A REVISION OF ISONEMA R. Br.
AND PYCNOBOTRYA Benth.
(APOCYNACEAE)

J. VAN DER PLOEG

Department of Plant Taxonomy and Plant Geography,
Wageningen Agricultural University, The Netherlands

Received 22-II-1983
Date of publication 13-VII-1983
INTRODUCTION

The present publication is a monograph of the genera *Isonema* and *Pycnobotrya*. It is based on the study of herbarium material as well as material on spirit in Wageningen. The material of *I. buchholzii* was poor, lacking fruits.

It was possible to trace all type specimens in both of these genera. A new key to the species of *Isonema* is added; *Pycnobotrya* is considered to be monotypic.

HISTORY OF THE GENUS ISONEMA R. Br.

In 1810 R. Brown described the monotypic genus *Isonema*, based on a collection of Smethman, but he failed to name the type species. Roemer & Schultes (1819) provided the combination *I. smeathmannii*. In 1886 Engler published a second species *I. buchholzii*, while the third species was described by Stapf (1898).

The present author maintains these three species.

GEOGRAPHICAL DISTRIBUTION

*Isonema* is restricted to West and Central Tropical Africa, from Senegal to Zaire. The most widely distributed species *I. smeathmannii* occurs from Senegal to Ghana. *I. buchholzii* is restricted to Nigeria and Cameroun, while *I. infundibuliflorum* occurs in Cameroun, Gabon and Zaire. Although *I. buchholzii* and *I. infundibuliflorum* both occur in Cameroun, their areas of distribution do not overlap.

RELATIONSHIP TO OTHER GENERA

When Robert Brown proposed *Isonema* in the *Apocynaceae*, he placed it between *Holarrhena* and *Vallaris*. Reichenbach (1828) referred it to the Echiteae Rchb. (1828: 133) and his view was followed by many authors including A. de Candolle (1844: 415) and Endlicher (1838: 584). Much later Schumann (1895: 183) placed *Isonema* in the Parsonsieae A. DC. (1844) and this century Pichon (1950: 50) referred it to the Nerieae Rchb. (1837) into the subtribe Amphineurininae Pichon (1950: 55) (French description only). This subtribe should be called *Neriinae* as it comprises the type genus of the *Nericeae*. Pichon proposed 9 subtribes in the *Nericeae*, Zwetsloot (1981) concurred, although he arranged them differently. The present author considers 8 of the 9 subtribes as natural, while the *Neriinae* form a kind of rest group as already indicated by Pichon (1950: 55). Next to *Isonema* Pichon's *Amphineurininae* consisted of the genera *Amphineurion*, *Dewevrella*, *Nerium* and *Pottsia*. Amphineurion was segregated.

Meded. Landbouwhogeschool Wageningen 83-4 (1983) 1
by Pichon from Aganosma, but Tsang & Li (1977) reversed this decision as the differences between both genera were too trivial. Dewevrella is characterized by very long filaments which are twisted around the style. The flowers of Nerium possess a corona and long pubescent appendages on the apex of the anthers. Potsia shows some resemblance with Isonema in the shape of the anthers, but less so in that of corolla, filaments and fruits. Isonema differs very much from the preceding genera by the presence of unilateral appendages to the corolla lobes.

The present author hopes that in future, Isonema can be removed into the neighbourhood of genera that show a more obvious relationship.

CYTOLOGY

In co-operation with J. C. Arends & F. M. van der Laan, a somatic chromosome number of 2n = 22 was found for a specimen of I. smeathmannii. This analyzed plant was grown from seed, collected by Oldeman in Ivory Coast in 1964, and flowered in the greenhouse of Wageningen (voucher Van Veldhuizen 24).

GENUS DIAGNOSIS OF ISONEMA R. Br.

Isonema R. Br., 1810: 63; Barling, 1830: 204; G. Don, 1837: 78; Endlicher, 1838: 584; Spach, 1839: 503; De Candolle, 1844: 415; Bentham & Hooker f., 1876: 712; Schumann, 1895: 184; Stapf, 1902: 187; Hutchinson & Dalziel, 1931: 49; Pichon, 1950: 53; Huber, 1963: 69; non Cassini, 1817 (which is Compositae).

Type species: I. smeathmannii Roem. & Schult.

Sarmentose or lianescent shrubs or lianes, 1–20 m high. Bark dark brown to black or dark violet, with or without latex, sometimes only present in the roots. Branchlets terete. Leaves decussate and those of a pair equal, petiolate; petiole grooved, with many colleters in the groove all over its length, of which the two at the end are bigger and resemble small horns. Inflorescences few- to many-flowered, terminal and in the axils of the apical leaves, occasionally axillary in I. smeathmannii; lower bracts mostly soon caducous, and often with colleters in the axils. Flowers 5-merous. Sepals fleshy, erect, free, imbricate, broadly ovate, outside pubescent, inside glabrous, with 5 groups of 2–4 (–5) colleters, alternating with the sepals. Corolla cylindrical at the base and widening into a saucer-shaped portion or infundibuliform, outside minutely pubescent with ordinary and some glandular hairs, inside glandular-puberulous, except for the basal 1–2 mm, on both sides; lobes oblong, acute at the apex, entire with or in I. smeathmannii sometimes without, a subapical undulate appendage, outside wholly or only on the base minutely pubescent, inside glandular-puberulous. Stamens exserted, inserted at the base of the widened portion of the corolla, curved, filaments short, outside glabrous, inside at the base of the anthers with
a dense tuft of hairs, sticking to the basal glabrous part of the clavuncula, below it on the filament and also on the filament ridges in the tube, which are about 3 mm long, long white, stiff, recurved hairs, which are more dense on the basal knob of the ridge, forming a ring-shaped belt in the middle of the tube; anthers narrowly triangular, whitish, acuminate at the apex, sagitate at the base, with revolute margins, conniving into a cone, 2-celled, intorse, fertile at the apex for 1/3 of the their length. 

Pistil: ovary of two free carpels, globose, gradually narrowed into the style; in each carpel one adaxial placenta with many ovules; style inserted on the apex of the carpels, filiform, sometimes slightly wrinkled at the apex, glabrous; clavuncula composed of two rings above each other: the basal glabrous, thin, recurved, sticking to the hairs at the base of the anthers, and the apical woolly and disk-shaped; stigma two-lobed. Fruit composed of two follicles, which are connate at the base, widely spreading, cylindrical, tapering towards the apex, obtuse at the tip, rusty-brown, velvety, opening with a longitudinal slit at the adaxial side, many-seeded. Seed with a deciduous basal coma and a apical coma directed towards the apex of the carpel, fusiform, 1.5–2.2 cm long, hemi-orbicular on section, flattened towards the apex and base; hilum raised; basal coma small, 1.5–2.0 cm long, only present in fruit; apical coma large, spreading, 3–4 cm long, hairs simple.

**KEY TO THE SPECIES**

1. Branchlets minutely puberulous or glabrous; leaves beneath with short hairs (domatia) in the axils of the secondary veins; glabrous above; inflorescence lax; corolla tube almost cylindrical
   1. *Isonema buchholzii*
   - Branchlets pubescent; leaves beneath pilose or pubescent, especially on the main veins
   2. Leaves glabrous above; secondary veins 6–9; inflorescence lax; corolla tube infundibuliform
   2. *Isonema infundibuliflorum*
   - Leaves above pilose to pubescent on the costa; secondary veins 4–6; inflorescence congested; corolla tube cylindrical
   1. *Isonema smaeuthmannii*

   Fig. 1; Map 1

Types: Cameroun, near Mungo, Buchholz Oct. 1874 (holotype not seen, destroyed in B); Cameroon R. (= Wouri R.) Mann 2211 (K. lectotype, was cited as second collection with original publication).

Climbing shrub or liane, 3–6 m high. Branches terete, dark violet. Branchlets minutely puberulous, soon glabrous. Leaves shortly petiolate; petiole 3–9 mm long, minutely puberulous; blade coriaceous, elliptic to obovate, 1.2–2.3 × as long as wide, 4.8–10 (–16) × 3.2–5.3 cm, acuminate with an obtuse tip at the apex, obtuse to rounded at the base, equal-sided, glabrous above, beneath in

FIG. 1. *Isotoma buchholzii* Engl.: 1. flowering branch, 2/3 ×; 2. petiole with colleters, 2 ×; 3. domatium in the axil of a secondary vein, 2 ×; 4. flower, 4 ×; 5. opened flower, 4 ×; 6. calyx with colleters, 4 ×. - (1–3. Letouzey 14760; 4–6 Van Meer 1214).
the axils of the main veins, mostly in the basal part, with a few short hairs (domatia), revolute at the margin; costa and the other veins impressed above, prominent beneath; secondary veins 4–5 on each side; tertiary venation reticulate. Inflorescences thyrsoid, lax, 11.5–19 × 9–16 cm, very minutely pubescent. Lower bracts narrowly ovate, up to 5 mm long, and soon caducous, mostly with colleters in the axils; other ovate and about 2 mm long. Peduncle light-green to yellowish, 2–4.5 cm long; pedicels pinkish 3–7 mm long. Flowers fragrant. Sepals dark green at the base, lighter towards the apex, broadly ovate, unequal, 1.6–2.2 × as long as wide, 2–2.2 × 1–1.2 cm, outside minutely pubescent, inside glabrous, with 5 groups of 2–4 green glands and alternating with the sepals. Corolla outside pinkish-yellow, pink or white (see Note), in the mature bud 7–8 × as long as the calyx, 14–16 mm long; tube 4–5 × as long as the calyx, 8.5–10 mm long, composed of an almost cylindrical portion, 2–2.5 mm wide, widening towards the throat for about 1 mm, and a saucer shaped portion at the apex which is 1–2 mm wider, outside minutely pubescent, which is more dense at the apex 4–5 mm, inside glandular-puberulous below the filament ridges; lobes pink, 4–7.5 × 1.5–3 mm, outside minutely appressed-puberulent, inside with minute glandular hairs; with an undulate subapical appendage, 1.2–4 × 1.2–3 mm. Stamens exserted for 2–2.5 mm; filaments 0.8–1 mm long, filament ridges 2.5–3 mm long; anthers whitish, 2.9–3.1 × 0.9–1.1 mm, fertile at the apex for 1.1–1.3 mm. Pistil 10–12 mm long; ovary 1–1.5 × 1–1.2 × 0.7–0.8 mm, tomentose for 0.25–0.75 of its length from the apex; in each carpel 7–8 series of 6–9 ovules; style filiform, 8–10 mm long; clavuncula: the lower ring 0.3–0.5 mm high, at the base 0.6–0.9 mm in diameter and the apex one third of that; the upper 0.5–0.7 × 0.2–0.4 mm; stigma composed of two oblong about 0.2 mm long lobes, one sometimes shorter than the other. Fruits unknown.

MAP 1. *Isonema buchholzii* Engl.

**Distribution:** Nigeria and Cameroun.

Ecology: Mainly in wet places, together with Raphia. Also in secondary vegetation.

Specimens examined:
Nigeria: Cross River State: Imo R. (fl. Dec.) Onochie FHI 40444 (K); near Ikot Ekpene (fl. Apr.) Van Meer 1214 (WAG); km 50 Oron – Eket Road (fl. Jan.) Talbot 3027 (BM, K, NBG, Z); Calabar (fl. May) Daramola 9 May 1965 (K); Ikom (fl. June) Latilo FHI 31844 (K, P); sin. loc. (fl. Apr.) Thompson 16 (K); (fl.) Talbot 106 (BM).
Cameroon: Kumba (Johann-Albrechtshöhe) (fl.) Staudt 481 (COI, K, P, S), 744 (A, BM, E, G); Abo R. (fl. Apr.) Letouzey 14760 (P, WAG); 5 km NE of Douala (fl. May) Letouzey 14930 (WAG); Wouri R. (Cameroon R.) (fl.) Mann 744 (GH, K, P, WAG), 2211 (K, lectotype).

Note: ENGLER describes the corolla as white, only in herb. Latilo FHI 31844 the flowers are noted as being white.

2. Isonema infundibuliflorum Stapf, 1898: 306; De Wildeman & Durand, 1899: 103; 1900: 40; 1901: 154; Schumann, 1900: 308; Stapf, 1902: 188; De Wildeman, 1908: 251.
Type: Zaïre, sin. loc., Dewèvre 554 (K: holotype; isotype: BR).

Sarmentose shrub or liane, 1–2 m high, up to 5 m long. Trunk 2 cm in diameter or more. Branches dark brown to black, glabrescent, branchlets minutely pubescent. Leaves shortly petiolate; petiole 4–6 mm, minutely pubescent; blade ovate, elliptic, or oblong, 2–3 × as long as wide, 8–19 × 3.7–7.7 cm, acuminate and with an acute tip at the apex, rounded to cordate at the base and equal-sided; parchmentaceous, somewhat glossy, above glabrous, beneath pilose, especially on the costa and secondary veins, which are impressed above and prominent beneath; secondary veins 6–9 (–12) on each side. Inflorescences thyrsoid, lax, 9.5–16 × 6–14 cm, minutely pubescent. Bracts ovate about 2 mm long, soon caducous. Peduncle 3–5.7 cm long; pedicels 5–7 mm long. Sepals dark green, paler at the apex, broadly ovate, 1.8–2.5 × as long as wide, 2.5–3.3 × 1.2–1.6 mm, outside minutely pubescent, less so towards the thinner margins, inside glabrous, with 5 groups of 2–4 (–5) glands and alternating with the sepals. Corolla dark red, inside in the throat with 10 white longitudinal stripes, in the mature bud 5–6 × as long as the calyx and 15.5–19 mm long; tube infundibuliform, at the apex pale green, 9–11 mm long, at the base 1.5–2 mm wide, at 0.25 of its length 2.5–3 mm wide, from there much more widened and at the mouth 4–6 mm wide, outside minutely pubescent with ordinary and some glandular hairs, inside glandular-puberulous; lobes reddish, yellow at the apex, 6–8 × 3–4 mm, outside with a minute pubescence, inside glandular-puberulous, with a large undulate sub-apical appendage, 2–4 × 3–4.5 mm. Stamens exserted for only 0.5–1 mm; filaments 0.9–1 mm long; anthers 2.8–3.8 × 1–1.2 mm, fertile at the apex for 1.2–1.5 mm. Pistil 9–10.2 mm long; ovary 1.2–1.5 × 1–1.2 × 0.6–0.8 mm, at the apex sparsely pilose; in each carpel 8–10 series of 7–9 ovules; style 8–9 mm long; clavuncula: the lower ring 0.4–0.5 mm high, at the base 0.9–1 mm in diameter, and at the apex one third of that; the upper
Fig. 2. *Isonema infundibuliflorum* Stapf: 1. flowering branch, 2/3 x; 2. petiole with colleters, 2 x; 3. flower, 4 x; 4. opened flower, 4 x; 5. calyx with colleters, 4 x; 6. fruit, 2/3 x. (1-5 J. J. de Wilde 8234; 6. Leemans 240).

0.5–0.6 × 0.2–0.3 mm; stigma composed of two oblong about 0.2 mm long lobes. Fruit: follicles 15–19 cm long. Seed: fusiform, apical 3–3.5 cm long; puberulous (? see Note); basal coma 1.5–2 cm long; apical 3–3.5 cm long.

MAP 2. Isomema infundibuliflorum Stapf

Distribution: Central Africa: Cameroun, Gabon, and Zaïre.
Ecology: Rain forest and secondary vegetation, often near rivers.
Vernacular names: Zaïre: Bosere (Lokudu).

Specimens examined:
Cameroun: near Ngolebang (fl. May) Asonganyi 13 (WAG); Nyong R., 40 km SE of Yaoundé (fl. Jan.) Breitler et al. 2543 (BR, P, WAG); Bitye, Dja R. (fl. Sept.) Bates 1771 (K, P); km 14 Ebolowa-Amamb Road (fl. May) J. J. de Wilde 8234 (WAG); 24 km WSW of Ambam, Mboro R. (fl. Febr.) Letouzey 10059 (K, P).

Gabon: Woleu-Ntem (fl. March) Le Testu 9037 (BM), 9091 ( BM, BR); Bêlinga (fl. June) N. Halle 3991 (P); Libreville (fl.) Cooway s.n. (LD).


** seen by LEEUWENBERG.

Note: Only two numbers examined, with immature seeds which were attacked by fungi. (Leemans 240 (K), Corbister Baland 2000 (BR)).

8 Meded. Landbouwhogeschool Wageningen 83-4 (1983)
3. *Isonema smeathmannii* Roem. & Schult., 1819: 401; Bentham, 1849: 450; Stapf, 1902: 188; Póbéquin, 1906: 147; Chevalier, 1920: 419; Hutchinson & Dalziel, 1931: 49; Dalziel, 1937: 373; Irvine, 1961: 625; Huber, 1963: 69; Berhaut, 1971: 391. Fig. 3; Map 3; Phot. 1

Type: Sierra Leone, sin. loc. *Smeathman s.n.* (BM, holotype).

Sarmentose *shrub*, often lianescent, 2–5 m high and up to 20 m long. Trunk 2 cm in diameter or more. *Branches* dark brown to black with white lenticels. Branchlets with rusty-brown pubescence. *Leaves* shortly petiolate; petiole 3–7 mm long, hirtu-pubescent, blade oblong to narrowly obovate, 1.9–3.0 × as long as wide, 4–12 × 2.3–4.8 cm, acuminate to apiculate at the apex or in leaves near the base of the branchlets often obtuse, rounded or emarginate, at the base rounded to cordate and equal- or unequal-sided, coriaceous, above pilose to pubescent on the costa, beneath pilose to pubescent, especially on the main veins; costa and other veins impressed above, prominent beneath as the reticulate tertiary venation; secondary veins 4–6 on each side. *Inflorescences* occasionally axillary, thyrsoid, 5.5–27.5 × 2.3–6.5 cm, densely pubescent; lower bracts leafy, with colleters in the axils; upper small, ovate to very narrowly elliptic, acuminate, densely pubescent. Peduncle 1.1–6.7 cm long; pedicels 3–5 mm long. *Sepals* brownish-green to dark brown, broadly ovate, with an ochraceous tip, sometimes slightly unequal, 1.1–1.6 × as long as wide, 1.8–2.5 × 1.2–2.0 mm, outside pubescent, glabrous near the margin, inside glabrous, with 5 groups of 2–3 glands, which are 1 mm long. *Corolla* outside yellow-green to brown, in the mature bud 6–8 × as long as the calyx, 12–18 mm long; tube 4–5 × as long as the calyx, 7–10.5 mm long, composed of a cylindrical 1.5–2.2 mm wide, and at the apex with a saucer-shaped portion, which is 1–2 mm wider, outside pubescent with ordinary and some glandular hairs, inside minutely glandular-pubescent and at the base for 1 mm glabrous; lobes inside red-brown to pink-red and with four yellow longitudinal stripes from the base to 1/3 of the length, 4.5–6 × 2–3.2 mm, outside mainly at the base yellowish-pubescent with ordinary and glandular hairs, with or without a small undulate sub-apical appendage at the right side, which is yellow at the margin, 0.5–1 × 1–2 mm. *Stamens* exserted for 3–4.5 mm; filaments 1.2–2 mm long, filament ridges in the tube 2.5–3.8 mm long; anthers whitish, turning greyish, narrowly triangular, 3.0–3.5 × 0.8–1.1 mm, fertile at the apex for 1.1–1.3 (–1.6) mm. *Pistil* 9.1–13.0 mm long; ovary 0.8–1.2 × 0.8–1.2 × 0.5–0.9 mm, glabrous at the base, pennicellate at the apex; in each carpel 6–10 series of 6–7 ovules; style 8.5–12 mm long; clavuncula: the lower ring 0.2–0.3 mm high, at the base 0.6–0.8 mm in diameter, and at the apex one third of that; the upper 0.6–0.8 × 0.2–0.3 mm; stigma composed of two oblong about 0.2 mm long lobes. *Fruit*: follicles 11–20 × 0.5–0.8 cm, rusty-brown, velvety. *Seed* laterally compressed, with a minute honeycombe-like structure, fusiform, 18–22 × 2–3.5 mm; most hairs of the basal coma directed downwards, about 2 cm long and a few directed upwards along the seed, about half as long as the seed.
Fig. 3. *Isonema smeathmannii* Roem. & Schult.: 1. flowering branch, 2/3 x; 2. petiole with colleters, 2 x; 3. flower, 4 x; 4. opened flower, 4 x; 5. calyx with colleters, 4 x; 6. fruit, 2/3 x; 7. young fruit, 2/3 x; 8. seed, 2/3 x; 9. detail seed, 2 x; 10. embryo, 2 x.-(1–2. Zwetsloot 1; 3–7. Beentje 274; 8–10. Jansen 1749).
MAP 3. Isonema smeathmannii Roem. & Schult.

Distribution: West Africa: Senegal to Ghana.
Ecology: Bush or forest, mainly near the coast.
Uses: The young leaves are said to be used as a vegetable in Sierra Leone.


Specimens examined:

SENEGAL: Diantém, Berhaut 6257 (BR, P); Oussouye Region, Berhaut 7174 (P), 7241 (BR, M, P); sin. loc. Berhaut 7027 (BR, P).

GUINEE BISSAU: between Suzana and São Domingo, Espirito Santo 2291 (COI, LISC, LISJC, WAG); Bissau Safim, Espirito Santo 1905 (COI, K, LISC, LISJC, WAG); between Cumura and Bor, Espirito Santo 1879 (BR, COI, K, LISC, LISJC, MO, P, WAG); Prabia, Espirito Santo 1826 (COI, LISC, WAG).

GUINEA: Pongo R., Heudelot 912 (BM, FI-W, K, P); Kindia, Adam 26769 (MO); ibid., Pobeguin 1283 (A, BR, K, P); near Friguiaué, Chevalier 25588 (P, WAG); ibid., Chillou 498 (C); sin. loc. Chevalier 12475 (P), Macaudec 1898 (P).

SIERRA LEONE: Petuí Creek, Pelly 423 (FHO); Rowala, Thomas 1138 (A, B); Port Loko Creek, Scott Elliot 5814 (BM, K, MO); Kumrabaï, Thomas 6817 (S), 7086 (Z), Kundu, Smyth 255 (K); Gunia Dam, Hepper 2506 (K, MO); Hamilton, Morton and Jarr SL 1657 (K, MO, WAG); Ronietta, Thomas 45 (BM, MO); sin. loc. (K); Sherbro Island, Scott Elliot 4305 (BM, K, MO); ibid., Hunter 49 (BM, MO); sin. loc. Afzelius s.n. (UPS); Marmo 4 (K); Sneathman s.n. (BM, type); Thomas 6262 (B), 7158 (A), 9182 (P), 9341 (A).

LIBERIA: Yekepa, Adam 28707 (WAG); Bonni Hills, Bos 1944 (BR, K, P, WAG), 2064 (BR, K, P, WAG); ibid., Breteler 5429 (WAG); Goll 99 (WAG); ibid., Jansen 793 (WAG), 1454 (WAG); ibid., Van Meer 67 (WAG); Dobbi Island, Bequaert 24 (A, K); Gibi Mt., Jansen 1749 (WAG); Tapeta, Bos 2708 (BR, WAG); Brewerville, Baldwin 10364 (BR, K, P, WAG); ibid., Dinklage 2521 (A); Barclay Mt., Dalziel 8120 (K), 70979 (K, MO); ibid., Kunkel 236 (WAG); ibid., De Gier & Goll 302 (WAG); ibid., Kunkel 236 (WAG), 240 (WAG); ibid., Van Meer 276 (BR, MO, WAG); ibid., De Wit 9106 (WAG); Roberts field, Baldwin 13204 (K), Payneville Arboretum, Voorhoeve 93 (WAG), 270 (WAG); Harbel, Baldwin 13210 (K), ibid., Hurley 2124 (K); Buchanan, Adam 16945 (P), 270 (WAG), 25386 (MO), 26106 (MO), 27858 (MO); ibid., Dinklage 1802 (A, B), 2048 (A); ibid., Vogel 65 (K); Schenkwehn (Sangwin), Baldwin 11308 (K, MO, WAG); Sinoe, Jansen 1117 (WAG); ibid., Whyte anno 1904 (BM, K); sin. loc., Barker 1338 (K); Carter Cook 203 (A, BR, NY); Millen 199 (K).

IVORY COAST: E of Tabou, Beentje 538 (WAG); ibid., Leeuwenberg 12301 (WAG); Grand Lahou, Pobeguine 10 (P); 4 km NW of Jaqueville, Beentje 667 (WAG); Dabou, Chevalier 17213 (P, WAG); ibid., Roberdy 13618 (G); Agnèby, Aké Assi 8887 (UCJ, WAG); ibid., Chevalier 17164 (P, WAG); near Ngaty, Beentje 525 (WAG); 8 km E of Dabou, Versteegh and Den Outer 111 (WAG); Niek, Roberdy 12450 (G, Z); Adiopodoumé, Beentje 1 (WAG), 2 (WAG), 3 (WAG), 275 (WAG), 276 (WAG); ibid., Dekker 3 (WAG); ibid., Geertling and Bokdam 290 (BR, WAG), 333 (BR, MO, WAG); ibid., F. Hallé 19-5-1955 (P); ibid., Leeuwenberg 4185 (K, P, WAG); ibid., Oldeman 441 (BR, K, P, WAG); ibid., Roberdy 14266 (G, Z), 15486 (G); ibid., J. J. de Wilde 91 (WAG); ibid., W. J. de Wilde 418 (K, P, WAG); ibid., Zwetsloot 1 (WAG); Bakrè Lake, Mieg 20-5-1965 (G); Abidjan, Chevalier 15359 (P), 15545 (P), 15603 (P), 16030 (P); Azito, Frédoux 689 (G); Vridi Canal, Garnier 277 (K, NY); Vridi, Roberdy 14226 (G, MO, Z); Port Bouet, Maitre 23-7-1944 (P); ibid., W. J. de Wilde 345 + 345 A (K, P, UC, WAG, Z); N of Agbien, Beentje 512 (WAG); 2 km S of Agbien, Beentje 500 (WAG); Bingerville, Chevalier 17825 (P); Moosou, Aké Assi 10131 (UCJ, WAG); ibid., J. and A. Raynal 13570 (BR, P); Abouabou Forest, Leeuwenberg 2693 (BR, COI, FHO, K, L, MO, UC, WAG, Z); ibid., Oldeman 203 (BR, COI, K, L, MO, P, W, WAG, Z); ibid., J. J. de Wilde 3156 (A, BR, K, P, WAG); Grand Bassam, Aké Assi 11277 (UCJ, WAG); ibid., Breteler 5967 (WAG); ibid., Versteegh and Den Outer 152 (MO, WAG); ibid., W. J. de Wilde 470 (BR, K, P, WAG); Ono Lagoon, Hedin 5-12-1930 (BR, K, P, WAG); Grand Bassam, Ake Assi 15127 (K), 15131 (K), 15137 (K), 15603 (K); ibid., Versteegh and Den Outer 152 (MO, WAG); ibid., W. J. de Wilde 470 (BR, K, P, WAG); Ono Lagoon, Hedin 5-12-1930 (P); sin. loc., Farmar 370 (BM, K).

GHANA: Mpitubta, Enti GL 42667 (MO); Atoabo, Irvine 2346 (FHO); Bronkrom, Hall and Naboch 46621 (WAG); sin. loc., Burton s.n. (K).

Note: This species is flowering during the whole year.
Bentham published *Pycnobotrya nitida* in Hooker's Icones and cited Bentham & Hooker f., Genera Plantarum even which page number for the genus publication. The first paper came out in April and the second in May 1876.

The only other species described in *Pycnobotrya* was *P. multiflora* (1902). It was reduced into synonymy of the type species by Huber in 1963. This view is followed by the present author.

**RELATIONSHIP TO OTHER GENERA**

Bentham (1876) placed *Pycnobotrya* in the tribe Echitideae, more appropriately to be considered as subfamily Echitoidae (= Apocynoideae). He was followed by Schumann (1895) and Staff (1902). Markgraf (1947) placed it in the subfamily Plumerioideae, after having studied fruiting material of *herb.* Zenker 3021a. In his publication the fruits are described for the first time. They resemble very much those of the American genus *Aspidosperma* Mart. & Zucc. Besides of this, he observed that the anthers do not stick to the clavuncula as was supposed by Bentham and Staff.

Pichon (1948) came independently to the same conclusion when studying the Echitooideae. Consequently he placed *Pycnobotrya* in the new subtribe Aspidospermatinae of the tribe Plumerieae.

Leeuwenberg (1980) and the present author agree with this concept, both consider the Aspidospermatinae to be a natural taxon, and therefore they decided to validate it, as Pichon published it with a French description only.

**Aspidospermatinae Pichon ex Leeuwenberg et Van der Ploeg, subtribus Plumeriearum** Endl. (1838), nova; Pichon 1950; 195 (French description only).


Type genus: *Aspidosperma* Mart. et Zucc.

5 genera:

*Diplorhynchus* Welw. ex Fic. et Hiern (1 species in tropical Africa)

*Pycnobotrya* Benth. (1 species in tropical Africa)

*Aspidosperma* Mart. et Zucc. (about 50 species in tropical America)

*Microplumeria* Baill. (1 species in South America)

*Geissospermum* Allem. (1–3 species in South America)
ETYMOLOGY

The generic names means inflorescence and is derived from the Greek words: μυκός, dense, and βότρυς, grape or inflorescence. The latin epithet nitida, shining, refers to the leaves.

DESCRIPTION


Type species: Pycnobotrya nitida Benth.


A large liane, up to 40 m high climbing in trees; latex white, turning pale yellow. Trunk up to 12 cm in diameter; bark dark brown to black when dry, smooth; branches terete, dark red-brown; branchlets rusty-pubescent when young, glabrescent. Leaves opposite or ternate, shortly petiolate, inserted on distinct leaf cushions; petiole 3–7 mm long, above glabrous, beneath with short curled hairs, with some minute glands in the axils; blade coriaceous, narrowly elliptic, 2.5–4 × as long as wide, 8–15 × 2–5 cm, acuminate with an obtuse tip, apiculate, or obtuse at the apex, cuneate at the base, dark green, glossy, with a paler or whitish midrib and glabrous above (reddish when young), beneath very pale green, glabrous or especially on the midrib pubescent with short curled hairs, and dotted with many black glands; secondary veins many, straight, parallel, inconspicuous, slightly prominent beneath when dry. Inflorescences terminal, and in the axils of the apical leaves, paniculate, first ramifications lax, other congested, 3–15 × 2–20 cm, many flowered, rusty-tomentose; bracts ovate to very narrowly elliptic, those near the base up to 6 mm long, with very minute glands in the axils; peduncle 1–5 cm long, pedicels 1–3 mm long. Flowers 5-merous, actinomorphic, or with only the sepals unequal, fragrant. Sepals pale green or pale yellowish, ovate, obtuse, free or nearly so, unequal, 1.2–2 × as long as wide, 0.75–1.3 × 0.45–1.0 mm, outside pubescent to tomentose, inside glabrous, without colleters, entire, ciliate, imbricate in bud. Corolla dark pink, usually turning paler at anthesis, with or without a pale yellow throat, 5–7 × as long as the calyx, 5–7 (–9) mm long; tube campanulate, 1.3–1.8 (–2) × as long as the calyx (only seen from outside; it seems to be as long as the calyx because of the auricles of the lobes at the base), 1.4–2 × 0.4–0.6 × 1.2–1.6
FIG. 4. *Pycnobotrya nitida* Benth.: 1. flowering branch, 2/3 ×; 2. detail of branch, showing ternate leaves, 2 ×; 3. flower, 6 ×; 4. opened flower, 6 ×; 5. stamen, adaxial side, 20 ×; 6. stamen, abaxial side, 20 ×; 7. pistil, 18 ×; 8. immature fruit, 2/3 ×; 9. fruit, 2/3 ×; 10. open fruit, with four side, 20 ×; 11. seed, 2/3 ×; 12. embryo, 2/3 ×. (1. Zenker 279; 2. Zenker 2063; 3–8, 12. Breteler & De Wilde 472; 9. Louis 14322; 10–11. Tisserant 1127).

mm, glabrous, inside with 5 prominent ridges from the mouth towards the base and there each dividing in two less prominent ridges behind the base of the filament; lobes 3.1–5.2 (–7.2) × 1.5–2.5 mm, oblong, obtuse at the apex, upcurved at the left side, pubescent with glandular hairs on both sides, contorted and overlapping to the left, spreading. Stamens included, inserted at the apex of the narrow basal portion of the corolla tube, about 0.2–0.3 mm from the base; filaments flattened, glabrous, 0.1–0.18 mm long; anthers narrowly triangular, 1.0–1.15 × 0.18–0.21 mm, basifixed, auriculate at the base, acuminate at the apex; the top and the basal part are sterile, both about 0.3 mm long; the locules about 0.4 mm long; the foot of the connective flat, inside with a papillose cushion in the centre and with a few short hairs at the base, outside with a few longer hairs, only at the fertile part. Pistil 0.6–0.9 mm long; ovary subglobose 0.3–0.5 × 0.24–0.33 mm, composed of two free carpels; ovules 4 in each carpel, 2-seriate, adaxial; style inserted barely below the apex of each carpel, very short, 0.13–0.18 mm long; clavuncula globose, 0.12–0.16 × 0.15–0.18 mm, minutely papillose; stigma conical, bifid, 0.06–0.15 mm long, glabrous. Fruit composed of two free follicles, which are widely spreading, shaping an angle of about 180°; outside green to dark brown when mature, 1.5 × as long as wide, 4.5–7 × 3–4.5 × 0.5–1.5 cm, obliquely elliptic, laterally compressed, outside with longitudinal curved lines, becoming straight and more prominent towards the abaxial side, when young undulate, warty when open and dry, inside shiny and wrinkled, two-valved, dehiscent at the adaxial side, 1–4 seeded. Seed flat, straightly or
obliquely oblong, in two alternating rows of one or two as in *Aspidosperma marcgravianum* Woods., 4–6 × 2.5–3.2 × 0.1 cm; surrounded by a papery wing, diaphanous except for the margin, 0.2 mm thick, at the base and apex 1–1.5 cm and laterally 0.4–0.6 cm wide; funicle 1.5–2 cm long; raphe running over the middle of the grain; embryo white, oblong, 2.5–3 × 1.7–2 cm, rounded at the top, auriculate at the base; radicle 0.5 cm long, between the auricles of the cotyledons.

**MAP. 4.** *Pycnothrya nitida* Benth.

**Distribution:** West en Central Africa, from Nigeria to Zaire at low altitudes.

**Ecology:** Forest, often on river banks.

**Uses:** Only reported to be used as vegetable, teste: Reygaert 221, 269.

**Vernacular names:** CENTRAL AFRICAN REPUBLIC: Kalabe (Lisongo). ZAIRE: Babua (Emba); Boïla la Ngema (Turumbu).

**Specimens examined:**

NIGERIA: Benin City (fl. Mar.) *Leeuwenberg* 11298 (WAG); Sapoba (fl.) *Kennedy* 1951 (A, FHO, K), 2083 (BR, K, P), 2258 (FHO); Calabar (fl. Aug.) *Chevalier* 13628 (BM, BR, G, P, WAG); sin. loc (fl.) *Kennedy* 185 (FHO).


EQUATORIAL GUINEA: Rio Muni: Bata (fl. May) Dinklage 1220 (HGB); Alen (fl. Sept.) Bates 585 (G, P).

GABON: 22 km NE of Asok (fl. Aug.) Breteler and J. J. de Wilde 78/251 (WAG); Mitzic (fl. May) Le Testu 9162 (BM, BR, LISC, P, WAG); Bata (fl. May) Dinklage 1220 (HGB); Alen (fl. Sept.) Bates 585 (G, P).

CONGO: near Ouesso, Bouquet 1569 (P); near Brazaville, Chevalier 27344 (P); Djoumouna R., Halle 1864 (P).

<table>
<thead>
<tr>
<th>Reference</th>
</tr>
</thead>
</table>

Meded. Landbouwhogeschool Wageningen 83-4 (1983) 19
ACKNOWLEDGEMENTS

The present author would like to thank everybody at the department of Plant Taxonomy and Plant Geography of Wageningen Agricultural University, especially Dr. A. J. M. Leeuwenberg for his supervision, Ir. J. J. Bos for correcting the text, Mrs. Drs. F. J. H. van Dilst for correcting the manuscript and the proofs, Miss Y. F. Tan for her excellent drawings, Dr. H. J. Beentje, Dr. G. Caballé and Mr J. W. Mugge for their photographs.

He is also grateful to the directors and curators of the following herbaria for putting their material at his disposal: A, B, BM, BOL, BR, C, COl, E, FHO, FI-W, G, GH, GOET, HBG, K, L, LD, LISC, LISJC, M, MO, NY, P, S, SAM, UC, UPS, W, WAG, WU, Z.

REGISTER

Synonyms are in italics. Page number of principal entries in bold face: those of figures, maps and photographs in italics.

Aganosma G. Don. 2
Amphineuriinae Pichon 1
Amphineurion (A.DC.) Pichon 1
Apocynaceae Juss. 1
Apocynoideae 13
Aspidosperma Mart. & Zucc. 13, 14
- marcgravianum Woods. 17
Aspidospermatinae Pichon ex Leeuwenberg et
Van der Ploeg 13
Compositae Giseke 2
Dewevrella De Wild. 1, 2
Diplorhynchus Welw. ex Fic. & Hiern. 14
Echiteae Rchb. 1
Echitidae 1, 13
Echitoideae 13, 14
Geissospermum Allem. 14
Holarthra R. Br. 1
Isonema R. Br. 1, 2
- buchholzii Engler 1, 3, 4, 5
- infundibuliformis Stapf 1, 3, 6, 7, 8
- smeathmannii Roem. & Schult. 1, 2, 3, 9, 10.

Isonea Cass. 2
Microplumeria Baill. 14
Neriinae 1
Nerium L. 1, 2
Parsonsieae A.DC. 1
Plumerieae Endl. 13
Plumerioideae 13
Pottsia Hook. & Arn. 1
Pycnobotrya Benth. 1, 13, 14
- nitida Benth. 13, 14, 15, 16, 17
- multiflora Schum. ex Stapf 14, 18
Vallaris Burm.f. 1