as *S. mucronata* Bolus); Pretoria District, Repton 1882 (PRE); Verdoorn 2430 (PRE, WAG), 2431 (PRE, WAG); Aapies Poort, Rehmann 4161 (BM, K, Z, cited as *S. henriquesiana* Bak. with syn. *S. mucronata* Bolus by GILG in Engler, Bot. Jahrb. 36: 92, 1905); *ibid.* (Nov.) Schlechter 3621 (BOL, BREM, G, K, W, WAG, Z); Johannesburg (Dec.) Gilfillan in herb. Galpin 6153 (GRA, K); Middelburg District, Marloth 11756 (A); *ibid.* (Nov.) Thode A 1627 (PRE).

Cult.: Ndola, Zambia (seedlings) Fanshawe 2301 (K).

Notes. Except for Welwitsch 4778, collected in Angola, all the syntypes of *S. pungens* were collected in East Africa. *S. pungens* and *S. occidentalis* were briefly described by SOLEREDER in his first reference (1892). He reduced the latter name to a synonym of the former in his second reference, the only one in which he cites specimens. Therefore the present author has designated lectotypes for both names using the best specimen available for the name in use for the species *S. pungens*.

The sharp point at the apex of the leaves is a very useful character by which to recognize the species.

58. *S. retinervis* Leeuwenberg, sp. nov.

Fig. 37, p. 229

Planta lignosa glabra verisimiliter arborea. Folia laminis coriaceis ellipticis vel anguste ellipticis apice acuminatis basi cuneatis nervis infimis curvatis ceteris reticulum irregulare formantibus. Inflorescentia axillaris parva congesta multiflora. Flores tetrameri. Sepala suborbicularia apice obtusa minute ciliata utrinque glabra. Corolla longa albastris gracilis extus glabra intus dense pilosa tubo cylindrico lobisque oblongis recurvatis. Stamina longe exserta fauce corollae inserta filamentis antheras oblongas glabras bis superantes. Pistillum glabrum ovario biloculari styloque gracili longe exserto et stigmatibus parvis. Fructus ignotus verisimiliter parvus et oligospermus.

Type: Gabon: Lastourville Region (fl.) Le Testu 7943 (P, holotype; isotype: WAG).

Tree (?). *Branchlets* glabrous, not lenticellate. *Leaves*: petiole glabrous, 8–11 mm long; blade coriaceous, elliptic or narrowly elliptic, 2–3 × as long as wide, (6.5)12–17.5 × (3)4–6 cm, acuminate at the apex, cuneate at the base, glabrous on both sides; 1–2 pairs of secondary veins from or from above the base curved along the margin, anastomosing with the other secondary veins, which are not less conspicuous; tertiary venation reticulate, prominent on both sides. *Inflorescence* axillary, small, congested, many-flowered, 1.5 × 1.5 – 3 × 3 cm, 1–2 × branched. *Flowers* 4-merous. *Sepals* connate at the base, subequal, suborbicular, 1.2–1.4 × 1 mm, obtuse at the apex, glabrous on both sides, minutely ciliate, without colletes. *Corolla* in the mature bud 5 × as long as the calyx, 7.5 mm long, and tapering at the apex, creamy (?), outside glabrous, inside densely pilose on the base of the lobes and in the throat (only a single hair in the tube); tube cylindrical or nearly so, 3 × as long as the calyx, 1.5 ×

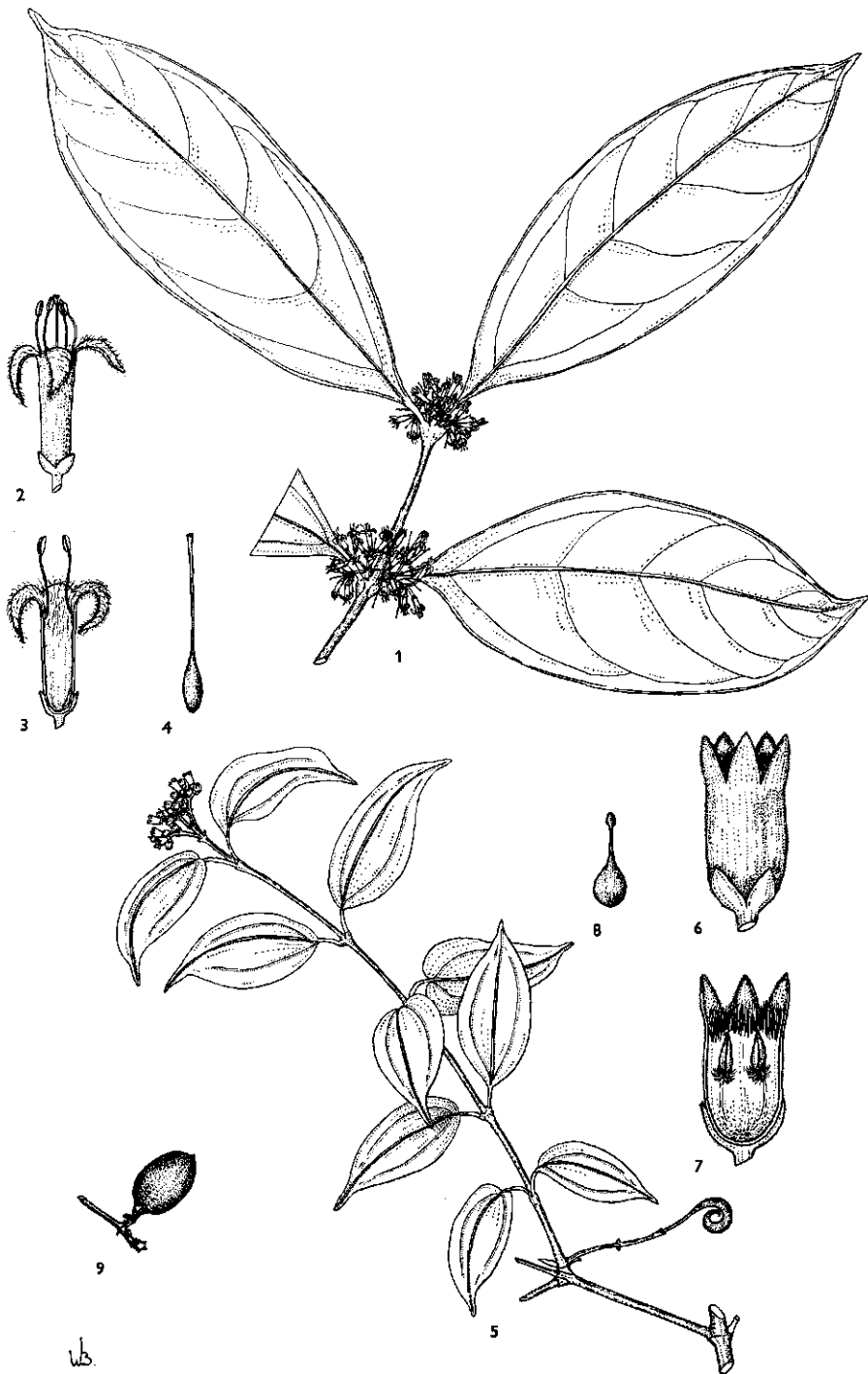


FIG. 37. 1-4. *S. retinervis*: 1. branch, $\frac{1}{2} \times$; 2. flower, $3 \times$; 3. opened flower, $3 \times$; 4. pistil, $3 \times$ (1-4. Le Testu 7943); 5-9. *S. tchibangensis*: 5. branch, $\frac{1}{2} \times$; 6. flower, $5 \times$; 7. opened flower, $5 \times$; 8. pistil, $5 \times$; 9. fruit, $\frac{1}{2} \times$ (6-8. Breteler 1430; 9. Louis 16186).

as long as the lobes, 4.5 mm long, at the throat 1.5 mm wide; lobes oblong, 3×1 mm, recurved. *Stamens* well-exserted; filaments glabrous, at least twice as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, 0.9×0.3 mm, glabrous, rounded at the apex, cordate at the base; cells parallel. *Pistil* glabrous, 8.5 mm long; ovary ovoid, 1×0.7 mm, 2-celled; style slender, 7.5 mm long, well-exserted; stigma capitate, small. In each cell about 5 ovules. *Fruit* unknown, supposed to be small and 1-seeded.

Distribution: Only once collected in Gabon.

Ecology: Rain forests, at low elevations.

Note. *S. retinervis* is closely allied to *S. elaeocarpa*. It differs from the latter as follows:

Stamens well-exserted; leaves coriaceous; several pairs of secondary veins as conspicuous as the arcuate; tertiary venation prominent on both sides . . .

S. retinervis

Stamens slightly exserted; leaves thickly coriaceous; secondary veins, except for the arcuate pair, not very conspicuous ***S. elaeocarpa***

59. *S. samba* DuVign., Bull. Séanc. Inst. Roy. Col. Belg. 19: 216. 1948 and Bull. Soc. Roy. Bot. Belg. 81: 24. 1949 and 85: 28, f. 10 A. 1952, partly (excl. De Wulf 121, which might be a *Memecylon*). **Fig. 21, p. 149; Map 36, p. 236**

Type: Congo (Kinshasa): Orientale, Bambesa Region, Brédo 1091 (BR, lectotype).

Liana at least 10 m high climbing in trees and at least 20 m long. Trunk 3–5 cm in diam. or more. Bark medium brown, with few lenticels, thin; wood yellow. *Branches* not lenticellate, green, dry medium brown and not sulcate; branchlets quadrangular, glabrous, green, dry greenish-brown or medium brown and not or slightly sulcate. *Tendrils* paired. *Leaves*: petiole glabrous, 5–12 mm long; blade slightly shining, dark green, and with often paler veins above, paler beneath, coriaceous in the sun, subcoriaceous in the shade, elliptic or narrowly elliptic, $(1)1.5\text{--}2.2 \times$ as long as wide, $5\text{--}10(17) \times 2.5\text{--}7(8.5)$ cm, apiculate or acuminate at the apex, cuneate or rounded at the base, glabrous on both sides; one pair of distinct secondary veins from or from above the base curved along the margin and often a faint submarginal pair; costa and main secondary veins impressed above; tertiary venation reticulate, prominent beneath. *Inflorescence* axillary and terminal, lax or in last branchings congested, few- to many-flowered, very variable in size, $3\text{--}10 \times 2\text{--}5$ cm (in fruit up to 15×10 cm), $3\text{--}4 \times$ branched. Peduncle and branches slender, sparsely pubescent with usually ranked hairs. Pedicels short or very short, glabrous or nearly so. Bracts narrowly triangular or sepal-like, above glabrous or appressed-pubescent, without colleters; when inflorescence terminal lower bracts leafy. *Flowers* 5-merous. *Sepals* pale green, connate at the base up to one-third of

their length, equal or subequal, ovate, $1.2-1.3 \times$ as long as wide, $0.6-1 \times 0.5-0.8$ mm, acute or obtuse at the apex, minutely ciliate, outside glabrous or with a single minute hair, inside glabrous or sometimes appressed-pubescent at the base, without colleters. *Corolla* in the mature bud $2.2-4 \times$ as long as the calyx, $2.2-2.5$ mm long, and rounded at the apex, greenish or pale green, outside glabrous, inside pilose on the lobes, mostly only at the base with creamy hairs; tube short, $1-1.7 \times$ as long as the calyx, 1 mm long, at the throat 1.5 mm wide; lobes $1.2-1.5 \times$ as long as the tube, narrowly triangular, $1.5-2 \times$ as long as wide, $1.2-1.5 \times 0.8-1$ mm, acute, suberect or spreading. *Stamens* slightly exerted; filaments glabrous, short, $0.3-0.5 \times$ as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong or triangular, $0.8-1 \times 0.4-0.6$ mm, glabrous, deeply cordate at the base; cells parallel or slightly divergent at the base. *Pistil* glabrous or with a single minute hair in the middle, $1.3-1.7$ mm long; ovary ovoid, $1 \times 0.8-1.2 \times 1$ mm, gradually narrowed into the style, 2-celled; style short $0.3-0.5$ mm long; stigma capitate. In each cell 8-9 ovules. *Fruit* pale green, small, soft, globose, 17-20 mm in diam., 1-seeded, with smooth skin, mat when living. *Seed* pale brown, flattened, obliquely ovate, irregularly curved (more or less resembling a saddle of a bike), $14 \times 13 \times 7$ mm, pubescent, smooth.

Distribution: Nigeria and Central Africa.

Ecology: Rain forests or secondary forests, on moist places; alt. 0-700 m.

Nigeria: Omo and Shasha For. Res. (fr. Feb.) Tamajong FHI 16972 (FHI, FHO, K).

Cameroun: E. of km 58 of Edéa-Kribi road (May) Leeuwenberg 5675 (WAG); N. of Lomié, Leeuwenberg 6513 (WAG); S. of Nguélémendouka (fr. Nov.) Bretelet 2051 (BR, K, P, WAG, YA); 15 km E. of Dimako, Leeuwenberg 7352 (WAG); W. of Yokadouma, Leeuwenberg 6233 (WAG).

Central African Republic: Berberati, Sandberg Berberati 5 (Pharm. Stock.); 22 km N. of Berberati, Leeuwenberg 7258 (WAG); W. of Sosso, Leeuwenberg 6248 (WAG); N. of Bania, Leeuwenberg 7206 (WAG); Nola, Sandberg Nola 29 (Pharm. Stock.); ibid., Leeuwenberg 7063 (WAG); 27 km S. of Nola, Leeuwenberg 7088 (WAG); Boukoko, N. of Bangui (May) Tisserant 1470 (P, WAG).

Gabon: Bélinga, N. Hallé & Le Thomas 503 (P); Fernan-Vaz, H. Lecomte Apr. 1894 (P); sin. loc., Thollon s.n. (P, WAG).

Congo (Kinshasa): Léopoldville: Bokoro (Oct.) Jans 862 (BR, WAG); Inkisi R. basin, Allard 240 (BR); Popokabaka Territory (fr. Feb.) Pauwels 1860 (BR), 2610 (BR), 3518 (BR), 3872 (BR), 4068 (BR); Dima (fr. Jan.) Sapin 35 I (BR, paratype); Dinga, Callens 2368 (BM); Bangala (fl.) Sapin Oct. 1910 (BR, paratype). Orientale: Bambésa Region (Apr.) Brédo 1091 (BR, lectotype). Kivu: Shabunda, Paquay 7 (BR, paratype), 16 (BR, paratype). Katanga: Difuma, Kibombo Territory, Rossignol 33 (BR, paratype).

Note. *S. samba* is closely allied to *S. johnsonii* (see notes there).

60. *S. scheffleri* Gilg, Notizbl. Bot. Gart. Berlin 3: 84. 1900, nomen; Baker in Fl. Trop. Afr. 4(1): 537. 1903, nomen; Gilg & Busse in Engler, Bot. Jahrb. 36: 94. 1905; E. A. Bruce, Kew Bull. 1956: 153. 1956; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 31, f. 5. 4–7. 1960, partly (excl. Proctor 385).

Fig. 38, p. 233; Map 37, p. 236

Type: Tanzania: E. Usambara Mts., Dereima, Scheffler 78 (E, lectotype; isotypes: A, BO).

Heterotypic synonyms: *S. subaquatica* De Wild., Bull. Jard. Bot. Brux. 5: 43. 1915; Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 32, f. 11. 1952. Type: Congo (Kinshasa): Equateur, Bumba Territory, Dundusana, Mortehan 847 (BR, lectotype).

S. dubia Philipp. et De Wild., Pl. Bequaert 2: 98. 1923, not A. W. Hill (1911). Type: Congo (Kinshasa): Orientale, between Kilo and Irumu, Bequaert 4879 (BR, holotype).

S. sumbensis Good, Journ. Bot. 67. Suppl. 2: 104. 1929. Type: Angola: Zaire, Sumba, Peco District, near Zaire R., Gossweiler 9148 b (BM, lectotype; isotypes: A, FHO, MO, US).

S. scheffleri var. *expansa* E. A. Bruce, Kew Bull. 1956: 153. 1956; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 31. 1960. Type: Congo (Kinshasa): Orientale: Yangambi, Mbutu R. source, Louis 6204 (K, holotype; isotypes: BR, C, EA, FHO, MO, P, S, U, UC, US).

Climber to large liana, up to 30 m high climbing in trees and 50 m long, twining when young. Trunk 3–15 cm in diam.; bark pale grey-brown or pale to dark brown, with large lenticels; wood pale yellowish. *Branches* lenticellate, pale green to brown, dark brown when dry; branchlets usually striate, also when living, glabrous or sometimes sparsely pubescent, not lenticellate, pale greenish-brown. Tendrils paired. *Leaves*: petiole glabrous or sometimes pubescent, 2–8 mm long; blade shining to mat and medium to dark green above, paler and less shining to mat beneath, coriaceous or subcoriaceous, also when living, thinner in the shade, narrowly ovate, elliptic, narrowly elliptic, or in leaves on the main axis and bases of branches sometimes ovate, 1.5–3.5(4.7) × as long as wide, 4.5–10(14) × 1.7–4(6.5) cm, acuminate to caudate at the apex, cuneate, rounded or – if ovate – sometimes subcordate at the base, glabrous on both sides or sometimes beneath pubescent on the veins; one pair of secondary veins from the base or nearly from the base curved along the margin, and a faint sub-marginal pair; tertiary venation reticulate, prominent beneath and often above. *Inflorescence* axillary, mostly rather lax, up to 0.7 × as long as the leaves, 1 × 1 – 6 × 4 cm, 2–4 × branched, several- to many-flowered. Peduncle, branches, and pedicels brown-pubescent with sometimes ranked hairs. Bracts small, ovate to triangular, often sparingly pubescent beneath, ciliate (upper without colleters). *Flowers* 5-merous. *Sepals* green, connate at the base for about one-quarter of their length, orbicular or nearly so, 1.3–1.7 mm long, rounded or sometimes obtuse at the apex, ciliate, glabrous or sparsely pubescent outside, glabrous or with few small hairs inside near the base, without colleters.

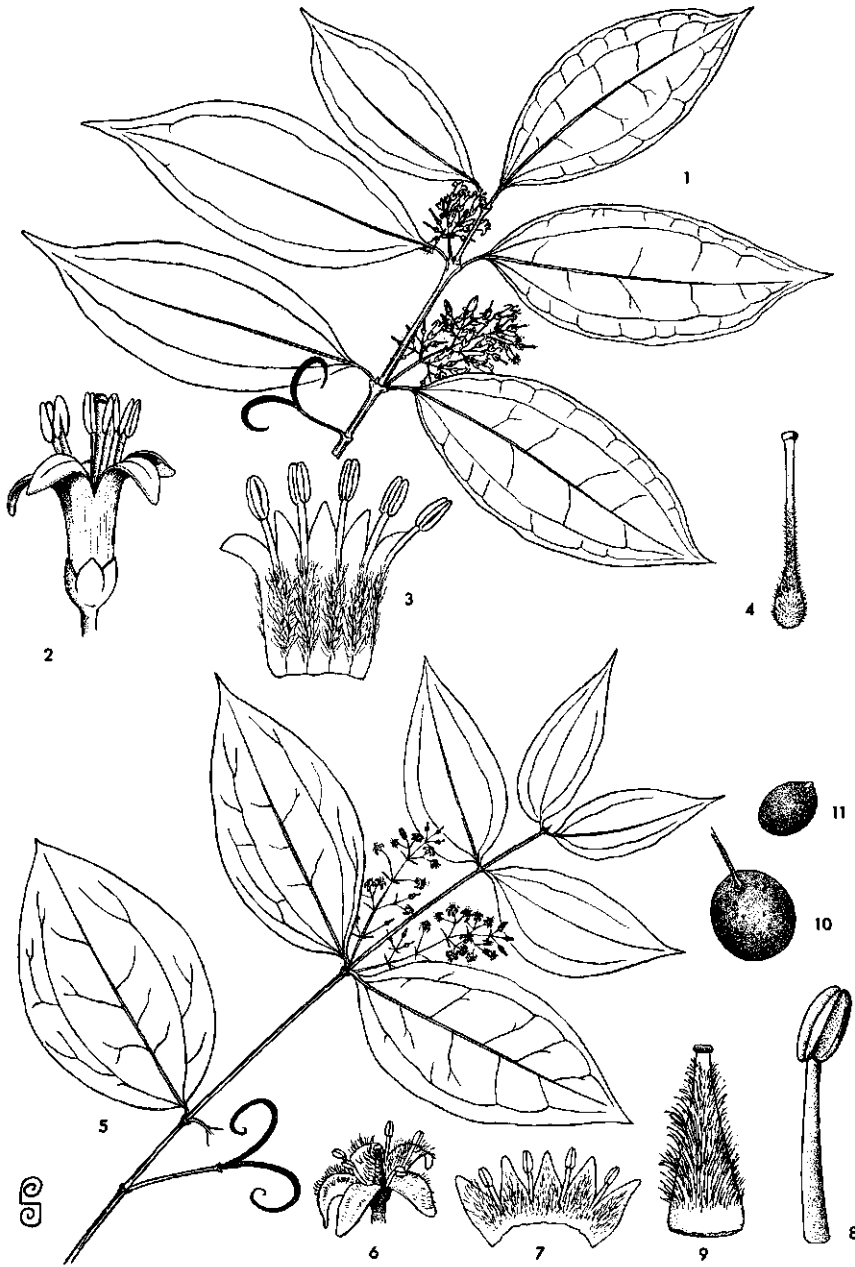


FIG. 38. 1-4. *S. scheffleri*: 1. branch, $\frac{1}{2} \times$; 2. flower, $3\frac{1}{2} \times$; 3. opened corolla with stamens; $3\frac{1}{2} \times$; 4. pistil, $3\frac{1}{2} \times$ (1-4. Louis 6204); 5-11. *S. splendens*: 5. branch, $\frac{1}{2} \times$; 6. flower, $3 \times$; 7. opened corolla with stamens, $3 \times$; 8. stamen, $10 \times$; 9. pistil, $6 \times$; 10. fruit, $\frac{1}{2} \times$; 11. seed, $\frac{1}{2} \times$ (7-9. Leeuwenberg 4566; 10-11. Leeuwenberg 3705).

Corolla in the mature bud 4.7–7 × as long as the calyx, 7–9.5 mm long, and rounded at the apex, white or creamy, widely cylindrical, outside glabrous or occasionally with a single hair, inside densely pilose in the tube except for the glabrous base; tube 1.8–3 × as long as the calyx, 0.6–1.3 × as long as the lobes, 3–4.5 mm long, about 2.5 mm wide, slightly widened towards the throat; lobes oblong, 3–4.5 × as long as wide, acute, recurved (not yet in young flowers). *Stamens* well-exserted; filaments 1–2 × as long as the anthers, 1.5–3 mm long, glabrous, inserted at the mouth of the corolla tube; anthers oblong, 1.2–2.2 × 0.5–0.8 mm, bearded with few pilose hairs at the deeply cordate base or not; cells parallel. *Pistil* hirtio-pilose, 6–9 mm long; ovary ovoid, 2–2.5 × 1–1.5 mm, glabrous at the base, 2-celled, gradually narrowed into the style; style 4–7 mm long, glabrous at the apex; stigma saucer-shaped. In each cell 15–25 ovules. *Fruit* yellow or orange, small, globose, 3–6 cm in diam., about 6–15-seeded. Wall rather thin, about 2 mm thick. Pulp yellow or orange. *Seed* obliquely elliptic, flattened, 15 × 10 × 3 – 18 × 13 × 5 mm, often curved, rough, minutely and densely scabrid. Testa thick.

Distribution: Central and East Africa.

Ecology: Rain forests, secondary forests, often on river banks, or in gallery forests; alt. 0–1100 m.

Cameroun: Bitya, near Dja R., about 60 km ENE. of Sangmélina, Bates 1746 (FHO, K, P, PRE); Dja R., Lomié area (May) Mildbraed 5363 (HBG, cited as *S. excellens*); 43 km NW. of Bertoua, Breteler 1393 (WAG, YA); near Garoua Sambé, 25 km NW. of Batouri, Breteler 2780 (BR, K, P, WAG, YA); Mt. Fèbé, 3 km NW. of Yaoundé, Breteler 1915 (WAG, YA), 2231 (K, P, S, WAG); near Nkolbisson, 7 km W. of Yaoundé, Breteler, J. de Wilde & Leeuwenberg 2293 (K, P, WAG, YA), 2295 (WAG); Nachtigal, left bank Sanaga R., W. de Wilde 2658 A (WAG, YA), 2658 B (WAG); km 6 of Yokadouma-Moloundou road, near Mendoungé, Breteler 1509 (K, P, WAG, YA); *ibid.*, Leeuwenberg 6239 (WAG); Mari R. Fall, about 8 km N. of Bétaré Oya, Leeuwenberg 7759 (WAG); km 25 of Nanga Eboko-Bertoua road, Leeuwenberg 7452 (WAG); km 24 of Bertoua-Bétaré Oya road, Breteler c.s. 2444 (BR, K, P, WAG); km 27 of same road, near Gounté, Leeuwenberg 7346 (WAG); 5 km E. of Gribi, km 28 of Yokadouma-Batouri road (May) Letouzey 5181 (P).

Central African Republic: near Mbanza, km 15 of Nola-Salo road, Leeuwenberg 7113 (WAG); 22 km N. of Berberati, along road to Carnot, Leeuwenberg 7259 (WAG).

Gabon: 13 km E. of Médouneu, N. Hallé & Villiers 4965 (P); Bélinga, N. Hallé & Le Thomas 687 (P); Koulamotou, Lastourville Region (Jan.) Le Testu 8691 (P).

Congo (Brazzaville): Sembé, Sandberg Sembé 46 (Pharm. Stockh.).

Congo (Kinshasa): Léopoldville: Kimfwoto, Popokabaka Territory, Pauwels 471 (BR); Mpangu, Pauwels 2339 (BR); Nto Mbombo, Popokabaka Territory, Pauwels 3999 (BR). **Equateur:** Musa (Sept.) De Giorgi 1249 (BR, paratype of *S. subaquatica*); Bongabo, Bobadi Road, Evrard 1152 (BR); Botudwa, Karawa-Likimi road, Evrard 1657 (BR); near Gundji (Nov.) Robyns 1072 (BR, C, MO, P, erroneously distributed as Lebrun 1072); Dundusana, Bumba Territory, Mortehan 764 (BR, paratype of *S. subaquatica*), 847 (BR, lectotype of *S. subaquatica*). **Orientale:** near Mobwasa (Dec.) Reygaert 1397 (BR); between Yabahondo and Yabalanga, Isangi Territory (Nov.) Germain 4507 (BR, K, PRE); Yangambi (Jan.) Germain 89 (BR, WAG); *ibid.* (fl. Feb.-Mar., Sept., Nov.-Dec., fr. Sept., Nov.-Dec.) Louis 6204 (BR, C, EA, FHO, K, MO, P, U, UC, US, type of *S. scheffleri* var. *expansa*), 6848 (BR, FHO), 7841 (BR, PRE, S, UC, obs. spec. 603), 16419 (BR, obs. spec. 603), 11192 (BR, MO), 11650 (BR, C, K, P), 12475 (BM, BR, C, F), 13422 (BR), 16331 (BR, K, MO, P, US); Yalo-

kombe, Isangi Territory (May) Germain 7316 (BR, WAG); Kisangani, Tshopo R. Falls, J. Léonard 1317 (BR); Bambesa, Buta Territory (Jan.) Gérard 4792 (BR, WAG); Rungu (June) Claessens 980 (BR); between Kilo and Irumu, Bequaert 4879 (BR, type of *S. dubia*). Kasai: Sankuru, Flamini 191 (FI). Kivu: Muliri, Walikale Territory, A. Léonard 2053 (BM, BR, WAG); Bunyakiri, Kalehe Territory (fr. Feb.) A. Léonard 2871 (BR); Lubalaka-Bunyakiri road, Kalehe Territory (Apr.) Gutzwiller 1796 (BR, WAG).

Angola: Zaire: Sumba, Peco District, near Zaire R. (May) Gossweiler 9148 a (BM, US, paratype of *S. sambensis*), 9148 b (A, BM, FHO, K, MO, US, lectotype of *S. sambensis*).

Kenya: Cha Simba Forest, Kwale District, Drummond & Hemsley 1094 (B, BR, EA, FI, K); Makadara (Aug.) R. M. Graham 2045 (EA, FHO, FI, K); sin. loc., Scott Elliot 327 (K).

Tanzania: E. Usambara Mts., near Amani, Peter 3715 (B), 3751 (B), 16180 (B), 51827 (B); Amani (Sept.) Braun G 7690 (EA); *ibid.*, Greenway 999 (EA, FHO, K); *ibid.*, Warnecke 389 (EA, paratype); *ibid.* (fl., fr. Sept.) Zimmermann 882 (EA, LE, PRE), G 7688 (EA); *ibid.* (Apr.) Zimmermann in coll. Peter 16180a (B); *ibid.*, Bomole Mt., Braun 837 (A, EA); *ibid.*, Peter 17452 (B); near Monga, Peter 23523 (B); near Derema, Peter 18924 (B); *ibid.*, Scheffler 78 (A, BO, E, lectotype); between Derema and Nguelo, Peter 17870 (B); between Sangerawe and Kwamkoro, Peter 18206 (B); *ibid.*, Zimmermann G 7689 (EA), G 7691 (EA); between Kwamkoro and Amani, Peter 51912 (B); Ngua Estate, W. slope of E. Usambara Mts. (July) Drummond & Hemsley 3354 (B, BR, EA, K, S); Longusa, Handeni District, Peter 19559 (B), 24730 (B); Matumbi Mts., Busse 3124 (EA, LY, paratype). Zanzibar: Sacleux 2213 (P).

Notes. The variety *expansa* cannot be maintained, according to the present author, as the differential characters are not as constant as was supposed by Miss BRUCE (1956). The corolla lobes are suberect in young flowers and become recurved at anthesis, as can be seen on the B sheet of Drummond & Hemsley 3354, cited as var. *scheffleri*, and Louis 6204, the type of var. *expansa*, and e.g. Germain 4507 and 7316. The East African specimens of *S. scheffleri* studied by Miss BRUCE are in bud and/or bear some young flowers. The style is hairy only at the base in Drummond & Hemsley 3354 and almost to the apex in Graham 2045, both cited as var. *scheffleri*. East African specimens with lax inflorescences in bud are herb. Warnecke 389, paratype of *S. scheffleri*, and Zimmermann G 7688. As is known of many *Strychnos* species, also in *S. scheffleri* the inflorescence axis and branches stretch at anthesis and also after.

Bequaert 4879, the type of *S. dubia*, reduced to a synonym of *S. scheffleri* here, has the congested inflorescence of var. *scheffleri* and the hairy style of var. *expansa*.

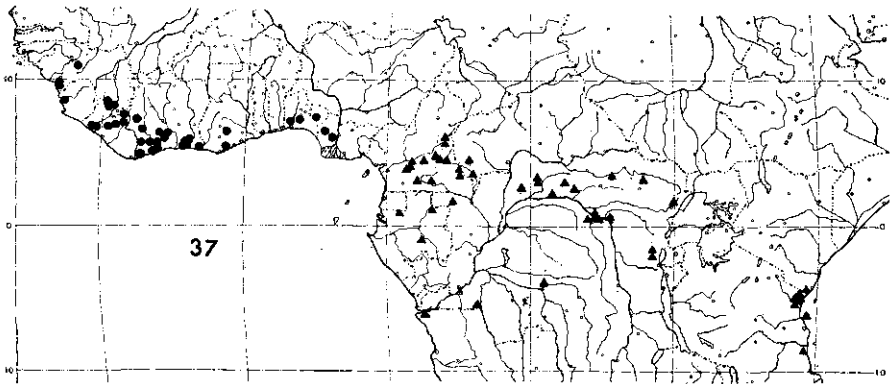
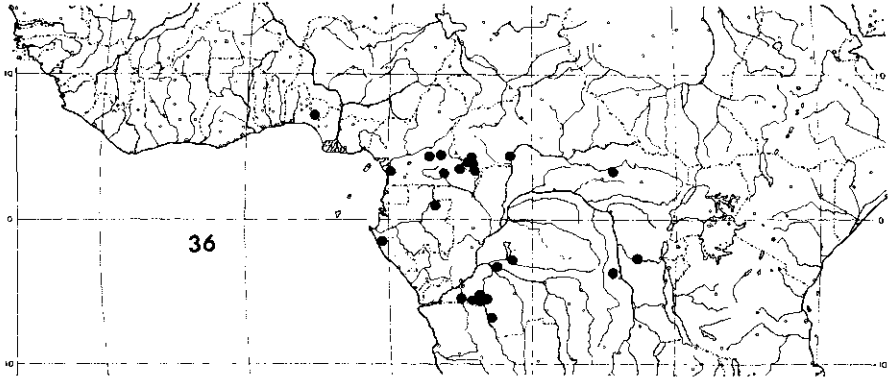
S. scheffleri is closely allied to *S. ngouniensis* and *S. soubrensis* by the habit, flowers, fruits, and seeds. The leaves of the former are thicker, while the corolla has outside occasionally a single hair instead of a distinct indumentum.

On the other hand, *S. scheffleri* is closely allied to *S. kasengaensis* by the same characters and also by the thickness of the leaves. They differ as follows:

Leaves minutely pubescent on main veins above; branchlets pubescent; corolla outside sparsely pubescent or glabrous, mature bud (4)6–7 mm long

S. kasengaensis

Leaves glabrous above; branchlets mostly glabrous, sometimes sparsely pubescent; corolla outside glabrous or with a single hair, mature bud 7–9.5 mm long **S. scheffleri**



MAP 36. *S. samba*; Map 37. ● *S. soubrensis*, ▲ *S. scheffleri*.

61. *S. soubrensis* Hutch. et Dalz., Fl. W. Trop. Afr. 2: 22. 1931 and Kew Bull. 1937: 333. 1937; Chevalier, Rev. Bot. Appliq. 27: 368, pl. 17 A. 1947; Leeuwenberg, Act. Bot. Neerl. 14: 218. 1965. **Fig. 31, p. 203; Map 37, p. 236**

Type: Ivory Coast: near Soubré, Sassandra R., Chevalier 17994 (K, holotype; isotypes: LY, P).

Heterotypic synonym: *S. jollyana* Pierre ex A. Chev., Rev. Bot. Appliq. 27: 364, pl. 14. 1947, partly (excl. fruit which is *S. aculeata*), not Chevalier, Expl. Bot. Afr. Occ. Fr. 1: 443. 1920, nomen (specimens cited are *S. aculeata* and *S. barteri*). Type: Ivory Coast: Dabou, Jolly 203 (P, holotype, photograph in K, neg. 4483; isotype: WAG).

Liana or scandent shrub, 10–50 m long, up to 40 m high climbing in trees. Bark pale grey to dark brown, with large lenticels; wood pale ochraceous-

yellow. *Branches* lenticellate or not, dark when dry, terete; branchlets sparsely brown-pubescent, often especially below the stipular line, glabrescent, not lenticellate, often sulcate when dry. Tendrils paired. *Leaves*: petiole short, often sparingly pubescent, 1–3 mm long; blade dark green and often slightly shining above, paler and slightly shining beneath, thinly coriaceous or papyraceous also when living, thinner in the shade, narrowly ovate, elliptic, or narrowly elliptic, near the base of the branchlets and on the main axis usually ovate, smaller and comparatively wider, or reduced to small bracts, $1.5-3 \times$ as long as wide, (1.8)3.5–12 \times (0.9)1.6–5.4 cm, acuminate and apiculate at the apex, rarely obtuse near the base of the branchlets, cuneate, rounded, or occasionally subcordate at the base, glabrous or with some hairs on the costa above, sparsely pubescent on the costa and the main secondary veins or glabrous beneath; costa impressed above, especially near the base; one pair of secondary veins from the base curved along the margin, rarely also a faint submarginal pair; tertiary venation reticulate, especially beneath. *Inflorescence* axillary and occasionally at the same time terminal, about 0.2–0.3 \times as long as the leaves, few- to many-flowered, 2–4 \times branched, congested or not, never lax, 1–2 cm long and wide. Peduncle, branches, and pedicels short, often sparsely pubescent. Bracts approximately sepal-like, sparsely pubescent. *Flowers* 5-merous. *Sepals* very pale green with paler mostly whitish margin, connate at the base up to one-third of their length, orbicular or nearly so, 1.2–2 mm long, rounded or nearly so at the apex, minutely ciliate, outside sparsely shortly pubescent to glabrous, inside glabrous and with some dark longitudinal stripes, without colleters. *Corolla* in the mature bud 4–6.5 \times as long as the calyx, 7–8.5 mm long, and rounded or nearly so at the apex, white, outside sparsely and often minutely pubescent, especially on the tube, inside with a wide densely pilose ring in the throat, lobes and one-third to one-half from the base of the tube glabrous; tube 2.2–4 \times as long as the calyx, 0.9–1.8 \times as long as the lobes, 4–4.8 mm long, gradually widened towards the throat and there (1.5)2–2.5 mm wide; lobes narrowly triangular, 2–3 \times as long as wide, 2.5–4 \times 1.2–2 mm, often slightly spreading. *Stamens* exerted; filaments glabrous, 1.3–1.7 \times as long as the anthers, 2 mm long, inserted at the mouth of the corolla tube; anthers pale yellow or pale green, turning black-brown at anthesis, 2.3–2.5 \times as long as wide, 1.2–1.6 \times 0.5–0.7 mm, deeply cordate at the base, ventrally at the base usually with some pilose hairs; cells parallel. *Pistil* pubescent in the middle, 7–8 mm long; ovary ovoid, glabrous at the base, 2–3 \times 1–1.5 mm, 2-celled, gradually narrowed into the style; style glabrous at the apex, 5–6 mm long; stigma capitate. In each cell about 15–18 ovules. *Fruit* orange, globose, 1.8–3 cm in diam., 2–12 seeded. Wall thin. *Seed* medium brown, obliquely and irregularly elliptic or ovate, flattened, 10 \times 8 \times 4 – 16 \times 11 \times 5 mm, rough, very shortly scabrid-pubescent. Testa thick.

Distribution: West Africa.

Ecology: Moist places in rain forests or secondary forests, often on river banks; alt. 0–1000 m.

Guinea: Kakoulima Mt., near Conakry (fr. Feb.) Schnell 2465 (IFAN, P); Benna Plateau, N. of Benty, Schnell 2168 (P); near Pita, Jacques-Felix 689 (P); Sérédou (Dec.) Yodou 1 (BR).
Sierra Leone: Kumrabai, Thomas 7080 (K).

Liberia: Mecca, Baldwin 10412 (K); Bong Range, 32 km N. of Kakata, Leeuwenberg & Voorhoeve 4947 (WAG); Soplina, Vonjama District, Baldwin 10062 (K); Woeme, Vonjama District, Baldwin 10097 A (K); right bank Gbata Ck., 32 km SW. of Suakoko (fr. July) Leeuwenberg & Voorhoeve 4589 (WAG); Ganta, Harley 1259 (K, LIB, P); km 42 of Tapita-Zwedru road (Feb.) van Meer 442 (WAG); Nimba Mts. (July) J. G. Adam 20508 (K, P), 21705 (P); *ibid.*, Leeuwenberg & Voorhoeve 4611 (WAG), 4807 (WAG).

Ivory Coast: Mt. Tonkoui (June) Aké Assi 2438 (ABI), 6260 (WAG), 6951 (WAG), 6953 (WAG); *ibid.*, Leeuwenberg 3866 (WAG); km 50 of Tabou-Taï road (Mar.) J. de Wilde & Leeuwenberg 3589 (BR, K, S, WAG); 8 km E. of Duékoué, Leeuwenberg 3900 (ABI, WAG); km 28 of Taï-Tabou road, Guillaumet 1426 (WAG); near Soubré, Sassandra R., Chevalier 17994 (K, LY, P, type); about 40 km W. of Sassandra, 5 km NE. of Monogaga, Leeuwenberg 4063 (WAG); about 25 km W. of Sassandra, Leeuwenberg 3240 (FHO, K, WAG); 20 km NW. of Sassandra, Leeuwenberg 4027 (WAG); 25 km SW. of Guéyo (fl. Mar., May, fr. Mar.) Leeuwenberg 3727 (WAG), 3762 (WAG); 76 km N. of Sassandra, along road to Gagnoa, near Baléko, Leeuwenberg 3216 (BR, FHO, K, WAG); 3 km N. of Niapidou, km 64 of Sassandra-Gagnoa road, Leeuwenberg 3204 (K, WAG); km 56 of same road, E. of Béyo, Leeuwenberg 3991 (WAG); 15 km S. of Sinfra, Bayota Forest, Leeuwenberg 4124 (WAG); 30 km E. of Gagnoa, Leeuwenberg 4507 (WAG); 4 km NE. of Oumé (May) Leeuwenberg 4146 (ABI, WAG); Dabou, Jolly 203 (P, WAG, type of *S. jollyana*); Banco Forest, near Abidjan, Bernardi 8105 (K, P); *ibid.*, J. de Wilde & Leeuwenberg 3439 (ABI, K, WAG); *ibid.*, Doumbia Apr. 1961 (ABI, WAG); Abidjan, Roberty 15796 (G); Yapo Forest, Aké Assi 2892 (ABI); E. of Krinjabo, S. of Aboisso, Leeuwenberg 4485 (WAG); about 15 km NE. of Bianouan, Leeuwenberg 3978 (WAG).

Ghana: Bosumtwi Lake, J. B. Hall 2504 (K); Yamoransa, near Cape Coast, J. B. Hall 1920 (K).

Nigeria: Olokemeji For. Res., Abeokuta Province, Onyeachusim FHI 46983 (FHI, K), 46985 (FHI, K); *ibid.*, D. A. H. Taylor 117 (FHO); Ibadan South For. Res. (Apr.) Keay FHI 22809 (BM, FHO, K); km 18 S. of Ipetu, Ondo Province, Onochie FHI 5227 (FHO, K, P); Iyekuselu District, Benin Province, Daramola FHI 45671 (K); between Sapoba and Agbacli (fr. Nov.) Meikle 636 (BR, K, P); Jamieson R. bank, Sapoba District, Onyeagocha FHI 7130 (FHO).

Cult.: Adiopodoumé, Ivory Coast, Leeuwenberg 4571 (WAG, seedlings of herb. Leeuwenberg 3727); Wageningen, seedlings of same mother plant: Leeuwenberg 4991 (WAG), 7815 (WAG), and J. de Bruyn 1792 (WAG, fl. Oct.).

Notes. There has been much confusion around the name *S. jollyana*. CHEVALIER (1920) cited it with some specimens which belong to *S. aculeata* and *S. barteri*. Several years later, in 1947, he describes a species, *S. jollyana*, based on Jolly 203, which should be identified as *S. soubrensis*, according to the present author. The figure which accompanies his description is apparently based on the latter specimen, except for the seeds. These belong doubtlessly to *S. aculeata* and are preserved in the carpological collection of the Paris Herbarium.

S. soubrensis is closely allied to *S. ngouniensis* (see notes there). It is also related to *S. scheffleri*, as is stated there, but less so. The third species, to which it shows resemblance, is *S. splendens*, which has thicker leaves, and a much shorter corolla tube. The shade-leaves of the latter are often undulate at the margin and the plant is often twining.

62. *S. spinosa* Lam., *Illustr.* 2: 38. 1794; Poirlet in Lamarck, *Enc.* 8: 697. 1808; Sprengel, *Syst.* 1: 672. 1825; Mérat & De Lens, *Dict. Mat. Med.* 6: 565. 1834; Harvey in Hooker, *Lond. Journ. Bot.* 1: 25. 1842; Baker in *Fl. Trop. Afr.* 4(1): 536. 1903, partly (excl. Welwitsch's specimens from Luanda); Jumelle & Perrier, *Ann. Mus. Col. Marseille Sér.* 2: 5: 395. 1907; Prain & Cummins in *Fl. Cap.* 4(1): 1058. 1909; Hutchinson & Dalziel, *Fl. W. Trop. Afr.* 2: 22, f. 186. 1931; Marloth, *Fl. S. Afr.* 3(1): 48, f. 16. 13–14, f. 17, pl. 14 D. 1932; Chevalier, *Rev. Bot. Appliq.* 27: 355, pl. 13. 1947, partly (excl. syns. *S. xerophila* and *S. schumanniana*); Duvigneaud, *Lejeunia* 13: 109. 1949 and *Bull. Soc. Roy. Bot. Belg.* 85: 20. 1952; Aubréville, *Fl. Soud.-Guin.* 438, pl. 96. 1–4. 1950; E. A. Bruce, *Kew Bull.* 1955: 40. 1955, partly (excl. syn. *S. madagascariensis*); Coates Palgrave, *Trees Centr. Afr.* 204–207. 1957, with photo. tree and col. dr. of habit, fl. and fr.; Bruce & Lewis in *Fl. Trop. E. Afr. Loganiaceae* 17, f. 3. 7–16. 1960, partly (excl. syn. *S. madagascariensis*); Verdoorn in *Fl. S. Afr.* 26: 147, f. 17. 4, 18. 2. 1963; Onochie & Leeuwenberg in *Fl. W. Trop. Afr.* 2nd ed. 2: 41. f. 209. 1963, partly (excl. f. 209 E and H, as the anthers are hairy and the seeds irregularly arranged); Leeuwenberg, *Act. Bot. Neerl.* 14: 219. 1965.

Figs. 39, p. 241, 40, p. 245; Phot. 4, p. 243; Map 38, p. 247

Type: Madagascar: sin. loc., herb. Lamarck s.n. (P, holotype, photograph in K). Homotypic synonyms: *Brehmia spinosa* (Lam.) Harv. ex D.C., *Prod.* 9: 18. 1845; Bentham, *Journ. Linn. Soc.* 1: 108. 1856; Baker, *Fl. Maurit.* 235. 1877, partly (excl. syn. *S. madagascariensis*). *S. vuntac* Boj., *Hort. Maurit.* 205. 1837, partly (excl. syn. *S. madagascariensis*). *S. vuntac* Du Petit-Thouars ex Spach, *Veg. Phan.* 8: 490. 1839.

Heterotypic synonyms: *S. flacurtii* Desv. ex Dubuisson et Du Petit-Thouars in Desvaux, *Journ. Bot. Paris* 1: 251. 1808; Mérat & De Lens, *Dict. Mat. Med.* 6: 565. 1834; Flückiger, *Arch. Pharm.* 230: 351. 1892 (as *flacourtii*). Type: Madagascar: sin. loc., Du Petit-Thouars s.n. (P, isotype ?).

S. lokua A. Rich., *Tent. Fl. Abyss.* 2: 53. 1851; Bentham, *Journ. Linn. Soc.* 1: 103. 1856 (not in Walpers, *Repert.*, as is cited by BENTHAM); Duvigneaud, *Lejeunia* 13: 112. 1949 and *Bull. Soc. Roy. Bot. Belg.* 85: 21, f. 6 C. 1952. Type: Ethiopia: Tacazzé R. Valley, near Tchélatchékanné, Quartin Dillon & Petit 412 (P, holotype, and two isotypes; photograph of one sheet in K). Homotypic synonym: *S. spinosa* subsp. *lokua* (A. Rich.) E. A. Bruce, *Kew Bull.* 1955: 42. 1955; Bruce & Lewis in *Fl. Trop. E. Afr. Loganiaceae* 20. 1960.

S. laxa Solered. in Engler, *Bot. Jahrb.* 17: 554. 1893. Type: Nigeria: Nupe, Barter 1140 (holotype not seen, destroyed in B; lectotype: K; other isotypes seen: GH, P, W).

S. buettneri Gilg in Engler, *Bot. Jahrb.* 17: 574. 1893; Baker in *Fl. Trop. Afr.* 4(1): 535. 1903. Types: Togo: Bismarckburg, Ketschenke Ck., Büttner 370 (syntype not seen, destroyed in B) and Jegge Ck., Büttner s.n. (syntype not seen, destroyed in B).

S. gracillima Gilg, l.c. p. 573; Baker, l.c. p. 536. Type: Sudan: Djurland, near Seriba Ghattas, Schweinfurth 1344 (holotype not seen, destroyed in B; no isotype seen).

S. schweinfurthii Gilg, l.c. p. 568; Baker, l.c. p. 525. Type: Congo: Orientale, Monbuttu Land, near Munsa's Dorf, Schweinfurth 3509 (holotype not seen, destroyed in B; no isotype seen).

S. tonga Gilg, l.c. p. 575; in Engler, Pflanzenw. Ost-Afr. C: 311, t. 38 B-K. 1895; Baker, l.c. 527. Type: Moçambique: Quilimane, Stuhlmann 1039 (HBG, lectotype; photograph in K, neg. 2492).

S. volkensii Gilg, Abh. Kön. Akad. Wiss. Berlin 1894: 25. 1894; in Engler, Pflanzenw. Ost-Afr. C: 311. 1895; Notizbl. Bot. Gart. Berlin 1: 76. 1895; Hiern. in Cat. Welw. Afr. Pl. 3: 702. 1898; Baker, l.c. p. 536; Duvigneaud, Lejeunia 13: 111. 1949 and Bull. Soc. Roy. Bot. Belg. 85: 21, f. 6. B. 1952. Type: Tanzania: Tanga, Kilimanjaro (Jan.) Volkens 103 (G, lectotype; isotype: BM). Homotypic synonym: *S. spinosa* subsp. *volkensii* (Gilg) E. A. Bruce, Kew Bull. 1955: 40. 1955; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 19. 1960.

S. miniungansamba Gilg, Notizbl. Bot. Gart. Berlin 1: 77. 1895; Baker, l.c. p. 536. Type: Angola: Kahungula, Buchner 617 (holotype not seen, destroyed in B; no isotype seen).

S. carvalhoi Gilg in Engler, Bot. Jahrb. 28: 123. 1899; Baker, l.c. p. 535. Type: Moçambique: between Mussoril and Cabeceira, Carvalho s.n. 1884-'85 (holotype not seen, destroyed in B; lectotype: COI).

S. sansibariensis Gilg, l.c. p. 124; Baker, l.c. p. 535. Type: Tanzania: Zanzibar, sin. loc., Stuhlmann 1011 (HBG, lectotype, photograph in K, neg. 2371).

S. euryphylla Gilg et Busse in Engler, Bot. Jahrb. 32: 179. 1902; in op. cit. 36: 108, f. 2 A. 1905; Baker, l.c. p. 526. Type: Tanzania: Kilossa, Usagara, Busse 174 (G, lectotype; isotypes: HBG, LY, P: fr. only; photograph of HBG sheet in K, neg. 2491).

S. megalocarpa Gilg et Busse in Engler, Bot. Jahrb. 32: 180. 1902; Baker, l.c. p. 526. Type: Tanzania: Handeni District, Kwa-Ssulanga (Kwa-Zuranga), Busse 323 (holotype not seen, destroyed in B, no. isotype seen).

S. omphalocarpa Gilg et Busse, l.c. p. 181; Baker, l.c. p. 525. Type: Tanzania: Handeni District, Kwa Mdoë, near Handeni, Busse 322 (holotype not seen, destroyed in B; lectotype: G).

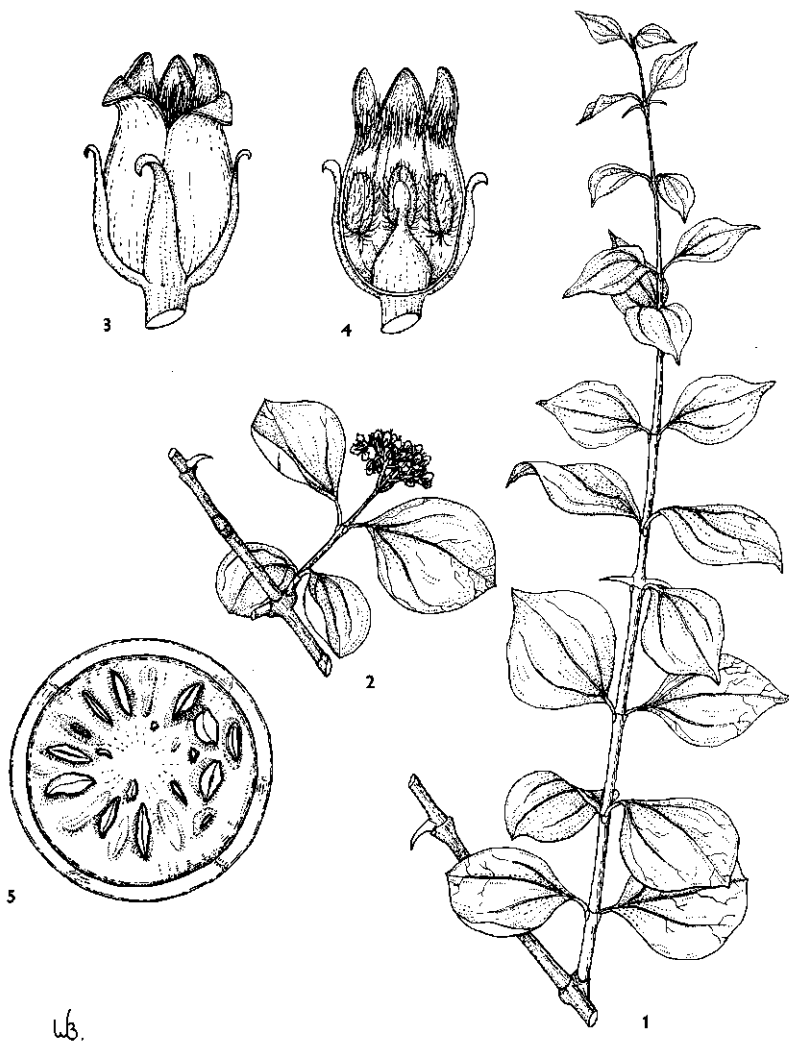
S. gracillima var. *paucispinosa* De Wild., Ann. Mus. Congo Sér. 4. 1: 97. 1903 (Jan.) and Bull. Jard. Bot. Brux. 2: 372. 1910. Type: Congo (Kinshasa): Katanga, Lukafu (Aug.) Verdick 48 (BR, holotype).

S. emarginata Bak. in Fl. Trop. Afr. 4(1): 537. 1903 (March); Duvigneaud, Lejeunia 13: 114. 1949 and Bull. Soc. Roy. Bot. Belg. 85: 21. 1952. Type: Sudan: Djurland, Seriba Ghattas (Apr.) Schweinfurth 1396 (K, holotype).

S. spinosa var. *pubescens* Bak., l.c. Type: Guinea: near Moria (Feb.) Scott Elliot 4801 (K, lectotype; isotypes: BM, GH).

S. gilletii De Wild., Ann. Mus. Congo Sér. 5. 1: 176. 1904; Baker, l.c. p. 624. 1904. Type: Congo (Kinshasa): Léopoldville Province, Kisantu, Gillet 134 (BR, 2 sheets, lectotype; photograph of one sheet in K, neg. 2207).

S. cardiophylla Gilg et Busse in Engl., Bot. Jahrb. 36: 110. 1905. Type: Tanzania: Kilwa District, Singino Hills, just S. of Kilwa Kavinje, Busse 3011 (holotype not seen, destroyed in B; lectotype: EA, photograph in K, neg. 2283).



W.B.

FIG. 39. *S. spinosa*: 1-2. branches, $\frac{1}{2} \times$; 3. flower, $6 \times$; 4. opened flower, $6 \times$; 5. dried slice of nearly mature fruit, $\frac{1}{2} \times$ (1-4. Leeuwenberg 7664; 5. Leeuwenberg 7483).

S. cuneifolia Gilg et Busse, l.c. p. 109, f. 2 C. Type: Tanzania: Lindi District, Lake Lutamba, Busse 2519 (holotype not seen, destroyed in B; lectotype: HBG; other isotypes seen: BR, EA, LY); photograph of EA sheet in K, neg. 2285).

S. harmsii Gilg et Busse, l.c. p. 109. Type: Tanzania: Lindi District, Rondo Plateau, Busse 2560 (EA, lectotype; isotypes: EA, LY; photographs of both EA sheets in K, negs. 2293 and 2294).

S. leiosepala Gilg et Busse, l.c. p. 111. Type: Angola: Huila (Oct.) Dekindt 499 (COI, lectotype; isotypes: COI, LISC, MPU).

S. radiosperma Gilg et Busse, l.c. p. 108, f. 2 C. Type: Tanzania: Kilwa District, Matumbi Mts., near Mirungamo, Busse 3061 (holotype not seen, destroyed in B; lectotype: HBG; other isotypes seen: BM, BR, EA, LY; photograph of EA sheet in K, neg. 2286).

S. rhombifolia Gilg et Busse, l.c. p. 107. Type: Sudan: Djurland, Seriba Ghattas, Schweinfurth 1407 (holotype not seen, destroyed in B; no isotype seen).

S. unguacha var. *retusa* Chiov., Fl. Somala 2: 305. 1932 (as *Strichnos*). Type: Somalia: Oltregiuba, Licchitore, Senni 481 (FI, lectotype).

S. mueghe Chiov., Racc. Miss. Consol. Kenya 83. 1935; A. W. Hill c.s., Ind. Kew. Suppl. 9: 270. 1938 (as *meughe*). Type: Kenya: Mt. Kenya, 'Saraka Steppe', Balbo 687 (TOM, lectotype).

S. djalonis A. Chev., Expl. Bot. Afr. Occ. Fr. 1: 442. 1920, nomen; Rev. Bot. Appliq. 27: 358, pl. 16 B. 1947. Type: Guinea: Ditinn (Apr.) Chevalier 12179 bis (P, holotype, photograph in K, neg. 2301; isotype: LY).

Deciduous shrub or small tree, (0.30)1–6(10) m high, sometimes flowering on one-year shoots (with small leaves) on old fire-cut stumps. Trunk 4–15 cm in diam., (sometimes fluted), branched from low down; bark pale to dark grey or brown, shallowly fissured, not or sometimes thinly corky, often scaly, sometimes blackened by bush fire, not lenticellate; wood hard, whitish, without bark-islets. *Branches* sometimes deeply ringed at nodes, grey or brown not lenticellate, often with recurved or straight spines; branchlets glabrous or pubescent, green or yellow-green when living, green or brown and often sulcate when dry, sometimes terminating in a straight spine. Stipules soon deciduous, 4 on each node, at the base of the petioles, narrowly triangular, 1–2 mm long. *Leaves* on main axis sometimes ternate; petiole 2–10 mm long, glabrous or pubescent; blade shining and pale to medium green above, mat and paler beneath, veins often pale on both sides, coriaceous also when living, young thinner and papyraceous when dry, very variable in shape and size, orbicular, elliptic, narrowly elliptic, ovate, or obovate, 1–2(3) × as long as wide, sometimes comparatively wider or narrower on main axis, usually comparatively wider on flowering branches, 1.4–9.5 × 1.2–7.5 cm, rarely larger, up to 13.5 × 7.5 cm, emarginate, rounded to acute and often apiculate, sometimes acuminate (mostly in trees along water courses), or rarely abruptly acuminate at the apex, cuneate, less often rounded, or sometimes on main axis subcordate at the base, often with hair pockets in the angles of the main veins beneath, glabrous or pubescent on both sides (in sucker shoots and seedlings of plants with few hairs more hairy, smaller and cordate); 1–3 pairs of distinct secondary veins from above the base curved along the margin. *Inflorescence* terminal, seemingly umbellate, congested or less often not, 1.5 × 1.5 – 5 × 3.5 (6.5 × 7) cm, mostly many-flowered, 3–4 × branched. Peduncle, branches, and pedicels often sparsely pubescent (never glabrous). Bracts linear or nearly so, upper sepal-like, lower larger, sparsely pubescent outside, especially at the base, above mostly with some hairs and occasionally with some colleters at the base. *Flowers* 5-merous. *Sepals* pale green, connate at



PHOT. 4. *S. spinosa*: crown of small tree (Leeuwenberg 3288).

the base, narrowly triangular to linear, equal, subequal, or sometimes unequal, $2-6(10) \times$ as long as wide, $1.5-6 \times (0.3) 0.5-1.2$ mm, elongate at anthesis, acuminate or subulate at the apex, minutely ciliate at the base or not, outside mostly sparsely pubescent at the base and glabrous at the apex or entirely glabrous, never with an even indumentum all over, inside glabrous and usually with some hairs at the base or sometimes minutely pubescent, without colleters. *Corolla* when mature $0.8-2.7 \times$ as long as the calyx, $4-5(3.8-6)$ mm long, pale green, greenish, or less often white, creamy, or yellow, glabrous or sparsely pubescent outside, inside with a narrow entire white-penicillate corona at the mouth of the tube; tube $1.2-2.7 \times$ as long as the lobes, $2.5-3(2.2-4.4) \times 2-3(3.5)$ mm, urceolate or campanulate, often somewhat contracted in the throat;

lobes tirangular, 1.2–1.8 × as long as wide, 1.2–2 × 1–1.5 mm, acute, erect or suberect. *Stamens* included; filaments glabrous, 0.7–1.5 × as long as the anthers, inserted at 0.4–0.8 mm from the base of the corolla; anthers inserted at 0.4–0.8 mm from the base of the corolla; anthers oblong or elliptic, 1.2–1.4 × 0.8–1 mm, deeply cordate at the base, ciliate with villose or sometimes pilose hairs all around by which they are coherent; cells parallel. *Pistil* pubescent, rarely obscurely so, glabrous just below the stigma, 1.8–2.4(3) mm long; ovary ovoid, broadly ovoid, or globose, (1)1.2–1.6(2) × 1–1.3 mm, acuminate at the apex, 1-celled; stigma subsessile, oblong. One large globose basal placenta with about 60–120 ovules. *Fruit* yellow or when nearly mature yellow-green or green, large, hard, resembling an orange or a grape fruit, globose, often slightly shining, with granular skin, 7–11(15) cm in diam., with about 10–100 seeds, immature often slightly pear-shaped. Wall rather thick, hard, 2–5(8) mm thick, thickened inside above the pedicel. Pulp yellow, edible. *Seed* ochraceous in fruit, very pale brown when dried up, darkening in rotten fruits, obliquely ovate or elliptic, flattened, more or less plano-convex, usually irregularly curved, about 1–2 × as long as wide, 11 × 6 × 2 — 23 × 18 × 5 mm, mostly smooth, very shortly pubescent. Testa thick.

Distribution: Tropical and South Africa.

Ecology: Woodlands, bushlands, or sometimes gallery forests; alt. 0–2200 m.

About 850 specimens collected throughout the area examined, of which some are cited: Senegal: Cap Vert Peninsula (July) Berhaut 2160 (P); Tambacounda (Apr.) Berhaut 131 (BR, P, Z), 2159 (P); (June) Trochain 3052 (P); Casamance R., Perrotet 493 (G).

Gambia: Albrede (fl.) Leprieur June 1827 (G, P); between Georgetown and Kuntaur, Dalziel 8072 (K).

Mali: between Bandiagara and Mopti, Chevalier 24937 (P); 12 km S. of Koutiala (Apr.) Roberty 1256 (IFAN, P), 1279 (P).

Portuguese Guinea: Canchungo (Apr.) Espírito Santo 1945 (COI, K, LISC, WAG); Fulacunda (May) Espírito Santo 2035 (COI, K, LISC, WAG).

Guinea: Rio Nunez (Mar.-Apr.) Heudelot 813 (BM, BR, G, IFAN, K, L, P, TCD); between Kaba R. and Upper Mamou R. (Apr.) Chevalier 12716 (P), 12766 (P); Faranah (Mar.) Scott Elliot 5383 (BM, as 5384, GH, K).

Sierra Leone: Newton (Mar., June) Deighton 2205 (K), 2491 (K), 2992 (BR, K, P); near Kukuna, Scott Elliot 4674 (K).

Ivory Coast: Ferké, Aubréville Serv. For. 1871 (P), 2281 (P); N. of Bouaké (fl., fr. Apr.) Leeuwenberg 3288 (BR, FHO, K, P, WAG).

Upper Volta: S. of Kera, km 116 of Bobo Dioulasso-Dédougou road (June) Leeuwenberg 4368 (WAG); 58 km E. of Bobo Dioulasso, Leeuwenberg 4405 (WAG); NE. of Léraba, Leeuwenberg 4288 (WAG).

Ghana: Tumu (Apr.) Vigne 3776 (BM); between Pan and Bujan (Apr.) Kitson 908 (K); near Yendi (Mar.) Hepper & Morton A 3080 (GC, K).

Togo: Kersting 102 (BM).

Dahomey: near Agouagou (May) Chevalier 23536 (P); Dassa Zoumé, Chevalier 23562 (P).

Niger: Magaria, S. of Zinder, Peyre de Fabrègues 1265 (ALF), 1845 (ALF).

Nigeria: Zamfara For. Res., Sokoto Province (Apr.) Keay FHI 15608 (K), 15680 (K), 15887 (FHO), 16159 (FHI, FHO); near Lantewa, Bornu Province (June) Onochie FHI 23391 (FHI, K); Jos Plateau (Mar.) Olorunfemi FHI 55722 (FHI, K).

Cameroun: km 5 of Mogodé-Mokolo road (Jan.) Leeuwenberg 7544 (WAG); km 185 of

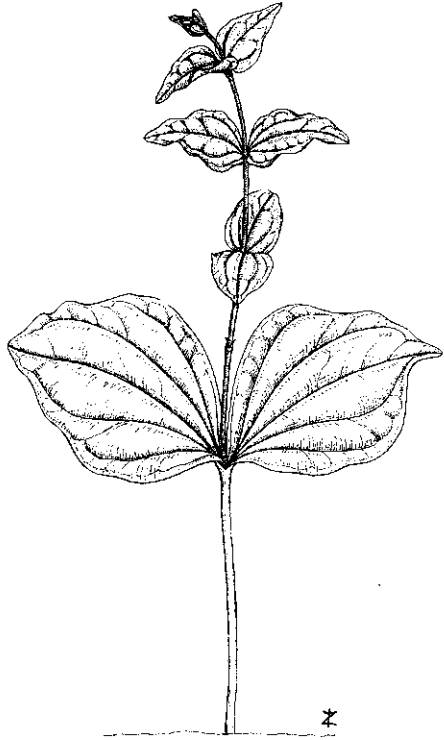


FIG. 40. *S. spinosa*: seedling, $\frac{1}{2}$ \times (Leeuwenberg 3508).

Garoua-Ngaoundéré road, between Sakje and Nigba (fl., fr. Jan.) Leeuwenberg 7612 (WAG); N. of Monay, 20 km N. of Bétaré Oya (Feb.) Breteler 1167 (K, P, WAG) = Letouzey 3574 (K, P, WAG, YA).

Central African Republic: Carnot, Leeuwenberg 7237 (WAG); Sandberg Carnot 58 (Pharm. Stockh., WAG); Bocaranga (Jan.) Aubréville 669 (P); Kaza Balidja (Dec.) Chevalier 6738 (G, L, P); Ndellé (Dec., Feb.) Chevalier 6994 (BR, P, cited as *S. dulcis*), 7117 (LY, P), 7118 (BR, G, L, P), 7543 (K, P, cited as *S. dulcis*), 7544 (P, cited as *S. courteti*), 7545 (G, K, L, P, cited as *S. courteti*), 8110 (G, P, cited as *S. pluvialis*).

Tchad: Fort Archambault (June) Chevalier 8648 (P), 8698 (P); Béti, E. of Moundou, Audru 857 (ALF).

Sudan: Marra Mts., W. de Wilde c.s. 5503 (WAG); (May) Wicken 1107 (K), 1672 (K); Djurland, between Dimo and Axim (Apr.) Schweinfurth 1573 (K); Soni R. source (Mar.) Hope-Simpson 264 (FHO), 270 (BM, FHO).

Ethiopia: Tacazze R. (June) Chioventa 598 (FI); Tzellemtí, Chioventa 663 (FI), 663 bis (FI).

Somalia: Fra Goriei e El Magu, Paoli 635 (FI); between Da Bur Gao and Cu Daio (June) Senni 89 (FI, paratype of *S. unguacha* var. *retusa*).

Congo (Kinshasa): Léopoldville: Kisantu, Gillet 880 (BR, paratype of *S. gilletii*). Equateur: Gangala na Bodio (Mar.) Elzius c.s. 681 (BR). Orientale: Tukpwo (Jan.-Apr.) Gérard 1020 (BR, PRE), 1108 (BR, PRE), 1215 (BR, WAG), 4434 (BR, WAG); Ndaro (Apr.) Van der Ben 1377 (BR, WAG). Kasai: Gandajika, Duvigneaud 1107 (P). Kivu: Kibangula, Kabambare Territory (fl., fr. Aug.) A. Léonard 5748 (BR, K, WAG). Katanga: Muhila

(Oct.) Quarré 7100 (BR); Upemba Nat. Park (Sept.) de Witte 4356 (BR, K, WAG); Robyns 3927 (BR, K, WAG); near Lubumbashi (Oct.) Schmitz (obs. tree 306) 675 (BR), 2610 (BR).

Rwanda: near Kindama, Kigali Territory (Nov.) Troupin 9067 (BR, WAG), 9100 (BR, WAG).

Burundi: Bubanza Territory, Lewalle 1632 (WAG); Mosso Ruyigi (Aug.-Sept.) Michel & Reed 163 (BR), 269 (BR, PRE), 307 (BR, PRE); Bururi Territory, Lewalle 914 (WAG).

Angola: Cuanza Norte: Golungo Alto (Dec.) Welwitsch 4769 (BM, LISU); Dalatanda = Vila Salazar (Nov.) Welwitsch 4768 (BM, COI, G, K, LE, LISU, P), 4775 (BM, LISU). Malanje: Gossweiler 1118 (BM, K, P), 1126 (BM, K, P). Lunda: Dundo (fr. Dec.) Cavaco 1404 (P, WAG). Cuanza Sul: Amboin (Oct.) Teixeira & Andrade 5065 (NLI, WAG). Benguela: Ganda, V. de Almeida 749 (NLI, WAG). Moçamedes: Vila Arriaga (July) Gossweiler 13099 (LISC). Huila: Huila (Oct.) Dekindt 1 (LISC), 10 (LISC), 1140 (LISC); Lopollo (Jan.) Welwitsch 4780, partly (K, LISU); Gambos, Dekindt 595 (COI). Cuando-Cubango: Santa Cruz (Nov.) Teixeira 134 (LISC, NLI).

Uganda: Ite Mt., W. Nile (Feb.) Eggeling (1439) 1509 (EA, FHO, K); Debasien Mt. (Jan.) Eggeling 2583 (ENT, K).

Kenya: Mt. Kenya, Ottune Steppe, Balbo 686 (TOM, paratype of *S. mueghe*); Witu, Lamu District, F. Thomas (Gebr. Denhardt) 198 (BM, BR, G, K); E. of Lamu (fl., fr. Feb.) Greenway & Rawlins 8903 (EA, K); Mowesa (Apr.) Graham 1737 (EA, FHO, FI, K), 1738 (EA, FHO, FI, K); 29 km S. of Mombasa (Aug.) Drummond & Hemsley 3999 (B, EA, FI, K).

Tanzania: Monga, E. Usambara Mts. (Jan.) Greenway 3684 (EA, FHO, K); Sawa, Tanga District (Apr.) Faulkner 1856 (B, BR, EA, K, S); 8 km S. of Ngomeni, Drummond & Hemsley 3612 (B, BR, EA, K, S); Amboni, Holst 2670 (HBG, K); Tanga (Jan.) Holst 2095 (K, paratype of *S. volkensii*); Pemba, Burt-Davy 22543 (FHO); Mafia Island (Aug.) Greenway 5026 (EA, FHO, K); Lutamba Lake (Nov.) Eggeling 6751 (EA, K). Zanzibar: Fumba (Mar., July, Sept.) Faulkner 2861 (BR, K), 3361 (K, S), 3428 (BR, K).

Zambia: Kasama District (Oct.) Robinson 3953 (EA, K, M, SRGH); 20 km S. of Lusaka (Oct.) Angus 1414 (BM, BR, FHO, K, PRE); Chilanga (Nov.) Rogers 8594, partly (BOL, K, Z); Gwembe District (fr. Apr.) White 2619 (BR, FHO), 2626 (FHO, K); Bombwe, near Livingstone (Oct.) J. D. Martin 321/32 (EA, FHO).

Malawi: Kasunga (fr. Aug.) Brass 17445 (K, MO, NY, SRGH, US); Shire Highlands (Oct.) Buchanan 47 (E, K, paratype of *S. spinosa* var. *pubescens*); Blantyre (July) Buchanan 34 (E, K).

Rhodesia: Salisbury (Nov.) Brain 10835 (SRGH); (Nov.) Eyles 4548 (K, SRGH); (Nov.) Lanjouw 1213 (U), 1220 (U); Inyanga (Oct.) Th. C. E. Fries 2454 (LD), 2625 (LD); Melsetter District (Oct.) R. Goodier & Phipps 303 (EA, K, M, PRE, S, SRGH).

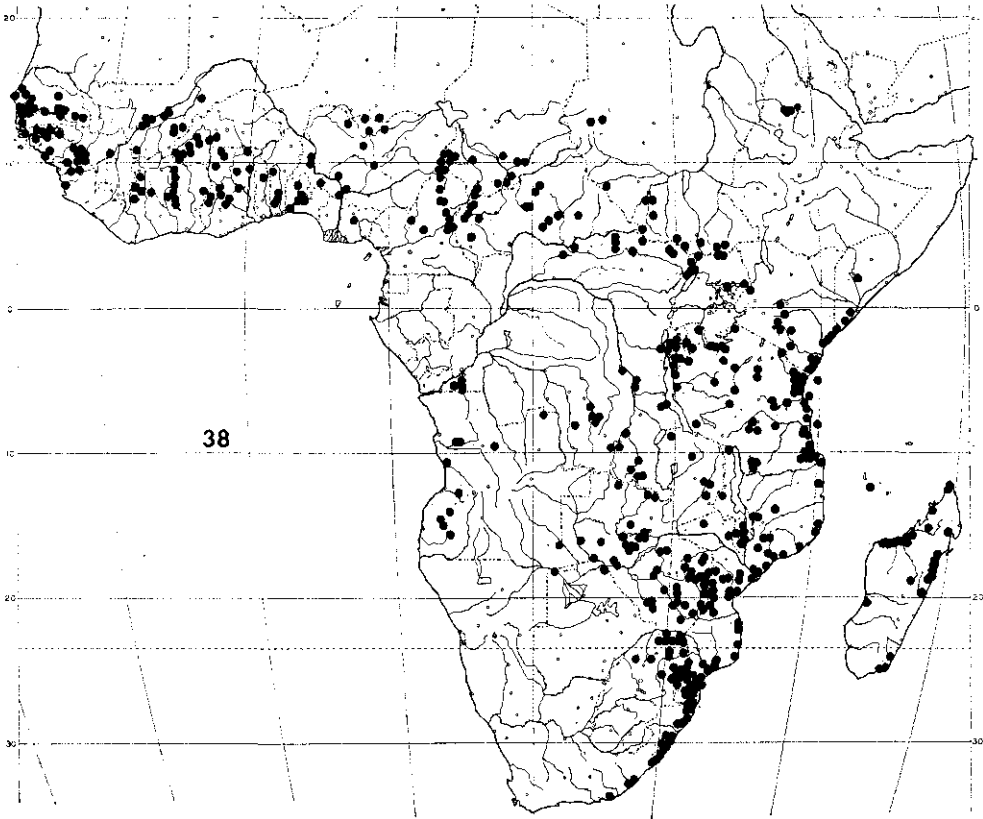
Moçambique: Niassa: Massangulo (fl., fr. Oct.) Mendonça 687 (LISC). Cabo Delgado: Macomia (Sept.) Barbosa 2084 (LISC). Tete: Zóbuè Mts. (Oct.) Torre 3694 (LISC). Moçambique: Mogincual (fr. Mar.) Torre & Paiva 11444 (LISC). Zambesia: Mocuba (Dec.) Torre 4780 A (LISC); Kongoni R., Zambesi Delta (both fl.) Kirk Jan. 1861 (K), 24 March 1859 (K). Manica e Sofala: near Vila Gouveia (Dec.) Torre & Correia 13413 (LISC). Gaza: Majancaze, Torre 2537 (LISC). Inhambane: Massinga (Sept.) Gomes e Sousa 1850 (COI, K, LISC, MO). Lourenço Marques: Santaca, Maputo (Aug.) Gomes e Sousa 3788 (C, COI, K, PRE); Inhaca Island (Oct.) Mogg 27460 (BM, K), 27727 (K).

South West Africa: Okavango Territory, de Winter & Marais 4798 (K).

Botswana: Mukoronga R. (Oct.) Holub s.n. (Z).

Swaziland: Umzimpopfu R., Pole-Evans 3420 (A, K, PRE); Stegi District (Sept.) Compton 29038 (NBG), 29039 (K).

South Africa: Transvaal: Waterberg District (Dec.) Theron 2052 (BM, BR, J, M), 2060 (FHO, K, M); Leeupan, Kruger Nat. Park (Oct.) Marais & van der Schijff 1256 (K), 1257 (K, M, SRGH); Pretorius Kop (Oct.) Marais & van der Schijff 1250 (K, PRE, SRGH), 1251 (K, M); Shabin, Nelspruit District, Marais & van der Schijff 1260 (K, M, SRGH); Crocodile Poort, near Barberton (Sept.) Galpin 1075 (BOL, GRA, K, NBG, PRE, SRGH, Z). Natal: Hluhluwe Game Res., Hlabisa District (Oct.) Hitchins 90 (K, NH); Durban (Oct.) Gerrard & M'Ken 591 (K, TCD); (Oct.) Krauss 99 (BM, FI, G, K, M, TCD, W); Dumisa (Sept.) Rudatis 1140 (BM,



MAP 38. *S. spinosa*.

E, G, GRO, JE, K, PR, S, W, WRSL, Z). Cape Province: between Umtentu and Umzimkulu Res., Drège Feb. 1831 (K, LE, OXF, S); Kentani District (Dec.) Pegler 723 (BOL); Komgha District, near Kei R. mouth (Oct.) Flanagan 2375 (BOL, GRA, S); Albany, Miss Bowker s.n. (K, TCD).

Comoro Islands: Mohéli (fl.) Boivin Sept. 1847 (P).

Madagascar: Sakaramy, Mt. des Français (Nov.) Homolle 363 (P); Majunga (fl.) Kaudern Oct. 1912 (G, S); Amborovy, near Majunga (fl.) K. Afzelius 1 May 1912 (S, UPS); Maroa, Mocquerys 136 (G); Soalala (Nov.) Randriamiera Res. Nat. 6860 (P, WAG); St. Marie Island (Mar.) Boivin 1777 (P); Fénériver District, Geay 9067 (P), 9068 (P), 9069 (P), 9070 (P); Foulpointe, Bojer anno 1830 (OXF, W); near Fort-Dauphin (Sept.) Humbert 5888 (C, P, US).

Seychelles: Silhouette: J. Stanley Gardiner anno 1908 (K). Mahé: Boivin s.n. (P); (Sept.) J. Horne 329 (K).

Mauritius: Sieber 106 (FI, G, M, MO, PR), II 267 (E, G, GOET, HAL, L, LE, W); R. T. Farquhar anno 1826 (LINN 367.5); Commerson s.n. (P); Bojer s.n. (K); Christison s.n. (E).

Cult.: Uitenhage, Durban, S. Africa, Brehm s.n. (TCD); Hort. Calcutta, India, Wallich Cat. 1588 (K); Wageningen, Leeuwenberg 3508 (WAG, seedling of herb. Bretelet 1167).

Notes. After comparison of about 850 specimens of this species the present author has confirmed Miss VERDOORN's conclusion that it cannot be subdivided as was done by Miss BRUCE, viz. subsp. *lokua*, *spinosa*, and *volkensis*. The species is variable in many characters and in many of these characters throughout its entire area which is the largest of all African *Strychnos* species. The leaves are variously shaped and generally more acute in vegetations along watercourses. Furthermore, the leaves in flowering branches are often comparatively wider and in very young plants or sucker shoots (which might flower) often cordate. In one plant the leaves may vary from orbicular to narrowly elliptic (e.g. herb. Leeuwenberg 4288, Upper Volta). The sepals vary very much in length, from 1.5 to 6 mm; moreover, they are elongate at anthesis. The indumentum of the leaves and branchlets is variable. The corolla, the pistil, and the seeds are relatively constant in most characters: the stamens and pistil are nearly constant in shape and indumentum and vary slightly in size; the ovary is always one-celled; the shape and indumentum of the seeds is also constant.

To illustrate why the species cannot be subdivided the following supporting evidence may be given:

Herb. Espirito Santo 1945 (Portuguese Guinea), Chioventa 663 (Somalia), Barbosa 2084 (Moçambique), Marais & van der Schijff 1260 (Transvaal), and Mocquerys 136 (Madagascar) have inflorescences and calyces of subsp. *spinosa* and powdery branches as in subsp. *lokua*. Herb. Drummond & Hemsley 3999 (Kenya) and Robinson 3953 (Zambia) have calyces of subsp. *volkensis* and powdery branches like subsp. *lokua*. Herb. Gomes e Sousa 1850 (Moçambique) has long sepals and varnished branches like subsp. *spinosa*, but rather lax inflorescences like subsp. *volkensis*. In herb. Compton 29038 the branches are varnished (subsp. *spinosa*) and powdery (subsp. *lokua*) and the sepals are long as in subsp. *spinosa*. The very long sepals of subsp. *spinosa* were also found in herb. J. D. Martin 321/32 (Zambia) which has powdery branches and pubescent leaves. Herb. Drummond & Hemsley 3612 (Tanzania), which was identified as subsp. *volkensis*, has mottled and powdery branches and pubescent leaves. Herb. Eggeling 6751 (Tanzania) has varnished and mottled branches like subsp. *spinosa* and *volkensis*, but sepals intermediate in length between the two. Herb. Theron 2060 (Transvaal) has varnished branches, pubescence all over, sepals as in subsp. *spinosa*, and inflorescences with few flowers as in subsp. *volkensis*. The variation of the species is well shown in the collections of Marais & van der Schijff (Transvaal) and Leeuwenberg (Ivory Coast, Upper Volta, and Cameroun).

63. *S. splendens* Gilg in Engler, Bot. Jahrb. 17: 571. 1893; Baker in Fl. Trop. Afr. 4(1): 524. 1903; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 41. 1963. **Fig. 38, p. 233; Map 39, p. 251**

Type: Sierra Leone: Bayabaya, Scarcies R., Scott Elliot 4292, partly (K, lectotype; isotype: BM; the GH sheet is *S. melastomatoides* Gilg).

Heterotypic synonym: *S. chrysocarpa* Bak., Kew Bull. 1895: 98. 1895 and l.c.

p. 529. Type: Sierra Leone: near Wilberforce, H. H. Johnston 98 (K, lectotype; isotype: E).

S. acutissima Gilg in Engler, Bot. Jahrb. 23: 200. 1896; Baker in Fl. Trop. Afr. l.c. p. 524. Type: Sierra Leone: sin. loc., Afzelius s.n. (UPS, lectotype).

Climbing shrub or liana, 8–20 m high climbing over shrubs and in trees, 20–40 m long, often twining. Trunk 2–12 cm in diam. Bark pale grey or pale brown, lenticellate, smooth; wood creamy. *Branches* mostly lenticellate, pale grey or pale brown and not sulcate when dry; branchlets puberulous or glabrous, terete, sometimes obscurely angular when living, not lenticellate, medium to dark brown and often slightly sulcate when dry. Tendrils paired. *Leaves*: petiole puberulous or glabrous, relatively short in shade leaves, 2–8 mm long; blade shining and dark green above, less shining or mat and slightly paler beneath, in the sun coriaceous or subcoriaceous, in the shade papyraceous, also when living, elliptic, narrowly elliptic, or sometimes ovate, usually comparatively narrower towards the apices of the branchlets, $1.3\text{--}4 \times$ as long as wide, $4.5\text{--}13 \times 2\text{--}5$ cm, up to 17×8 cm in the shade, acuminate and often very acute at the apex, cuneate or rounded at the base, slightly undulate in the shade, glabrous on both sides; one or two pairs of secondary veins from the base curved along the margin; tertiary venation reticulate, not very conspicuous, prominent beneath. *Inflorescence* axillary, often also in the axils of the apical leaves and therefore seemingly terminal, solitary, lax, $0.2\text{--}1 \times$ as long as the leaves, $2.5\text{--}5(6.5) \times 2\text{--}2.5$ cm, few-flowered, $1\text{--}2 \times$ branched. Peduncle, branches, and pedicels slender, pubescent to nearly glabrous. Bracts very narrowly elliptic or very narrowly triangular, about $1\text{--}3 \times$ as long as the sepals, beneath hairy as the peduncles, above glabrous and often with colleters at the base. *Flowers* 5-merous. *Sepals* pale green, free or connate at the base, subequal, broadly ovate, $1\text{--}1.5 \times$ as long as wide, $0.6\text{--}1 \times 0.5\text{--}0.8$ mm, acute or obtuse at the apex, ciliate, often sparingly pubescent outside, glabrous inside, without colleters. *Corolla* in the mature bud $4\text{--}6 \times$ as long as the calyx, 3–4 mm long, and rounded at the apex, white, whitish, or pale yellow, in bud at apex often pale bluish, outside glabrous or with some minute hairs, inside pilose on the lobes, especially at the base (glabrous in the tube and at the apices of the lobes); tube very short, mostly shorter than the calyx, 0.4–1 mm long; lobes $3\text{--}7 \times$ as long as the tube, oblong, $2\text{--}3.5 \times$ as long as wide, $3\text{--}3.5 \times 1\text{--}1.4$ mm, acute, recurved. *Stamens* well-exserted; filaments white, glabrous, about $1.5\text{--}2 \times$ as long as the anthers, 1.5–2.4 mm long, elongate at anthesis, inserted at the mouth of the corolla tube; anthers oblong, $2\text{--}2.5 \times$ as long as wide, $1\text{--}1.2 \times 0.5\text{--}0.6$ mm, cordate at the base, glabrous; cells parallel. *Pistil* pilose-pubescent, 3–4 mm long; ovary ovoid-conical, $1\text{--}1.5 \times 1$ mm, only at the very base glabrous, 2-celled, gradually narrowed into the style; style thick, glabrous at the apex, 2.5–3 mm long; stigma capitate. In each cell 7–8 ovules. *Fruit* orange or orange-yellow, immature green and often topped by the hairy base of the style, subglobose or nearly so, usually depressed, small, soft, $13 \times 16 \times 13\text{--}19 \times 24 \times 21$ mm or more (up to about 30 mm in diam.), 1–2 (6)-seeded, with smooth

skin, hardly shining. Wall thin, about 0.3 mm thick. Pulp orange. *Seed* ochraceous, obliquely elliptic, flattened, often irregularly curved, $12 \times 10 \times 4 - 18 \times 13 \times 6$ mm, slightly plano-convex, rough, with short scabrid hairs. Testa thick.

Distribution: West Africa.

Ecology: River banks and there often near rocks, in rain forests or secondary forests, or in gallery forests; alt. 0–400 m.

Portuguese Guinea: Prabis, Bissau, Espírito Santo 1856 (COI, K, LISC, LISJC); Cumura, Espírito Santo 2230 (COI, K, LISC, WAG); between Cumura and Bár, Bissau, Espírito Santo 1893 A (COI); between Saucunda and Empada, Espírito Santo 7 Apr. 1946 (COI); between Catio and Saucunda (Oct.) Espírito Santo 2191 (COI, K, LISC), 2192 (COI, K, LISC, WAG); between Susana and Praia de Varela, Espírito Santo 3685 (COI, LISC, LISJC).

Guinea: Panoukou, near Youkounkoun, Roberty 16747 (G, K).

Sierra Leone: near Wilberforce, Freetown (fr. Mar.) H. H. Johnston 98 (E, K, lectotype of *S. chrysocarpa*); near Bayabaya, Scarcies (fr. Feb.) Scott Elliot 4292, partly (BM, K, lectotype, paratype of *S. johnsonii*); Loma Mt., Jaeger 803 (WAG), 8883 (WAG); Baiima (Aug.) Deighton 6108 (B, BR, K, P); sin. loc., Afzelius 37 (UPS), s.n. (UPS, lectotype of *S. acutissima*), s.n. (BM, paratype).

Liberia: Jene, Loffa R. banks, J. C. Bequaert 31 (K); Mecca, Baldwin 10791 (K); Kodessu, Boporo District, Baldwin 10662 B (K); Monrovia, Dinklage 2914 (A, K, P, paratype of *S. odorata*); Peátah, J. Bequaert in coll. Linder 1073, partly (A, paratype of *S. venulosa*); *ibid.*, Linder 1084 (A, K, LE, P); Ganta (?), Harley 1056 (LIB); Nimba Mts., J. G. Adam 20668 (K, P, WAG); crossing Cestos R. and Tapita-Zwedru road (Mar.) J. de Wilde & Voorhoeve 3732 (BR, K, S, WAG).

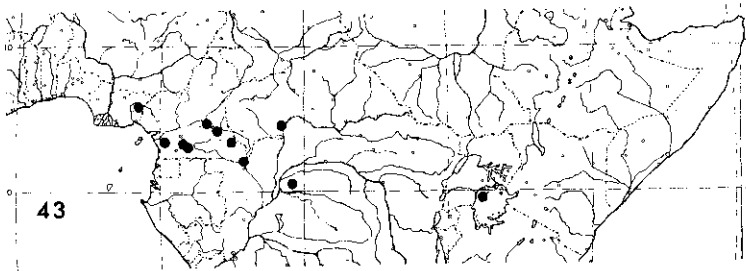
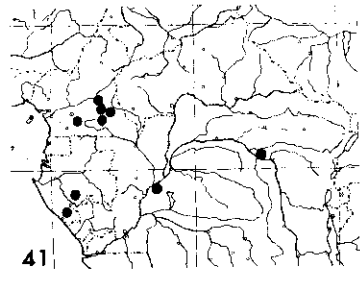
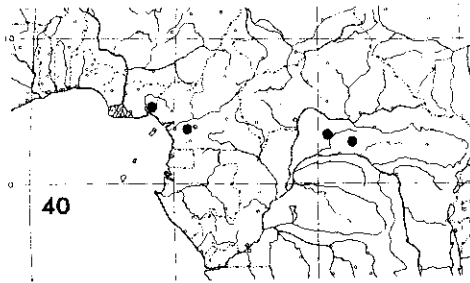
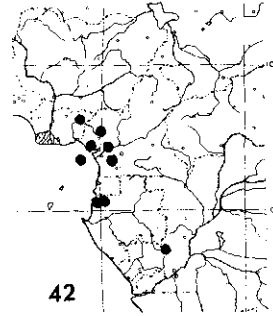
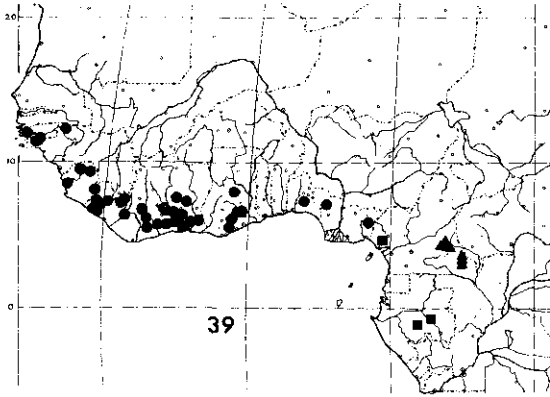
Ivory Coast: 5 km NW. of Duékoué, Leeuwenberg 3884 (WAG); between Sassandra and Cavally Rs., Chevalier 19273 (P, paratype of *S. odorata*); near Tapéguhé, right bank Sassandra R., 50 km NW. of Soubré, Leeuwenberg 4537 (WAG); Bouaflé Forest, Aké Assi 6539 (WAG); about 5 km W. of Bouaflé, Leeuwenberg 3915 (WAG); Soubré, left bank Sassandra R., Leeuwenberg 3232 (WAG); right bank Sassandra R., 7 km WNW. of Soubré, J. de Wilde 3303 (K, WAG); km 31 of Divo-Lakota road, right bank Do R., Leeuwenberg 3987 (WAG); left bank Bandama R., 21 km NE. of Oumé, Leeuwenberg 4153 (WAG); Bamora Forest, N. of Bouaké, Leeuwenberg 4263 (WAG); between Lomo and Assakra, Aké Assi 6717 (WAG); 26 km W. of Ndouci, along road to Divo, Leeuwenberg 3983 (WAG); Sinécrou, Nzi R. region, Croux in coll. Chevalier 20131 (P); Brafouédi, 75 km NW. of Abidjan, Aké Assi 3101 (ABI), 6776 (WAG); *ibid.* (fr. Aug.) W. de Wilde 677 A (WAG), 677 B (WAG); *ibid.* (fr. Dec.) H. C. D. de Wit 7795 (WAG); *ibid.*, F. Hallé 352 (P); *ibid.*, Jaeger 6267 (WAG); *ibid.* (fl. July, fr. Mar.-Apr., July) Leeuwenberg 3331 (BR, K, PRE, WAG), 3340 (FHO, K, WAG), 3705 (ABI, WAG), 4566 (WAG); Ananda-Mbayakro road, Bouquet 5 June 1962 (ABI, WAG); Mt. Ma-fou (Aug.) F. Hallé 974 (P, WAG); 15 km NE. of Bianouan, Leeuwenberg 3925 (WAG).

Ghana: Cape Coast, Brass s.n. (BM); *ibid.*, J. B. Hall 1913 (K); Asama, near Anamabu, J. B. Hall 1662 (K, WAG); Prang (June) Vigne 3901 (K, P); Aframso (Oct.) Vigne 4033 (EA, FHO); Volta R. For. Res., Morton A 4673 (K); Abetifi (Aug.) Plumtre 205 (GC, K); sin. loc. Burton & Cameron s.n. (K, paratype of *S. chrysocarpa*).

Nigeria: Ibadan South For. Res. (July) Ahmed & Chizea FHI 19782 (FHI, FHO, K, P); *ibid.* (Aug.) Keay FHI 25366 (K); Owo For. Res., Ondo Province (fr. Apr.) A. P. D. Jones FHI 3133 (FHI, FHO); Ukpon For. Res., Ogoja Prov. (July) Latilo FHI 31874 (FHI, K).

Cult.: Adiopodoumé, Ivory Coast, Leeuwenberg 4577 (WAG, seedlings of herb. Leeuwenberg 3705); Wageningen, Leeuwenberg 7823 (WAG, seedling of herb. Leeuwenberg 3705).

Notes. *S. splendens* is related to *S. scheffleri* (q.v.) and *S. soubrensis* (q.v.). It is immediately recognized by its extremely short corolla tube.



MAP 39. ● *S. splendens*, ■ *S. staudtii*, ▲ *S. ternata*; Map 40. *S. talbotiae*; Map 41. *S. tchibangensis*; Map 42. *S. tricalysioides*; Map 43. *S. urceolata*.

64. *S. staudtii* Gilg, Notizbl. Bot. Gart. Berlin 1: 182. 1896; Baker in Fl. Trop. Afr. 4(1): 528. 1903; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 24. 1931; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 43. 1963.

Fig. 41, p. 252; Phot. 5, p. 254; Map 39, p. 251

Type: Cameroun: Johann-Albrechtshöhe (= Kumba), Staudt 616 (holotype not seen, destroyed in B; lectotype: K, other isotypes seen: COI, G, LE, P, S, Z).

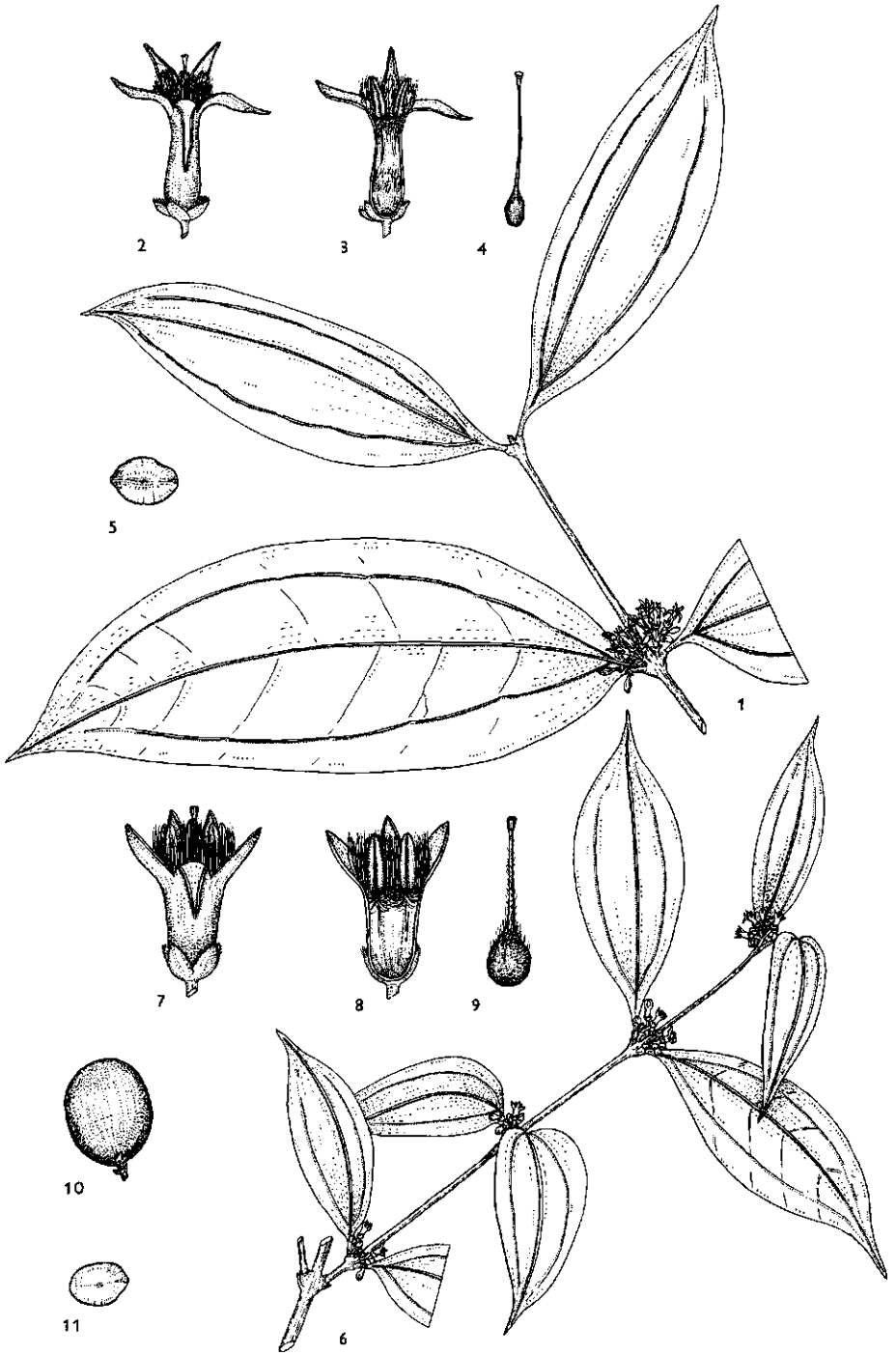


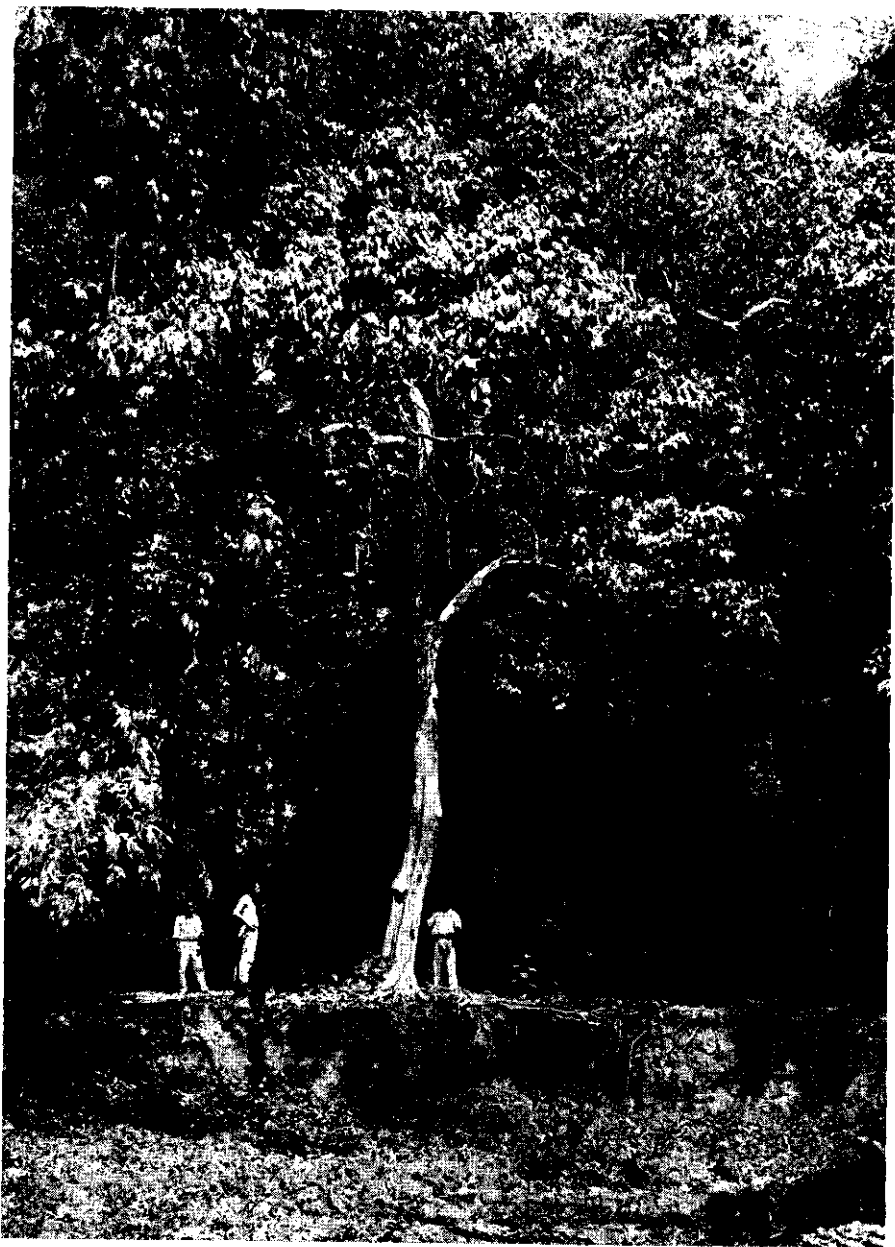
FIG. 41. 1-5. *S. staudtii*: 1. branch, $\frac{1}{2} \times$; 2. flower, $3 \times$; 3. opened flower, $3 \times$; 4. pistil, $3 \times$; 5. seed, $\frac{1}{2} \times$ (1-5. Breteker c.s. 2575); 6-11. *S. zenkeri*: 6. branch, $\frac{1}{2} \times$; 7. flower, $4 \times$; 8. opened flower, $4 \times$; 9. pistil, $4 \times$; 10. fruit, $\frac{1}{2} \times$; 11. seed, $\frac{1}{2} \times$ (6-9. Zenker 2436; 10-11. Pierlot 2373).

Tree, 7.50–20 m high. Trunk somewhat fluted, 40–60 cm in diam., or less. Bark very thin, grey-brown, with large lenticels; wood hard, very pale yellowish-brown. *Branches* pale grey to pale brown, not lenticellate, sometimes umbellately branched; branchlets mostly minutely pubescent below the stipular line, further glabrous, pale to medium brown or pale grey, not lenticellate nor sulcate. *Leaves*: petiole glabrous or with some minute hairs, 3–8 mm long; blade dark green and slightly shining above, somewhat paler beneath, papyraceous when living, coriaceous when dry, elliptic or narrowly elliptic, 2–3.5 × as long as wide, (8)10–20.5 × (3)4–8.5 cm, often shortly acuminate at the apex, cuneate or rounded at the base, glabrous on both sides; one pair of secondary veins from above the base curved along the margin and a faint submarginal pair from the base; costa and main secondary veins impressed above, prominent beneath; tertiary venation not distinctly reticulate. *Inflorescence* axillary, rather congested, few-flowered, much shorter than the leaves, 1.5–3 × 1.5–2.5 cm, 1–3 × branched. Peduncle, branches, and pedicels shortly pubescent all over. Bracts small, approximately sepal-like, beneath shortly pubescent like the peduncle, above glabrous and often (?) with some colleters at the base. *Flowers* (4–)5-merous. *Sepals* greenish-white, connate at the base for one-third of their length, broadly ovate to suborbicular, 1–1.6 × as long as wide, 1.5–3 × 1.5–2.2 mm, obtuse or rounded at the apex, minutely ciliate, minutely puberulous outside, glabrous and with colleters at the base inside. *Corolla* in the mature bud 3.7–5.3 × as long as the calyx, 8–11 mm long, and rounded at the apex, outside greenish-white, inside white, turning pale yellow, outside minutely puberulous, especially on the tube, inside with two rings of white brush-like hairs, one on the middle of the tube and one on a narrow corona in the throat; corona annular, 0.5–1 mm high, entire or with 5 very short broad lobes opposite the corolla lobes; tube somewhat ventricose in the middle or widely cylindrical, 2–2.6 × as long as the calyx, 1–1.4 × as long as the lobes, 4–6.5 mm long, at the throat 2–4 mm wide; lobes narrowly triangular, 2–2.6 × as long as wide, 4–5 × 1.5–2.5 mm, acute, spreading. *Stamens* exerted; filaments glabrous, short, about 0.4–1 × as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, 1.5–2 × 0.4–1 mm, deeply cordate to sagittate and mostly shortly bearded at the base; cells parallel. *Pistil* glabrous, pale green, 8.5–10 mm long; ovary ovoid or broadly ovoid, 2–2.5 × 1.5–2 mm, 2-celled, more or less gradually narrowed into the style; style 6–8 mm long, rather thin; stigma white, small, capitate. In each cell 20–30 ovules. *Fruit* white, small, subglobose, 22 × 20 – 37 × 35 mm, 1- to (probably) several-seeded. Wall thin, dry 1–1.5 mm thick. *Seed* pale brown, nearly elliptic, flattened, 20 × 15 × 7 – 23 × 17 × 7 mm, rather rough, very shortly scabrid-pubescent. Testa thick.

Distribution: Cameroun, Gabon.

Ecology: Rain forests, often on river banks; alt. up to about 400 m.

Cameroun: Johann-Albrechtshöhe (= Kumba) Staudt 616 (COI, G, K, LE, P, S, Z, type), 966 (A, BM, BO, E, G); Koto Barombi, Kumba District, Babute 11 (K); S. of Ebonji, Olorunfemi FHI 30598 (K); between Baimayan and Barombi (Feb.) Binuyo & Daramola FHI



PHOT. 5. *S. staudtii*: tree, with Mr. Breteler and two Camerounese assistants (Breteler c.s. 2575).

35511 (FHO, K, P); left bank Mungo R., near bridge in Kumba-Loum road (fl., fr. Feb.) Breteler, J. de Wilde & Leeuwenberg 2575 (BR, K, P, WAG, YA); *ibid.*, Leeuwenberg 6849 (WAG, seedlings of preceding).

Gabon: Boucimbi, Upper Ngounyé R. (Sept.) Le Testu 6093 (P, WAG); Lastourville Region, Le Testu 7563 (P, WAG).

Note. *S. staudtii* is closely allied to *S. zenkeri* by the habit, leaves, inflorescences, outside of flowers, fruits, and seeds. They differ strikingly in the following characters:

Corolla with two rings or hairs inside; pistil glabrous *S. staudtii*

Corolla with one ring of hairs only in the throat; pistil pilose-pubescent

S. zenkeri

65. *S. talbotiae* S. Moore in Cat. Talbot's Nig. Pl. 69. 1913; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 43. 1963; Leeuwenberg Act. Bot. Neerl. 14: 219. 1965. **Fig. 42, p. 256; Map 40, p. 251**

Type: Nigeria: Oban, Calabar Province, Talbot 2077 (BM, holotype; isotype: K).

Heterotypic synonym: *S. reygartii* De Wild., Pl. Bequaert. 2: 99. 1923. Type: Congo (Kinshasa): Equateur, Bumba Territory, Dundusana, Reygaert 225 (BR, holotype).

Liana. *Branches* greenish-brown-spotted, not lenticellate; branchlets glabrous, slightly sulcate and pale to medium brown when dry, more or less terete. Tendrils paired. *Leaves*: petiole glabrous, 4–8 mm long; blade when dry shining and pale brownish-green above, less shining and paler beneath, coriaceous, elliptic or narrowly elliptic, 1.5–3 × as long as wide, 7–12 × 3.5–8.5 cm, acuminate at the apex, cuneate at the base, glabrous on both sides; one or two pairs of secondary veins from above the base curved along the margin and often a faint submarginal pair; tertiary venation reticulate, especially beneath. *Inflorescence* axillary, many-flowered, 2–2.5 × 1.5 cm, 3 × branched, much shorter than the leaves, more or less congested. Peduncle and branches glabrous or nearly so. Bracts sepal-like, but mostly smaller than the sepals, without colleters, appressed-pubescent above at the base. *Flowers* 5-merous. *Sepals* subequal or unequal, connate at the base for about one-quarter of their length, suborbicular, as long as wide, 0.8–1.2 mm long, rounded at the apex, ciliate, glabrous or minutely pubescent outside, inside with a horizontal stripe of pubescence on the level where they are united, that is interrupted in the middle, without colleters. *Corolla* in the mature bud 2–2.5 × as long as the calyx, 2 mm long, rounded at the apex, pale yellow (?), outside pubescent, inside with a ring of villose hairs in the throat; tube shorter than the calyx, 0.7 mm long; lobes triangular to ovate, 1.8 × 1 mm, acute, suberect. *Stamens* exerted; filaments nearly as long as the anthers, glabrous or with a single hair, inserted at the mouth of the corolla tube; anthers cordate, 1 × 0.6–0.8 mm, bearded with villose hairs at the cordate base; cells parallel. *Pistil* pubescent in the upper portion, 2.5 mm

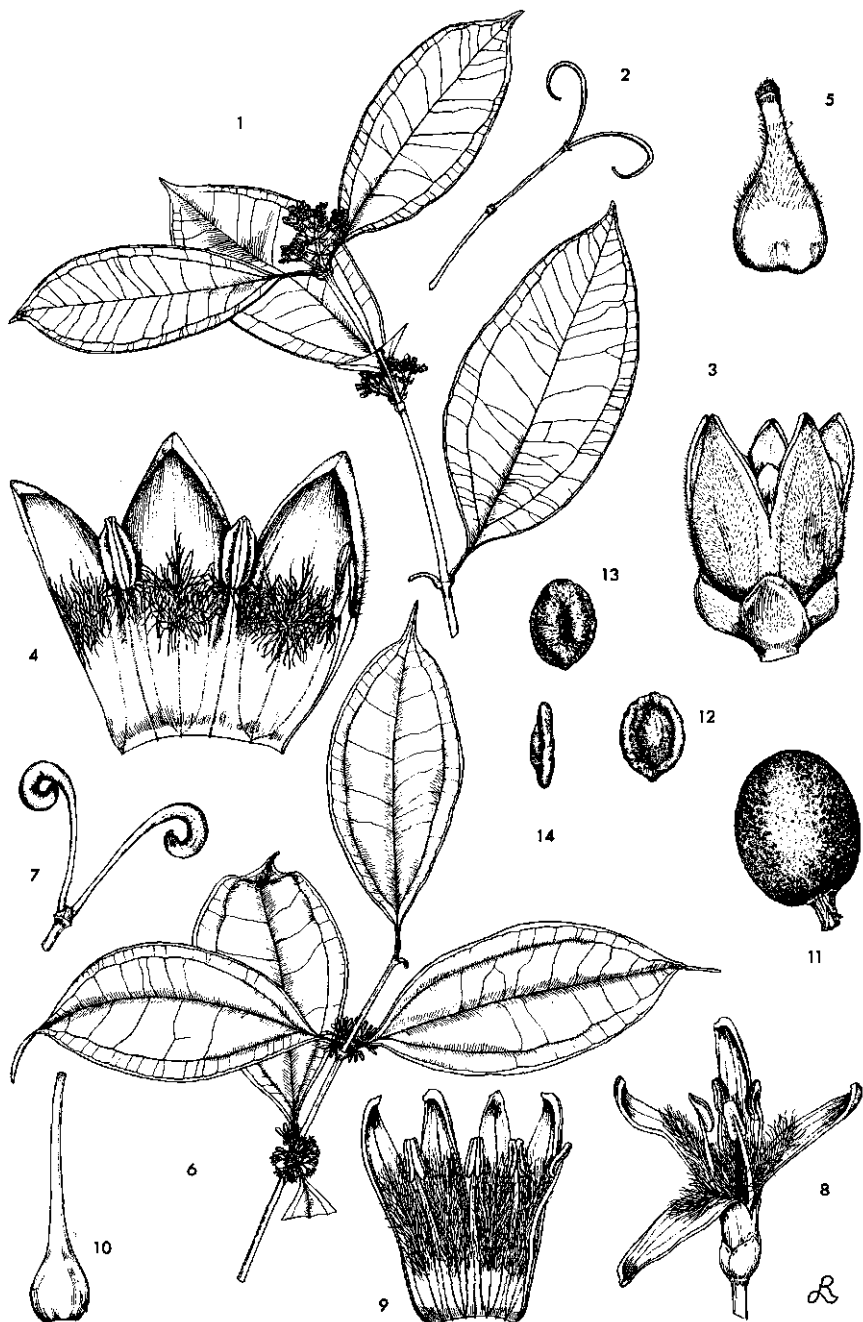


FIG. 42. 1-5. *S. talbotiae*: 1. branch, $\frac{1}{2} \times$; 2. tendrils, $\frac{1}{2} \times$; 3. flower, $7 \times$; 4. portion of corolla with stamens, $10 \times$; 5. pistil, $12 \times$ (1-5. W. de Wilde 2202). 6-14. *S. tricalysioides*: 6. branch, $\frac{1}{2} \times$; 7. tendrils, $\frac{1}{2} \times$; 8. flower, $5 \times$; 9. opened corolla with stamens, $5 \times$; 10. pistil, $8 \times$; 11. fruit, $\frac{1}{2} \times$; 12-14. seeds, 3 sides, $\frac{1}{2} \times$ (6, 8-10. Mildbraed 10576; 7, 11. Leeuwenberg 5389; 12-14. FHI 18929).

long; ovary ovoid, pubescent at the very apex, further glabrous, 1.5–2 × 1–1.2 mm, 2-celled; style short, 1 mm long or less; stigma capitate. In each cell 10–12 ovules. *Fruit* about 3 cm in diam., several-seeded. Wall rather thin. *Seed* flattened, rough (?).

Distribution: Nigeria, Cameroun, Congo (Kinshasa).

Ecology: Rain forests, often on river banks; alt. about 0–500 m.

Nigeria: Oban, Calabar Province, Talbot 2077 (BM, K, type).

Cameroun: bank of small river, N. of Kélé R., about 50 km NNW. of Eséka (Mar.) W. de Wilde 2202 (WAG).

Congo (Kinshasa): Equateur: Gbo-Sassa (Mar.) Evrard 380 (BR); Dundusana, Bumba Territory (Apr.) Reygaert 225 (BR, type of *S. reygartii*).

Notes. The types of *S. talbotiae* and *S. reygartii* resemble each other so strikingly that there is no doubt they belong to a single species.

S. talbotiae is distinguished from its nearest relative, *S. chrysophylla* (q.v.).

66. *S. tchibangensis* Pellegr., Bull. Mus. Hist. Nat. Paris 32: 394. 1926; Mém. Soc. Linn. Nor. n. sér. 1: 39, f. 9. 1928; Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 23, f. 7 B. 1952.

Fig. 37, p. 229; Map 41, p. 251

Type: Gabon: Ganda, Le Testu 1175 (P, lectotype; isotypes: B, IFAN, P).

Climbing shrub or liana. Trunk 5 cm in diam. (or more). Bark dark brown, with large lenticels; wood creamy. *Branches* not lenticellate, terete, medium to dark brown and slightly sulcate when dry; branchlets sparsely pubescent to nearly glabrous (in a single branch), medium to dark brown and slightly sulcate when dry. Tendrils solitary. *Leaves*: petiole sparsely pubescent, 3–7 mm long; blade medium green and slightly shining to mat above, paler and sometimes with dark veins beneath, thinly coriaceous or papyraceous also when living, elliptic, narrowly elliptic, narrowly ovate, or on the main axis or at the bases of the branchlets often ovate, (1.3)2–3(4) × as long as wide, 3–10(12) × 1–4(6.5) cm, acuminate to caudate at the apex, cuneate or rounded at the base, glabrous on both sides or sometimes with few hairs at the base beneath; one or two pairs of secondary veins from or from above the base curved along the margin and a faint submarginal pair; tertiary venation reticulate, not very conspicuous. *Inflorescence* terminal, lax at the base, congested in the ultimate branchings, many-flowered, 3 × 2 – 5.5 × 4.5 cm, 3–4 × branched. Peduncle and branches pubescent as the very short pedicels. Lower bracts often leafy, otherwise narrowly triangular to linear and often pubescent and with colleters at the base above, upper narrowly triangular to linear and often pubescent and with colleters at the base above, or sepal-like and glabrous above and without colleters. *Flowers* 5-merous. *Sepals* pale green, connate at the base for one-quarter to one-third of their length, equal, broadly ovate, about as long as wide,

1.2–1.5 × 1.2–1.4 mm, acute at the apex, ciliate, outside minutely pubescent, especially at the base, inside glabrous, without colleters. *Corolla* in the mature bud 3–3.7 × as long as the calyx, 4.5 mm long, white or greenish, outside shortly pubescent, inside white-penicillate in the throat; tube nearly cylindrical above the contracted base, 2–2.3 × as long as the calyx, 1.6 × as long as the lobes, 2.8 mm long, at the throat 2.5 mm wide; lobes 1.7 × 1–1.1 mm, acute, suberect. *Stamens* included; filaments very short, 0.3 × as long as the anthers, glabrous, inserted at two-thirds from the base of the corolla tube; anthers narrowly triangular, 1.3 × 0.6 mm, deeply cordate at the bearded base; cells parallel. *Pistil* glabrous, 2.5–3 mm long; ovary globose, 1 mm long, abruptly narrowed into the style, 2-celled; style 1.5 mm long; stigma capitate, up to 0.5 mm long. In each cell 18–30 ovules. *Fruit* orange, immature pale green or glaucous, small, soft, ellipsoid, 19 × 13–14 mm, mucronate, 1(–2)-seeded, with somewhat granular skin. Wall thin. *Seed* not much flattened, ellipsoid, 11 × 9 × 7 – 12 × 10 × 7 mm, glabrous, smooth, often slightly dented at one side. Testa thin, sticking to the pulp.

Distribution: Cameroun, Gabon, Congo (Kinshasa).

Ecology: River banks in rain forests; alt. 0–600 m.

Cameroun: bank Nyong R., 40 km SE. of Yaoundé, Breteler 1780 (P, WAG, YA); left bank Sanaga R., near Ebaka (May) Breteler 1430 (BR, K, P, WAG, YA); 5 km NE. of Doumé, Breteler 1695 (K, P, WAG, YA); bank Doumé R., near Bimbia, 40 km SW. of Batouri (Apr.) Breteler 2802 (WAG) = Letouzey 4759 bis (P, WAG, YA); bank Dja R., between Edjune and Meu Rs., Letouzey 3773 (P, WAG, YA).

Gabon: Mayombe Bayaka, Tchibanga (Dec.) Le Testu 1909 (A, B, FHO, P, paratype); Tchibanga (Jan.) Le Testu 2131 (IFAN, P, paratype); Ganda (Oct.) Le Testu 1175 (B, IFAN, K, P, lectotype).

Congo (Kinshasa): Equateur: Lukolela, Pynaert 267 (BR). Orientale: Yangambi (fr. Feb., Oct.) Louis 13645 (BR, K, MO, P), 16186 (BR).

Note. *S. tchibangensis* resembles *S. urceolata* when fruiting, as is noted under the description of the latter.

67. *S. ternata* Gilg ex Leeuwenberg, Act. Bot. Neerl. 14: 224, f. 2. 7–14. 1965 (Gilg in Mildbraed, Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped. 1910–1911. 2: 62. 1922, nomen).

Fig. 43, p. 253; Phot. 6 p. 261; Phot. 7, p. 263; Map 39, p. 251

Type: Cameroun: Mopwo, km 22 of Yokadouma-Batouri road, Letouzey 5271 (WAG, holotype; isotypes: A, BR, G, K, P, PRE, YA).

Medium sized deciduous forest tree, 12–25 m high. Trunk 70–80 cm in diam., with long narrow buttresses by which it is more or less irregularly fluted; bark thin, pale grey-brown, somewhat scaly; wood hard, yellowish, with paler

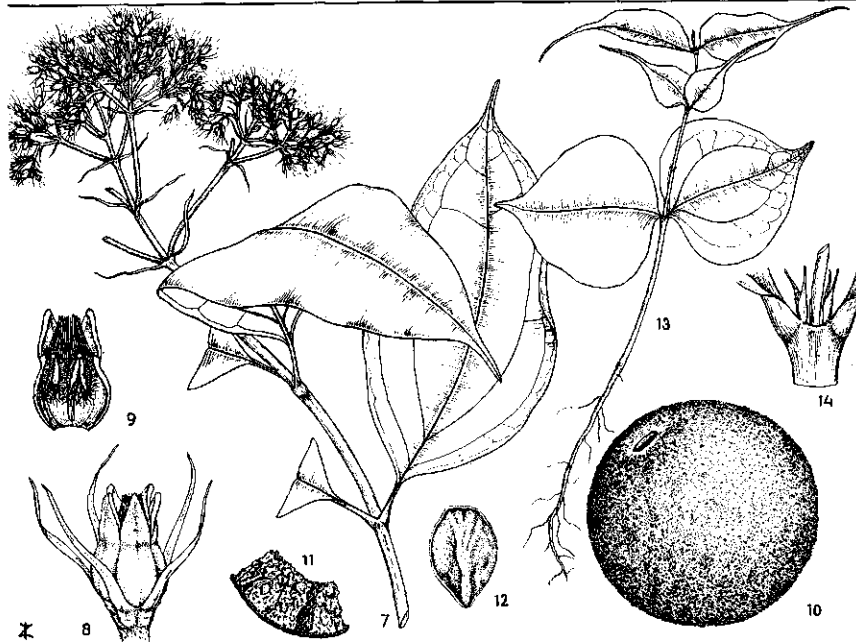
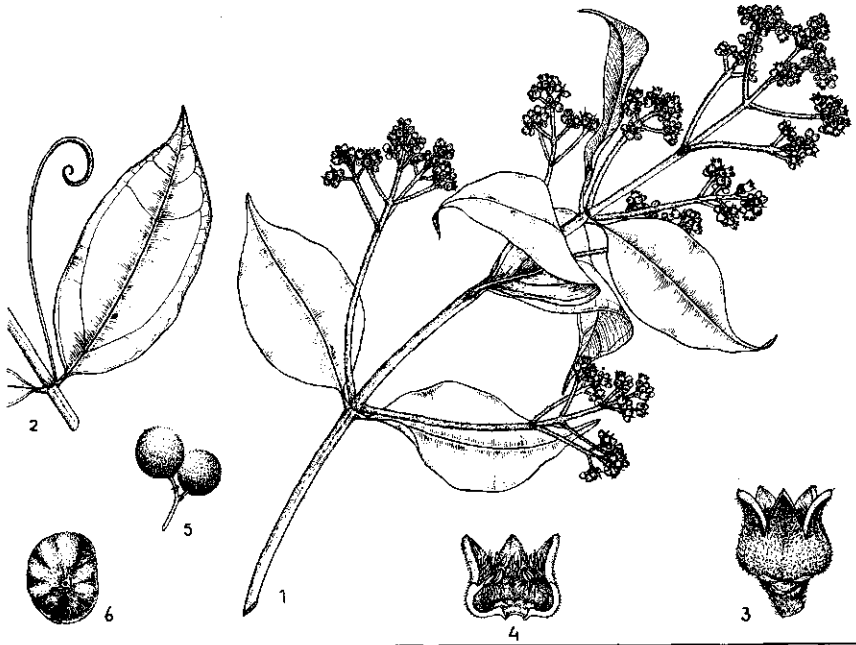


FIG. 43. 1-6. *S. urceolata*: 1. branch, $\frac{1}{2} \times$; 2. portion of branch with tendril, $\frac{1}{2} \times$; 3. flower, $5 \times$; 4. opened corolla, $5 \times$; 5. fruits, $\frac{1}{2} \times$; 6. seed, $1 \times$ (1-4. Bretelet 2803; 5-6. Tisserant 1852). 7-14. *S. ternata*: 7. branch, $\frac{1}{2} \times$; 8. flower, $5 \times$; 9. opened corolla, $5 \times$; 10. fruit, $\frac{1}{2} \times$; 11. portion of fruit wall, $\frac{1}{2} \times$; 12. seed, $\frac{1}{2} \times$; 13. seedling, $\frac{1}{2} \times$; 14. node of seedling with stipules, $5 \times$ (7-9. Letouzey 5271; 10-12. Bretelet 2196; 13-14. Bretelet 2994).

sapwood, without bark-islets. *Branches* unarmed, obscurely lenticellate, pale brown; branchlets often with few hairs when young, soon glabrous, not lenticellate and green when young, like branches when leaves mature. Stipules deciduous (only seen in seedling with very young leaves), 4 on each node, at bases of petioles, small, narrowly triangular. Stipular line distinct. *Leaves* opposite, never ternate; petiole with some hairs or glabrous, 5–15 mm long; blade shining and dark green above, less shining and paler beneath, papyraceous to coriaceous also when living, elliptic, oblong, or ovate, 1.5–2.7 × as long as wide, 10–20 × 4–10 cm, (or sometimes some smaller), apiculate, acuminate, or nearly caudate at the apex, rounded or cuneate at the base, glabrous above, beneath on main veins partially hirsute; 2–4 pairs of distinct secondary veins curved along the margin which are impressed above and prominent beneath like the costa. *Inflorescence* terminal, seemingly umbellate, not very congested, many-flowered, 5–10 × 6–9 cm, 4–5 × branched. Peduncle, branches, and pedicels pubescent. Bracts linear, smaller upwards and then sepal-like, with several distinct colleters in the axils. *Flowers* 5-merous. *Sepals* pale green, connate at the base, unequal, linear, 4–6 × 0.2 mm, subulate at the apex, not ciliate, sparsely pubescent outside, inside often only at the base with some hairs, without colleters. *Corolla* when mature somewhat shorter than the calyx, 4.5 mm long, pale green, thin at the base, thicker towards the apex, glabrous outside, inside with an entire narrow white-penicillate corona at the mouth of the tube; tube urceolate, about half as long as the sepals and twice as long as the lobes, 3 mm long, in the middle 3 mm wide, contracted at the base and at the apex; lobes triangular, 1.5 × 0.8 mm, acute, erect. *Stamens* included; filaments shortly pubescent, twice as long as the anthers, inserted at the base of the corolla tube; anthers cordate, 1.2 × 0.8 mm, deeply cordate at the base, ciliate all around with villose hairs, but less so at the apex; cells parallel. *Pistil* pubescent, 2 mm long; ovary ovoid, 1.8 × 1.2 mm, acuminate at the apex, 2-celled; stigma subsessile. In each cell about 50 ovules. *Fruit* large, hard, dark green, often slightly yellowish, slightly shining, like a bowl, globose, 9.5–15 cm in diam., 10–90-seeded. Wall very thick, hard, ochraceous on section and inside, where it is irregularly knobby by which the thickness varies from 9 to 22 mm, even in a single fruit, thickest above the pedicel. Pulp ochraceous, scented like rotten apples, with thin fibres. *Seeds* ochraceous when in fruit, white when dried up, flattened, more or less plano-convex, obliquely ovate or elliptic, usually irregularly curved, 1.2–2 × as long as wide, 19–30 × 13–21 × 4–7 mm, smooth, shortly pubescent. Testa thick.

Distribution: S.E. Cameroun.

Ecology: Rather dry high forests with *Celtis* and *Sterculiaceae* (e.g. *Triplochiton scleroxylon* K. Schum.); alt. 600–800 m.

Uses: The fruit used as mortar (Leeuwenberg 6231).

Cameroun: km 27 of Bertoua-Bétaré Oya road, near Gounté (fr. Dec.) Breteler 2196 (BR, K, P, WAG); of same tree, Leeuwenberg 5977 (WAG); 45 km SW. of Batouri, Breteler 2855



PHOT. 6. *S. ternata*: tree (left), with prof. Finn Sandberg from Stockholm (Leeuwenberg 7324).

(WAG); near Dimako Breteler 1715 (WAG, YA); 15 km E. of Dimako, Leeuwenberg 7324 (WAG); Mopwo, km 22 of Yokadouma-Batouri road (June) Letouzey 5271 (A, BR, G, K, P, PRE, WAG, YA, type); 7 km W. of Yokadouma, along path to Lomié, Leeuwenberg 6231 (WAG); between Yokadouma and Bangé R. mouth, Mildbraed 4598 (HBG, cited by GILG); 25 km NE. of Bangé, km 75 of Yokadouma-Moloundou road, Letouzey 5154 (P, YA); Bifoum, Nké R. region, Durand 1319 (P).

Cult.: Yaoundé, Breteler 2994 (P, WAG, seedlings of herb. Breteler 2196).

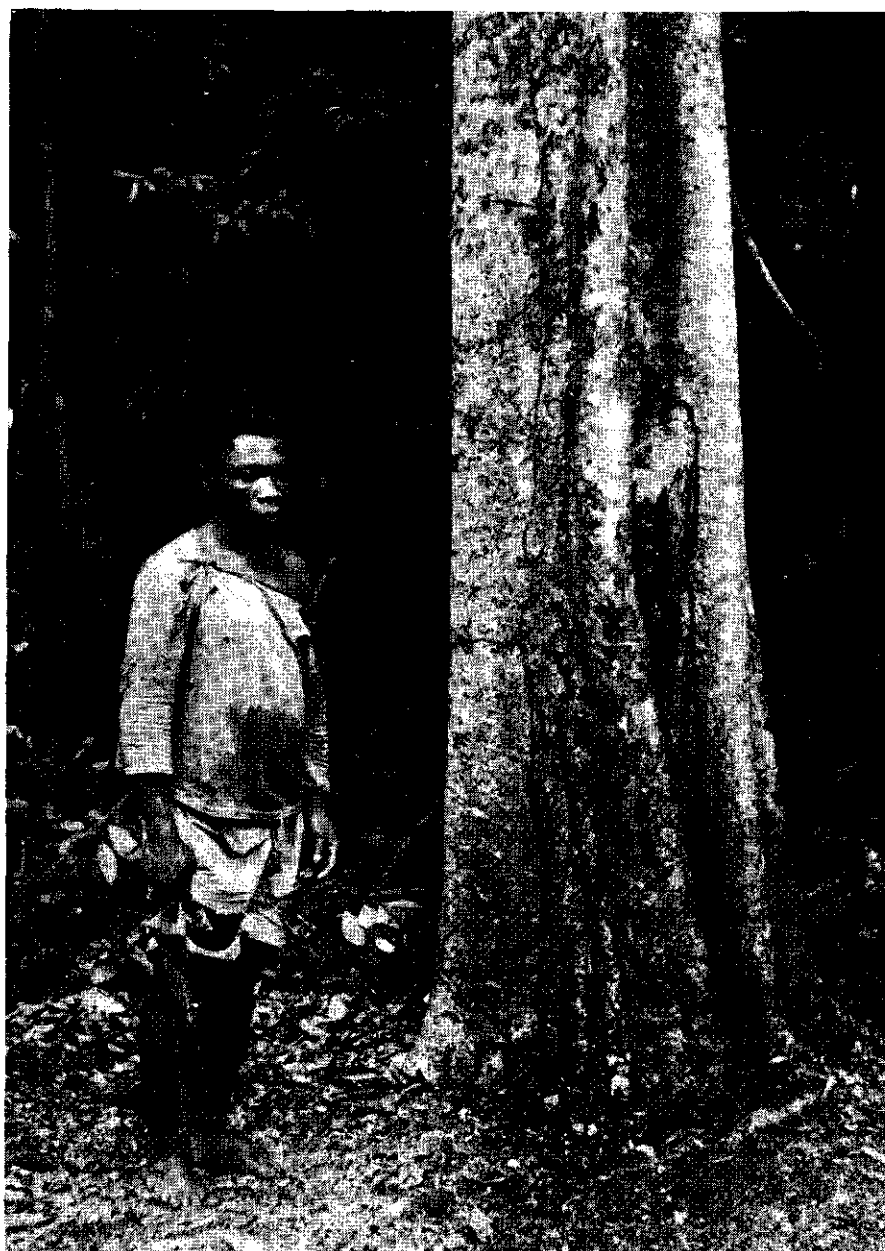
Note. The present author has never seen ternate leaves in this species. In all trees he observed the leaves were opposite.

68. *S. tricalysioides* Hutch. et M. B. Moss in Fl. W. Trop. Afr. 2: 24. 1931 and Kew Bull. 1937: 334. 1937; Leeuwenberg, Act. Bot. Neerl. 14: 219. 1965.

Fig. 42, p. 256; Map 42, p. 251

Type: Cameroun: Likomba, N.E. of Victoria, Mildbraed 10576 (K, holotype; isotype: A).

Climbing shrub or liana, 6–40 m high climbing in trees, up to at least 50 m long. Trunk 3–9 cm in diam.; bark dark brown, with large pustule-like lenticels; wood pale brown. Branches pale greenish-brown or medium brown and not sulcate when dry, terete, not lenticellate; branchlets glabrous, terete, green when living, pale greenish-brown or medium brown and not or slightly sulcate when dry. Tendrils paired. Leaves: petiole glabrous, 5–6 mm long; blade dull, above dark green, beneath somewhat paler, subcoriaceous when dry, elliptic or narrowly elliptic, 2–3 × as long as wide, 7–14 × 2.5–6 cm, caudate at the apex (cauda 10–15 mm long), cuneate at the base, glabrous on both sides; one pair of secondary veins from above the base curved along the margin to the apex and a faint submarginal pair; costa and main secondary veins impressed above (also in living leaves); tertiary venation reticulate, not very conspicuous. Inflorescences axillary, several together, seemingly fasciculate, much shorter than the leaves, 1 × 1 – 1.5 × 1.5 cm, rather congested, few-flowered, 1–2 × branched. Peduncle, branches, and pedicels short, glabrous. Bracts small, approximately sepal-like. Flowers 4-merous. Sepals connate at the base for one-quarter of their length, subequal, suborbicular, as long as wide, 1.2–1.3 mm long, rounded at the apex, minutely ciliate, glabrous on both sides, without colleters. Corolla in the mature bud 5 × as long as the calyx, 6 mm long, and tapering at the apex, creamy, outside glabrous, inside densely pilose except for the glabrous base of the tube and apex of the lobes; tube 1.5 × as long as the calyx, 2 mm long, gradually widened towards the throat, about 1.5 mm wide at the throat; lobes 1.6 × as long as the tube, oblong, 4 × 1.4 mm, acute, recurved. Stamens well-exserted; filaments glabrous, 2.5 × as long as the anthers, 2.2 mm long, inserted at the mouth of the corolla tube; anthers oblong, 0.7–0.9 × 0.4–0.5 mm, glabrous, cordate at the base; cells parallel. Pistil glabrous, 4–4.5 mm long; ovary ovoid, 0.8 × 0.8 – 1.2 × 1 mm, 2-celled; style slender, nearly 3.5 mm long; stigma small, capitate, not thicker than the style. In each cell



PHOT. 7. *S. ternata*: trunk, with Pigmee assistant (Leeuwenberg 7324).

about 10 ovules. *Fruit* orange, rather small, rather hard, subglobose or ellipsoid, $2.5 \times 2 - 4 \times 3.5$ cm, with about 1–10 seeds, with somewhat granular skin, slightly shining. Wall 2 mm thick when dry, brittle in mature fresh fruits, hard when dry. *Seed* pale brown, elliptic, flattened, $21-24 \times 16 \times 6-8$ mm, at one side with a deep pit, at the other with a bulge surrounded by a shallow groove, seemingly papillose; false papillae simulated by short curved hairs.

Distribution: SE. Nigeria, Fernando Po, Cameroun, Gabon, Congo (Brazzaville).

Ecology: Rain forests or secondary forests, mostly on river banks; alt. 0–400 m.

Nigeria: Afi For. Res., Ogoja Prov. (fr. May) Jones & Onochie FHI 18929 (FHI, FHO).

Fernando Po: N. side of Sta. Isabel Peak, Mildbraed 6353 (HBG, cited as *S. isabellina*; aberrant young vegetative specimen).

Cameroun: Likomba, NE. of Victoria (Oct.) Mildbraed 10576 (A, K, type); left bank Mungo R., near bridge in Kumba-Loum road, Breteler, J. de Wilde & Leeuwenberg 2576 (WAG); *ibid.*, Leeuwenberg 6847 (WAG); 19 km W. of Masok, near Ekem R., tributary right bank Sanaga R., Leeuwenberg 5389 (WAG); right bank Kélé R., 30 km N. of Eséka, Leeuwenberg 7468 (WAG); about 30 km ESE. of Kribi (fr. Apr.) Letouzey 9415 (WAG).

Gabon: Cristal Mts., N. Hallé & Villiers 5341 (P); near Libreville (fr. Oct.) Klaine 3152 (BR, K, P, distributed as *S. macrorrhiza*).

Congo (Brazzaville): near Kingami, Bouquet 1870 (P).

Notes. *S. tricalysioides* differs from its nearest relatives *S. barteri* and *S. gossweileri* by the thin and caudate leaves with above impressed costa and main secondary veins. Klaine 3152, which has acuminate leaves with impressed costa, shows a tendency towards *S. barteri* which is not yet known from Gabon.

69. *S. trichoneura* Leeuwenberg, sp. nov.

Fig. 33, p. 213

Liana pubescens vel hirto-pubescens ramis inermibus lenticellatis cirrhisque solitariis. Folia parva laminis ovatis ellipticis vel obovatis apice acutis mucronatisque vel rotundatis basi cuneatis, rotundatis vel subcordatis nervisque infimis curvatis. Inflorescentia terminalis pedunculo pedicellisique brevibus. Flores pentameri parvi. Sepala anguste triangularia apice acuminata intus glabra. Corolla extus seriebus pilorum pubescentium lobis suberectis alternantibus intus fauce penicillata. Stamina inclusa filamentis brevibus antherisque oblongis basi cordata barbatis. Pistillum glabrum ovario biloculari styloque brevi. Fructus ignotus verisimiliter parvus monospermus.

Type: Madagascar: Upper Bemarivo R., Boina Region (Sept.) Perrier de la Bâthie 8028 (P, holotype; isotype: WAG).

Branches not partially greyish; branchlets pubescent. *Leaves:* petiole pubescent, 0.3–2 mm long; blade shining and dark green above, mat and paler beneath, ovate, elliptic, or obovate, $1.2-2.3 \times$ as long as wide, $12-33 \times 8-16$ mm, acute and mucronate or rounded at the apex, cuneate, rounded, or sub-

cordate at the base, sparsely pubescent above, hirtopubescent beneath, especially on the costa; tertiary venation conspicuous beneath. *Inflorescence* 2 × branched, several-flowered, 0.8 × 0.6 — 1.5 × 1 cm. Bracts sepal-like. *Sepals* connate at the base, narrowly triangular, 2.2 × as long as wide, 1.2–1.3 × 0.5–0.6 mm, acuminate at the apex, pubescent outside, glabrous inside, without colleters. *Corolla* in the mature bud 2.5 × as long as the calyx, 3.2 mm long, white (?), outside with one rank of pubescent hairs between the lobes on the tube; tube 1.5 × as long as the calyx, 1.3 × as long as the lobes, 1.8 mm long. *Stamens*: filaments 0.3 × as long as the anthers, inserted on the middle of the corolla tube; anthers 0.9 × 0.5 mm. *Pistil* 1.8 mm long; ovary ovoid, 1 × 0.8 mm, gradually narrowed into the style; style 0.8 mm long. In each cell 12 ovules. *Fruit* unknown, supposed to be small and 1-seeded. Other characters see *S. pentantha*.

Distribution: Only once collected in Madagascar.

Ecology: Riverine forest, on rocks; alt. about 400 m.

Notes. *S. trichoneura* resembles the American species *S. parvifolia* A.D.C. and *S. rubiginosa* A.D.C. by the arrangement of the tendrils, and moreover, the former by the habit and the leaves and the latter by the indumentum and the inflorescence. It differs from both essentially by the insertion of the stamens which is in the tube instead of at the mouth. Furthermore, *S. parvifolia* is spiny and *S. rubiginosa* has larger leaves. The hairs in the corolla of these two American species are less stiff than the hairs in the corolla of *S. trichoneura*. They belong in *Breviflorae*. *S. trichoneura* belongs in *Penicillatae*.

70. *S. urceolata* Leeuwenberg, Act. Bot. Neerl. 14: 226, f. 2. 1–6. 1965.

Fig. 43, p. 259; Map 43, p. 251

Type: Cameroun: 40 km SW. of Batouri, Doumé R. bank, near Bimbia, Breteler 2803 (WAG, holotype; isotypes: A, BR, FI, K, M, P; Letouzey 4758 (P, YA) collected on the same day of the same plant).

Large liana, at least up to 80 m long, 10–40 m high climbing in trees. Trunk 3–18 cm in diam. Bark dark brown, with large lenticels; wood pale yellowish. *Branches* not lenticellate, medium brown; branchlets brown-pubescent, medium brown when dry. Tendrils solitary, in the axils of ordinary leaves. *Leaves*: petiole brown-pubescent, 2–4 mm long; blade slightly shining and medium green above, somewhat or much paler beneath, subcoriaceous, elliptic, narrowly elliptic, ovate, or narrowly ovate, comparatively wider on the main axis and at the bases of the branchlets, (1)1.5–3.5 × as long as wide, 3–7.5(11.5) × 1.5–3 (4.5) cm, acuminate at the apex, cuneate, rounded, or on the main axis sometimes subcordate at the base, often sparsely pubescent on the costa on both sides, and on the main secondary veins beneath, furthermore beneath often barbate in the axils of the upper pair of main secondary veins which arise from

about 0.5–1 cm above the base and reach nearly the apex; lower pair less conspicuous, arising from the base; tertiary venation inconspicuous. *In-florescence* terminal and often at the same time axillary, lax, many-flowered, 8–15 × 5–10 cm, 4–5 × branched. Peduncle, branches, and pedicels brown-pubescent. Lower bracts often leafy; other small, diminishing in size, upper most approximately sepal-like, pubescent beneath. *Flowers* 5-merous, sweet-scented. *Sepals* pale green, about one-third connate, equal, triangular, as long as wide, 0.6–1 mm long, acute, ciliate, pubescent outside, glabrous inside, without colleters. *Corolla* in the mature bud 3 × as long as the calyx, 2–3 × 2 mm, and rounded at the apex, pale grey-green, urceolate, minutely pubescent on both sides and inside pilose on the base of the lobes; tube slightly longer than the calyx, 0.7–1 mm long; lobes narrowly triangular, 1.5–2 × as long as the tube, 1.2–2 × 1–1.2 mm, acute, suberect. *Stamens* slightly exerted; filaments glabrous, about as long as the anthers, inserted at the mouth of the corolla tube; anthers triangular to ovate, 0.6 × 0.5 – 1 × 0.8 mm, cordate at the base, ciliate all around or more often only at the base; cells parallel. *Pistil* glabrous, 1.3–1.6 mm long; ovary depressed-globose, 0.7–0.8 × 1 mm, rather abruptly narrowed into the style, 2-celled; style 0.6–0.7 mm long; stigma capitate. In each cell 8–10 ovules. *Fruit* orange, small, soft, ellipsoid, 12 × 10 – 14 × 12 mm, 1-seeded, mat. Wall thin. *Seed* medium brown, ellipsoid, flattened, 11 × 9 × 3 mm, biconvex, shortly and densely pubescent, rather rough. Testa thick, not sticking to the pulp.

Distribution: Nigeria and northern Central Africa.

Ecology: rain forests or secondary forests, often on river banks; alt. 0–700 m.

Nigeria: Afi For. Res., Ogoja Province, Latilo FHI 31811 (FHI, K, paratype of *S. dolichothyrsa*).

Cameroun: 2 km E. of km 58 of Edéa-Kribi road (fl. Apr., fr. Oct.) Leeuwenberg 5527 (WAG), 6811 (WAG, of same plant); 35 km SE. of Mbalmayo, Leeuwenberg 5771 (WAG); km 27 of Sangmélima-Yaoundé road, Breteler 2666 (K, P, WAG, YA); left bank Sanaga R., near Ebaka, Breteler 2913 (BR, K, P, WAG, YA, paratype); *ibid.*, Leeuwenberg 7417 (WAG); 40 km SW. of Batouri, left bank Doumé R., near Bimbia (Apr.) Breteler 2803 (A, BR, FI, K, M, P, WAG) = Letouzey 4758 (P, YA, type); km 6 of Yokadouma-Moloundou road, near Mendoungé, Breteler 1506 (WAG, YA); *ibid.*, Leeuwenberg 6123 (WAG); 15 km from Ngoko R., Mangokélé, Bouquet 1632 (P, WAG).

Central African Republic: Boukoko, N. of Bangui (fl. Apr., Oct., fr. Aug.) Tisserant 391 (P, WAG, paratype), 900 (K, P, WAG, paratype), 1852 (K, P, WAG, paratype).

Congo (Kinshasa): Equateur: Djoa, Bolombo Territory (Oct.) Evrard 5061 (BR, WAG, paratype).

Uganda: Bugala, Sese, Masaka District, A. S. Thomas 21 (K).

Note. *S. dolichothyrsa* so closely resembles *S. urceolata*, that the authors of *S. dolichothyrsa* confused them. They designated, however, the holotype of *S. dolichothyrsa* and this prevented problems of nomenclature. It ought to be noted that the name *S. urceolata* should replace *S. dolichothyrsa* in the Flora of West Trop. Africa. These species resemble each other so much, that they are

easily confused, even in the field. The differential characters appear clearly in the first key, no. 47, p. 40.

71. *S. usambarensis* Gilg, Abh. Preuss. Akad. Wiss. 1894: 36. 1894 and in Engler, Pflanzenw. Ost-Afr. C: 311. 1895; Baker in Fl. Trop. Afr. 4(1): 526. 1903; E. A. Bruce, Kew Bull. 1955: 627, f. 1 B. 1956; Verdoorn, Fl. Pl. Afr. 32: 125, pl. 1242. 1957; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 34. 1960; Leeuwenberg, Act. Bot. Neerl. 11: 47. 1962; Verdoorn in Fl. S. Afr. 26: 140, f. 18. 5. 1963; Onochie & Leeuwenberg in Fl. W. Trop. Afr. 2nd ed. 2: 44. 1963.

Fig. 44, p. 269; Map 44, p. 271

Type: Tanzania: E. Usambara Mts., Mashewa, Holst 3582 (holotype not seen, destroyed in B; lectotype: K; other isotypes seen: HBG, M, W, Z).

Heterotypic synonyms: ? *S. cerasifera* Gilg in Engler, Pflanzenw. Ost-Afr. C: 311. 1895; Baker, l.c. p. 531; Bruce & Lewis, l.c. p. 35. Type: Tanzania: coastal region, unlocalized, Stuhlmann 6089 (holotype not seen, destroyed in B; no isotype seen).

? *S. distichophylla* Gilg, l.c. p. 310; Baker, l.c. 525; Bruce & Lewis, l.c. p. 35. Type: Tanzania: Biharamulo District, Kimoani (Kimwani) Plateau, Stuhlmann 3397 (holotype not seen, destroyed in B; no isotype seen).

S. micans S. Moore, Journ. Linn. Soc. 40: 146. 1911; Verdoorn, Bothalia 3: 587–588, f. 3. 1939. Type: Rhodesia: Chirinda Forest, Swynnerton 125 (BM, holotype; isotypes: K, Z).

S. cooperi Hutch. et M. B. Moss in Fl. W. Trop. Afr. 2: 24. 1931 and Kew Bull. 1937: 355. 1937; Duvigneaud, Lejeunia 11: 74. 1947, partly (as for the type). Type: Liberia: Dukwia R., Cooper 300 (K, holotype; isotypes: A, BM, F, FHO, GH, NY, US).

Shrub, climbing shrub, large liana, or much branched small tree, as shrub 1.50–5 m high, as liana 2–20 m high or more climbing over shrubs and in trees, and up to 70 m long, as tree 3–10(15) m high. *Liana*: trunk 2–9 cm in diam. (or more ?); bark dark brown, thin, with many lenticels; wood pale yellow. *Tree*: trunk 15–25 cm in diam.; bark pale or dark grey or pale grey-brown with darker patches, smooth, on section orange; wood pale yellow. *Branches* lenticellate, usually very dark brown, often covered with a pale skin which later splits and peels off, not sulcate when dry; branchlets glabrous or shortly pubescent, near the base lenticellate, pale brown and not or slightly sulcate when dry. Tendrils solitary, only present in climbing shrubs or lianas. *Leaves*: petiole glabrous, 2–6 mm long; blade slightly shining and dark green above, less shining to dull and paler beneath, coriaceous or thinly coriaceous in the sun, in the shade thinner and thinly coriaceous or papyraceous, also when living, ovate, narrowly ovate, elliptic, or narrowly elliptic, 1.5–3 × as long as wide, 3–8 × 1.2–3.5 cm, in lianas in the shade up to 16 × 7 cm, distinctly acuminate or in the shade mostly caudate at the apex, usually mucronate at the very apex, cuneate, rounded, or occasionally subcordate at the base, glabrous on both

sides; two pairs of secondary veins from or from above the base curved along the margin, outer usually fainter; tertiary venation reticulate, inconspicuous above, prominent beneath and there not very conspicuous. *Inflorescences* axillary, solitary or several together, lax or congested, usually much shorter than the leaves, 1–2.5 × 1–1.5 cm, few-flowered, 1–3 × branched. Peduncle, branches, and pedicels glabrous or shortly pubescent. Bracts approximately sepai-like, above glabrous, upper often with colleters at the base above, lower not. *Flowers* 4–5-merous. *Sepals* pale green, connate at the base, subequal, ovate, broadly ovate, or triangular, 1–1.3 × as long as wide, 0.6–1 × 0.6–1 mm, acute or obtuse, very minutely ciliate, glabrous on both sides or shortly pubescent outside, without colleters. *Corolla* in the mature bud 3–4 × as long as the calyx, 2–3.5 mm long, and rounded at the apex, white, yellow, or sometimes orange, glabrous or minutely papillose-pubescent outside, inside with a ring of pilose hairs in the throat and often, when outside so, minutely papillose-pubescent on the lobes; tube short, urceolate, 1–1.4(1.7) × as long as the calyx, 1–1.4 mm long; at the throat 1.4–2.2 mm wide; lobes 1.4–1.6(2.7) × as long as the tube, oblong, 1.3–2.2 × as long as wide, 1.2–2.2 × 0.8–1.3 mm, acute, recurved from somewhat below the middle. *Stamens* exerted; filaments glabrous, 0.5–1.2(2) × as long as the anthers, inserted at the mouth of the corolla tube; anthers suborbicular or oblong, 1–2 × as long as wide, 0.6–0.9 × 0.3–0.7 mm, glabrous, deeply cordate at the base; cells parallel. *Pistil* glabrous, 1.1–2.5 mm long; ovary ovoid, slightly longer than wide, 0.7–1 × 0.6–0.8 mm, rather abruptly narrowed into the style, 2-celled; style short, 0.4–1.5 mm long; stigma capitate or sometimes obscurely bilobed (in a single inflorescence). In each cell 4–7 ovules. *Fruit* orange or orange-yellow, immature pale green and often with a glaucous bloom, or glaucous, small, soft, globose or subglobose, often laterally compressed, sometimes shortly stipitate within the calyx, 11–18 × 10–18 × 10–18 mm, with smooth skin, 1-seeded, mat, mostly obliquely pedicellate. Wall thin, about 0.3 mm thick. Pulp orange. *Seed* pale brown, depressed-globose or ellipsoid, 9 × 7 × 5 – 12 × 11 × 8 mm, shortly and densely pubescent, smooth, with a central hilum at one side. Testa thin.

Distribution: Tropical and northern South Africa.

Ecology: Upland and lowland rain forests and secondary forests, especially on river banks, gallery forests, semi-evergreen, and coastal evergreen bushlands; alt. 0–2000 m.

Guinea: Benna Plateaux, N. of Benty, Schnell 2180 (IFAN); Frigiabé, Chillou 512 (C).
Sierra Leone: Njala, Deighton 2788 (K); Loma Mts., Jaeger 7624 (WAG), 8732 (WAG), 9237 (WAG); Kondembaia (Mar.) Morton & Gledhill SL 1147 (WAG); Bumbuna, Thomas 3898 (K); sin. loc., Thomas 10493 (K).

Liberia: Dukwia R., Cooper 300 (A, BM, F, FHO, GH, K, NY, US, type of *S. cooperi*); Bong Range, Leeuwenberg & Voorhoeve 4935 (WAG); Ganta (?), Harley 674 (LIB); Nimba Mts., Leeuwenberg & Voorhoeve 4593 (WAG), 4654 (WAG).

Ivory Coast: Mt. Tonkouï, Jaeger 4743 (WAG); *ibid.*, Leeuwenberg 2976 (WAG), 3865

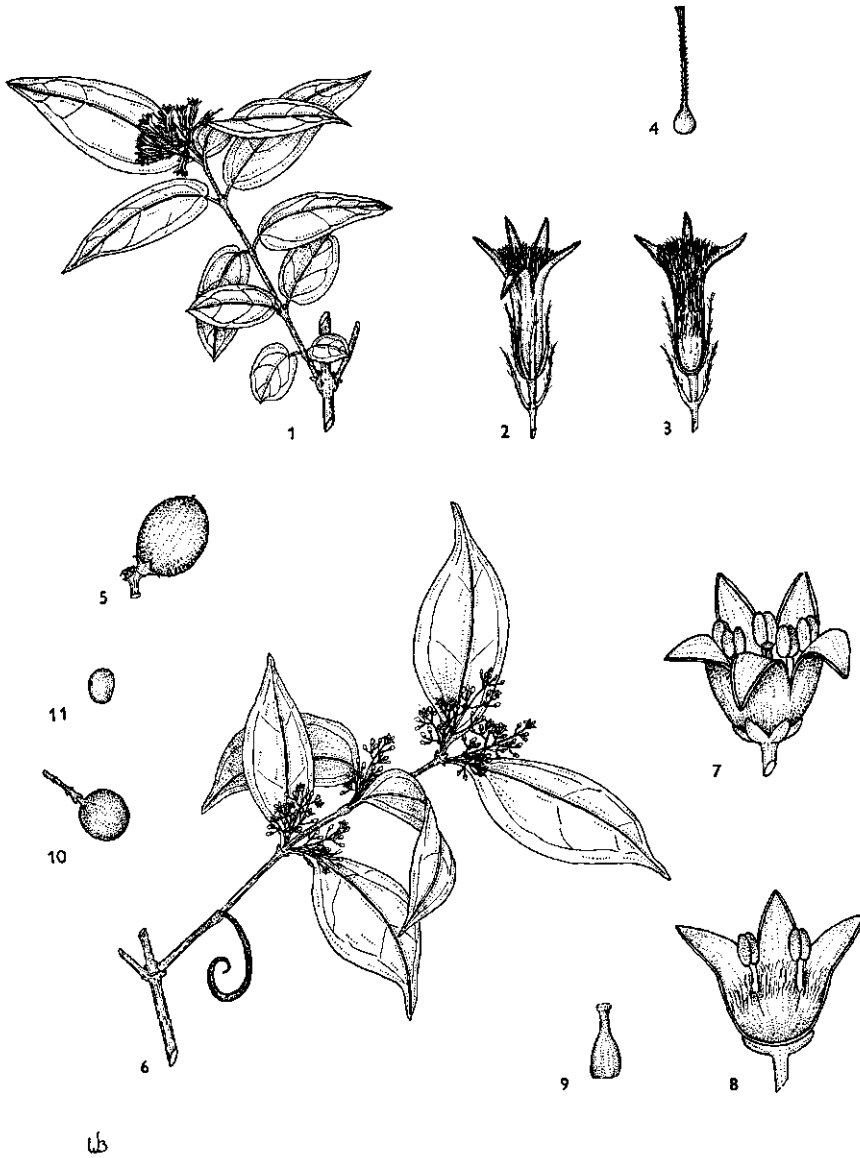


FIG. 44. 1-5. *S. variabilis*: 1. branch, $\frac{1}{2} \times$; 2. flower, $3 \times$; 3. opened flower without pistil, $3 \times$; 4. pistil, $3 \times$; 5. fruit, $\frac{1}{2} \times$ (1-4. Pauwels 4107; 5. J. Gillet 808). 6-11. *S. usambarensis*: 6. branch, $\frac{1}{2} \times$; 7. flower, $9 \times$; 8. opened flower without pistil, $9 \times$; 9. pistil, $9 \times$; 10. stipitate fruit, $\frac{1}{2} \times$; 11. seed, $\frac{1}{2} \times$ (6-9. Leeuwenberg 3710; 10. Greenway 8706; 11. Leeuwenberg 3874).

(WAG); *ibid.*, Schnell 4111 (ABT); km 53 of Duékoué-Man road, Leeuwenberg 3874 (WAG); Buyo, Sassandra R. bank, Guillaumet 1790 (WAG); 17 km NW. of Mankono, J. de Wilde 973 (WAG); N. of Mankono, Aké Assi 3837 (WAG); Marahoué R., between Bouaké and Séguéla, Aké Assi 6641 (WAG); 8 km S. of Issia, Leeuwenberg 4125 (WAG); 10 km W. of Tapéguhé, right bank Sassandra R., 50 km NW. of Soubré, Leeuwenberg 4513 (WAG); Davo R. bank, 31 km S. of Gagnoa, Leeuwenberg 4115 (WAG); Middle Sassandra R., Guidéko, Chevalier 16361 (P); about 35 km SW. of Guéyo, Leeuwenberg 4108 (WAG); 56 km N. of Sassandra, E. of Béyo, Leeuwenberg 3993 (WAG); Sassandra R. bank, 14 km N. of Sassandra (fl., fr. Apr.) Leeuwenberg 3241 (BR, FHO, K, P, WAG); 20 km NW. of Sassandra, Leeuwenberg 4558 (WAG); Monogaga, 40 km W. of Sassandra, Guillaumet 1606 (WAG); *ibid.*, Leeuwenberg 4050 (WAG); 31 km W. of Divo, Leeuwenberg 3988 (WAG); Yapo Forest, Jaeger 6059 (WAG); Kotobi-Akoupé road, Bouquet 4 June 1962 (ABI, WAG); Angedédou Forest, 22 km WNW. of Abidjan, J. de Wilde & Leeuwenberg 3426 (K, WAG); *ibid.*, Leeuwenberg 3814 (WAG); Banco Forest, NW. of Abidjan (June) Aké Assi 2945 (ABI); *ibid.*, Bouquet July 1960 (WAG); *ibid.* (Mar.) Leeuwenberg 3703 (WAG), 3710 (ABI, WAG); Bingerville-Abidjan-Dabou region, Chevalier 15530 (P); E. of Krinjabo, S. of Aboisso, Leeuwenberg 4483 (WAG); between Krinjabo and Aboisso, right bank Bia R. (June) Leeuwenberg 4488 (WAG); 15 km NE. of Bianouan, Leeuwenberg 3924 (WAG); Comoé R. bank, about 40 km S. of Wango-Fitini, J. de Wilde & Leeuwenberg 3468 (WAG), 3483 (WAG), 3489 (WAG).

Ghana: Cape Coast (Mar.) J. B. Hall 1031 (K), 1080 (K), 1200 (GC, K), 2229 (K); between Bojasao and Adiembra, Kitson 1214 (K); Achimota (Mar.) Irvine 343 (GC, K), 423 (FHO), 1456 (K); Afram R., Mankrong For. Res. (fr. Dec.) C. D. Adams 4965 (GC); km 13 of Kete Krachi-Atebubu road, C. D. Adams 4620 (GC); Akuse (Apr.) Morton A 4166 (K, WAG).

Nigeria: near Lagos, Rowland 28 (K); Olokemeji For. Res., Abeokuta Province, Jones c.s. FHI 14548 (FHI, FHO, K, WAG); *ibid.*, Onochie FHI 40276 (K); Omo For. Res., Ijebu District, Awunti FHI 36575 (FHI); Omo and Shasha For. Res., Jones & Onochie FHI 17152 (K); Dogon Kurmi, Zaria Province, Olorunfemi FHI 55659 (FHI, K, WAG).

Congo (Brazzaville): km 45 of Komono-Mossendjo road, Bouquet & Sitha 2370 (WAG).

Congo (Kinshasa): Léopoldville: Boma-Banane road, Wagemans 1442 (BR); Mbola, Boma Territory (Nov.) Wagemans 1838 (BR, WAG); Temvo, Vermoesen 1466 (BR), 1502 (BR), 1734 (BR); Kasongo-Lunda, Callens 4317 (BR); *ibid.*, DuVigneaud 786 A (BR, cited as *S. fernandiae*), 788 (BR); Bokoro (Aug.) Jans 765 (BR). Equateur: Dundusana, Bumba Territory, Reygaert 240 (BR). Orientale: Yangambi (fr. May) Louis 3852 (BR, K, P, PRE, distributed as *S. stenura*), 3928 (BR, MO).

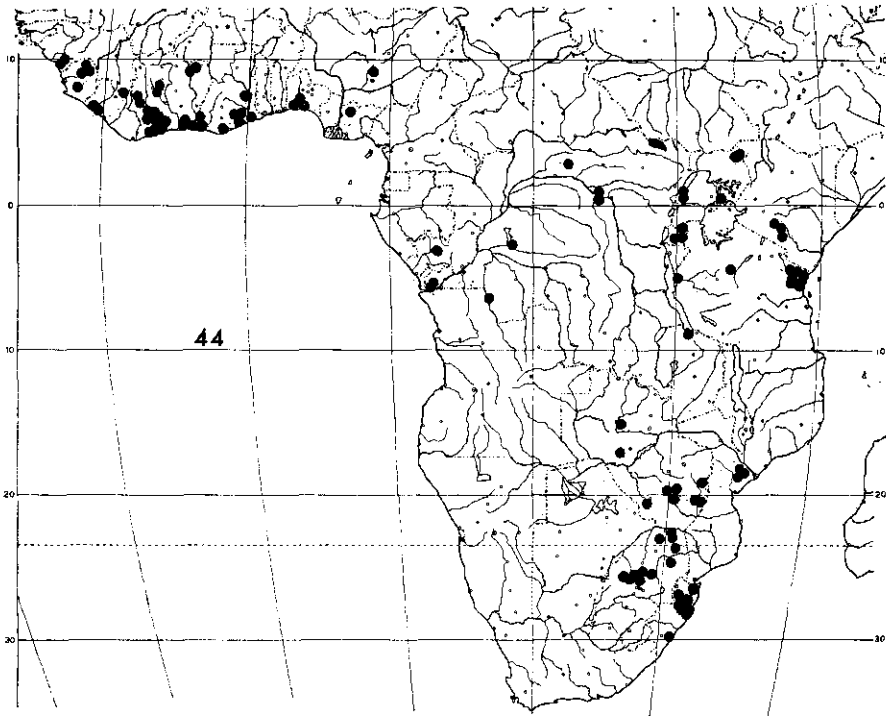
Rwanda: Akagera Nat. Park, Troupin 7484 (BR), 8691 (BR, WAG); near Kigali, Becquet 433 (BR); Gasharu, Kigali Territory, Liben 1222 (BR, ENT, PRE, WAG).

Uganda: Kibale Forest, Dawe 531 (ENT, K); Mpanga Mt., Bagshawe 1174 (BM); Bwenda, SW. of Busoga, Dale U 151 (EA); Kaabong (June) Dale U 280 (EA, ENT, K); Timu Forest, N. Karamoja, Eggeling 5684 (EA); *sin. loc.*, Poulton Apr. 1926 (K).

Kenya: Machakos district, Clayton 45 (EA, K); *ibid.*, Hemming 223 (EA, K), 233 (EA, FI, K); Nairobi (Mar.) Battiscombe 464 (EA, K); *ibid.*, H. M. Gardner in Battiscombe 936 (EA, K); *ibid.* (Mar.) van Someren 1810 (EA, K); Emali Hill, van Someren 97 (K); *sin. loc.*, Scott Elliot 346 (K).

Tanzania: W. of Lugufu, Uvinza Region, Peter 46151 (B); Igunga, Burt 4785 (EA, FHO, K); Mkomazi Game Res., Tanga Province, Ibrahim 707 (EA); near Mashewa, Lushoto District, Drummond & Hemsley 3099 (B, BR, EA, K, LISC, S, SRGH); *ibid.*, Peter 13760 (B); *ibid.*, Holst 3582 (HBG, K, M, W, Z, type); Ndola For. Res., Makuyuni, Semsei 2942 (EA, M, PRE); Moa District (fr. Dec.) Greenway 4247 (BR, EA, FHO, K); near Moa, Brenan & Greenway 8316 (BM, BR, EA, FHO, K); *ibid.*, Greenway 8706 (EA, K, PRE); Mangubumisoswe (Feb.) Greenway 2897 (EA, FHO, K, WAG); E. Usambara Mts., Maramba, Peter 21122 (B); 8 km SE. of Ngomeni, Drummond & Hemsley 3607 (BR, EA, K, SRGH); Sindeni, Handeni District, Burt 4885 (EA, FHO, K); Msubugwe For. Res., Pangani District, Mgaza 73 (EA, FHO, K).

Zambia: Lunzua R., near Abercorn, R. E. Fries 1234 (UPS); Kafwala, Fanshawe 7003 (K); Kalomo, Mitchell 15/30 (K).



MAP 44. *S. usambarensis*.

Rhodesia: Matobo District, Guy 1/58 (K, SRGH); *ibid.* (fr. Sept.) Plowers 1465 (BR, MO, PRE, SRGH); Selukwe District, Biegel 1543 (WAG); km 45 of Uvuma-Fort Victoria road (fl., fr. May) Grout 22/47 (FHO, SRGH); Fort Victoria, Eyles Herb. Q.V.M. 6601 (SRGH); Umtali District (fr. Aug.) Chase 553 (BM, PRE, SRGH), 1656 (BM, LISC, SRGH), 4146 (BM, BR, COI, MO, NY, PRE, SRGH); *ibid.*, Fisher 1525 (SRGH); Vumba, Ferrar 4099 (PRE); Bikita District, O. West 6332 (WAG); Chirinda, Hack 7 (FHO, SRGH); Chirinda Forest, Chipinga District, Goldsmith 137/62 (BR, K, LISC, WAG), 18/67 (WAG); *ibid.* (Dec.) Swynnerton 125 (BM, K, Z, type of *S. micans*); *ibid.*, H. Wild 2238 (BR, K, S, SRGH).

Moçambique: Manica e Sofala: Inhamitanga (Dec.) Simão 28 (LISC), 1282 (PRE); Cheringoma, between Inhamitanga and Lacerdonia, Torre 4095 (LISC). Lourenço Marques: Maputo (Jan.) R. M. Hornby 2547 (BM, PRE, SRGH); *ibid.*, Goba, Balsinhas 173 (K, LISC, PRE); *ibid.* (fr. Nov.) Mendonça 3065 (LISC); Salamanga, Mendonça 4504 (LISC).

Swaziland: Hlatikulu Forest, Boocock 22 (PRE, PRF); Mapungwana or Tilobe Forest, O. B. Miller 8/82 (FHO).

South Africa: Transvaal: Boshhoek, Rustenburg District (fr. Oct.) R. Rose Innes 22177 (J); Jacksonstuin, Brits District (fr. May) Leistner 184 (K, L), 657 (K, NBG, PRE); *ibid.* (Jan.) Marais 1107 (K, M, WAG); *ibid.*, Obermeyer 30996 (K); *ibid.*, Story 744 (K); *ibid.* (Feb.) Strey 2865 (K, M); Bakfontein, Brits District (fr. Oct.) Vahrmeyer 1262 (K); Pretoria District, Repton 4286 (K); *ibid.*, near Rust der Winter, Codd 6297 (K); Loskop Dam, Middelburg District, Mogg 20458 (K); Soutpansberg, Smuts & Gillet 4106 (PRE); Ramputas, Soutpansberg District, Curson & Irvine 129 (PRE); Sibasa District, van Warmelo 51219/21 (K);

Cyprus Kloof, Letaba District (Jan.) Anonym. 196 (K); Abel Erasmus Pass, Lydenburg District, Poynton PRF 11626 (PRF); *ibid.*, Strey 3300 (K, M, SRGH). Natal: Pongolo Poort-Repton 5995 (PRE); Pongolo R. bank, D. Edwards 2917 (K); Ubombo District, Acocks 13114 (PRE); *ibid.*, Codd 2061 (K); Mkuze Game Res., Guy 84 (K); Hluhluwe Game Res., Hlabisa District, Guy 118 (NH); near Hlabisa, Gerstner 3104 (K); Durban (fr. Mar.) Marriot 4 = NH 28147 = PRE 23198 (BM, K, NH), PRE 23047 (K); *ibid.*, Meebold 13027 (M).

Cult.: Nairobi, Kenya (fr. Mar.) Greenway 8716 (EA, FHO, K, PRE); Luki, Léopoldville Province, Congo, Wagemans 1777 (BR, seedlings of Herb. Wagemans 1442).

Notes. The West African, the Congolese, and several of the East African specimens of *S. usambarensis* are climbers, while the other East and the South African are small trees.

The following specimens may belong to *S. usambarensis*:

Zambia: Chingola (fl. Mar., fr. Nov.) Fanshawe 2813 (BR, K, LISC), 5262 (K); near Mufulira (veg.) Schmitz 2299 (BR, PRE); Kitwe (veg.) Fanshawe Kitwe 9 (WAG).

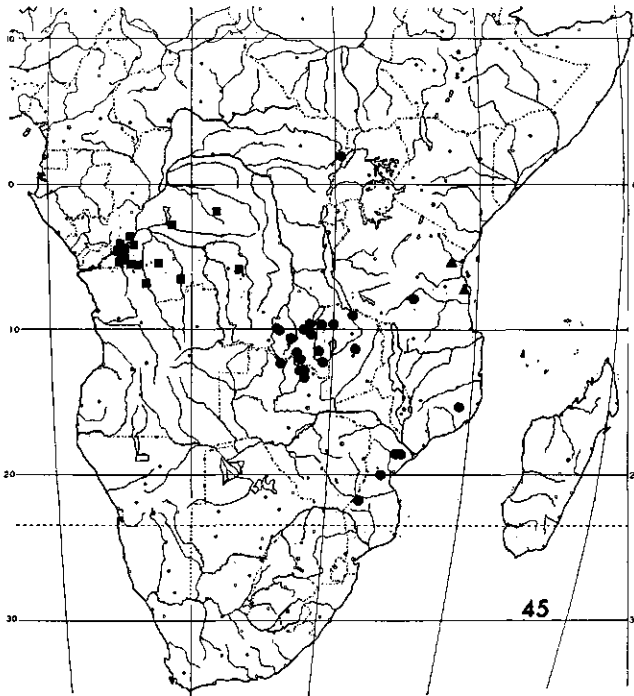
The leaves are like those of *S. usambarensis*, but they have distinctly prominent veins above like those of *S. dale*. The flower-buds and pistils of herb. Fanshawe 2818 are 4 mm long as in *S. dale*, while the fruit of herb. Fanshawe 5262 is like that of *S. usambarensis*. They resemble also *S. floribunda*. As the three species all are variable the present author referred the four above cited specimens to '*S. usambarensis* (?)'.

72. *S. variabilis* De Wild., Ann. Mus. Congo Sér. 5. 1: 178. 1904; Baker in Fl. Trop. Afr. 4(1): 623. 1904; Duvigneaud, Bull. Soc. Roy. Bot. Belg. 85: 19, f. 5. 1952.

Type: Congo (Kinshasa): Léopoldville Province, Kimuenza, Gillet 2081 (BR, lectotype). **Fig. 44, p. 269; Map 45, p. 273**

Small deciduous tree, 3–12(25) m high. Trunk 10(–50) cm in diam.; wood very hard, yellow-orange. *Branches* pale brown or ochraceous, distinctly lenticellate; branchlets densely hirtopubescent with appressed and often also erect hairs, not lenticellate, or when leaves mature lenticellate and coloured like branches. *Leaves*: petiole short, hirtopubescent, 1–2 mm long; blade shining and dark green above, mat and paler beneath, subcoriaceous, thinner and dull when dry and young, elliptic, oblong, ovate, or narrowly ovate, usually larger and comparatively narrower towards the apices of the branchlets, 1.5–3 × as long as wide, 3–9 × 1–3.5 cm or sometimes smaller, acute, acuminate, or in leaves at the base of the branchlets obtuse, subcordate or sometimes rounded at the base, sparsely appressed-pubescent, especially on the costa on both sides or sometimes only above; one pair of secondary veins from or from above the base curved along the margin and mostly a faint submarginal pair; venation reticulate, but not very distinct, prominent on both sides. *Inflorescence* terminal, congested, often seemingly capitate, 1.5 × 1.5 – 3.5 × 3 cm, 3–4 × branched, many-flowered. Peduncle, branches, and pedicels hirtopubescent.

Bracts sepal-like, hirto-pubescent beneath, glabrous or with few hairs at the base above, without colleters. *Flowers* 5-merous. *Sepals* connate at the base, subequal or sometimes very unequal and then largest up to twice as long as smallest, narrowly triangular, 3–7 × as long as wide, (2)3–4(5) × 0.5–1 mm, acuminate or subulate at the apex, ciliate, hirto-pubescent outside, glabrous inside, without colleters. *Corolla* in the mature bud cylindrical, 1.4–2 × as long as the calyx, 4.5–6.5 mm long, white or greenish-white, glabrous outside, inside densely villose except for the glabrous base, tips of lobes sometimes also glabrous; tube 0.5–1 × as long as the calyx, slightly widened towards the throat; lobes oblong, 1–2.7 × as long as the tube, 2.7–4.4 × as long as wide, 2.7–4 × 0.8–1.2 mm, acute, spreading. *Stamens* exserted; filaments glabrous, 1–1.2 × as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, 2.4–4.5 × as long as wide, 1–1.2 × 0.25–0.5 mm, cordate at the base, glabrous; cells parallel. *Pistil* pubescent, often glabrous at the base, 4.4–5.5 mm long; ovary pubescent, glabrous, or only apically pubescent, ovoid, 1–1.2 × 0.8–0.9 mm, 2-celled; style 3.4–4.5 mm long, thick, about 0.2 mm in diam., persistent on the immature fruit; stigma capitate. In each cell 6–8 ovules. *Fruit* orange (?), green when immature, ellipsoid, about 1.5 × 1.2 – 2.5 × 2 cm, 1–2-seeded. Wall thin. *Seeds* pale ochraceous, ellipsoid, flattened, 15 × 11 × 4 mm, very minutely papillose (not hairy), smooth. Colleters in the axils of the leaves.



MAP 45. ■ *S. variabilis*, ● *S. xantha*, ▲ *S. xylophylla*.

Distribution: Congo (both).

Ecology: Woodland or gallery forest; alt. about 300–500 m.

Congo (Brazzaville): Batéké Plateau, Koechlin 761 (IRSC); Brazzaville, Chevalier 4011 (P), 4015 (P), 11232 (P), 27286 (P, WAG), 27287 (P); *ibid.*, de Wit 5984 (WAG); *ibid.* (Sept.) Koechlin 391 (IRSC), 2379 (IRSC), 5315 (IRSC); *ibid.*, Pobéguin 241 (P); *ibid.* (July) Trochain 9263 (IRSC, WAG); km 50 of Brazzaville-Kinkala road (May) Koechlin 1126 (IRSC, WAG); Toumba, Chevalier 4065 (P).

Congo (Kinshasa): Léopoldville: Kinshasa, Achten 104 a (BR), 104 B (BR); *ibid.* (Apr.) Bequaert 7253 (BR), 7426 (BR); *ibid.* (Aug.) Claessens 33 (BR, LY); *ibid.*, Gillet Aug. 1902 (BR, paratype); *ibid.*, Vermoesen 2477 (BR); Kimuenza (Mar.) Gillet 1726 (BR, paratype), 2081 (BR, lectotype); *ibid.*, Mildbraed 3676 (HBG); *ibid.* (Apr.) Pauwels 3314 (BR), 4372 (BR); *ibid.*, Lovanium (fl., fr. Aug.) Carlier 57 (BR, FHO); *ibid.* (Dec.) Evrard 6468 (BR), 6592 (BR); *ibid.*, Robyns 4316 (BR, K, L, M, SRGH); Kisantu, Gillet 808 (BR, paratype); Kibambi, Vanderyst 35967 (BR); Mpese, Germain 2068 (BR); *ibid.*, Pauwels 2232 (BR); Kinkole (Sept.) Pauwels 4663 (BR); Popokabaka Territory (Aug.) Pauwels 160 (BR), 466 (BR), 809 (BR), 1147 (BR), 1844 (BR), 2603 (BR), 4107 (BR, WAG); Lake Léopold II (Oct.) Jans 62 (BR); Benga R., Vanderyst 14965 (BR); Kisandji, Renier 1 (BR). Equateur: Monkoto Territory (fr. Aug.) Evrard 4725 (BR, K, WAG). Kasai: Dibaya Territory, Liben 1792 (BR, WAG).

Note. According to the notes of most collectors *S. variabilis* is a small tree, 3–12 m high, with a trunk of 10 cm diam. Only Liben, who collected the only specimen known from Kasai, noted: large tree, 20–25 m high; trunk 50 cm in diam.

73. *S. xantha* Leeuwenberg, sp. nov.

Fig. 45, p. 277; Map 45, p. 273

Frutex scandens, liana vel arbor ramis lianescentibus cirrhis per paria dispositis. Folia glabra laminis in sicco flavis coriaceis ellipticis, anguste ellipticis, ovatis vel anguste ovatis apice acuminatis basi cuneatis vel rotundatis nervisque infimis curvatis. Inflorescentia axillaris et nonnunquam etiam terminalis subcongesta pauciflora pedunculo pedicellisque glabris tenuibus. Flores tetrameri. Sepala suborbicularia apice rotundata minute ciliata utrinque glabra. Corolla alba extus glabra vel minute papilloso-pubescent intus fauce et lobis dense pilosa tubo cylindrico lobis oblongis recurvatis. Stamina exserta glabra corollae fauce inserta filamentis antheras oblongas subaequantibus vel superantibus. Pistillum glabrum ovario biloculari styloque gracili et stigmathe parvo. Fructus aurantiacus vel luteus parvus ellipsoideus mono- vel bispermus. Semen ellipsoideum applanatum latere profunde excavato, latere altero protuberatione fossa parva circumdata ut videtur papillosa. Papillae falsae pilis curvatis compositis.

Type: Zambia: Kitwe District, Fanshawe 3185 (K, holotype; isotypes: BR, EA, PRE, SRGH, WAG).

Climbing shrub or *liana* at least 6–10 m high climbing over shrubs or in trees, not climbing shrub or small *tree* with short thick trunk and often *liana*-like branches, 2–12 m high. Trunk short (in trees), 50 cm in diam. Bark slightly

rough, grey or black, on section faded yellow; sapwood white; wood faded yellow. *Branches* ochraceous or black-brown, often spotted, not lenticellate, terete, not or hardly sulcate when dry; branchlets glabrous, green, terete, ochraceous and often sulcate when dry. Tendrils – if present – paired. *Leaves*: petiole glabrous, 5–8 mm long; blade hardly shining and pale green, not or slightly paler beneath, usually yellow when dry, often stiffly coriaceous also when living, elliptic, narrowly elliptic, ovate, or narrowly ovate, (1.5)2–3 × as long as wide, 4–9(11.5) × 1.5–4.5(7) cm, acuminate at the apex, cuneate or rounded at the base, glabrous on both sides; one or two pairs of secondary veins from or from above the base curved along the margin and often a faint submarginal pair; costa impressed above; tertiary venation reticulate, conspicuous, in dry leaves prominent on both sides, in living beneath only. *Inflorescence* axillary and occasionally also terminal, rather congested, few-flowered, much shorter than the leaves, 1.5 × 1 – 2.5 × 1.5 cm, 1–2 × branched. Peduncle, branched, and pedicels short, thin, glabrous. Bracts ovate or sepal-like, lower approximately shovel-shaped and about 3 × as long as the sepals, beneath glabrous, above often with colleters at the base. *Flowers* 4-merous. *Sepals* connate at the base, equal or subequal, suborbicular, 1–1.4 × as long as wide, 1.2–1.5 × 0.9–1.4 mm, obtuse or rounded at the apex, minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud 3.5–5 × as long as the calyx, 4.5–6.5 mm long and rounded at the apex, white, outside glabrous or minutely papillose-pubescent, inside densely pilose on the lobes and in the throat, less pilose in the tube, glabrous at the base; tube cylindrical or nearly so, 1.7–3 × as long as the calyx, 1–1.3 × as long as the lobes, 2.4–3.5 mm long, at the throat 1.8–2.2 mm wide; lobes oblong, 1.7–2.5 × as long as wide, 2.4–3.3 × 1.2–1.5 mm, acute, recurved. *Stamens* exerted; filaments glabrous, 0.8–1.5 × as long as the anthers, elongate at anthesis, inserted at the mouth of the corolla tube; anthers oblong, 0.7–1 × 0.4–0.6 mm, glabrous, cordate at the base; cells parallel. *Pistil* glabrous, 4–5.5 mm long; ovary ovoid or nearly so, 1–1.5 × 0.8–1 mm, more or less abruptly narrowed into the style, 2-celled; style slender, 2.8–4.2 mm long; stigma obscurely bilobed or less often capitate. In each cell 6–8 ovules. *Fruit* orange or yellow, nearly mature pale green, with paler dots, small, soft, ellipsoid, 15 × 10 – 20 × 18 mm, often mucronate, often obliquely pedicellate, with a smooth skin, 1–2-seeded. Wall thin, when dry 0.3–0.5 mm thick. Pulp orange or yellow. *Seed* ochraceous, often obliquely ellipsoid, flattened, 10 × 8 × 3 – 14 × 11 × 4 mm, at one side with a deep pit, at the other with a bulge surrounded by a shallow groove; seemingly papillose; false papillae simulated by short curved hairs.

Distribution: Eastern Congo (Kinshasa), Tanzania, Zambia, Moçambique.

Ecology: Gallery forests or riverine thickets; alt. 0–1800 m.

Congo (Kinshasa): Orientale: Nioka-Djugu road, Mahagi Territory, Taton 727 (BR, WAG). Katanga: 54 km S. of Mukulakulu, Schmitz 6193 (BR); between Guba and Mokabé-Kasari, Schmitz 4016 (BR); km 16 of Kashiobwe-Mukupa road, Schmitz 6241 (BR); Luapulu

R. (Apr.) Robyns 1889 (BR, K, P); *ibid.*, near Chembi Ferry, Brenan & Greenway 8010 (BR, EA, FHO, K); between Kienge and Mwashya, Schmitz 7362 (BR); Chibambo (Apr.) Symoens 7427 (BR); 10 km SSW. of Lubumbashi, Schmitz 2896 (BR, PRE); Muhulu, 40 km SE. of Lubumbashi, Schmitz 6284 (BR).

Tanzania: Iringa, Ede 13 (EA, K, SRGH).

Zambia: 5 km S. of Solwezi, White 3197 E (K); Chingola (fr. July) Fanshawe 2392 (BR, EA, K, LISC, SRGH); Mufulira, Schmitz 2300 (BR); Kitwe District (Apr.) Fanshawe 3185 (BR, EA, K, PRE, SRGH, WAG, type), Kitwe 8 (WAG); Luapula R., R. E. Fries 561 (UPS); Kapalala, Fanshawe 263 (BR, FHO, K); Museshia (fr. Oct.) Fanshawe 4869 (FHO, K, SRGH); Kawambwa, Fanshawe 3872 (BR, K, LISC, SRGH); Mporokoso, Trapnell 1831 (K); Abercorn District (June) Richards 15196 (K); Mpika District (fr. Nov.) White 3785 (FHO, K); S. of Shiwa Ngandu Lake, Greenway & Trapnell 5485 (EA, FHO, K).

Moçambique: Moçambique: Nampula, Torre & Paiva 11594 (LISC). Manica e Sofala: Maringua, Save R., Chase 2534 (BM, LISC, SRGH); Inhamitanga, Simão 742 (K), 1200 (PRE); *ibid.*, Cheringoma (Feb.) Andrada 1067 (LISC); *ibid.* (Oct.) Simão 240 (LISC); Chissadze, Cheringoma (Dec.) Simão 1278 (PRE); Cheringoma, between Inhamitanga and Lacerdonia, Torre 3100 (LISC); Madanda Forests (fl., fr. Dec.) Swynnerton 1071 (BM, K, Z); Muccheve For. Res., Buzi R., M. F. de Carvalho 752 (K).

Notes. *S. xantha* belongs to the section *Dolichanthae* and is closely allied to *S. barteri* and *S. melastomatoides* by the flowers and seeds. It differs strikingly from these and the other species of the section by the mostly yellow-drying leaves.

It shows a strikingly resemblance to *S. floribunda* by the flowers and the shape of the leaves. It differs from the latter by the paired instead of solitary tendrils, the mostly yellow-drying leaves which have a more prominent venation, and the typical dented seeds. The latter seeds are only known for the section *Dolichanthae*.

74. *S. xylophylla* Gilg in Engler, Bot. Jahrb. 28: 122. 1899; Baker in Fl. Trop. Afr. 4(1): 526. 1903; E. A. Bruce, Kew Bull. 1956: 155. 1956; Bruce & Lewis in Fl. Trop. E. Afr. Loganiaceae 32. 1960. **Fig. 45, p. 277; Map 45, p. 273**

Types: Tanzania: Uzaramo District, Kikulu, Stuhlmann 6853 (holotype not seen, destroyed in B, no isotype seen) and 16 km S. of Dar es Salaam, Vaughan 2763 (BM, neotype, photograph in K, neg. 2517; iso-neotype: EA, designated by BRUCE & LEWIS).

Shrub or tree. *Branches* not lenticellate, pale greenish-brown to dark brown, not sulcate when dry; branchlets glabrous, pale greenish-brown to dark brown and usually slightly sulcate when dry, often subquadrangular. *Leaves*: petiole short, glabrous, 2–5 mm long; blade shining and dark green above, paler beneath, drying pale greenish-brown often with dark brown, paler and mat beneath, thickly coriaceous, elliptic, 1.3–2.2 × as long as wide, 4.5–10.5 × 2.5–6 cm, apiculate at the apex, cuneate or rounded at the base, glabrous on both sides; one or two pairs of secondary veins from or from above the base curved along the margin, and often a faint submarginal pair; tertiary venation

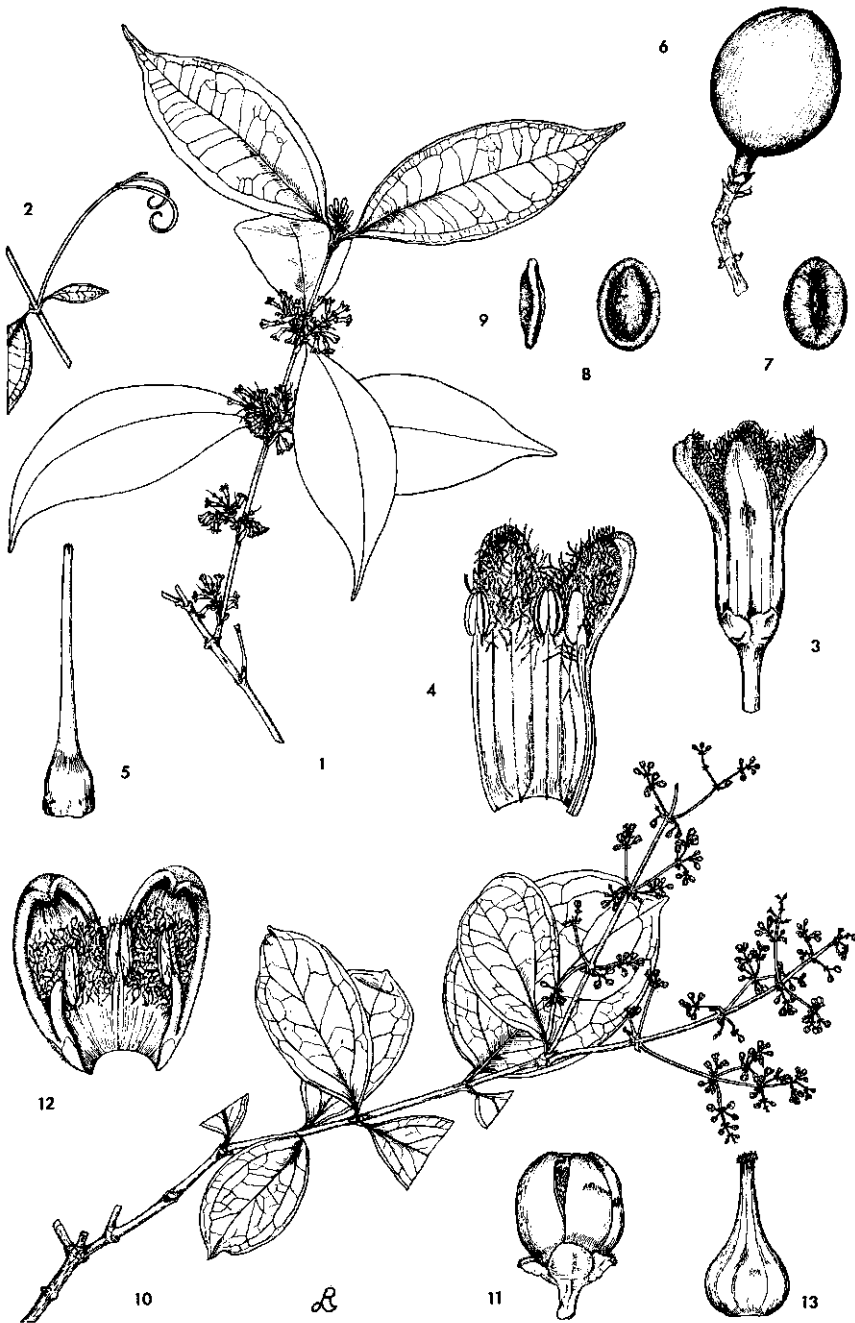


FIG. 45. 1-9. *S. xantha*: 1. branch, $\frac{1}{2} \times$; 2. tendrils, $\frac{1}{2} \times$; 3. flower, $5 \times$; 4. portion of corolla with stamens, $7 \times$; 5. pistil, $7 \times$; 6. fruit, $1 \times$; 7-9. seed, 3 sides, $1 \times$ (1, 3-5. Fanshawe 3185; 2. Richards 15196; 6. Torre & Paiva 11594; 7-9. Schmitz 1362); 10-13. *S. xylophylla*: 10. branch, $\frac{1}{2} \times$; 11. flower, $5 \times$; 12. portion of corolla with stamens, $14 \times$; 13. pistil, $14 \times$ (10-13. Vaughan 2937).

reticulate, prominent on both sides. *Inflorescence* axillary, usually also in the axils of the apical leaves and therefore seemingly terminal, lax, many-flowered, longer than the leaves, $5 \times 4 - 11 \times 8$ cm, $3-4 \times$ branched. Peduncle, branches, and pedicels slender or rather slender, glabrous. Bracts small, narrowly triangular or sepal-like, at least upper glabrous above and without colleters. *Flowers* 4-merous. *Sepals* free, equal, broadly ovate, 0.8×0.8 mm, rounded at the apex, minutely ciliate, glabrous on both sides, without colleters. *Corolla* in the mature bud $3 \times$ as long as the calyx, 2.5 mm long, and rounded at the apex, white (?), outside glabrous, inside densely pilose on the lobes of which the apices glabrous; tube very short, slightly shorter than the calyx, 0.7 mm long; lobes oblong, $2.5 \times$ as long as the tube, 1.8×1.2 mm, acute, spreading. *Stamens* slightly exerted; filaments very short, inserted at the mouth of the corolla tube; anthers oblong, 0.8×0.4 mm, cordate at the base, glabrous; cells parallel. *Pistil* glabrous, 1.5 mm long; ovary globose, 0.7 mm long, 1-celled, rather abruptly narrowed into the style; style short, 0.8 mm long; stigma capitate. One basal placenta with 6 ovules. *Fruit* orange, small, globose, about 15 mm in diam., 3-seeded. Wall thin. *Seed* subtetragonal, slightly compressed, about $10 \times 8 \times 4$ mm, smooth, glabrous. Testa thin.

Distribution: Tanzania, near the coast.

Ecology: River banks, in forests(?); at low elevations.

Tanzania: Sindeni Hill, Handeni District (very young bud Dec.) Burt 5419 (BM, BR, FHO, K); 16 km S. of Dar es Salaam (fr. Feb.) Vaughan 2763 (BM, EA, neotype), (Jan.) Vaughan 2937 (BM, EA).

Notes. *S. xylophylla* is closely allied to *S. mellodora* by the habit and flowers. Both species differ as follows:

Branchlets mostly dark, terete (always?); leaves coriaceous; main secondary veins not much longer than the other; veins often paler beneath; inflorescence axis and branches rather thick, pubescent ***S. mellodora***
 Branchlets often (?) paler, subquadrangular; leaves thickly coriaceous, mostly broader; main secondary veins much longer than the other, nearly reaching the leaf apex; inflorescence axis and branches rather thin, glabrous

S. xylophylla

75. *S. zenkeri* Gilg ex Bak. in Fl. Trop. Afr. 4 (1): 529. 1903.

Fig. 41, p. 252

Type: Cameroun: Bipindi, Zenker 2436 (K, holotype; isotypes: A, BM, BR, COI, E, G, GOET, GRO, HBG, L, LY, M, MO, P, PR, PRE, S, W, WAG, WRSL, WU, Z).

Shrub or small tree up to 15 m high. *Branches* pale grey-brown, not lenticellate, sometimes umbellately branched; branchlets apically often with two

lines of minute pubescence below the stipular lines. *Leaves*: petiole short, glabrous, 2–3 mm long; blade shining above, paler beneath, coriaceous, elliptic or narrowly elliptic, 2–3.5 × as long as wide, 4–14 × 1.5–5 cm, distinctly acuminate at the apex, cuneate at the base, glabrous on both sides; two pairs of secondary veins from the base to the apex of which the lower fainter; tertiary venation conspicuously reticulate beneath. *Inflorescences* axillary, several together, congested, much shorter than the leaves, about 1 cm long. Peduncle, branches, and pedicels very short, somewhat pubescent. Bracts approximately sepal-like. *Flowers* subfasciculate, 5-merous. *Sepals* connate at the base for about one-third of their length, subequal, broadly ovate to suborbicular, 2 × 2–2.2 mm, obtuse or rounded at the apex, ciliate, practically glabrous outside, inside minutely pubescent and without colleters at the base. *Corolla* in the mature bud about 3 × as long as the calyx, 6.5 mm long, and rounded or slightly tapering at the apex, white (?), outside glabrous, inside with a ring of white brush-like hairs on the very base of the lobes only; tube approximately cylindrical, 1.7 × as long as the calyx, about as long as the lobes, 3.3 mm long, 1.5–2 mm wide at the throat, lobes narrowly triangular, 3.2 × 1.5 mm, acute, spreading. *Stamens* slightly exserted; filaments glabrous, about half as long as the anthers, inserted at the mouth of the corolla tube; anthers oblong, 1.8 × 0.6 mm, cordate at the base, glabrous; cells parallel. *Pistil* pilose-pubescent in the middle, 5.6 mm long, ovary broadly ovoid, 1.6 × 1.5 mm, glabrous, 2-celled; style 4 mm long; stigma capitate. In each cell 14 ovules. *Fruit* nearly globose, white (?), about 2 cm in diam., 2-seeded. Wall thin, about 1 mm thick. *Seed* pale ochraceous, obliquely elliptic, flattened, plano-convex, 15 × 13 × 5 mm, with a raised hilum in the middle of the convex side, rather rough.

Distribution: only three times collected, once in Cameroun, and twice in Congo (Kivu).

Ecology: Rain forests, often on mountains; alt. 0–1800 m.

Cameroun: (fl.) type, see above.

Congo (Kinshasa): Kivu: km 48 of Kavumu-Walikale road (fr. Aug.) Pierlot 2373 (BR, K, WAG); Ndolere, Kabare Territory, A. Léonard 3685 (BR, WAG).

Notes. Zenker, who collected an excellent flowering specimen with many duplicates, unfortunately did not describe the ecology and habit. Both specimens from Congo were collected in montane rain forest. The fruiting specimen has still the hairy pistil-base on the fruit.

S. zenkeri is closely allied to *S. staudtii* by the habit and leaves, although the leaves of *S. staudtii* are generally larger. They differ mainly as follows:

Pistil glabrous; corolla with two rings of hairs inside **S. staudtii**
 Pistil pilose-pubescent; corolla with one ring of hairs inside **S. zenkeri**

HYBRIDS

There are a few specimens which are almost perfect intermediates between well-defined and often collected species. The present author supposes that they may be hybrids.

Two vegetative specimens have the corky bark, branchlets, spines, and leaves of *S. cocculoides*. The leaves, however, are slightly thicker than is usual in this species and they bear the sharp apex of those of *S. pungens*:

South West Africa: Garu, 90 km S. of Runtu, Maguire 1584 (NBG); Karakowida, Dinter 7298 (B).

Five specimens of which two are flowering and the other vegetative have branches and leaves of *S. innocua*. The leaves here again have the sharp apex of those of *S. pungens*. The flowers of both species are not distinctly different:

Tanzania: Ngulu District, Peter 34795 (B).

Zambia: Luanshya District (July) Fanshawe 1402 (BR, FHO, K, SRGH, WAG).

Rhodesia: Urungwe District (Dec.) R. Goodier 468 (BR, K, LISC, PRE, SRGH); *ibid.*, Chipani, Whellan 668 (MO, PRE, SRGH); Lomagundi District, Herb. Dept. Agric. 1200 (K).

One specimen is intermediate between *S. innocua* and *S. lucens* by the branches, leaves, inflorescences, and flowers, while it has the small fruit which may occur in *S. lucens*:

Congo (Kinshasa): Katanga: near Lubumbashi (fl., fr. Oct.) Quarré 1927 (A, BR).

One specimen is exactly *S. scheffleri* in branchlets, leaves, lax inflorescences, and flowers, but it is hairy as *S. kasengaensis*:

Tanzania: Malagarasi ferry, Kibondo District (Feb.) Proctor 385 (EA, FHO, K).

DOUBTFUL SPECIES

S. farinosa Blume, Rumphia 1: 70. 1836. Description incomplete. Specimen cited which was not examined by BLUME not found among DU PETIT THOUARS'S collections (reference: Du Petit Thouars, Dict. Sci. Nat. 6: 429. 1806).

NOMINA NUDA

S. bakanko Bourquelet et Hérissé, Journ. Pharm. 6. 25: 417. 1907 and 28: 433. 1908. = *S. madagascariensis* Poir.

S. brazzavillensis A. Chev., Sudania 1: 62. 1911. = *S. pungens* Solered.

S. brunneonigricans Duvign. ex Denoël c.s., Contrib. Et. Chim. Strychnos Bruxelles 136. 1953. = ? *S. phaeotricha* Gilg. Herb. Duvigneaud 193 (not seen, on loan in BRLU), cited with both names.

S. caryophyllus A. Chev., Expl. Bot. Afr. Occ. Fr. 1: 442. 1920. = *S. afzelii* Gilg.

S. cordatifolia Duvign. ex Denoël c.s., l.c. p. 140. = *S. memecyloides* S. Moore.

- S. corymbifera* Gilg ex Duvign., Bull. Soc. Roy. Bot. Belg. 85: 27. 1952. = *S. panganensis* Gilg.
- S. courteti* A. Chev., Et. Fl. Afr. Centr. Fr. 1: 203. 1913. = *S. spinosa* Lam.
- S. dulcis* A. Chev., l.c. = *S. spinosa* Lam.
- S. excellens* Gilg in Mildbraed, Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped. 1910–1911. 2: 79. 1922. = *S. scheffleri* Gilg.
- S. fernandiae* Duvign. ex Denoël c.s., l.c. p. 144. = *S. usambarensis* Gilg.
- S. fleuryana* A. Chev., Expl. Bot. Afr. Occ. Fr. 1: 443. 1920. = *S. nigritana* Bak.
- S. goniodes* Duvign., Bull. Séanc. Inst. Roy. Col. Belg. 19: 221. 1948. = *S. johnsonii* Hutch. et M. B. Moss.
- S. greveana* Baill. ex Pernet, Mem. Inst. Sci. Madag. 9: 270. 1959. = *S. decussata* (Pappe) Gilg.
- S. hankei* H. Winkl. ex E. Guinea López, Essayo Géobotanico de la Guinea Continental Española 345. 1946. = *S. malacoclados* C. H. Wright.
- S. hippocrateoides* Gilg in Mildbraed, Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped. 1910–1911. 2: 79. 1922. = *S. angolensis* Gilg.
- S. imbricata* A. W. Hill ex Duvign., Bull. Soc. Roy. Bot. Belg. 84: 71. 1951. = *S. nigritana* Bak.
- S. isabellina* Gilg in Mildbraed, Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped. 1910–1911. 2: 190. 1922. = *S. tricalysioides* Hutch. et M. B. Moss.
- S. kongofera* H. Thoms, Arb. Pharm. Inst. Berlin 10: 80. 1912. Seeds collected by Kersting. In his collection: no. A 591(A), Kongo, Togo, *S. innocua* Del. He collected also *S. nigritana* Bak. and *S. spinosa* Lam. in other localities.
- S. lissophylla* Pierre ex Duvigneaud, Bull. Séanc. Inst. Roy. Col. Belg. 19: 213. 1948, in syn. = *S. icaja* Baill.
- S. luteocostata* Duvign., Bull. Soc. Roy. Bot. Belg. 85: 59. 1952. = *S. xantha* Leeuwenberg ?
- S. maboca* Sauvan, Des Loganiacées Thèse Montpellier 92. 1896. Specimens cited: herb. Welwitsch 4768 is *S. spinosa* Lam., 4778 is *S. pungens* Solered., and 4780 (erroneously 4730) is *S. cocculoides* Bak.
- S. macrorrhiza* Pierre ex Duvign., Bull. Séanc. Inst. Roy. Col. Belg. 19: 213. 1948, in syn. = *S. tricalysioides* Hutch. et M. B. Moss.
- S. martreti* A. Chev., Et. Fl. Afr. Centr. Fr. 1: 204. 1913. = *S. nigritana* Bak.
- S. m'boundou* Kauffeisen, Du M'boundou ou Poison d'Épreuve du Gabon, Thèse Montpellier 9. 1876. = *S. icaja* Baill. The original text is: 'Le m'boundou serait donc alors le *Strychnos m'boundou*, ou *Strychnos icaja*.'
- S. menyanthoides* Duvign. ex Denoël c.s., l.c. p. 165.
- S. phaeopoda* Gilg ex De Wildeman, Comp. d. Kasai 382. 1910. = *S. ngouniensis* Pellegr.
- S. phuvialis* A. Chev., Et. Fl. Afr. Centr. Fr. 1: 204. 1913. = *S. spinosa* Lam.
- S. quadrangularis* Gilg in Mildbraed, Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped. 1910–1911. 2: 190. 1922, not A. W. Hill (1917). = ? *S. johnsonii* Hutch. et M. B. Moss. (specimen cited not seen, destroyed in B).
- S. scaberrima* Gilg ex Pellegr., Mém. Soc. Linn. Norm. n. sér. 1: 39. 1928. = *S. phaeotricha* Gilg.

- S. stenura* Duvign. ex Denoël c.s., l.c. p. 183. = *S. usambarensis* Gilg.
S. transiens Gilg in Mildbraed, Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped. 1910-1911. 2: 62. 1922. = *S. congolana* Gilg.
S. trillesiana Pierre ex A. Chev., Rev. Bot. Appliq. 27: 212. 1947. = *S. dale* De Wild.
S. viridescens Gilg ex Mildbraed in Fedde, Repert. 41: 263. 1937. = *S. afzelii* Gilg.
S. volubilis Duvign. ex Denoël c.s., l.c. p. 195. = *S. scheffleri* Gilg?, which is twining when young.
Unguacha Hochst., Flora 27: 103. 1844. Species on which it is based: *S. unguacha* A. Rich. (= *S. innocua* Del.).

EXCLUDED SPECIES

- S. abyssinica* Hochst., Flora 24: 101. 1841, nomen; ex D.C., Prod. 8: 675. 1844. = *Acokanthera schimperi* (D.C.) Schweinf. (*Apocynaceae*).
S. cuneata Schinz ex Klein et Herndlhofer, Oesterr. Bot. Zeitschr. 76: 95. 1927, nomen; Wehmer, Die Pflanzenstoffe 2nd ed. 2: 970. 1931 (as *cunctata*). = *Diospyros guiloensis* (Hiern) White (*Ebenaceae*). The specimen with the above stated name, E. Africa, Menyharth 1163 (WU), is identified by G. J. H. AMSHOFF.
S. guineensis Thonn. ex F. Didr., Kjoeb. Vidensk. Meddel. 1854: 190. 1855, in syn. with *Landolphia scandens* (Schum. et Thonn.) F. Didr. = *Ancylobotrys scandens* (Schum. et Thonn.) Pichon (*Apocynaceae*).
S. oblongifolia Hochst., Flora 27: 827. 1844, in syn. = *Carissa oblongifolia* Hochst., l.c. (*Apocynaceae*).
S. rutenbergi Klein et Herndlhofer. l.c., nomen = *Genipa rutenbergii* Baill. ex Vatke, Abh. naturw. Ver. Bremen 9: 118. 1885 (*Rubiaceae*). Syntypes: Hildebrandt 3465 (WU), 3101. The first syntype was in the WU herbarium among the *Strychnos* material.
S. scandens Schum. et Thonn., Beskr. Guin. Pl. 147. 1827. = *Ancylobotrys scandens* (Schum. et Thonn.) Pichon (*Apocynaceae*).

LIST OF NAMES AND SYNONYMS NOT CITED ELSEWHERE IN THIS REVISION

- S. acuminata* Wall. ex D.C., Prod. 9: 14. 1845. = *S. colubrina* L.
aneae var. *acuminata* A. W. Hill, Kew Bull. 1917: 138. 1917. – As.
angustifolia Benth. ex Jackson, Ind. Kew. 2: 1009. 1895. = *S. angustiflora*
 Benth.
arborea A. W. Hill, Kew Bull. 1917: 172. 1917. = *S. axillaris* Colebr.
armata A. W. Hill, l.c. p. 170. = *S. axillaris* Colebr.
balansae A. W. Hill, l.c. p. 200. = *S. ignatii* Berg.
bancroftiana F. M. Bail., Rep. Exp. Bellenden-Ker 49. 1889. = *S. colubrina* L.
barbata A. W. Hill, Kew Bull. 1909: 359. 1909. = *S. colubrina* L.
beccarii Gilg, Notizbl. Bot. Gart. Berlin 1: 267. 1897. = *S. ignatii* Berg.
beddomei C. B. Clarke in J. D. Hooker, Fl. Br. Ind. 4: 88. 1883. = *S. colu-*
brina L.
beddomei var. *coriacea* (Thwaites) C. B. Clarke, l.c. p. 89. = *S. coriacea*
 Thwaites.
bentharii var. *angustior* (Benth.) A. W. Hill, Kew Bull. 1917: 166. 1917 (as
bentharii). – As.
bentharii var. *parvifolia* (Benth.) C. B. Clarke, l.c. p. 87 (as *bentharii*). – As.
blay-hitam Dragendorf, Heilpflanzen 534. 1898, nomen. = *S. ignatii* Berg.
 (the plant, Vaughan Stevens anno 1890 (SING), from Malaya, is identified
 by P. W. LEENHOUTS).
blumenaviensis Gilg in Engler, Bot. Jahrb. 25. Beibl. 60: 36. 1898. = *S. tri-*
nervis (Vell.) Mart.
borneensis Leenh., Bul. Jard. Bot. Brux. 32: 458. 1962. – As.
bourdillonii Brandis, Indian Trees 474. 1906. = *S. cinnamomifolia* Thwaites.
brachia Ruiz et Pav. ex Mérat et De Lens, Dict. Mat. Med. 6: 552. 1834 (err.
 typ.) = *S. brachiata* Ruiz et Pav.
brachistantha Standley, Field Mus. Publ. Bot. 12: 412. 1936. = *S. nigricans*
 Prog.
brasiliensis var. *lagoensis* Prog., Vidensk. Meddel. 1869: 33. 1869. = *S. bra-*
siliensis (Spreng.) Mart.
brasiliensis var. *minor* Benth., Journ. Linn. Soc. 1: 107. 1856. = *S. parvifolia*
 A. D.C.
brasiliensis var. *normalis* Benth., Journ. Linn. Soc. 1: 107. 1856. = *S. brasi-*
liensis (Spreng.) Mart.
brasiliensis var. *rigida* Benth., l.c. = *S. parvifolia* A. D.C.
brasiliensis var. *selloana* Prog. in Martius, Fl. Bras. 6(1): 281. 1868. = *S.*
brasiliensis (Spreng.) Mart.
bredemeyeri (Schult.) Sprague et Sandw., Kew Bull. 1927: 128. 1927. = ? *S.*
pedunculata (A. D.C.) Benth. which is of later date.
breviflora A. D.C., Prod. 9: 15. 1845. = *S. brasiliensis* (Spreng.) Mart.
brevifolia Spruce ex Benth., Journ. Linn. Soc. 1: 106. 1856. = *S. subcordata*
 Spruce ex Benth.

- cabalunga* Hort. Lind. ex Dragendorff, Heilpflanzen 535. 1898 (err. typ.). = *S. cabalongo* Appun. = *Sloanea* sp. (*Tiliaceae*).
- calantha* Gilg ex Ule in Engler, Bot. Jahrb. 40: 138. 1907, nomen. = *S. guianensis* (Aubl.) Mart.
- calophylla* Gilg in Engler, Bot. Jahrb. 25. Beibl. 60: 37. 1898. = *S. bicolor* Prog.
- castelnaei* Wedd. ex Benth., Journ. Linn. Soc. 1: 108. 1856 (err. typ.). = *S. castelnaeana* Wedd.
- cathayensis* Merr., Lingn. Sc. Journ. 13: 44. 1934. – As.
- celebica* Koord., Med. Lands Pl. Tuin 19: 540, 631. 1898. = *S. colubrina* L.
- cenabrei* Merr., Philip. Journ. Sc. 20: 433. 1922. = *S. axillaris* Colebr.
- cheliensis* Hu, Bull. Fan. Mem. Inst. Biol. 10: 163. 1940. – As.
- chloropetala* A. W. Hill, Kew Bull. 1930: 175. 1930. = *S. axillaris* Colebr.
- cinnamomea* Thwaites, Enum. Pl. Zeyl. 425. 1864 (err. typ.). = *S. cinnamomifolia* Thwaites.
- cinnamomifolia* var. *wightii* A. W. Hill, Kew Bull. 1917: 194. 1917. – As.
- cinnamophylla* Gilg et Bened. in Engler, Bot. Jahrb. 54: 166. 1916. = *S. colubrina* L.
- cirrhusa* Stokes, Bot. Mat. Med. 1: 414. 1812. = *S. colubrina* L. ?
- cobalongo* Appun, Unter den Tropen 1: 550. 1871. = *Sloanea* sp. (*Tiliaceae*).
- cochinchinensis* Pierre ex Sauvan, Des Loganiacées, Thèse Montpellier 104. 1896, nomen. = *S. axillaris* Colebr.
- colubrina* var. *zeylanica* C. B. Clarke in J. D. Hooker, Fl. Br. Ind. 4: 87. 1883. = *S. trichocalyx* A. W. Hill.
- concinna* Gilg in Engler, Bot. Jahrb. 25. Beibl. 60: 39. 1898. = *S. parvifolia* A. D.C.
- confertiflora* Merr. et Chun, Sunyatsenia 2: 305, f. 40. 1935. – As.
- cordifolia* Gilg in Engler, Bot. Jahrb. 25. Beibl. 60: 38. 1898. = *S. subcordata* Spruce ex Benth.
- crevauxiana* Baill., Adansonia 12: 377. 1879. = *S. glabra* Sagot ex Prog.
- crevauxii* G. Planch., Compt. Rend. Acad. Paris 88: 134. 1880 (err. typ.). = prec.
- curare* (H.B.K.) Benth., Journ. Linn. Soc. 1: 108. 1856. = *S. guianensis* (Aubl.) Mart.
- cuspidata* A. W. Hill, Kew Bull. 1909: 359. 1909. = *S. ignatii* Berg.
- dalzellii* var. *lanceolaris* A. W. Hill, Kew Bull. 1917: 177. 1917. – As.
- depauperata* Baill., Adansonia 12: 372. 1879. = *S. subcordata* Spruce ex Benth.
- doungnaiensis* Pierre ex Sauvan, Des Loganiacées Thèse Montpellier 104. 1896, nomen. = *S. donnaiensis* Pierre ex Dop.
- dubia* A. W. Hill, Kew Bull. 1911: 298. 1911. = *S. colubrina* L.
- elais* Wehmer, Die Pflanzenstoffe 2: 969. 1931, nomen. = *Elaeis* Jacq. (*Palmae*).
- ericetina* Barb. Rodr., Vellosia 2nd ed. 1: 34, pl. 3. f. B. 1891. = *S. subcordata* Spruce ex Benth. ?
- esquirolii* Léveillé, Fl. Kouy Tchéou 262. 1914–1915. = *Zizyphus* sp. (*Rhamnaceae*).

forbesii A. W. Hill, Kew Bull. 1909: 360. 1909. = *S. colubrina* L.
fulvotomentosa Gilg in Engler, Bot. Jahrb. 25. Beibl. 60: 40. 1898. = *S. rubiginosa* A. D.C.
gauthierana Pierre ex Jackson, Ind. Kew. 2: 1010. 1895. = *S. gauthierana* Pierre ex Dop.
gauthierana Pierre ex J. D. Hooker, Kew Report 1877: 31. 1878, nomen. = *S. gauthierana* Pierre ex Dop. (see also C. Tirel, Adansonia 1969, ined.).
geoffraeana Baill., Adansonia 12: 378. 1897. = *S. guianensis* (Aubl.) Mart.
gigantea Barb. Rodr., Vellozia 2nd ed. 1: 37, pl. 3. f. A. 1891. = *S. peckii* B. L. Robinson?
glaziovii Gilg in Engler, Bot. Jahrb. 25. Beibl. 60: 36. 1898. = *S. gardneri* A. D.C.
gomesiana Casaretto, Nov. stirp. bras. 14. 1842. = *S. trinervis* (Vell.) Mart.
grandis Wall., Cat. no. 4454. 1831, nomen. = *Anisophyllea grandis* (Benth.) Burk. (*Rhizophoraceae*).
gubleri G. Planch., Compt. Rend. Acad. Sci. Paris 88: 134. 1880, nomen; Journ. de Pharm. 5. 1: 196. 1880., doubtful. – Am.
gubleriana G. Planch. ex Baill., Bot. Méd. 1219. 1884. = prec.
guianensis var. *trichina* F. Macbr., Candollea 5: 401. 1934 = *S. guianensis* (Aubl.) Mart.
hachensis Karst., Fl. Columb. 2: 75, pl. 138. 1863. = *S. panamensis* Seem.
hainanensis Merr. et Chun, Sunyatsenia 2: 306, t. 69. 1935. – As.
henryi Merr. et Yamamoto, Journ. Soc. Trop. Agr. Taiwan 7: 145. 1935. – As.
hirsutiflora A. W. Hill, Kew Bull. 1917: 144. 1917. = *S. villosa* A. W. Hill.
hirtiflora (Standley) Lundell, Bull. Torr. Bot. Cl. 64: 556. 1937. = *S. tabascana* Sprague et Sandw.
horsfieldiana Miq., Fl. Ind. Bat. 2: 379. 1857. = *S. axillaris* Colebr.
impressinervis A. W. Hill, Kew Bull. 1917: 180. 1917. = *S. axillaris* Colebr.
javanica Hardy ex Rabuteau et Piétri, Compt. Rend. Séanc. Mém. Soc. Biol. Sér. 6. 5: 211. 1878; Bisset & Vidal, Adansonia Nov. Sér. 5: 436. 1965, nomen. = *S. gauthierana* Pierre ex Dop.
javensis Baill., Bot. Méd. 1216. 1884, nomen. = prec.
kauichana Barb. Rodr., Vellozia 2nd ed. 1: 37. 1891, doubtful. – Am.
kawbet A. W. Hill, Kew Bull. 1925: 425. 1925. = *S. axillaris* Colebr.
kerrii A. W. Hill, Kew Bull. 1925: 426. 1925. – As.
kerstingii Gilg et Schum. in K. Schumann & Lauterbach, Fl. Schutzgeb. 498. 1901. = *S. colubrina* L.
krabiensis A. W. Hill, Kew Bull. 1940: 199. 1940. = *S. ignatii* Berg.
lanceolata Spruce ex Benth., Journ. Lin. Soc. 1: 105. 1856. = *S. guianensis* (Aubl.) Mart.
laurina Wall. ex D.C., Prod. 9: 13. 1845. = *S. colubrina* L.
laurina var. *thorelii* A. W. Hill, Kew Bull. 1917: 151. 1917. = *S. colubrina* L.
lethalis Barb. Rodr., Vellozia 2nd ed. 1: 38. 1891, doubtful. – Am.
leuconeura Gilg et Bened. in Engler, Bot. Jahrb. 54: 169. 1916. = *S. colubrina* L.

ligustrina Blume, Rumphia 1: 68, t. 25. 1836. = *S. lucida* R.Br.
longissima Loesener in Fedde, Repert. 9: 357. 1911. = *S. panamensis* Seem.
lucbanensis Elmer ex Merrill, Enum. Philipp. Fl. Pl. 3: 312. 1923, nomen. =
S. luzonensis Elmer.
macroacanthos Prog. in Martius, Fl. Bras. 6(1): 280, pl. 82. f. 7. 1868. = *S.*
brasiliensis (Spreng.) Mart.
macroura Gilg in F. Macbride, Candollea 5: 400. 1934, nomen. = *S. dariensis*
 Seem.?
maingayi subsp. *borneensis* Leenh., Blumea 14: 230. 1966. – As.
maingayi var. *fruticosa* C. B. Clarke in J. D. Hooker, Fl. Br. Ind. 4: 88. 1883.
 = *S. ignatii* Berg.
malaccensis Benth., Journ. Linn. Soc. 1: 101. 1856. = *S. axillaris* Colebr.
manaoensis Barb. Rodr., Vellozia 2nd ed. 1: 36, pl. 5. 1891. = *S. dariensis* Seem.?
marginata Benth., l.c. p. 107. = *S. parvifolia* A. D.C.
martii Prog. in Martius, Fl. Bras. 6(1): 279, pl. 77. f. 2. 1868. = *S. parvifolia*
 A. D.C.
martii var. *obtusata* Prog., l.c. p. 279. = *S. parvifolia* A. D.C.?
mattogrossensis var. *sarmentosa* S. Moore, Trans. Linn. Soc. Ser. 2. 4: 393.
 1895. = *S. mattogrossensis* S. Moore.
merrillii A. W. Hill, Kew Bull. 1911: 297. 1911. = *S. colubrina* L.?
micrantha Spruce ex Solered. in Engler & Prantl, Nat. Pflanzenf. 4(2): 40.
 1892, nomen. = *S. tarapotensis* Sprague et Sandw.
micrantha var. *rhomboidalis* Dop, Bull. Soc. Bot. France 57. Mém. 19: 14.
 1910. = partly *S. dalzellii* A. W. Hill and partly *S. trichocalyx* A. W. Hill.
minhassae Koord. ex Boerl., Handl. 2: 460. 1899, nomen. = *S. colubrina* L.
minor Blume, Rumphia 1: 70. 1836. = partly *S. colubrina* L.
minor Dennst., Schluess. Hort. Malab. 33. 1818. = *S. colubrina* L.?
minor var. *angustior* Benth., Journ. Linn. Soc. 1: 101. 1856. = *S. benthamii*
 var. *angustior* (Benth.) A. W. Hill.
minor var. *nitida* Benth., l.c. = *S. trichocalyx* A. W. Hill.
minor var. *ovata* Benth., l.c. = *S. benthamii* C. B. Clarke.
minor var. *parvifolia* Benth., l.c. = *S. benthamii* var. *parvifolia* (Benth.)
 C. B. Clarke.
mitscherlichii var. *pubescentior* Sandw., Brittonia 3: 91. 1938. – Am.
moluccensis Benth. ex Dragendorf, Heilpfl. 533. 1898 (err. typ.). = *S. ma-*
laccensis Benth. = *S. axillaris* Colebr.
monosperma Miq., Fl. Ind. Bat. 2: 381. 1857. = *S. axillaris* Colebr.
mucronata A. W. Hill, Kew Bull. 1917: 181. 1917. = *S. axillaris* Colebr.
multiflora Benth., Journ. Linn. Soc. 1: 102. 1856. = *S. colubrina* L.
muricata Kost., Allg. Med.-Pharm. Fl. 3: 1072. 1834. = *S. lucida* R.Br.
myriantha Gilg et Bened. in Engler, Bot. Jahrb. 54: 167, f. 5. 1916. = *S. colu-*
brina L.
narcondamensis A. W. Hill, Kew Bull. 1917: 203. 1917. = *S. nux-vomica* L.?
niederleinii Gilg in Engler, Bot. Jahrb. 25. Beibl. 60: 41. 1898. = *S. brasi-*
liensis (Spreng.) Mart.

- nitida* G. Don, Gen. Syst. 4: 66. 1838. = *S. wallichiana* Steud. ex A. D.C.?, see also forthcoming publication of C. Tirel.
- nitida* Gagnep., Bot. Syst. 14: 22. 1950. = *S. vanprukii* Craib.
- nova* Thell., Bull. Herb. Boiss. Sér. 2. 8: 784. 1908. = partly *S. ignatii* Berg.
- nux-blanda* var. *hirsuta* A. W. Hill, Kew Bull. 1917: 191. 1917 (see also C. Tirel).
- nux-vomica* forma *depauperata* Miq., Fl. Ind. Bat. 2: 378. 1857. = *S. lucida* R.Br.
- nux-vomica* var. *glaucinia* Pierre ex Sauvan in Morot, Journ. Bot. 10: 129. 1896 and ex Sauvan, Des Loganiacées Thèse Montpellier 104. 1896. – As.
- nux-vomica* var. *grandifolia* Dop, Bull. Soc. Bot. France 57. Mém. 19: 18. 1910. – As. (is syn., see C. Tirel, Adansonia 1969, ined.).
- nux-vomica* var. *oligosperma* Dop, l.c. – As.
- oblonga* Gilg in Engler, Bot. Jahrb. 25. Beibl. 60: 37. 1898. = *S. guianensis* (Aubl.) Mart.
- oligoneura* Gilg, l.c. p. 41. = *S. brasiliensis* (Spreng.) Mart.
- ovalifolia* Wall. ex G. Don, Gen. Syst. 4: 65. 1838. = *S. ignatii* Berg.
- palembanica* Miq., Sum. 227, 551. 1861. = *S. axillaris* Colebr.
- panamensis* var. *hirtiflora* Standley, Field Mus. Publ. Bot. 11: 138. 1932. = *S. tabascanana* Sprague et Sandw.
- panayensis* A. W. Hill, Kew Bull. 1917: 148. 1917. = *S. ovata* A. W. Hill.
- papilosa* Barb. Rodr., Vellosia 2nd ed. 1: 36, pl. 4. f. B. 1891. = *S. guianensis* (Aubl.) Mart.
- parvifolia* var. *acutifolia* Hassler, Addenda Pl. Hassl. 8. 1917, nomen. = *S. parvifolia* A. D.C.
- parvifolia* var. *rupestris* Hassler, Addenda Pl. Hassl. 8. 1917, nomen. = *S. parvifolia* A. D.C.
- penicillata* A. W. Hill, Kew Bull. 1917: 178. 1917. = *S. axillaris* Colebr.
- petrophila* Gilg in Engler, Bot. Jahrb. 25. Beibl. 60: 39. 1898. = *S. subcordata* Spruce ex Benth.
- philippensis* Blanco, Fl. Filip. 2nd ed. 61. 1845. = *S. ignatii* Berg.
- philippinensis* Blanco ex De Lanessan, Pl. Ut. Col. Fr. 767. 1886, as syn. of *S. ignatii* Berg. (err. typ. for prec.).
- philippinica* L. ex De Lanessan, l.c., also as syn. of *S. ignatii* Berg. = prec.
- phytelephas* Wehmer, Pflanzenst. 2: 969. 1931, nomen. = *Phytelephas* Ruiz et Pav. (*Palmae*).
- pierreana* A. W. Hill, Kew Bull. 1917: 197. 1917. = *S. gauthierana* Pierre ex Dop. (see Bisset & Vidal, Adansonia Sér. 2. 5: 431. 1965).
- pilgeriana* Gilg, Notizb. Bot. Gart. Berlin 1: 268. 1897. = *S. axillaris* Colebr.
- placida* F. Macbr., Candollea 5: 400. 1934. = *S. panurensis* Sprague et Sandw.
- plumosa* A. W. Hill, Kew Bull. 1917: 171. 1917. = *S. axillaris* Colebr.
- poepigiana* Prog. ex Krukoff et Monachino, Brittonia 4: 305. 1942 (err. typ.). = *S. poepigii* Prog.
- polytoma* Gilg et Bened. in Engler, Bot. Jahrb. 54: 173, f. 7. 1916. = *S. axillaris* Colebr.

- potatorum* var. *multiflora* Vidal, Sinopsis 33, t. 69. f. D. 1883. = *S. colubrina* L.
- pseudo-china* A. St. Hil. ex Endl., Ench. 292. 1841 (err. typ.). = *S. pseudo-quina* A. St. Hil.
- pseudochina* A. St. Hil. ex Benth., Journ. Linn. Soc. 1: 104. 1856 (err. typ.). = *S. pseudo-quina* A. St. Hil.
- pseudo-quina* var. *longiflora* Hassler, Addenda Pl. Hassl. 9. 1917, nomen. = *S. pseudo-quina* A. St. Hil.
- pseudo-tieuté* A. W. Hill, Kew Bull. 1911: 287. 1911. = *S. ignatii* Berg.
- psilosperma* F. v. Muell., Fragm. 4: 44. 1863. = *S. axillaris* Colebr.
- pubescens* C. B. Clarke in J. D. Hooker, Fl. Br. Ind. 4: 89. 1883. = *S. axillaris* Colebr.
- pubescens* var. *scortechinii* King et Gamble, J. As. Soc. Beng. 74. II: 620. 1908. = *S. axillaris* Colebr.
- pungens* Gagnep., Not. Syst. 14: 23. 1950. = *Carissa* sp. (*Apocynaceae*). Type seen in Paris herbarium by the present author.
- pynconeura* Gilg et Bened. in Engler, Bot. Jahrb. 54: 164, f. 4. 1916. = *S. colubrina* L.
- quintuplinervis* A. W. Hill, Kew Bull. 1917: 166. 1917. = *S. axillaris* Colebr.
- ramonensis* Pierre ex Sauvan, Des Loganiacées Thèse Montpellier 104. 1896, nomen. = seq.
- ranconensis* Pierre ex A. W. Hill, Kew Bull. 1917: 193. 1917, nomen. = *S. nux-blanda* var. *hirsuta* A. W. Hill, l.c. p. 191. (see also C. Tirel, *Adansonia* 1969, ined.).
- rheedei* C. B. Clarke in J. D. Hooker, Fl. Br. Ind. 4: 87. 1883. = partly *S. nux-vomica* L.
- rhexioides* Klotzsch ex Rich. Schomb., Reisen 3: 114. 1848. = *S. tomentosa* Benth.
- rivularia* Barb. Rodr., Vellozia 2nd ed. 1: 35, pl. 2. f. B, pl. 4. f. C. 1891. = *S. guianensis* (Aubl.) Mart. ?
- robinsonii* A. W. Hill, Kew Bull. 1917: 168. 1917. = *S. axillaris* Colebr.
- roborans* A. W. Hill, Kew Bull. 1925: 424. 1925. = *S. lucida* R.Br.
- rouhamon* Benth., Journ. Linn. Soc. 1: 106. 1856. = *S. guianensis* (Aubl.) Mart.
- rufa* var. *candollei* C. B. Clarke in J. D. Hooker, Fl. Br. Ind. 4: 89. 1883. – As. *ruizii* Sprague et Sandw., Kew Bull. 1927: 130. 1927. = *S. brachiata* Ruiz et Pav.
- schmidtii* Gilg, Bot. Tidsskr. 32: 312. 1915. = *S. axillaris* Colebr.
- schomburgkiana* Klotzsch ex Rich. Schomb., Reisen 3: 1144. 1848. = *S. pedunculata* (A. D.C.) Benth.
- scortechinii* A. W. Hill, Kew Bull. 1917: 168. 1917. = *S. axillaris* Colebr.
- sellowiana* Gilg in Engler, Bot. Jahrb. 25. Beibl. 60: 41. 1898. = *S. brasiliensis* (Spreng.) Mart.
- septemnervis* C. B. Clarke in J. D. Hooker, Fl. Br. Ind. 4: 88. 1883. = *S. colubrina* L.

- septemnervis* var. *imberbis* A. W. Hill, Kew Bull. 1917: 149. 1917. = *S. colubrina* L.
- silvicola* A. W. Hill, Kew Bull. 1930: 156. 1930. = *S. colubrina* L.
- similis* A. W. Hill, Kew Bull. 1912: 38. 1912. = *S. colubrina* L.
- smilacina* Benth., Journ. Linn. Soc. 1: 105. 1856. = *S. mitscherlichii* Rich. Schomb.
- solerederi* Gilg in Engler, Bot. Jahrb. 25. Beibl. 60: 40. 1898. = *S. mitscherlichii* Rich. Schomb.
- stylosa* Pierre ex Sauvan, Des Loganiacées Thèse Montpellier 104. 1896, nomen. = *S. colubrina* L.
- syntoxica* Sprague et Sandw., Kew Bull. 1927: 129. 1927. = *S. toxifera* Rob. Schomb. ex Benth.
- tenuiflora* Froes in Curare and Curare-like agents, edited by D. Bovet, F. Bovet-Nitti, and G. B. Marini-Bettollo 85. 1959; Ducke in same publ. p. 99, 110. = *S. mitscherlichii* Rich. Schomb.
- tipicensis* Standley, Contrib. U.S.Nat. Herb. 23: 1142. 1924. = *S. panamensis* Seem.
- tesseroidea* A. W. Hill, Kew Bull. 1917: 206. 1917. = *S. axillaris* Colebr.
- thonningii* Solered. ex Durand et Jackson, Ind. Kew. Suppl. 1: 415. 1906. = *S. micrantha* Thwaites.
- thwaitesii* Solered. in Engler & Prantl, Nat. Pflanzenf. 4(2): 40. 1892. = *S. micrantha* Thwaites.
- ticute* Lechen. ex Steud., Nom. 2nd ed. 2: 648. 1841 (err. typ.) = seq.
- tieute* Lesch., Ann. Mus. Hist. Nat. Paris 16: 479, 480, t. 23. 1810. = *S. ignatii* Berg.
- tonantinensis* Barb. Rodr., Vellozia 2nd ed. 1: 38. 1891, doubtful. – Am.
- toxifera* var. *acuminata* Klotzsch ex Rich. Schomb., Reisen 3: 950. 1848, nomen; ex Prog. in Martius, Fl. Bras. 6(1): 271. 1868. = *S. toxifera* Rob. Schomb. ex Benth.
- toxifera* var. *latifolia* Klotzsch ex Rich. Schomb., l.c., nomen; ex Prog., l.c. = *S. toxifera* Rob. Schomb. ex Benth.
- toxifera* var. *obliqua* Klotzsch ex Rich. Schomb., l.c., nomen; ex Prog., l.c. = *S. toxifera* Rob. Schomb. ex Benth.
- trichostyla* Ducke, Bull. Mus. Nat. Paris 2.4: 746. 1932. = *S. jobertiana* Baill.
- trinitensis* Griseb., Fl. Br. W. Ind. 407. 1861. = *S. pedunculata* (A. D.C.) Benth.
- triplinervia* Mart., Flora 25. Beibl. 2: 83. 1841. = *S. trinervis* (Vell.) Mart.
- ulei* Gilg ex Ule in Engler, Bot. Jahrb. 40: 136. 1907, nomen. = *S. dariensis* Seem.
- umbellata* (Lour.) Merr., Philip. Journ. Sc. 15: 252. 1920. – As.
- urari-üva* Mart. ex Prog. in Martius, Fl. Bras. 6(1): 278. 1868, in syn. = *S. castelnaeana* Wedd.
- urbaniana* Gilg in Engler, Bot. Jahrb. 25. Beibl. 60: 38. 1868. = *S. parvifolia* A. D.C.
- urbanii* Barb. Rodr., Vellozia 2nd ed. 1: 38, pl. 4. f. A. 1891. = *S. erichsonii* Rich. Schomb.?

usitata var. *cirrosa* Dop, Bull. Soc. Bot. France 57. Mém. 19: 19. 1910. – *As. vestita* Prog., Vidensk. Meddel. 1869: 32. 1869. = *S. brasiliensis* (Spreng.) Mart.

viridiflora A. W. Hill, Kew Bull. 1925: 424. 1925. = *S. axillaris* Colebr.

vomicus St. Lag., Ann. Soc. Bot. Lyon 7: 70. 1880. = *S. nux-vomica* L.

wallichiana var. *intermedia* A. W. Hill, Kew Bull. 1917: 199. 1917, see C. Tirel, Adansonia 1969, ined.

wallichiana var. *ovata* A. W. Hill, l.c. – As.

wenzelii Merrill, Philip. Journ. Sc. 11: Bot. 202. 1916. = *S. axillaris* Colebr.

yapurensis G. Planch., Journ. de Pharm. 5. 1: 492. 1880, doubtful. – Am.

This list is compiled after the publications cited after the genus diagnosis. Mme. C. TIREL will reduce several names of Asiatic species to synonyms in Adansonia 1969 (ined.). The Asiatic species described after 1917 are also included in this list.

ACKNOWLEDGEMENTS

The present author is greatly indebted to the directors and curators of the herbaria cited in the introduction for putting their material at his disposal. He is also very grateful to prof. dr. H. C. D. DE WIT, through whose intermediary possibilities were found for travel in Africa. He gave also noteworthy critical remarks. Furthermore he acknowledges in particular the drawings of Miss H. G. D. ZEWALD, and further the additional drawings of Miss W. BRAND, Miss L. TH. M. E. VAN DER RIET, and Mr. W. SCHEEPMAKER. These drawings are an indispensable contribution to this revision. He wants also to express his gratitude to dr. P. W. LEENHOUTS for his critical remarks, especially on the Asiatic species, and dr. N. G. BISSET for tracing obscure names, especially in pharmaceutical publications.

The author received a grant of the Netherlands Organization for the Advancement of Pure Research (Z.W.O.) for the last visit to the herbaria of Kew, London, and Oxford.

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- Davison, H. J., 55 (35).
- Dawe, M. T., 86 (62), 531 (71), 830 (30), 996 (44).
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- Desenfans, R., 1894, 4202 (57).
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- Edwards, L. C., 56, 219 (18).
- Eggeling, W. J., 483 = FH 819, 753 = FH 1150, 904 = FH 1252 (30), 1228 = FH 1331 (28), 1253 (44), 1509 = FH 1439 (62), 1515 = FH 1445, 1667, 1680 (30), 1715, 2583 (62), 2629 (30), 3344, 3378, 3449 (44), 3817 (1), 3976 (28), 5322 (44), 5684 (71), 6212 (3), 6482 (44), 6724 (35), 6751 (62).
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- Elliot, C. F., 176 (28).
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- Erens, J., 362 (56).
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- Esselen, L., PRE 29239 (34).
- Evans, A. C., 20 (13).
- Evrard, C., 380 (65), 516 (37), 550 (33), 698 (29), 902 (33), 912 (29), 947 (7), 1064, 1067 (33), 1130 (55), 1152 (60), 1299 (29), 1575 (37), 1657 (60), 1841, 2740 (3), 3034 (33), 3548 (17), 4725 (72), 4777 (24), 4797 (55), 5061 (70), 5727 (16), 5786 (37), 6153 (16), 6195 (19), 6357, 6465 (57), 6466, 6467 (13), 6468, 6592 (72).
- Exell, A. W., & F. A. Mendonça, 19 (28), 20 (25), 23 (45), 41 (25), 59, 66 (28), 610 (52), 637 (56), 931 (3), 1065 (13), 1506 (38).
- Eyles, F., 976, 1182 (38), 3688 (62), 3694 (13), SRGH 4315 (62), SRGH 4317 (13), 4386, 4540 (62), 4541 (13), 4542 (62), 4543 (13), 4544, 4545 (57), 4546, 4547 (13), 4548, 5123 (62), 5525 (57), 5526, 5527 (30), QVM 6601 (71), QVM 7029, QVM 7548 (62), 8155 (57), QVM 8156 (13), QVM 8202 (30).
- Eynatten, van, see van Eynatten.

- Fanshawe, D. B., 76 (57), 263 (73), 561 (56), 826 (13), 1324, 1397 (56), 1402 (30 × 57), 1575, 1620 (34), 1637 (3), 1641 (34), 2105, 2122 (3), 2123 (28), 2124 (3), 2301 (57), 2387 (3), 2392 (73), 2405, 2669 (28), 2813 (72 ?), 3185 (73), 3345 (28), 3872 (73), 3882 (56), 4058, 4652, 4698 (38), 4700 (32), 4759 (28), 4869 (73), 4881 (28), 4885 (38), 5262 (71 ?), 5792, 5836 (27), 6599 (18), 6667, 6751 (62), 7003 (71), 7627 (27), 8013 (28), Kitwe sent from Kitwe to Prof. Finn Sandberg in Stockholm who presented the specimens to WAG: 1 (3), 2 (57), 3 (62), 4 (30), 5 (56), 6 (13), 8 (73), 9 (71 ?).
- Farquhar, 12/47 (34).
- Farrell, J. A., 14 (56), 43 (62), 164 (35), 199 (28), 219 (18).
- Faulkner, H. G., 55 (28), 214 (30), 1656 (52), 1856, 1965 (62), 1966 (35), 2861 (62), 2904 (34), 3149 (35), 3361, 3428 (62).
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- Feedy, J. M., 117 (56).
- Fegen, see PRF.
- Fernando, F. C., see PRF or SRGH.
- Ferrar, E., 4099 (71).
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- FHI, 3133 (63), 3363 (5), 3529 (2), 3542 (50), 4996 (62), 5227, 7130 (61), 12713 (30), 14548 (71), 15529 (9), 15608, 15680, 15887 (62), 16060 (5), 16159 (62), 16629 (50), 16632 (25), 16782 (33), 16969 (50), 16972 (59), 17152 (71), 18066 (62), 18929 (68), 19782 (63), 19838 (30), 20121 (50), 20739 (31), 21182 (30), 21190 (62), 21582 (1), 21627 (25), 21871 (55), 21957 (50), 21973 (62), 22809 (61), 22909 (50), 22965 (30), 23391, 24385 (62), 25366 (63), 27735 (62), 28849 (25), 29666 (1), 30563 (41), 30566 (9), 30598 (64), 31247 (4), 31634 (19), 31806 (41), 31811 (70), 31874 (63), 31878, 32235 (2), 32413 (62), 32910 (41), 34052 (25), 35511 (64), 35670 (55), 35969 (1), 36285 (3), 36575 (71), 37032, 38067, 38704(7), 40276(71), 41018(55), 42247(71), 43231 (30), 43389, 43916 (62), 45344 (55), 45545 (62), 45671 (61), 46649 (62), 46983, 46985 (61), 47122 (50), 47773 (30), 55659 (71), 55722 (62), 55813, 56166 (30), 56852 (1), 56871 (9), 59073 (1).
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- Fries, Th. C. E., 2044, 2236, 2454, 2625, 2893 (62), 3318, 3369 (13), 3938 (34).
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- Gairdner, A. E., 92 (13), 98 (62).
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- Gamble, J. S., 9322, 11232, 15219 (56).
- Garcia, J. G., 66 (62), 132 (35), 133 (62), 160 (35), 254 (62), 939 (28).
- Gardner, H. M., 2292 = R. M. Graham 2292 (35), 3453 (44).
- Gathy, A. L., 561 (13), 630 (57), 689, 1064 (13), 1149 (57), 1319, 2097 (13), 2136 (57), 2153 (30), 2169 (13), 2264 (57), 2326b (62), 2332 (57).
- Geay, F., 6366, 9067, 9068, 9069, 9070, 9098 (62).
- Gérard, Ph., 601 (33), 842 (30), 1020, 1108, 1215 (62), 1230 (8), 1411 (62), 1578 (33), 1990 (7), 2184 (33), 2537 (29), 3239 (33), 3391 (62), 3517 (55), 3590, 3653, 3705 (44), 3849, 3930 (7), 4434 (62), 4452 (33), 4792 (60), 4848 (55), 4857 (8), 4923 (55), 5123 (33), 5177 (8), 5240 (55), 5256 (7), 5436 (8), 5536 (55), 5675 (62), 5694 (17), 5721 (41), 5739 (33).
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- Gerrard, W. T., 67 (62), 174 (35), 262 (18), 591 (62), 726 (35), 847 (18), 1421, 1422, 1660 (35), 1917 (28).

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- Gilbert, G., 140 (62), 1859 (37), 2201 (44), 7943 (14), 7966 (31), 10143 (14), 14610 (1).
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- Gillet, J., 134 (62), 808 (72), 880 (62), 1726, 2081 (72), 2209 (57), 2261 (13), 3780 (57), 4013 (45).
- Gillet, J. B., 2916 (62), 3010 (35), 12914 (28).
- Gilliland, H. B., 1016 (62), 1836 (35).
- Gillman, H., 533 (30), 834, 1076 (35), 1137 (28), 1287 (35), 1388 (47), 1391 (35), 1482 (62).
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- Goldsmith, B., 34/59 (18), 81/62 (62), 82/62 (28), 137/62 (71), 49/63 (34), 1/65 (44), 18/67 (71).
- Gomes Pedro, J., 1191, 1280 (62), 1281, 1516 (35), 1818 (28), 3382 (56), 3487 (13), 4230 (62), 4264 (35), 4288 (62), 4318, 4436, 4443 (35), 4451 (13), 4499 (62), 4500 (35), 4511 (62), 4653 (56), 4690 (35), 5060 (28), 5188 (52), 5196 (35), 5418, 5436 (47).
- Gomes e Sousa, A. F., 1819, 1850 (62), 3454 (44), 3691, 3788 (62), 3804 (35), 3843 (62), 3888 (35), 3968 (18), 4252 (56), 4346 (18), 4438 (56).
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- Goodier, J. H., 21 (56).
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- Graham, R. M., 237, 297 (35), 374 (52), 375 (35), 1581 (52), 1737, 1738, 1770 (62), 1854 (52), 2045 (60), 2290 (52), 2292 (35).
- Greenway, P. J., 798 (35), 999 (60), 1289, 1966 (35), 2782 (3), 2897 (71), 3684 (62), 4135 (52), 4247 (71), 4761, 4851, 4935 (35), 5026, 5031 (62), 5083 (44), 5213 (62), 5485 (73), 6034 (62), 6035 (35), 6043 (62), 6053 (40), 6561, 6562 (28), 7339 (30), 7952 (56), 8661 (62), 8706, 8716 (71), 8717 (28), 8853 (18), 8895 (35), 8903 (62), 9499, 9761 (18), 10222, 10753 (28), 10759 (44), 10825 (52), 11022 (34), 11444 (35), 11593 (38), 11634 (30), 11867 (44), 12074 (56), 13433 (44).
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