SERIES OF REVISIONS OF APOCYNACEAE
PART XXVI

A revision of Cleghornia Wight, Sindechites Oliv., and Epigynum chinense Merr. (Apocynaceae)

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Summary

Three Asian genera of Apocynaceae were studied. *Cleghornia* Wight contains four species: *C. acuminata* Wight (the type species), *C. borneensis* King & Gamble, *C. gracilis* King & Gamble and *C. malaccensis* (Hook.f.)King & Gamble. *Sindechites* Oliv. is monotypic with *S. henryi* Oliv. *Epigynum chinense* Merr. is treated in detail because of its confusion with *Sindechites*. *Epigynum* has about 10 species which have to be covered at a later date.

The species are fully described, with literature and synonyms. Illustrations and distribution maps are added. The genera are compared with some of the nearest relatives in the subfamily Apocynoideae.

INTRODUCTION AND DISCUSSION

This publication is a monographic revision of the Asian genera *Cleghornia* Wight and *Sindechites* Oliver, with special reference to *Epigynum chinense* Merr. (Apocynaceae, subfamily Apocynoideae). The generic relationship of *Baissea* A. DC., *Cleghornia* Wight, *Epigynum* Wight, and *Sindechites* Oliver is probed. The study is based on the herbarium material available.

Since Wight (1848) published *Cleghornia*, this genus has been under dispute for more than 100 years (see 'The History of *Cleghornia*' in this paper). Recently, P. T. Li (1984) made a review on *Cleghornia* Wight. He supported the recognition of *Cleghornia* Wight and moved *Sindechites* Oliv. into *Cleghornia*. This combination meant a second transfer of *Epigynum chinense* Merr. (– *Sindechites chinensis* (Merr.) Markgraf & Tsiang – *Cleghornia chinensis* (Merr.) P. T. Li). After the monographic study of these groups including the examination of most specimens of *Epigynum* Wight, the present author decided to support the original establishment of *Cleghornia* Wight, *Sindechites* Oliv. and *Epigynum chinense* Merr.

Between *Baissea* A. DC. and *Cleghornia* Wight, there are distinctive differences in the morphology of the flower:

Baissea A. DC.: Flower large (much larger than that of *Cleghornia*); corolla lobes long and reflexed; corolla tube short and campanulate. Distributed only in Africa.

Cleghornia Wight: Flower very small; corolla tube much longer than (or longer than, or in one species equal to) corolla lobes, cylindrical; lobes erect. Distributed only in tropical Asia.

It is also very easy to distinguish *Sindechites* Oliv. and *Cleghornia* Wight:

Cleghornia: Stamens oblong, inserted on the base of the corolla tube. Style very short or even absent. Ovary glabrous.

Sindechites Oliv.: Stamens elliptic, inserted on the throat wall of the corolla tube. Style very long. Ovary pubescent. Endemic in subtropical China, never reaching tropical areas.

Even *Cleghornia* and *Sindechites* can be distinguished by their dried leaves:

Sindechites: Leaves brown and densely veined.

Cleghornia: Leaves more or less green and sparser veined.

The combination of *Sindechites* Oliv. and *Cleghornia* Wight by P. T. Li is made because the two genera have the same hairy stamens and conspicuous colleters inside the calyx. Unfortunately, he had no chance to study all species of *Cleghornia* nor any African *Baissea*. In fact, *Cleghornia* includes species with pubescent stamens and species with glabrous stamens, and so does *Baissea*. The character 'colleters inside the calyx' is a popular phenomenon in *Apocynaceae*. The hairs on the stamens and the colleters inside the calyx are no reliable generic characters. In these related genera, the morphology of the corolla, the inserted

position of the stamens on the corolla tube, and the morphology of the stamens and pistil are the most important characters.

The status of *Epigynum chinense* Merr. is more troublesome. When Merrill (1923) published this species, he noticed that it was well characterized by its small leaves and flowers from other *Epigynum*. Later, Tsiang & Markgraf (1936) moved this species into *Sindechites* Oliv. There is no explanation for the treatment in the publication. But from their communication with each other (preserved in IBSC), Prof. Tsiang indicated the similarity of characters in both *Epigynum chinense* Merr. and *Sindechites henryi* Oliv.: Stamens pubescent and with colleters inside the calyx. As previously discussed in this paper, hairy stamens and colleters cannot be used for generic limitation.

Because they are so different, I immediately doubted that the two species can be combined:

E. chinense Merr.: Dried leaves dark green, with three veins proceeding from the base and only 3-6 pairs secondary veins, very conspicuous.

S. henryi Oliv.: Dried leaves brown. Secondary veins slender, dense, pinnate and nearly forming a right angle with the costa.

Their flowers are also different:

E. chinense: Flower large; corolla tube long and cylindrical; lobes large and spreading, several times larger in open flowers than in buds. Stamens inserted in the middle of the corolla tube. Ovary glabrous.

S. henryi: Flower small; corolla tube short and more or less campanulate; lobes small (shorter than the tube) and erect, no difference in size between those in open flowers and in buds. Stamens inserted in the throat of the corolla tube. Ovary pubescent.

In order to make a more reliable decision, the present author examined nearly all species of *Epigynum* (about 10 species). Surprisingly, he found out that, except for *E. chinense* Merr. and *E. auritum* (Schneid.) Tsiang et P. T. Li, *Epigynum* Wight is a natural group:

No colleters inside the calyx. Corolla tube long and twisted; lobes large and spreading (much larger in open flowers than in buds). Stamens inserted at the base of the corolla tube, glabrous. Ovary glabrous.

It seems that *E. chinense* is an intermediate species between this natural group of *Epigynum* and *Sindechites henryi*:

	Natural group of *Epigynum*	*E. chinense*	*S. henryi*
Colleters inside the sepals	no	yes	yes
Corolla tube twisted	yes	no	no
Corolla lobes large and spreading	yes	yes	no
Stamens inserted on the corolla tube	base	middle	throat
Anthers pubescent	no	yes	yes
Ovary pubescent	no	no	yes

Furthermore, the shape of the anthers of *E. chinense* is more similar to that

of *S. henryi* than to that of 'natural *Epigynum*', but the fruits of *E. chinense* are more or less torulose and this is exactly the character of 'natural *Epigynum*'. The fruits of *S. henryi* are smoother and straight. If we only consider the above characters, it seems that *E. chinense* belongs to neither *Sindechites* nor *Epigynum*. But probing into the evolution of the corolla morphology, we can say that *E. chinense* is much more related to the 'natural *Epigynum*' than to *S. henryi*. In this natural group, evolutionary trends can be seen:

The twisting of the corolla tube from very much to very little; the inserted position of the stamens from the extreme base somewhat upward; and the most important character is that the corolla lobes are much folded in bud and result in much larger corolla lobes in open flowers than in buds. It is obvious that *E. chinense* shares this character, but *Sindechites* does not.

From the knowledge available now, it seems we may draw the following conclusions:

Epigynum chinense Merr. should remain in *Epigynum* Wight for now. But this species seems to be situated at the margin of the evolution of the natural *Epigynum* (the starting point or the end point). It is possible to raise this species to generic rank, but that can be concluded only when a monograph of *Epigynum* and other evidence from cytology, chemistry and morphology, etc. corroborate this point of view.

No doubt *E. chinense* has the same origin as the natural group of *Epigynum*, but because of the geographical isolation, this species has differentiated from its original group.

Epigynum auritum (Schneid.) Tsiang et P. T. Li does not belong to the natural group of *Epigynum*, and has to be removed from *Epigynum*. But the solution should wait for the revision of *Epigynum* Wight.

Baissea A.DC., *Cleghornia* Wight, *Epigynum* Wight and *Sindechites* Oliv. are no doubt related to each other and they should belong to the same tribe. The following evolution in morphology can be seen in these genera:

Corolla tube from short to long, from untwisted to twisted; lobes from small and erect to large and spreading or even recurved. Stamens inserted on the corolla tube from the base to the throat. Styles from short (even absent) to long.

It seems that *Cleghornia* and *Sindechites* are more primitive than *Baissea* and *Epigynum*.

KEY TO RELATED GENERA

1. Flowers large, normally more than 1 cm long in mature bud; corolla lobes large and spreading (or reflexed) 2
– Flowers small, normally less than 5 mm long in mature bud; corolla lobes short and erect (or slightly spreading) 3
2. Corolla tube short (ca less than 5 mm) and campanulate (or obconical), not twisted; lobes narrowly oblong or triangular, much longer than the tube; distributed in tropical Africa . . . . . **Baissea** A. DC.
– Corolla tube long (usually longer than 1.5 cm) and cylindrical, twisted; lobes large, ovate or obovate or nearly so, but usually shorter than the tube; distributed in tropical Asia . . . . . **Epigynum** Wight
3. Stamens inserted on the base of the corolla tube; style very short (no longer than 0.5 mm) or even absent; ovary glabrous; distributed in tropical Asia. . . . . **Cleghornia** Wight
– Stamens inserted in the throat of the corolla tube; style long (3.5-4 mm) and distinctive, ovary pubescent; distributed in subtropical China . . . . . **Sindechites** Oliv.

HISTORY OF THE GENERA

Cleghornia Wight

Cleghornia was described by Wight in 1848 based on two species *C. cymosa* Wight and *C. acuminata* Wight. The name of the genus *Cleghornia* was dedicated to 'Dr. Hugh Cleghorn of the Madras Medical Establishment, a zealous cultivator of Botany, but more especially directing his attention to Medical Botany'. In 1876, Bentham and Hooker f. treated *Cleghornia* as a synonym of *Baissea* A. DC. and reduced *C. cymosa* Wight to synonymy. Later, another *Cleghornia* under the name of *Baissea--B. malaccensis* Hook. f. (1882) was published. The treatment was followed by Schumann (1895), Trimen (1895), Tsiang et P. T. Li (1977); but King & Gamble (1908) did not agree with the treatment of Bentham and Hooker f. They removed *Cleghornia* from *Baissea*, and published two other new species of *Cleghornia--C. gracilis* and *C. borneensis*. Thwaites (1860), Ridley (1923), Pitard (1933), Hüber (1973) and P. T. Li (1984) agree on the independent status of *Cleghornia*. In 1894, L. Planchon published a nomen nudum '*Aganonerion dongnaiense* Pierre, Gen. et Sp. nov.'. J. Pitard (1933) correctly placed *Aganonerion dongnaiense* Pierre in *Cleghornia* (*C.dongnaiensis* (Pierre) Pitard, but this name again turns out to be a synonym of *C. malaccensis*. Without well-founded arguments M. Pichon (1948, 1950) divided *Cleghornia* into 2 genera --*Giadotrum* Pichon (including *G. dongnaiense* (Pierre ex Pitard) Pichon and *G. malaccense* (Hook.f.) Pichon) and *Cleghornia* (including *C. borneensis*, *C. acuminata* and *C. gracilis*). Tsiang & P. T. Li (1977) and P. T. Li (1984) misidentified the Chinese *Cleghornia* specimens as *Cleghornia* (or *Baissea*) *acuminata*. Up to now, all Chinese *Cleghornia* known actually belong to *C. malaccensis*.

Sindechites Oliver

Oliver (1888) published *Sindechites* based on a Chinese plant collected by Dr. Henry from central China--*S. henryi* Oliv. Although Oliver gave no explanation about the generic name he adopted, *Sindechites* is easy to be explained as 'a Chinese (Sina) Echitideae' for this new genus was placed by Oliver in the Tribe Echitideae. Léveillé (1911, 1914), Tsiang (1932), and Woodson (1934) published several names related to this genus and all of them belong to the synonymy. In 1936, Tsiang & Markgraf moved *Epigynum chinense* Merr. into *Sindechites* and so added one more species to this genus. P. T. Li (1984) reduced *Sindechites* to a synonym of *Cleghornia*. These treatments are erroneous as was discussed in the preceding introduction. In this revision, the genus remains monotypic.

The history of *Epigynum* Wight will be left to a publication of the revision of this genus.

GEOGRAPHICAL DISTRIBUTION

Cleghornia Wight is a tropical Asian genus distributed from Sri Lanka and Borneo northward to Indochina and up to the southern border area of China (Yunnan, Pingbien). The whole distribution is Tropical Asian (Map 1).

Epigynum chinense Merr. was considered as endemic in Hainan Island (China) (Map 5), but is also found in Laos and Thailand.

Sindechites Oliv. is endemic in China, from central China to the east, south, and west, but restricted to the subtropical zone and without reaching tropical or temperate zones (Map 6).

TAXONOMIC PART

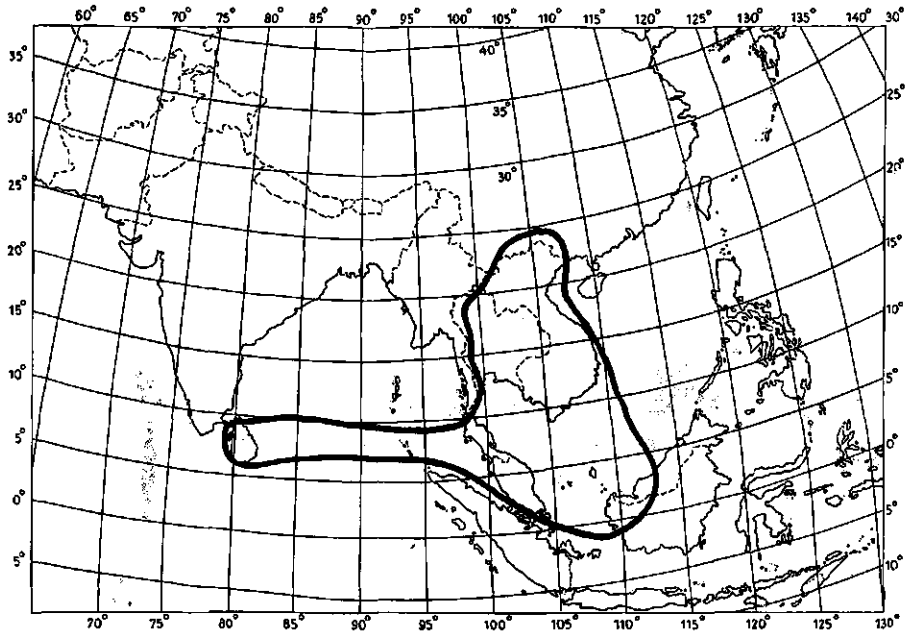
Cleghornia Wight

Icon. Pl. Ind. Or. 4 (2): 5, tt. 1310, 1312, 1848; Thwaites, Enum. Pl. Zeyl.: 194. 1860; King & Gamble, Journ. Roy. As. Soc. Beng. 74 (2): 490. 1908; Ridley, Fl. Malay Pen. 2: 363. 1923; J. Pitard in Fl. Gén. Indo-Chine 3: 1208. 1933; Pichon, Bull. Mus. Nat. Hist. Nat. 20 : 19. 1948, Mém. Mus. Nat. Hist. Nat. Bot. 1: 86. 1950. Hüber in Rev. Handb. Fl. Ceyl. 1 (1): 25. 1973; P. T. Li, Guihaia 4(3): 192. 1984.

Type species: *C. acuminata* Wight (Sri Lanka).

Heterotypic synonyms: *Aganonerion* Pierre ex Planchon, Prodr. Apocyn.: 206. 1894. nomen (based on *A. dongnaiense* Pierre, nomen). *Giadotrum* Pichon, Bull. Mus. Nat. Hist. Nat. 20: 300. 1948. Type: *G. dongnaiense* (Pierre ex Planch.) Pichon (Vietnam: Annam).

Woody climber, with milky latex. Branches and branchlets glabrous, and more or less lenticellate. *Leaves* opposite, those of a pair equal, petiolate. Blade elliptic, ovate or narrowly so, seldom obovate, acuminate at the apex, cuneate or rounded at base, glabrous, with parallel and nearly horizontal veins. *Inflorescence* axillary or terminal, corymbose, pedunculate, few- to many-flowered. Bracts sepal-like. *Flower* very small (except for *C. borneense*). *Calyx* 5-lobed. Sepals connate at the base, erect, ovate or nearly so, often glabrous outside, ciliate, with 1-4 colleters inside. *Corolla* yellow or brown, actinomorphic; corolla tube cylindrical, not twisted, often longer than the calyx and the corolla lobes (except for *C. malaccensis* which has equal corolla tube and lobes), glabrous outside or minutely pubescent, with pubescent belt inside in the throat; lobes ovate or nearly so, erect or slightly spreading, slightly twisting to the right when in bud. *Stamens* included, inserted at the base of the corolla tube, with very short filaments; anther acuminate at the apex and sagittate at the base, pubescent on the back or not. *Pistil* glabrous. Ovary ovoid, of 2 free carpels, surrounded by a slightly lower disk which is fissured or not. Style very short or even undistinguishable; pistil head composed of a 2-parted stigmoid apical part and an ellipsoid (or globose) basal part. The basal part is coherent with the stamens. The true stigma is located at the base of the basal part. Ovules few to many in each carpel. *Fruit* of 2 slender follicles, divaricate, connate at the extreme base. *Seeds* narrowly oblong or fusiform, with the apex directed toward the apex of the fruit, at the apex with a coma; coma of silky unbranched hairs. Embryo surrounded by a thin layer of endosperm but free from it; cotyledons large, elliptic; radicle thin and much shorter than the cotyledons.



MAP 1. *Cleghornia* Wight

4 species, distributed in S. and SE. Asian tropical areas, from Sri Lanka and Borneo to N. tropical border in Yunnan (China).

KEY TO THE SPECIES

1. Anthers pubescent on the back 2
– Anthers glabrous on the back 3
2. Corolla tube much longer than corolla lobes, 1.9-2.8 x as long as the lobes; endemic in Sri Lanka . . . . . **1. C. acuminata** Wight
– Corolla tube as long as the lobes or nearly so, 0.8-1.2 x as long as the lobes; in Malaya, Indochina, and S. China . . . . . **4. C. malaccensis** (Hook.f.) King & Gamble
3. Flowers large, 7-10 mm long in the mature bud, corolla lobes spreading when open; endemic in Borneo . . . . . **2. C. borneensis** King & Gamble
– Flower very small, 1.8-2.6 mm long in the mature bud, corolla lobes erect when open; endemic in Malaya Peninsula . . **3. C. gracilis** King & Gamble

1. Cleghornia acuminata Wight, Icon. Pl. Ind. Or. 4 (2): 5, t. 1310. 1848; Thwaites in Enum. Pl. Zeylan.: 194. 1860; Hüber in Rev. Handb. Fl. Ceylon. 1 (1): 25. 1973. **Fig. 1; Map 2**

Type: Sri Lanka (Ceylon): Herb. Wight Propr. s.n. (K, holotype). Wight 2512 (E, paratype).

Homotypic synomym: *Baissea acuminata* (Wight) Benth. ex Hook. f., Fl. Brit. Ind. 3: 663. 1882; Trimen, Handb. Fl. Ceylon 3: 140. 1895; Schumann in Engler & Prantl, Nat. Pflanzenfam. 4 (2): 172. 1895.

Heterotypic synonym: *Cleghornia cymosa* Wight, Icon. Pl. Ind. Or. 4 (2): 5, t. 1312. 1848. Type: Sri Lanka: Wight s. n. (K).

Woody twining climber. Branches pale to dark brown, with small concolourous lenticels, with shallowly and longitudinally fissured bark; branchlets terete, often sulcate when dried, glabrous. *Leaves* petiolate; petiole glabrous, 5-15 mm long, between bases of a pair forming a connecting line; blade papery when dried, elliptic or narrowly elliptic; 2-5 x as long as wide, 4.5-12.5 x 1.2-4.5 cm, acuminate or caudate at the apex, with an obtuse point (acumen 2-10 mm long), cuneate or rounded at the base, glabrous on both sides, with 7-18 pairs of secondary veins, forming an almost right angle with the costa and a faint submarginal vein; tertiary venation reticulate, conspicuous or not. *Inflorescence* terminal, sometimes seemingly axillary when axillary branchlet developing, corymbose cyme, 2.5-7 x 1.5-5 cm, pedunculate, few- to many-flowered, congested or rather lax; peduncle 1-2.7 cm long; pedicels glabrous or minutely pubescent, 1-2.5 mm long; bracts sepal-like, smaller than the sepal. *Flowers: Sepals* connate at the base, erect, ovate, oblong, or narrowly so, 2-2.5 x as long as wide, 1.3-2.3 x 0.7-1.2 mm, imbricate in bud, obtuse or sometimes acute, entire, glabrous outside, ciliate, glabrous and with sets of 1-4 colleters alternating with the sepals at the base inside; colleters in the same set (inside one sepal) usually unequal, 0.1-0.3 mm long. *Corolla* yellow, dark yellow or brown, in the mature bud 3-4 mm long and forming a spherical or slightly conical head equally as wide as the tube or very slightly wider, 0.7-1.4 x 1-1.6 mm, glabrous or sometimes minutely pubescent outside, inside pubescent in the throat and at the base of the lobes and with 5 lines of pubescence from the throat to the base; tube (1-) 1.5-1.8 x as long as the sepals, 1.9-2.4 (-2.8) x as long as the lobes, 2.1-3 x 1-1.8 mm, cylindrical, not twisted; lobes broadly ovate or orbicular, 0.3-0.8 x as long as the tube, 0.7-1.7 x as long as wide, 0.8-1.4 x 0.8-1.4 mm, overlapping to the right, erect or slightly spreading. *Stamens* just included (reaching the mouth of the corolla tube), inserted 0.5 mm from the corolla base; filaments nearly strap-shaped, 0.2-0.4 x 0.3-0.4 mm, sparsely pubescent inside, glabrous outside; anthers narrowly oblong, 1.7-2.5 x 0.5 mm, fertile in the upper part for about 1 mm long, sterile at the 0.2 mm long acute apex and the 0.7-0.9 mm long basal part, sagittate at the base (points 0.2-0.4 mm long), outside densely pubescent at the 0.4-0.6 mm long upper part, inside sparsely pubescent at the sterile basal part and with a fissure in the middle of the connective (this fissure is coherent with the ridge of the basal part of the pistil head). *Pistil* glabrous, 1.8-2.1 mm long, with the apex pointing at about 2/3 of their length from the base of the anthers; ovary subglobose or ovoid, 0.5-0.8 x 0.6-1 mm; disk 0.5-0.6 mm high, slightly lower than the ovary, lobed; style very short, less than 0.3 mm long, thick, 0.2-0.4 mm in diameter; pistil head composed of a subglobose or ellipsoid basal part and a stigmoid apical part; the basal part 0.4-1 x 0.4-0.5 mm, with

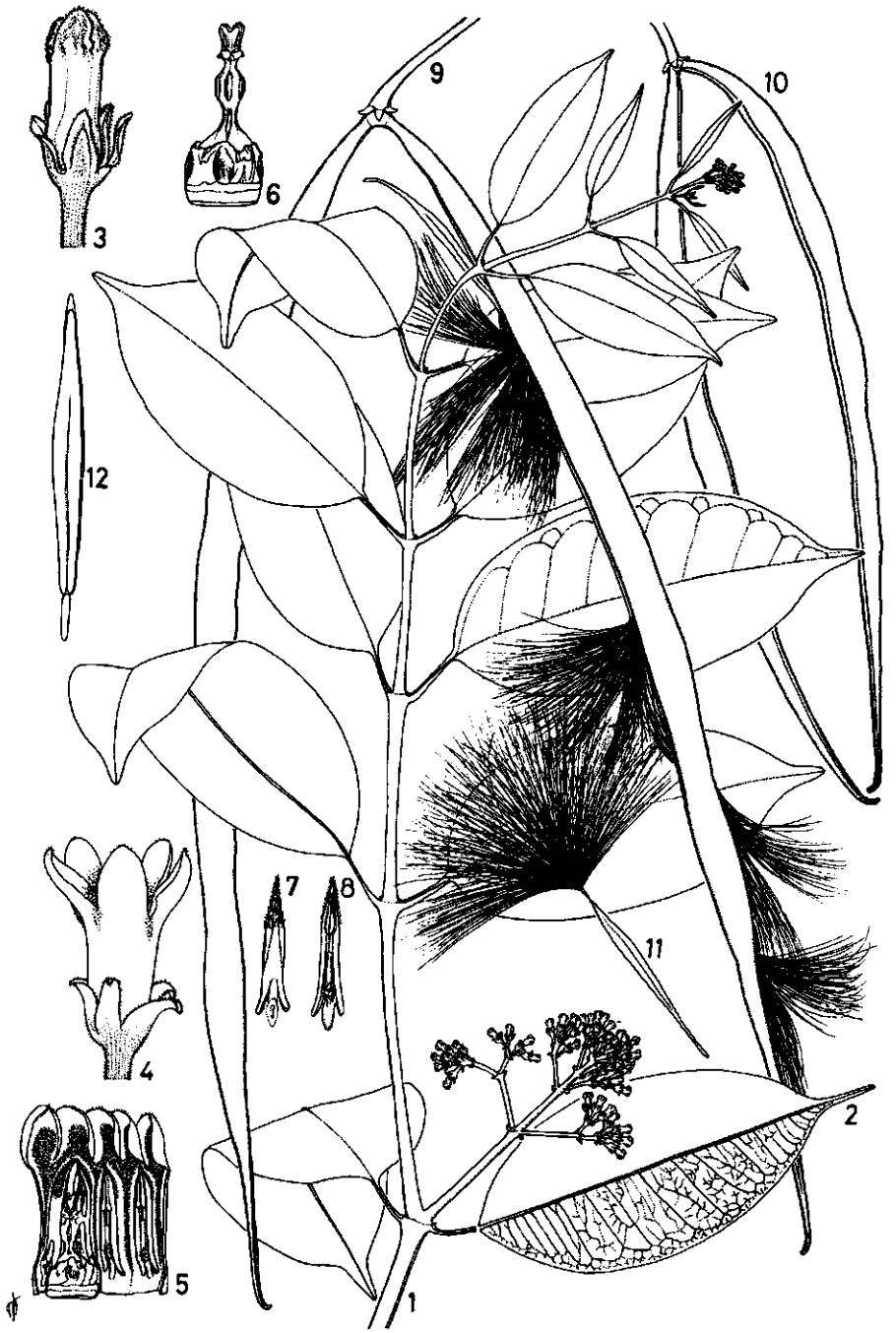
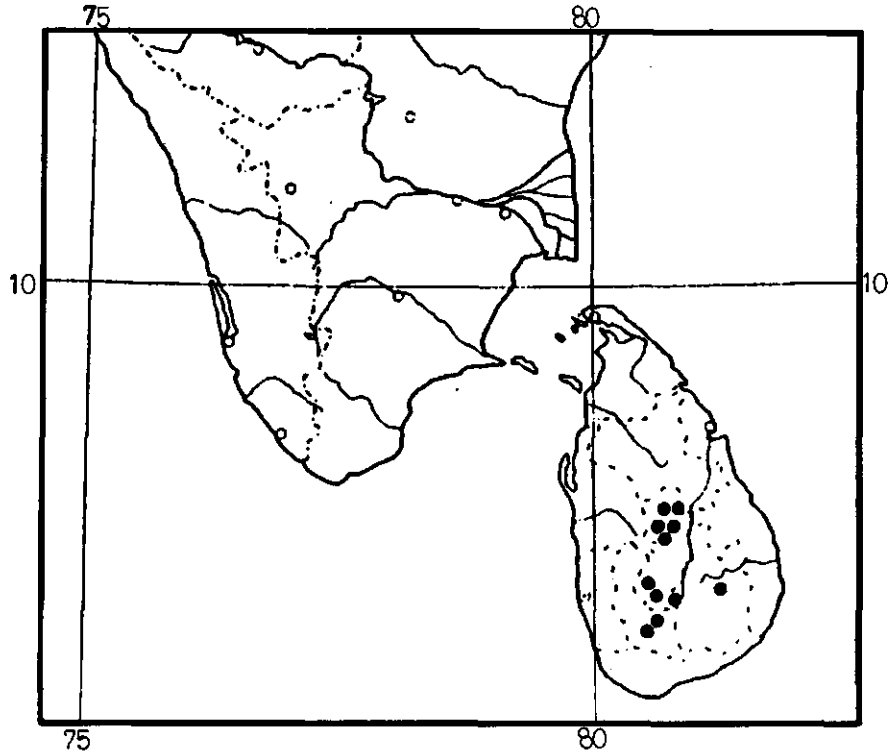


FIG. 1. *Cleghornia acuminata* Wight: 1. flowering branches (x $\frac{2}{3}$); 2. detail of the leaf blade (x $\frac{2}{3}$); 3. flower bud (x 6); 4. opened flower (x 6); 5. flower inside (x 6); 6. pistil (x 12); 7. stamen (outside) (x 8); 8. stamen (inside) (x 12); 9-10. fruit (x $\frac{2}{3}$); 11. seed (x $\frac{2}{3}$); 12. embryo (x 2). --1. from Wight, Ic. Ind. Or. 4 (2): t. 1310. 1848; inflorescence of 1. and 2. from Moon 113; 3. from Kostermann 23632 (B); 4-9. from Thwaites 1861 (G); 10. from Nooteboom 3295 (L); 11-12. from Thwaites 1861 (W).



MAP 2. *Cleghornia acuminata* Wight

5 longitudinal ridges and a narrow ring (just below the apical part) which are respectively coherent with the 5 fissures and the extreme base of the fertile parts of the anthers; the apical part bilobed, 0.4-0.5 x 0.2 mm, sometimes appearing hat-like; the true stigma is the lower half of the basal part of the pistil head. When the corolla is shed, the pistil head will be torn between the true stigma and the ridged section of the basal part of the pistil head. Ovules 12-20 in each carpel. *Fruit* of two slender follicles; follicles capsular, connate at the extreme base only, 15-22 x 0.7-0.8 cm, not lenticellate, glabrous, acuminate at the apex (apices of a pair of follicles sometimes united). *Seeds* dark brown, fusiform, 22-30 x 2 mm, with an apex directed towards the apex of the fruit, smooth, truncate and with a coma at the apex, long-acuminate at the base; coma of brownish unbranched hairs, 30-35 mm long; embryo 22 x 2.5 mm, with a thin layer of endosperm around but free from the embryo; cotyledons narrowly elliptic, obtuse at the apex, truncate at base, 19 x 2.5 mm; radicle (rootlet) 3 x 0.8 mm, with the root tip towards the apex of the seed.

Distribution: Endemic in Sri Lanka.

Ecology: In bushes or forest, often growing on river banks. Alt. 200-1000 m.

Specimens examined:

SRI LANKA: Ball F. R. S. Herb. (fl.) (E); Bernardi 14142 (fl.) (K); Champion 1851 (fl., fr.) (K); Central Prov.: Kandy Distr.: Kadugannawa, Poilakande (fl. May), Cramer 4212 (K, L, US); Herb. Hook. s. n. (fr.) (K); Matale Distr., Mile 37 of Rattota-Illukkumbura Road (fl. Aug.), Hüber 711 (E, US), M. Jayasuriya 286 (K, MO, US); Ambagamawa (fl.), Imdelilaa 32 (NY); Kalugammana (fl. June), Imsiwa 89 (C); Rakwana (fl. May), Kostermans 23632 (B, Z); Double Cuffing, Road Laxapana to Maskeliya (fl. May), Kostermans 24064 (US, Z); SW. Sri Lanka: Weddegale Entrance, Sinharaja Forest (fl. March), Kostermans 27460 (G, K, L); Slope of Hantane ridge above Kandy (fl. April), Kostermans 28259 (G, L); Summit of Hantane Ridge above Kandy (fl. April), Kostermans 28290 (G, K, L); MacRae 103 (fl. fr.) (BM); Kandy (fl. Feb.), Moor 113 (BM); Ratnapura Distr., S. Side of Forest between Opanaka and Wewelwatte (fl. Oct.), Nooteboom 3295 (L, US); Thwaites 555 (fl.) (K); Thwaites s.n. (fl. fr.) (G), (fl.) (BP); Thwaites 1861 (fl. fr.) (A, BM, BO, G, K, L, P, W); Walker 1711 (fl.) (E, K, W); Herb. Wight Propr. 2512 (fl.) (E, paratype); Herb. Wight propr. s.n. (fl) (K, holotype).

2. Cleghornia borneensis King & Gamble in Fl. Malay. Pen.: 492. 1908.

Fig. 2; Map 3

Type: Malaysia, North Borneo: near Kuching, Jan. 27, 1893, Haviland and Hose 2169 (fl.) (SING, holotype; K, L, isotypes).

Woody climber. Branchlets when dried purplish-brown, 4-angled, with shallowly and longitudinally fissured bark or smooth, with very few concolourous lenticels, glabrous. *Leaves* shortly petiolate; petiole glabrous, sulcate, 3-7 mm long, between bases of a pair with a line of triangular small scales; blade papery or nearly membranaceous when dried, elliptic or slightly obovate, about 2 x as long as wide, 8-12 x 4-6 cm, abruptly cuspidate-acuminate at apex (acumen about 1 cm long), rounded at base, glabrous on both sides; costa slender, raised and sharp beneath; secondary veins 10-14 pairs, parallel, forming a 70° angle with the costa, curved and nearly meeting each other at the very margin of the blade; tertiary venation reticulate, inconspicuous. *Inflorescence* axillary or terminal, glabrous; a corymbose cyme, 7-11 x 5-8 cm, pedunculate, few- to many-flowered, rather lax; peduncle slender, 3-5 cm long; pedicels glabrous, 2-5 mm long; bracteoles small, sepal-like, in pairs at the branches of the inflorescence and usually 2 in the middle of each pedicel; *Flowers* small. *Sepals* connate at the base, erect, ovate, 1.4-2 x as long as wide, 1.2-1.5 x 0.6-1 mm, imbricate in bud, obtuse, glabrous, with one about 0.3 mm high colleter at the left side of the base of each sepal inside. *Corolla* yellow, in the mature bud 7-10 mm long and forming an 2.5-3.5 x 1.5-2 mm ovoid head with the lobes (not wider than the tube), glabrous outside, inside pubescent in the throat and at the base of the lobes (especially on the right margin which is often folded) and forming 5 pubescent lines downwards which become sparser at the corolla base; tube 3.8-5 x as long as the sepals, 1.4-2.4 x as long as the lobes, 4.5-7.5 x 1.2-1.6 mm, cylindrical, not twisted; lobes obliquely ovate, 0.4-0.7 x as long as the tube, 1.4-1.8 x as long as wide, 3-4.5 x 2-2.5 mm, overlapping to the right, spreading, but not recurved. *Stamens* included, inserted 0.5 mm from the base of the corolla, with the apex reaching about 1/4 of the length of the corolla tube, glabrous; filaments strap-shaped, about 0.2-0.25 x 0.3 mm; anthers ovate, 1.4-1.75 x

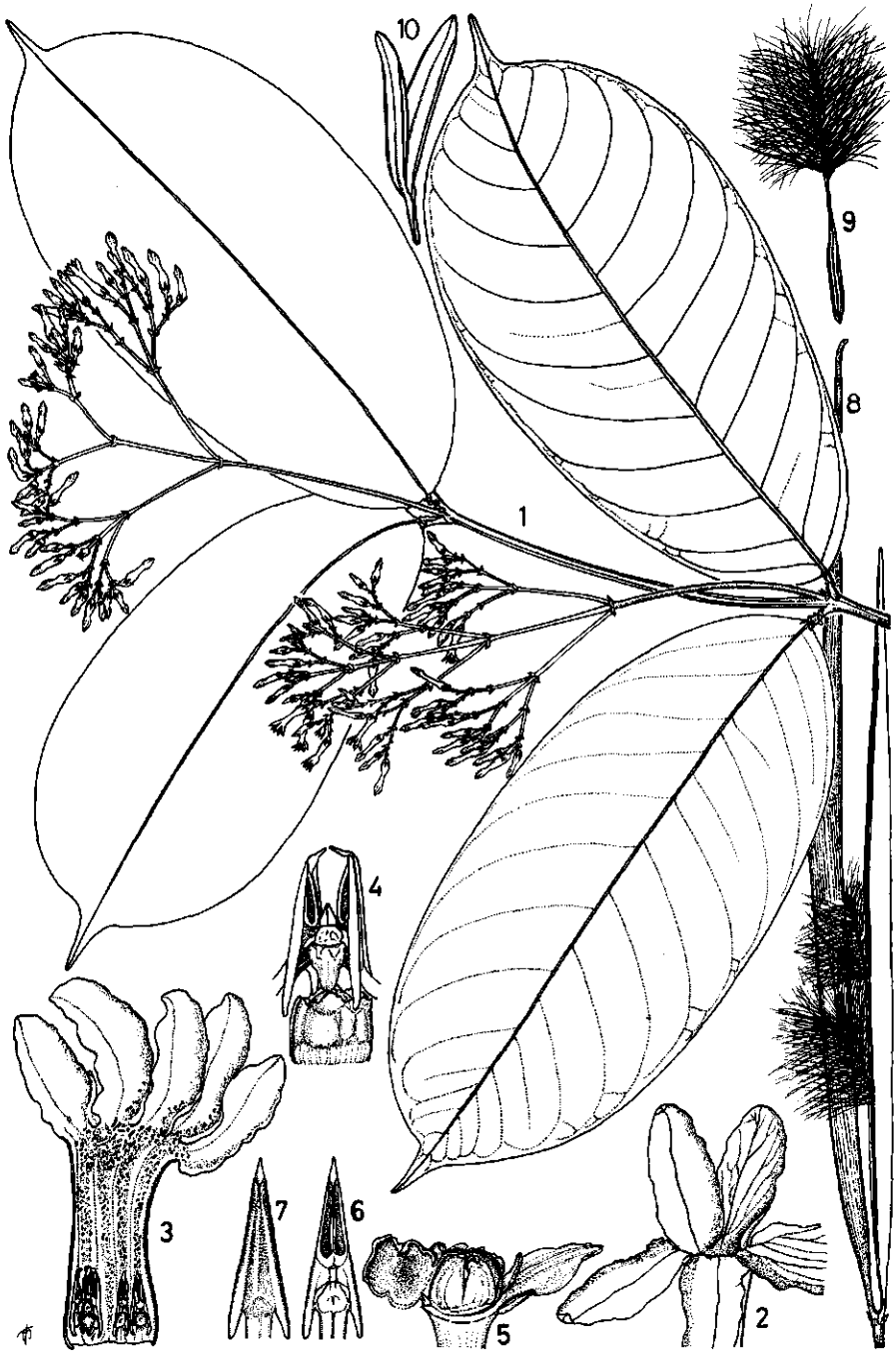
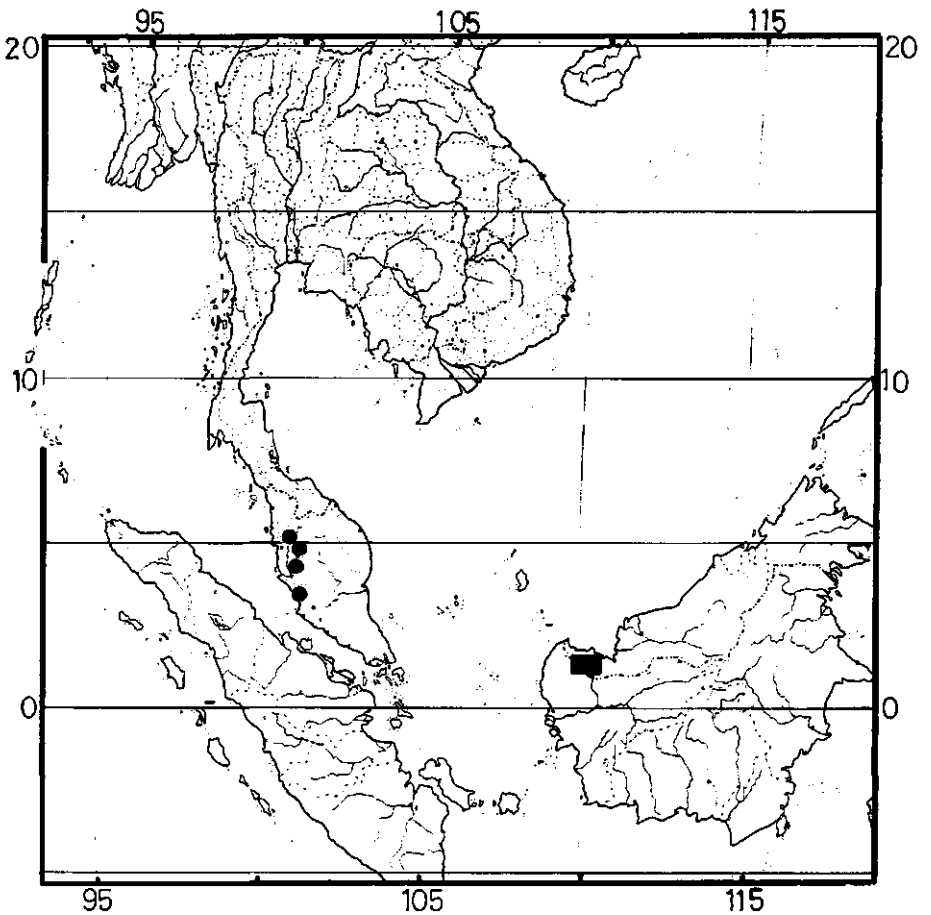


FIG. 2. *Cleghornia borneensis* King & Gamble: 1. flowering branch (x $\frac{2}{3}$); 2. corolla lobes (x $\frac{2}{3}$); 3. opened flower (x $\frac{2}{3}$); 4. coherence of stamens with pistil (x 30); 5. ovary and disk (opened) (x $\frac{2}{3}$); 6. stamen (inside) (x $\frac{2}{3}$); 7. stamen (outside) (x $\frac{2}{3}$); 8. fruit (x $\frac{2}{3}$); 9. seed (x $\frac{2}{3}$); 10. embryo (x 3). –1-2, 4-10. from Haviland 2169 (K); 3. from Haviland 2169 (L).

0.4-0.5 mm, fertile in the 0.7 mm long upper part, with a 0.2 mm long sterile acute apex, sagittate at the base (points about 0.25 mm long), inside below the fertile part with 2 patches coherent to the pistil head. *Pistil* glabrous, 1.6-1.8 mm long, with the apex halfway the fertile part of the anthers; ovary of 2 separate carpels, broadly ovoid or spherical, about 0.6 x 0.6 mm; disk as high as the ovary, lobed; pistil head sessile, composed of a subglobose or ellipsoid basal part and a stigmoid apical part; the basal part 0.8-0.9 x 0.4- 0.5 mm, coherent by its 0.3 mm high ring-shaped upper part with the connectives of the anthers (just below their fertile parts); the apical part bilobed, 0.2-0.3 x 0.2 mm; the true stigma is thought to be located at the basal part below the coherent ring of the pistil head. Ovules about 8 in each carpel. *Fruit* of 2 separate follicles; follicles unequal in a pair, divaricate at a small angle, 15-20 x 0.5 cm, connate



MAP 3. ● *Cleghornia gracilis* King & Gamble
■ *Cleghornia borneensis* King & Gamble

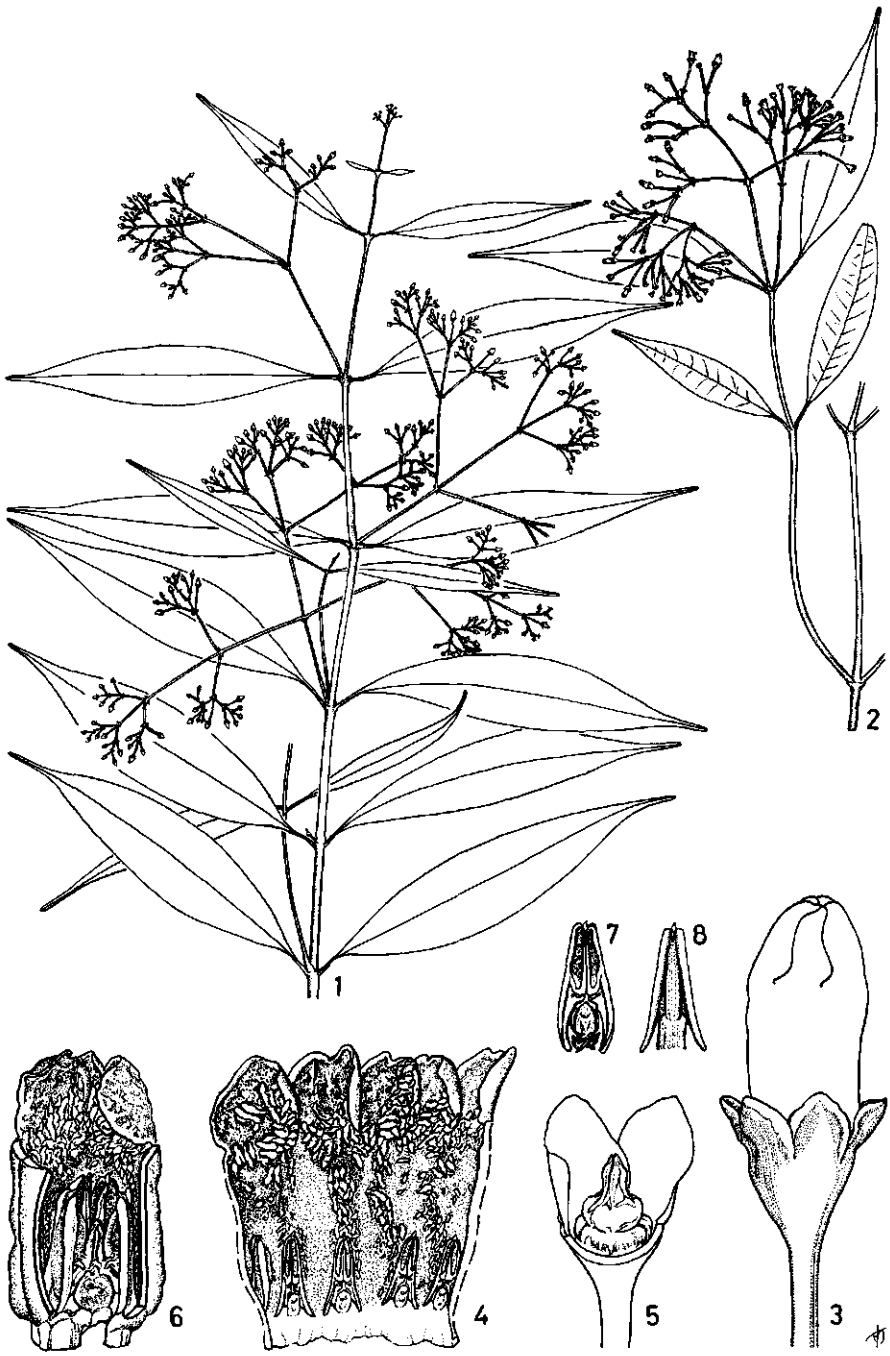


FIG. 3. *Cleghornia gracilis* King & Gamble: 1-2. flowering branches (x $\frac{2}{3}$); 3. flower bud (x 20); 4. opened flower (x 20); 5. pistil (x 20); 6. coherence of the stamens with the pistil (x 20); 7. stamen (inside) (x 20); 8. stamen (outside) (x 20). –1. from Wray 3209 (K); 2, 6-8. from Scortechini 384 (K); 3-5. from King's collector 6352 (K).

at the base, acuminate at the apex, glabrous. *Seeds* elliptic, ca 30 x 2.5 mm, with an linear (ca 1 cm long) apex pointing at the same direction of the fruit apex, with a coma at the apex; coma of unbranched white silky hairs, 3-5 cm long; embryo 17 mm long, surrounded by a thin layer of endosperm but free from the embryo; cotyledons elliptic, obtuse at the apex, suborbicular at base, 13 x 3 mm, unequal in a pair, very thin; radicle (rootlet) 3.5 x 0.5 mm, with the root tip towards the apex of the seed.

Distribution: Endemic in Borneo.
Ecology: ?

Specimens examined:
NORTH BORNEO: near Kuching, Haviland and Hose 2169 (fl.) (K, holotype, isotypes: K, SING).

When King and Gamble published this species in 'Flora of the Malayan Peninsula', they said this species might eventually be found in the Malay Peninsula. But, unfortunately, up to now, there has been no record other than the type specimen even in Borneo. Perhaps this species is an endangered one.

3. Cleghornia gracilis King & Gamble in Fl. Malay. Pen.: 491, 1908; Ridley, Fl. Malay. Pen. 2: 363. 1923. **Fig. 3; Map 3**

Type: Malay Peninsula: Perak, Dawfiels Hill, April 1884, Scortechini 384 (fl.) (K).

Woody climber, reaching 20-35 m long; the stem up to 2-6 cm in diameter; branches dark brown, with darker lenticels, and with inconspicuously fissured bark; branchlets when dried slightly enlarged at the nodes, very slender, terete or 4-angled, glabrous. *Leaves* petiolate; petiole glabrous, 0.6-1 cm long; blade membranaceous or papery, narrowly elliptic or narrowly ovate, 2.9-5 x as long as wide, 5-7 x 1.4-1.7 cm, cuneate at base, long-but obtuse-acuminate at the apex, bright green above, paler beneath, glabrous at both sides, with 12-20 pairs of inconspicuous secondary veins, forming a nearly right angle with the costa and meeting each other in an intramarginal looped vein; tertiary veins indistinct. *Inflorescence* terminal and axillary, corymbose, 3.5-6 x 2-5 cm, pedunculate, many-flowered, lax; peduncle very slender, 1-2 cm long; branches trichotomous, capillary; pedicels glabrous, 2-4 mm long; bracts very minute, hardly visible to the naked eye. *Flower* very small. *Sepals* connate at the base, erect, ovate, broadly ovate or suborbicular, 0.6-1.1 (-2) x as long as wide, 0.5-1 x 0.5-0.8 mm, imbricate in bud, obtuse, entire, glabrous outside, ciliate, glabrous and with one colleter about 0.1 mm long at the right side of the base of each sepal inside. *Corolla* light yellow, in the mature bud 1.8-2.6 mm long with a conical or ovoid head formed by the lobes not wider than the tube, glabrous outside, inside on the throat and at the base of the lobes with an about 0.5 mm wide belt of pubescence; tube 1.5-3 x as long as sepals, 1.5-2.1 x as long as lobes, 1.2-1.7 x 0.9-1 mm, cylindrical, not twisted; lobes suborbicular or broadly ovate, 0.5-0.7 x as long as the tube, 0.7-1 x 0.7-1 mm, overlapping to the right, slightly twisted when

in bud, erect in open flower. *Stamens* included, inserted at 0.2-0.4 mm from the base of the corolla, with the apex about halfway the corolla tube; filaments flat, about 0.2 mm long, glabrous; anthers ovate, 0.5-0.8 x 0.3-0.4 mm, fertile in the upper 0.3-0.5 mm, sagittate at the base (points 0.1 mm long), coherent to the pistil head by a patch just below the fertile part (about halfway the anther). *Pistil* glabrous, 0.7-1.1 mm long, with the apex slightly lower than the apices of the anthers; ovary of 2 carpels, depressed-globose 0.3-0.5 x 0.4-0.8 mm; disk slightly higher than the ovary, about 0.5 mm high, lobed; pistil head sessile, composed of a stigmoid apical part and a relatively larger subglobose basal part (nearly equal in size to the ovary); the basal part about 0.2-0.4 x 0.2-0.4 mm with an obscure ring near the apical part (this ring is coherent to the stamens just below their fertile parts); the apical part bilobed, 0.2-0.3 x 0.1-0.2 mm; the true stigma is thought to be located at the basal part just below the coherent ring. Ovules 2-4 in each carpel. *Fruit* unknown.

Distribution: Endemic in Perak, Malaysia.

Ecology: Clinging to trees in forest; Alt. 1000-1300 m.

Specimens examined:

PERAK: Larut (fl. July), Dr. King's collector 6351 (BO, K, paratype); Gunong Hijau (fl. Feb.), Nur 2465 (K); Wray 3209 (fl.) (K, Z, paratype); Selangor (fl. Sept.), FRI (Forest Research Institute, Kepong) 7177 (K); Dawfiels Hill (fl. April), Scortechini 384 (K, holotype).

There is one specimen in K (Herb. F. D. Sandakan 53670), collected from Sabah (Malaysia, in Borneo), very similar to *C. gracilis*, but the leaves are elliptic and have a short and obtuse acumen, the corolla tube becoming narrower in the throat, and is easily distinguished from this species. The present author supposes that the specimen belongs to a new species, but because only one specimen is available, he would like to leave it to be published when more material is available.

4. Cleghornia malaccensis (Hook. f.) King & Gamble in Fl. Malay. Pen.: 491, 1908; Ridley, Fl. Malay. Pen. 2: 363. 1923. **Fig. 4; Map 4**

Basionym: *Baissea malaccensis* Hook. f., Fl. Brit. Ind. 3: 663. 1882; K. Schumann in Engler & Prantl, Nat. Pflanzenfam. 4 (2): 172. 1895.

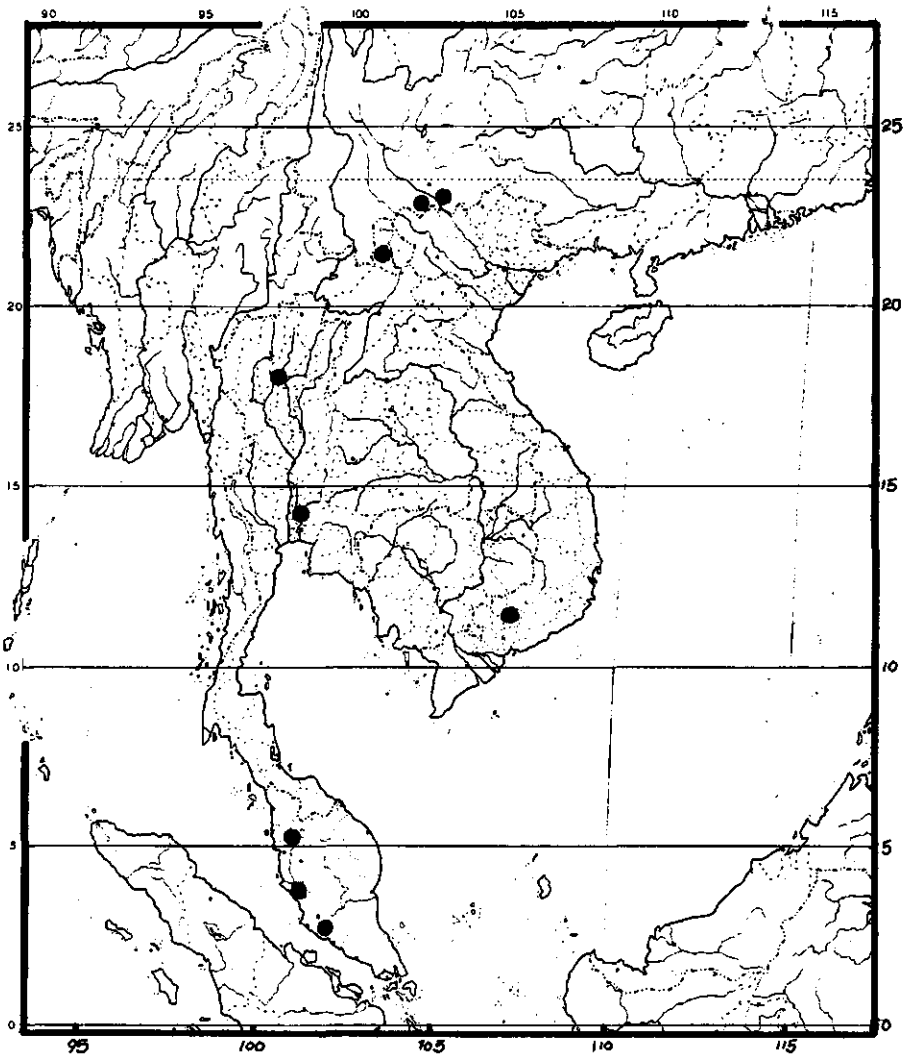
Type: Malay Peninsula: Malacca: March 27, 1868, Maingay 3276 (fl.) (K, holotype and isotype).

Homotypic synonyms: *Giadotrum malaccense* (Hook. f.) Pichon, Bull. Mus. Nat. Hist. Nat. 20: 300. 1948, Mém. Mus. Nat. Hist. Nat., Bot. 1: 87. 1950.

Heterotypic synonyms: *Cleghornia dongnaiensis* Pierre ex Pitard in Lecomte & Humbert, Fl. Gén. Indo-Chine, 3: 1208. 1933. Type: Vietnam: Annam, Bien Hoa Prov., Baochiang, July 1877, L. Pierre 2027 (fl.) (P). Homotypic synonym: *Giadotrum dongnaiense* (Pierre ex Pitard) Pichon.

Misapplied names: *Baissea acuminata* auct. non (Wight) Benth. ex Hook. f., Icon. Corm. Sin. 3: 446, t. 4845. 1974; Tsiang & P. T. Li, Fl. Reip. Pop. Sin. 63: 172, pl. 58. 1977, Fl. Yunnan. 3: 532, pl. 159 (1-7). 1983. – *Cleghornia acuminata* auct. non Wight, P. T. Li, Guihaia 4 (3): 193. 1984.

Woody climber, up to 20-35 m long; stem reaching 5 cm in diameter, dark brown; branches pale to dark brown, smooth, glabrous; branchlets pale brown, terete, often sulcate when dried, glabrous. *Leaves* petiolate; petiole glabrous, 0.7-1.5 cm long, between each pair forming a connecting line; blade bright green above, bluish-green beneath, membranaceous or papery when dried, elliptic or slightly obovate, 2-3 x as long as wide, 4-9 x 1.5-4 cm, abruptly caudate-acuminate at apex, with an obtuse point (acumen less than 1 cm long), cuneate or rounded at base, with 10-14 pairs of secondary veins, forming a nearly right angle with the costa and a faint submarginal vein; tertiary venation reticulate, conspicuous or not. *Inflorescence* paniculate, 4-7 x 2-5 cm, terminal, sometimes seemingly axillary when axillary branchlet developing, 4-7 x 2-5 cm, many-flowered, congested or lax, with a glabrous 1-3 cm long peduncle; branches trichotomous, minutely pubescent; pedicels 1-3 mm long, minutely pubescent; bracts sepal-like, smaller than the sepals. *Flowers* small. *Sepals* connate at the base, erect, ovate or narrowly so, 1.3-1.7 (-2.3) x as long as wide, 0.8-1.5 x 0.6-0.8 mm, imbricate in bud, obtuse, entire, glabrous outside, ciliate, glabrous and with sets of 1-3 small colleters about 0.1 mm long alternating with the sepals at the base inside. *Corolla* white or pale yellow or yellow, in the mature bud 3.3-4.5 mm long, not forming a wider head with the lobes, outside minutely pubescent on the lobes especially on their margins and glabrous on the tube, inside with an about 0.5 mm wide sparsely pubescent belt on the throat connected with 5 stripes from there downwards to the base and upwards along the margins of the lobes; tube 1.3-2.3 x as long as sepals, more or less equally (0.8-1.2 x) as long as the lobes, 1.6-2 x 2.5 mm, cylindrical, not twisted; lobes oblong or narrowly ovate, 1.9-3.6 x as long as wide, 0.9-1.3 x as long as the tube, 1.8-3.2 x 0.7-1 mm, overlapping to the right, not much twisted when in bud, almost horizontally spreading, rarely recurved. *Stamens* just included, inserted 0.5 mm from the corolla base; filaments nearly strap-shaped, 0.2 x 0.3 mm, minutely pubescent inside, glabrous outside; anthers narrowly oblong 1.8-2 x 0.5 mm, fertile at the upper part for about 1 mm, sterile at the acute apex for about 0.2 mm and at the basal part for 0.7-0.9 mm, sagittate at the base (points 0.2-0.4 mm long), outside densely pubescent on the upper part for 0.4-0.6 mm, inside sparsely pubescent on the basal sterile part and forming a fissure in the middle of the connective which is coherent with the ridge of the basal part of the pistil head. *Pistil* glabrous, 1.5-2 mm long, with the apex at about 2/3 of their length from the base of the anthers; ovary subglobose or ovoid 0.5-0.8 x 0.5-1 mm, of 2 separate carpels; disk about 0.5 mm high, slightly lower than the ovary, 5-parted, and each part 2-lobed; style short, 0.2-0.5 x 0.15-0.2 mm; pistil head composed of a subglobose or ellipsoid basal part and a stigmoid apical part; the basal part about 0.4 x 0.3 mm, with 5 longitudinal ridges and a narrow ring (just below the apical part) which are respectively coherent with the 5 fissures and the extreme base of the fertile parts of the anthers; the apical part bilobed, 0.4 x 0.2 mm (sometimes appearing hat-like); the true stigma is the lower half of the basal part of the pistil head. When the corolla is shed, the pistil head is torn between the true stigma and the ridged section of the basal



MAP 4. *Cleghornia malaccensis* (Hook.f.) King & Gamble

part. Ovules about 20-24 in each carpel. *Fruit* of 2 slender follicles, divaricate at a small angle; follicles capsular, 7-17 x 0.5-1.5 cm, not lenticellate, acuminate at the apex, glabrous. *Seeds* brown-yellow, narrowly or very narrowly oblong or fusiform, 2-3 x 0.4 cm, with the apex directed towards the apex of the fruit, at the apex with a coma; coma of yellowly white silky hairs, up to 4 cm long; embryo 28 x 4.5 mm, with a thin layer of endosperm arround but free from the embryo; cotyledons narrowly elliptic, obtuse at the apex, truncate at the base, 25 x 4.5 mm, thick; radicle (rootlet) 3 x 1.5 mm, with the root tip towards the apex of the seed.

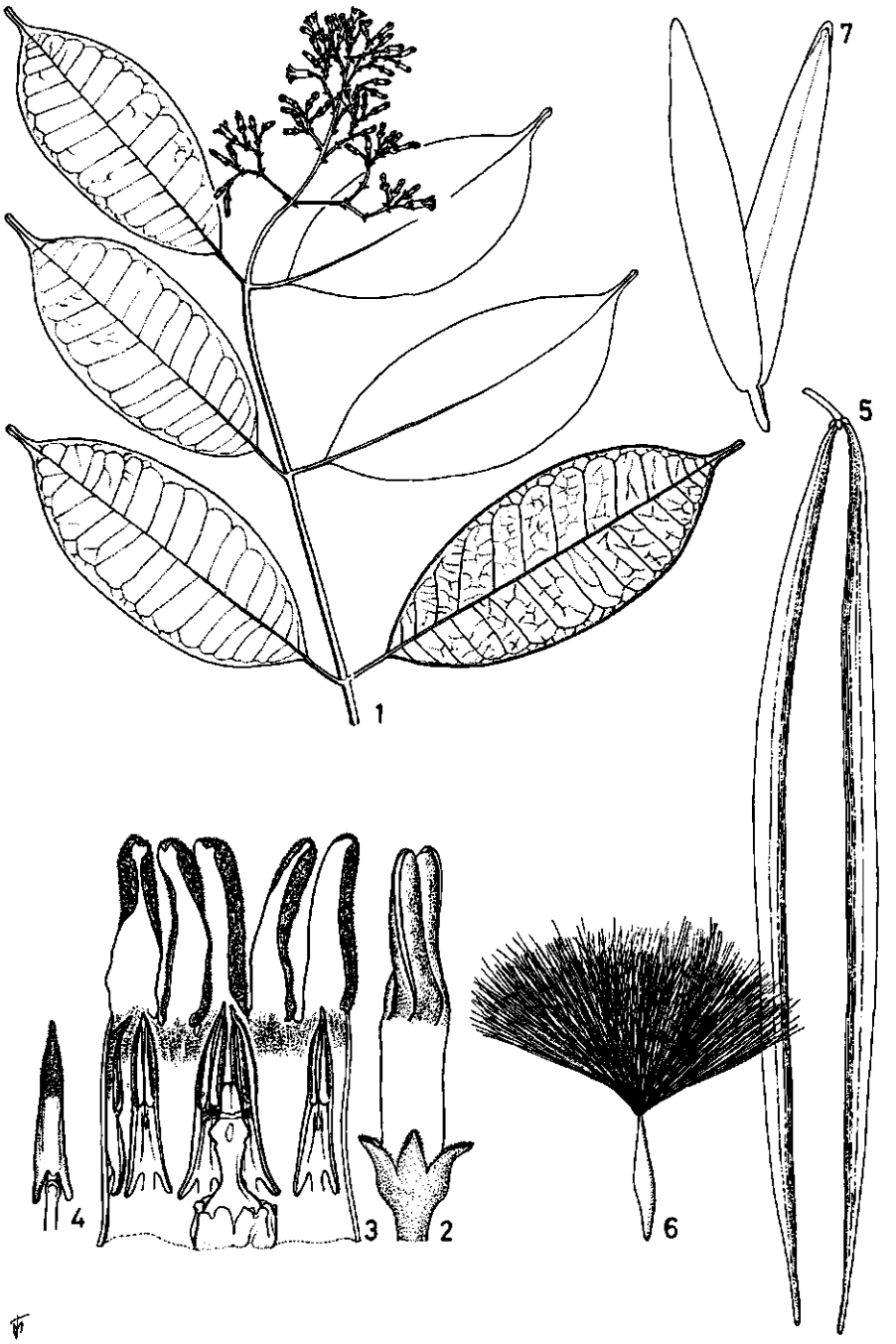


FIG. 4. *Cleghornia malaccensis* (Hook.f.) King & Gamble: 1. flowering branch (x $\frac{2}{3}$); 2. flower bud (x 9); 3. opened flower (x 12); 4. stamen (outside) (x 12); 5. fruit (x $\frac{2}{3}$); 6. seed (x $\frac{2}{3}$); 7. embryo (x 2). –1. from Wray 3457 (BM); 2. from Pierre 1807 (L); 3-4. from Scortechini s. n. (K); 5. from Tsiang & P. T. Li, Fl. Reip. Pop. Sin. 63: pl. 58. 1977; 6-7. from Kerr 4745 (K).

Distribution: Malay Peninsula (Perak, Malacca), Vietnam (Baochang), Thailand, Laos, China (Yunnan).

Ecology: Alt. 100-1600 m, in bush or forest on mountains, river banks, or near streams.

Vernacular names:

Malaysia: Mengawa (Kepong Plantation, Selangor).

Vietnam (Annam): Giay do trong (Baochiang, Bien Hoa Province).

China: Jinpingteng (Tsiang et P. T. Li, Fl. Reip. Pop. Sin. 63: 172. 1977); Yunnan Maoyeoteng (P. T. Li, Guihaia 4 (3): 193. 1984.). The latter name was invented by P. T. Li and based on the combination of *Cleghornia* Wight and *Sindechites* Oliv. The original Chinese name for *Sindechites* Oliv. is Maoyaoteng. When P. T. Li made this combination, he used Maoyaoteng for the Chinese name of *Cleghornia* Wight and changed the Chinese name Jinpingteng for *Cleghornia acuminata* Wight into a new Chinese name Yunnan Maoyaoteng. Because the Chinese specimens placed under the name of *C. acuminata* (or *Baissea acuminata*) actually belong to *C. malaccensis*, and because the combination of *Cleghornia* and *Sindechites* is unreasonable, the Chinese names Maoyaoteng for *Sindechites* and Jinpingteng for *C. malaccensis* should be retained. Other newly invented names should be rejected.

Specimens examined:

MALAYSIA: Malay Peninsula: Perak: Larut (fl. April), Dr. King's collector 5900 (BO, E, K, L, P, SING), 8798 (E, K), 10799 (fr.) (K); Scortechini s.n. (fl.) (BM, K, P); Wray 3457 (fl.) (BM, G); Malacca: Maingay 3276 (K, type). Selangor: Kepong Plantation (fl. April), Hamid 36035 (K).

VIETNAM: Annam: Bien Hoa Prov., Baochiang (fl. July), L. Pierre 2027 (P, holotype of *C. dongnaiensis* Pierre), 1827 (fl. July) (K, L, NY, P).

LAOS: Phong Aaly (fl. May), Poilane 26008 (P).

THAILAND: Lam Pang Prov., Che Sawn (fr.), Kerr 4745 (K). Muang Cha, Chieng Kuang (fl. April), Kerr 20988 (BM, K, P).

CHINA: Yunnan: Che-li County (fr. Sept.), C. W. Wang 79068 (PE); Pingbien (fr. Sept.), K. M. Feng 4717 (PE).

Epigynum Wight

Epigynum chinense Merr., Philip. Journ. Sci. 23: 262. 1923 and Lingnan Sci. Journ. 5: 151. 1927. **Fig. 5; Map 5**

Type: China: Hainan: Yijuomao (Yik Tsok Mau), May 18, 1922, McClure 9710 (fl., fr.) (Holotype not seen, photos seen in A and GH; isotypes: A, BM, C, E, G, P, UC, US, Z).

Homotypic synonyms: *Sindechites chinensis* (Merr.) Markgr. & Tsiang, Sunyatsenia 3: 152. 1936; Icon. Corm. Sin. 3: 445, t. 4844. 1974; Fl. Hainan. 3: 244. t. 692. 1974; Tsiang & P. T. Li, Fl. Reip. Pop. Sin. 63: 170, pl. 57. 1977. *Cleghornia chinensis* (Merr.) P. T. Li, Guihaia 4 (3): 192. 1984.

Woody twining climber, up to 6 m long; branches brown or pale brown,

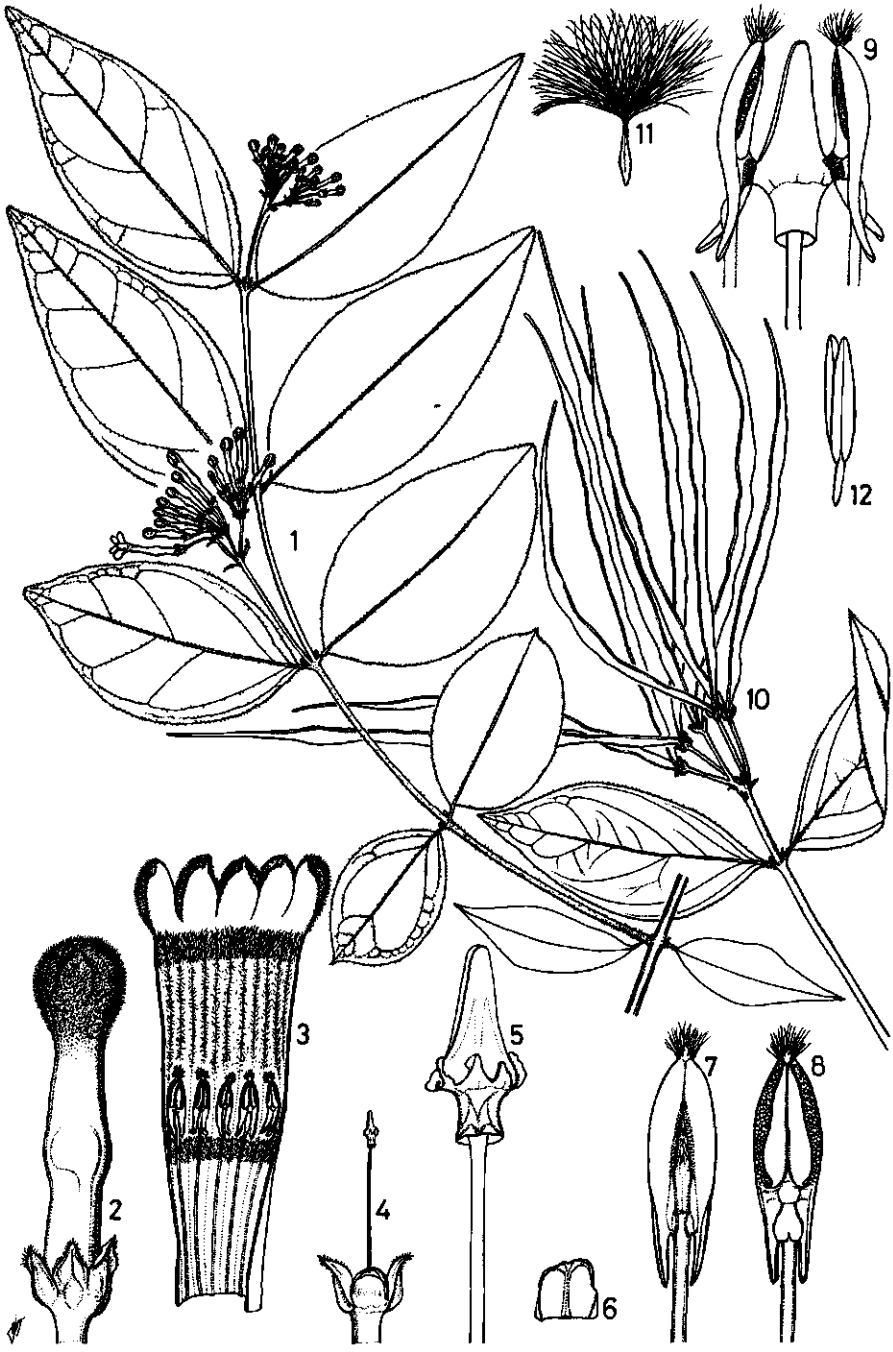
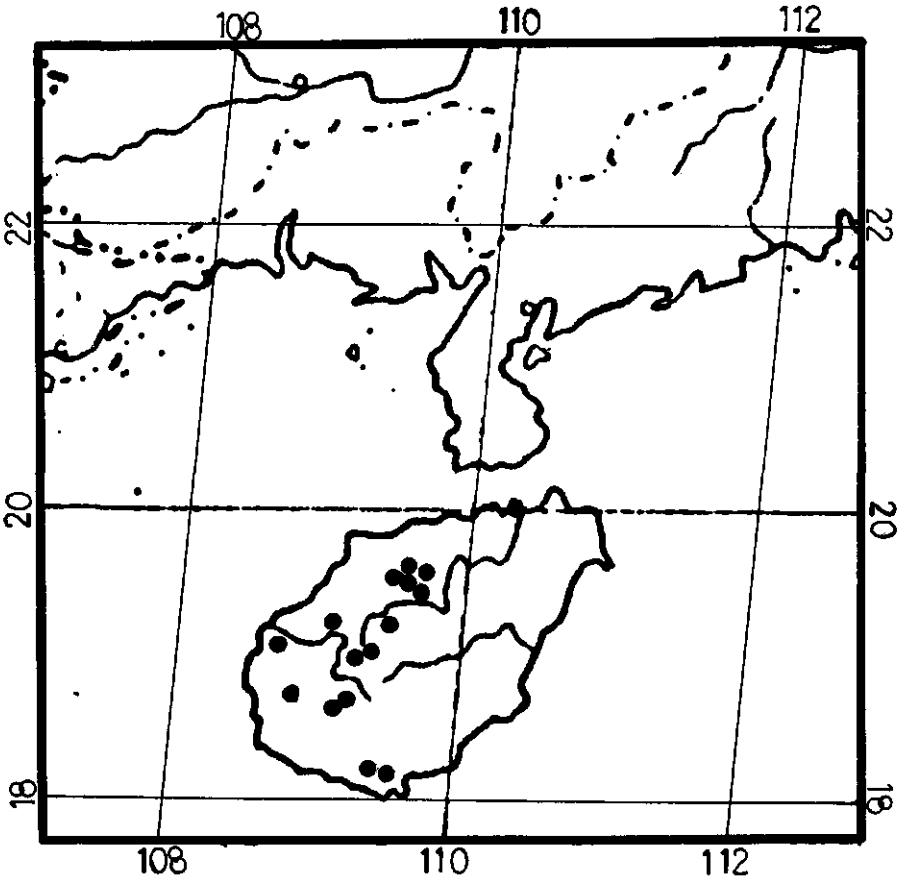


FIG. 5. *Epigynum chinense* Merr.: 1. flowering branch (x $\frac{2}{3}$); 2. flower bud (x 4); 3. opened flower (x 4); 4. pistil (x 4); 5. pistil head (x 20); 6. opened disk (x 8); 7. stamen (outside) (x 20); 8. stamen (inside) (x 20); 9. coherence of the stamens with the pistil head (x 20); 10. fruiting branch (x $\frac{2}{3}$); 11. seed (x $\frac{2}{3}$); 12. embryo (x 2). –1. habit from S. K. Lau 1791 (A), flower from W. Y. Chun 1689 (UC); 2, 5. from S. K. Lau 26778 (A); 3-4, 6-9. from McClure 9710 (E); 10. from S. K. Lau 27221 (A); 11. from S. K. Lau 4964 (A).



MAP 5. *Epigynum chinense* MERR.

smooth, glabrous; branchlets terete, green, minutely pubescent when juvenile and glabrescent when mature, with fine fibrous cortex which can be easily peeled off. *Leaves* shortly petiolate; petiole minutely pubescent, 2-4 mm long, between bases of a pair with small scales (gland-like); blade dark green above, paler beneath, membranaceous or papery when dried, ovate or narrowly ovate, 2-3 x as long as wide, 3.5-9 x 2-4.5 cm, acuminate or obtuse at the apex, rounded and unequal at the base, glabrous above, minutely pubescent at the veins beneath when juvenile and glabrescent when mature, with 3-6 pairs of secondary veins; the first pair of secondary veins from the base curved along the margin and reaching halfway of the blade, seemingly triple-veined; tertiary veins inconspicuous. *Inflorescence* cymose, terminal or axillary, 3.5-5 x 2-4 cm, relatively long-pedunculate but with short branches, few- to many-flowered, congested; pedun-

cle 1-2.5 cm long, glabrous; pedicels glabrous or minutely pubescent, 4-6 mm long; bracts linear, up to 3 mm long. *Flower: Sepals* broadly triangular or ovate, 1.1-2 x as long as wide, 1.5-2 x 1-1.5 mm, glabrous, entire, ciliate, glabrous and with sets of 2-3 colleters alternating with the sepals at the base inside; colleters 0.2-0.3 x 0.1-0.4 mm, sometimes lobed. *Corolla* white, in the mature bud 12-16.5 mm long and forming with the lobes a globose head (1.1-1.8 x as wide as the tube), outside minutely pubescent on the lobes and the upper part of the tube, inside densely pubescent on the throat and becoming less so downwards; tube 6-8.7 x as long as the sepals, 4.4-6 x as long as the lobes, 9-15 x 1.2-2.5 mm, cylindrical, not twisted, slightly widened at the middle where the stamens are inserted; lobes broadly ovate or suborbicular 0.2-0.3 x as long as the tube, 0.8-1.3 x as long as wide, 2-3.5 x 1.5-4 mm, overlapping to the right, spreading, not recurved. *Stamens* inserted halfway the corolla tube, about 6.5 mm from the base, glabrous except for a bunch of hairs at the acute apex; filaments strap-shaped, very short, 0.3 x 0.2 mm; anthers ovate or elliptic, 1.5-1.8 x 0.6 mm, fertile only on the upper part for about 1 mm, sagittate at the base with two 0.3-0.5 mm long points, coherent to the pistil head with 2 patches at both sides of the filament just below the fertile part. *Pistil* glabrous, 7.3-7.8 mm long, with the apex reaching the same height as the apices of the stamens; ovary ovoid or broadly ovoid about 1 x 1 mm, of two carpels; disk 2-parted, as high as the ovary; style long, 5-5.5 x 0.1 mm; pistil head composed of a basal part and a stigmoid apical part; the basal part cylindrical or obovoid, 0.5-0.6 x 0.4 mm, on its upper part with an obscure ring which is coherent to the coherent patches of the stamens; the apical part 2-lobed, about 0.7 x 0.3-0.5 mm; the true stigma is thought to be located at the base of the pistil head. Ovules about 25 in each carpel. *Fruit* of two slender follicles; follicles capsular, obscurely torulose, connate at the extreme base only, length unequal in a pair, 3.5-16 x 0.3-0.5 cm, not lenticellate, glabrous, acuminate at the apex. *Seeds* dark brown, flat, linear-oblong, 1-1.5 x 0.2-0.25 cm, with an apex directed towards the apex of the fruit, smooth, truncate and with a coma at the apex, acuminate or obtuse at the base; coma of white unbranched hairs 2-3 cm long; embryo 11 mm long, surrounded by a thin layer of endosperm but free from the embryo; cotyledons narrowly ovate, obtuse at the apex, rounded at base, 8 x 2 mm; radicle (rootlet) 3 x 0.5 mm, with the root tip towards the apex of the fruit.

Distribution: China (Hainan Island), Laos, Thailand.

Ecology: In dry or moist forest, in mountains or ravines of low to middle altitudes (100-700 m).

Note: Prof. P. T. Li (1984) indicated that the type specimen F. A. McClure 9710 was preserved in IBSC (Botanical Institute of South China, Academica Sinica). But when the present author examined the specimens of this species in IBSC, he was unable to find that type specimen neither there, nor in PE. Only the paratypes (McClure 8616) are preserved in PE and IBSC.

Vernacular name: Hainan: Niteng (in Fl. Reip. Pop. Sin. 63: 170. 1977) (or Naitang in Cantonese pronunciation).

Specimens examined:

CHINA: Hainan: Nada: Five Finger Mt. (fl. May), W. Y. Chun 6676 (IBSC), 1689 (UC); Nada, Tai-han Village (fl. fr.), Hook. Herb. 445 (K); Yazhou (fr.), F. C. How 70691 (IBSC, K, US); Chang Jiang County, Qichaling (fl. May), S. K. Lau 1791 (A, BM, IBSC, P, SYS); Changjiang county, Chung Ngo Shan (fr. Feb.), S. K. Lau 3271 (A, P, SYS); Jianfungling (Chim Fung Ling) near Sam Mo Watt Village (fl. April), S. K. Lau 3695 (GH, IBSC, P, SYS); S. K. Lau 4964 (A); Baisha (fr. Feb.), S. K. Lau 25419 (A, IBSC, PE); Lotung county (fl. May), S. K. Lau 26778 (A, IBSC, PE); Lotung county, Chang-e-ling (fr. June), S. K. Lau 27221 (A, IBSC); Gan-en Xian (fr. Sept.), H. Y. Liang 63319 (IBSC), 63655 (fr. Nov.) (A, IBSC); Erlishan, H. Y. Liang 65080 (IBSC); Five Finger Mt. (fr. Dec.), F. A. McClure 8616 (A, IBSC, PE: paratype); Nada county, Yijuomao (Yik Tsok Mau) (fl. fr. May), F. A. McClure 9710 (holotype not seen, photos seen in A and GH; isotypes: A, BM, C, E, G, P, UC, US, Z); Jan Xien, Yabingshan (Nga Ping Shan) (fr. Sept.), W. T. Tsang 911 (A, G, IBSC, K, PE, SYS, UC); Hongmaoshan (Hung Mo Shan) and vicinity (fl. fr. Aug.), Tsang & Fung 666 (A, IBSC, K, PE, SYS, UC, US); Ya Xian (fl. fr. July), C. Wang 33107 (IBSC).

Note: Put 3231 (fr.) (BM, P), collected from Thailand (Prachuab), and Spire 1192 (fl.) (P), collected from Laos (Cammon or Champassak?), also belong to this species. No other records of this species are known from continental China and the nearby areas of Vietnam. A future revision of *Epigynum* may possibly solve the question of geographical distribution and endorse that the Laos and Thai specimens bear correct labels.

Sindechites Oliv.

In Hooker, Ic. Pl. 18: Pl. 1772. 1888; Schumann in Engler & Prantl, Nat. Pflanzenfam. 4 (2): 173. 1895; Pichon, Mém. Mus Nat. Hist. Nat. Bot. 1: 104. 1950; Tsiang & P. T. Li, Fl. Reip. Pop. Sin. 63: 168. 1977.

Type species: *S. henryi* Oliv. (Hubei, China).

Woody climber, with milky latex, glabrous. *Leaves* opposite, petiolate; blade elliptic or narrowly so, long-acuminate at the apex, cuneate or rounded at base, with pinnate, dense, slender and parallel veins. *Inflorescence* paniculate-corymbose, terminal, trichotomous, seemingly sessile, with sepal-like bracts. *Flower* small. *Sepals* triangular or ovate or broadly so, pubescent or glabrous, inside with 2-3 colleters at each sepal. *Corolla* pubescent; lobes small and erect, slightly spreading, shorter than the tube, overlapping to the right when in bud; corolla tube cylindrical and slighly enlarged toward the throat, not twisted. *Stamens* 5, included, inserted at the throat, coherent with the pistil; anthers elliptic, sagittate at the base, pubescent on the back; filament short, curved toward the pistil head and forming a knee. *Pistil* glabrous except for the hairy ovary; ovary ovoid, composed of 2 separate carpels; disk lower than the ovary, entire or lobed; style long; pistil head composed of an ovoid basal part and a stigmoid 2-parted apical part; ovules many. *Fruit* of 2 slender follicles, divaricate at a small or large angle, connate at the extreme base, glabrous. *Seeds* narrowly oblong, with a silky coma.

A monotypic genus, distributed in subtropical China.

Sindechites henryi Oliv. in Hooker, Ic. Pl. 18: 1772. 1888; Chung, Mem. Sc. Soc.

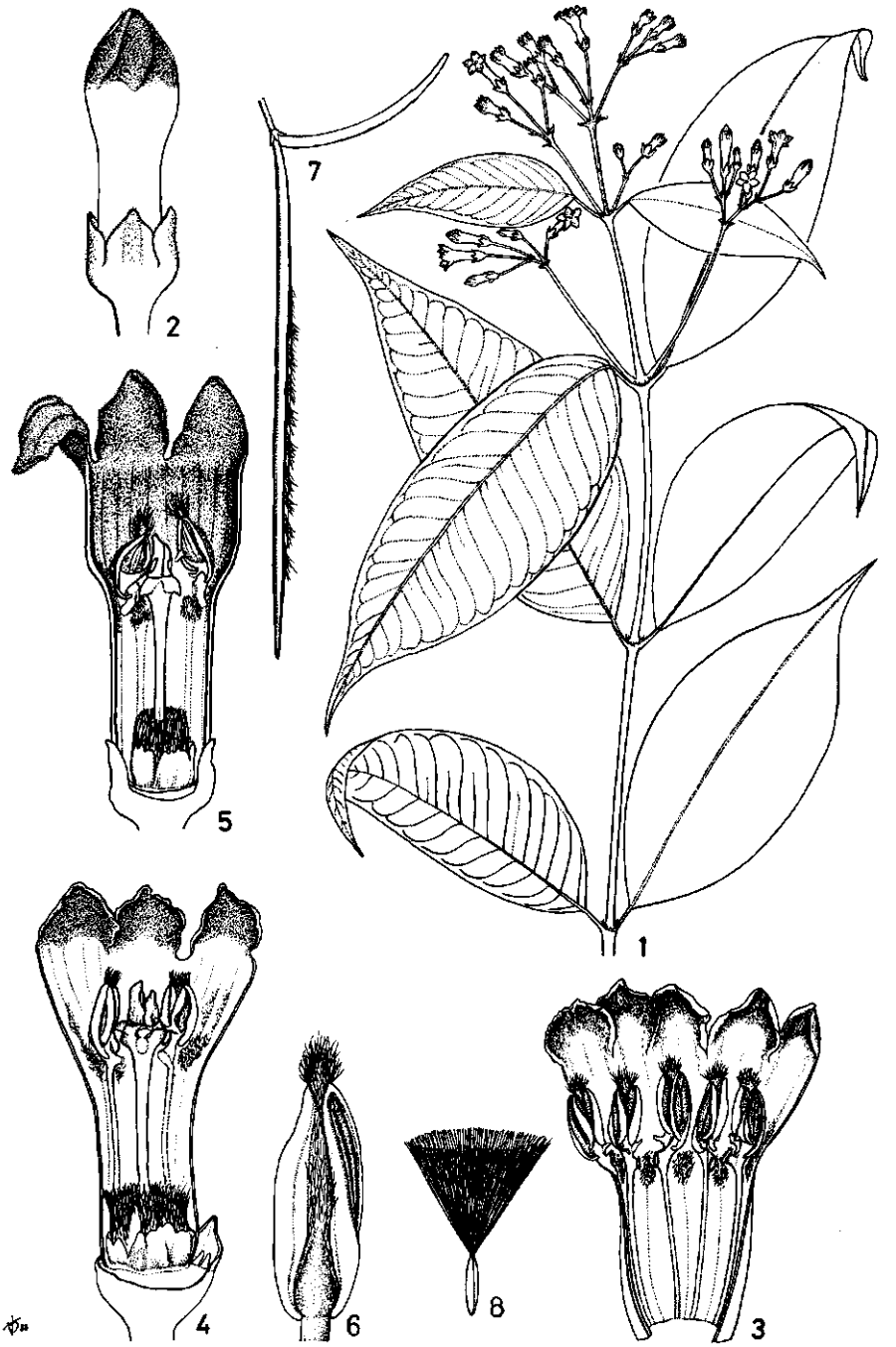


FIG. 6. *Sindechites henryi* Oliv.: 1. flowering branch (x $\frac{2}{3}$); 2. flower bud (x $1\frac{1}{3}$); 3-5. opened flower (x 6); 6. stamen (outside) (x 20); 7. fruit (x $\frac{2}{3}$); 8. seed (x $\frac{2}{3}$). –1. from Oliv. in Hook. Ic. Pl. 18, t. 1772. 1888; flower of 1. from E. Bodinier 2300 (E); 2. from Henry 3636 (GH); 3-4. from E. H. Wilson 456E (A); 5-6. from Cavalerie 1025 (E); 7-8. from Tsiang et P. T. Li, Fl. Reip. Pop. Sin. 63: pl. 56. 1977.

China 1: 220. 1924; Diels in Engler, Bot. Jahrb. 29: 540. 1900; Hand.-Mazz., Symb. Sin. 7: 992. 1936; Hemsley, Journ. Linn. Soc. 26: 100. 1889; A. Rehder, Journ. Arn. Arb. 18: 238. 1937; Schneider in Sargent, Pl. Wils. 3: 342. 1916; K. Schumann in Engler & Prantl, Nat. Pflanzenfam. 4 (2): 174. 1895; Tsiang, Sunyatsenia 3: 151. 1936, and in Fang, Ic. Pl. Omei. 1 (2): pl. 87. 1944; Econ. Corm. Sin. 3: 445, t. 4843. 1974; Tsiang & P. T. Li, Fl. Reip. Pop. Sin. 63: 173, pl. 58. 1977 and in Fl. Yunnan. 3: 532, pl. 159 (1-7). 1983.

Fig. 6; Map 6

Type: China: Hubei (Hupeh) Prov., Ichang and immediate neighbourhood, Henry 3636 (fl.) (holotype: BM; isotypes: GH, P). Homotypic synonym: *Cleghornia henryi* (Oliv.) P. T. Li, Guihaia 4 (3): 192. 1984.

Heterotypic synonyms: *Parameria esquirolii* Lévl. in Fedde, Rep. Sp. Nov. 13: 178. 1914. Type: China: Guizhou: Haies, June 1905, J. Esquirol 427 (fl.) (E, holotype, photo in A. – P. T. Li (1984) erroneously supposed that the type specimen (J. Esquirol 427) was preserved in IBSC.) Homotypic synonym: *Sindechites esquirolii* (Lévl.) Woods. in Rehder, Journ. Arn. Arb. 15: 316. 1934.

Antirrhaea martinii Lévl. in Fedde, Rep. Sp. Nov. 13: 178. 1914, Fl. Kóuy-Tchéou: 364. 1915. Types: China: Guizhou, Gan-pin, June 5, 1898, L. Martin in Herb. Bodinier 2300 (fl.) (E, lectotype; photo in A); Pin-fa, June 3, 1903, J. Cavalerie 1025 (fl.) (E, paratype; photo in A).

Sindechites henryi Oliv. var. *parvifolia* Tsiang, Sunyatsenia 3: 159. 1932. Type: China: Zhejiang, Longquan, June 6, 1917, K. K. Tsoong 551 (NAS, holotype; isotypes: IBSC, PE).

Woody climber, up to 8 m long; branches dark brown, smooth, glabrous; branchlets pale or dark brown, more or less angled when dried, glabrous. *Leaves* petiolate; petiole glabrous, 4-10 mm long, between bases of a pair with a line of small colleters (gland-like); blade when dried membranaceous or papery, elliptic or narrowly so, 2-3 x as long as wide, 5.5-12.5 x 1.5-3.7 cm, long-acuminate at the apex, cuneate or rounded at base, glabrous at both sides; secondary veins 15-25 pairs, nearly parallel, forming a 60°-70° angle with the costa, anastomosing with each other near the margin; tertiary venation reticulate. *Inflorescence* paniculate, terminal, 3-7 x 4-8 cm, trichotomous, seemingly without peduncle, few- to many-flowered, lax; pedicels slender, as long as the flower or slightly longer, 6-15 mm long, glabrous; bracts sepal-like, smaller than the sepal. *Flower: Sepals* triangular or ovate or broadly so, 0.8-1.3 x as long as wide, 1-2 x 1.2-2 mm, outside glabrous or sometimes sparsely and minutely pubescent, entire, minutely ciliate or not, inside glabrous and with sets of 2-3 colleters at the base alternating with the sepals; colleters variable, 0.4-0.6 x 0.2-0.5 mm, lobed, fleshy. *Corolla* white, in the mature bud 7.5-9 mm long, forming a conical equally wide head, outside minutely pubescent on the lobes and glabrous on the tube, inside with a ca. 2 mm wide pubescent belt on the throat where the stamens are inserted and minutely pubescent on the lobes; tube 3-6.7 x as long as the sepals, 2.4-5 x as long as the lobes, 5-8 x 2-5 mm, almost cylindrical, slightly widened at the throat, not twisted; lobes ovate or suborbicular, 0.2-0.4 x as long as the

tube, nearly as long as wide, 1-2.5 x 1-2.5 mm, overlapping to the right, slightly spreading. *Stamens* 0-1 mm included, inserted on the throat, 4-5 mm from the base; filaments about 0.5 x 0.1 mm, curved towards the pistil head, forming a knee which is coherent to the pistil head, pubescent at the base inside, and glabrous outside; anthers elliptic 1.4-1.8 x 0.5-0.8 mm, with a bunch of nearly 0.5 mm long hairs at the acute apex, fertile at the upper part for 1.2 mm, sagittate at the base (points about 0.2 mm long), near the base of the fertile part with a patch on the connective also being coherent with the pistil head. *Pistil* 6-6.5 mm long, glabrous except for the ovary which is long- and dense-pubescent on the upper part; ovary ovoid, 1-1.5 x 1-1.2 mm; disk about 1 mm high, lobed or entire; style rather long, 3.5-4 x 0.3 mm; pistil head composed of an ovoid basal part and a stigmoid apical part; the basal part 0.4-0.6 x 0.5-0.7 mm, respectively coherent by its upper part (just below the apical part) to the connectives and by its lower part (about 2 mm from the true stigma) to the knees of the filaments; the apical part 2-lobed, 1 x 0.2-0.5 mm; the true stigma is thought to be the extreme base of the pistil head. Ovules about 18-20 in each carpel. *Fruit* of 2 slender follicles; follicles green, in a pair length-unequal, divaricate at a small angle, connate at the extreme base, 3-14 x 0.2-0.3 cm, glabrous, acuminate at the apex. *Seeds* narrowly oblong, 1.3 x 0.2 cm, with a coma at the apex; coma of yellowly silky hairs, about 2.5 cm long; embryo about 8 mm long; cotyledons narrowly elliptic, acuminate at the apex, cuneate at base, about 5 x 1.2 mm; radicle (rootlet) 3 x 0.2 mm, with the root tip towards the apex of the seed.

Distribution: Endemic in China (Guangxi, Guizhou, Hubei, Hunan, Jiangsi, Sichuan, Yunnan and Zhejiang).

Ecology: In bush or forest, growing on mountains, at roadsides or near streams. Alt. 500-1300 m. Flowering in May-July, fruiting in July-October.

Vernacular names:

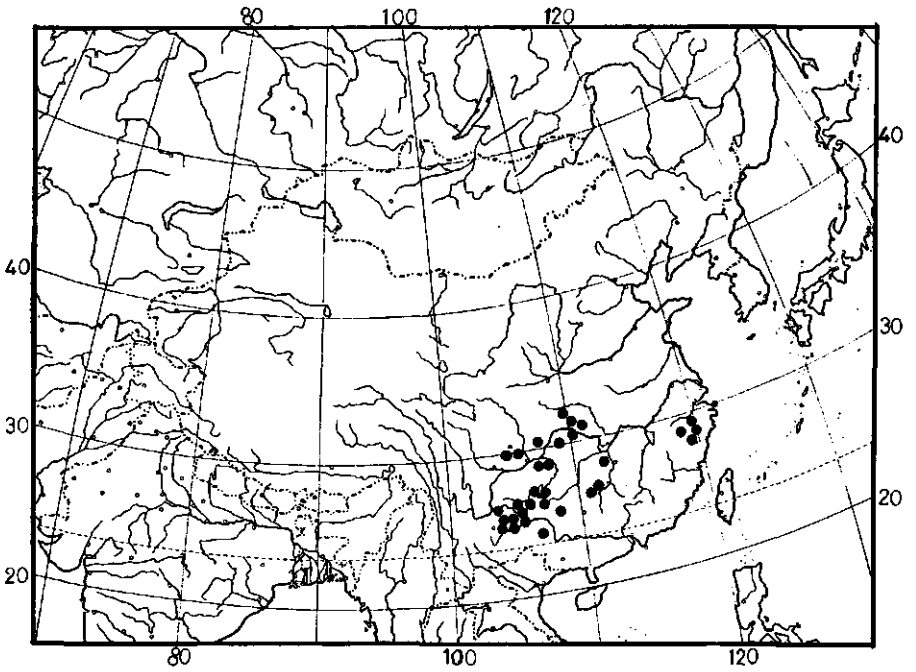
Fl. Reip. Pop. Sin. 63: 168.: Maoyaoteng (Chinese); Tuniudangqi (Guangxi); Huangjingshu and Qiangweigen (Sichuan).

Specimens examined:

CHINA: GUANGXI: Baise, Lingle (fl. June), X. G. Li 204170 (IBSC); Nandan (fr. July), C. Wang 41147 (IBSC).

GUIZHOU: Anlong: Shipan (fl. May), Z. X. Zhang & Y. T. Chang 2481 (PE); Longshan (fl. June), Guizhou Team 5197 (IBSC), Z. X. Zhang & Y. T. Chang 5197 (PE); Huali, Dewo (fl. May), Z. X. Zhang & Y. T. Chang 3651 (IBSC, PE); Najo (fr. July), Cavalerie 3161 (P); Anshun: Sa-tze-ba (fl. May), S. W. Teng 478 (IBSC); Qingzhen (fr. Oct.), Chuan-Chien Team 1916 (PE); Dushan: Liming (fr. July), Lipo Team 1270 (PE); Ceheng (fr. Sept.), Z. Y. Cao 662 (PE); Pinfa (fl. June), J. Cavalerie 1025 (E, photo in A, paratype of *Antirrhaea martinii* Lévl.); Guiyang (fr. Aug.), Z. Y. Cao 374 (PE); S. S. Sin 52092 (IBSC, paratype of *Sindechites henryi* var. *parvifolia* Tsiang); Thu Qui (fr. July), L. Martin 1148 (E); Gan-pin (fl. June), L. Martin in E. Bodinier 2300 (E, lectotype of *Antirrhaea martinii* Lévl., photo in A); Haies (fl. June), J. Esquirol 427 (E, holotype of *Parameria esquirolii* Lévl., photo in A); Cavalerie et Fortunat 1148 (P).

HUBEI: Ichang and immediate neighbourhood (fl. Oct.), A. Henry 3636 (BM: holotype; GH and P: isotypes); A. Henry 3636A (fl.) (E, G, GH); W. Hubei, Nanto (fl. June), E. H. Wilson 1214



MAP 6. *Sindechites henryi* Oliv.

(E); Fang Hsien (fl. June), E. H. Wilson 4563 (BM, E); Lichuan, Maoba (fr. March), L. Y. Dai & C. H. Chien 982 (IBSC, PE); Lu Xian (fr. Sept.), K. P. Liu 277 (PE); Xianfung, Qingshui (fr. July), W. B. Lin 600 (PE).

HUNAN: Qili Xian (fl. June), X. G. Li 204170 (IBSC).

JIANGXI: Anfu, Wugongshan (fr. Aug.), J. X. Qiu 3530 (IBSC, PE); Pingxiang, Jiangxi Team 715 (PE).

SICHUAN: Tchen-Keou-Tin (East Sichuan)(fl.), R. P. Farges s. n. (P); H. Smith 2359 (fl. June) (A); Mt. Omei: C. H. Hsing & S. S. Chang 31057 (fl. June) (IBSC), W. P. Fang 16866 (fl. June) (IBSC, PE), J. H. Xiong, S. S. Chang & X. G. Tsiang 31057 (fl. June) (PE), K. J. Guan, Z. W. Wang & C. L. Li 696 (PE), Q. L. Sun 547 (fl. June) (US), K. H. Yang 56905 (fr. Aug.) (PE), 55579 (fl. June) (PE), 56789 (fr. Aug.) (IBSC, PE), 57509 (fr.) (IBSC), T. N. Liou & C. Wang 980 (fr. Sept.) (PE), E. H. Wilson 4695 (fr. Nov.) (K), G. H. Yang 56905, 56789 (fr. Aug.) (SYS); Nanchuan: J. H. Xiong & Z. L. Zhou 91420 (fl. June) (PE); Daheba (fr. Aug.), H. H. Xiong & Z. L. Zhou s.n. (PE); Jinfoshan (fl. June), Z. X. Qu 1356, 1498 (IBSC,PE); Muping, Y. Chen 5422 (IBSC).

YUNNAN: Erdaoqiau (fl. June), China-USSR Team 1718 (PE); Zhangquanping (fl. June), China-USSR Team 1904 (PE).

ZHEJIANG: Longquan (fl. June), K. K. Tsoong 551 (IBSC, NAS, PE, type of *Sindechites henryi* Oliv. var. *parvifolia* Tsiang), R. H. Xan 5754 (fr. Aug.) (PE), S. Y. Zhang 7314 (fr. Oct.) (PE), 3221 (fr. July) (PE); Taishun (fr.), S. Y. Zhang 3703 (PE); Lishui (fr. Aug.), S. Y. Zhang 6499 (PE); Suichang (fl. May), Zhejiang Team 25858 (PE); Jiuyie (fr. Sept.), S. Y. Zhang 3703 (PE).

Nomen nudum

Aganonerion dongnaiense Pierre ex Planchon, Prod. Apocyn. 206. 1894 = *Cleghornia malaccensis* (Hook. f.) King & Gamble.

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