

PART XII
A REVISION OF PLEIOCERAS BAILL.,
STEPHANOSTEMA K. SCHUM. AND
SCHIZOZYGIA BAILL. (APOCYNACEAE)

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INTRODUCTION

This publication is a revision of the exclusively African genera *Pleioceras*, *Stephanostema* and *Schizogygia*. The author was able to study and collect *P. barteri* in the field in Ivory Coast. The present account is further based on the available herbarium material. Unfortunately, no collections of *P. afzelii* with fruits and seeds were seen. *Stephanostema stenocarpum* and *Schizogygia coffaeoides* were growing in the greenhouses at Kew, so that it was also possible to study living material of these two species.

PLEIOCERAS AND STEPHANOSTEMA

HISTORY OF THE GENERA

Pleioceras was described by BAILLON (1888) with the single species *P. barteri*. Stapf (1902) subsequently added *P. afzelii*, originally described by SCHUMANN (1896) as *Wrightia afzelii*, and *P. zenkeri* and *P. gillettii*. HUBER (1962) reduced *P. zenkeri* to a variety of *P. barteri*. The present author, however, is of the opinion that it should be maintained as a separate species. *P. orientale* Vollesen (1980), the most recently proposed member of the genus, is also accepted.

Stephanostema was set up by SCHUMANN (1904). The type material of this monotypic genus was probably in Berlin and has therefore been lost. WINGFIELD rediscovered the plant in 1977 and obtained the living plant now at Kew.

GEOGRAPHICAL DISTRIBUTION

Pleioceras occurs in tropical continental Africa, from Sierra Leone to Moçambique. The area of distribution of *Stephanostema* is much smaller and it is only known from the remaining part of the 'Sachsenwald', which dates from the German period, near Dar-es-Salaam in Tanzania.

HABIT AND ECOLOGY

Most *Pleioceras* species are small trees, shrubs, or lianes. Only *P. orientale* is a fairly large tree. The small yellow flowers are borne in panicles at the ends of the branches. With the exception of *P. gillettii*, which occurs particularly in riverside forests, all the species are found in the coastal strips in bush and forests.

Stephanostema stenocarpum is a small shrub and its small yellow flowers, likewise grouped in panicles, are distinguished by their white corona. The species probably flowers throughout the year and it grows in fairly well shaded places in the forest.

RELATIONSHIPS WITH OTHER GENERA INCLUSIVE OF ITS HISTORY

Pleioceras belongs to the tribe *Nerieae* of the subfamily *Apocynoideae* (*Echitoideae*). This was first indicated by BAILLON (1888) and later confirmed by PICHON (1950) and Ngan (1965). Within the *Nerieae*, *Pleioceras* is placed together with *Wrightia* in the subtribe *Wrightiinae*. PICHON produced a table showing the main differentiating characters, which was later revised by NGAN. *Pleioceras* and *Wrightia* are very similar in their growth habit and fruits, and the most important differences between these two closely related genera are to be found in the flowers: *Pleioceras* species have 20 filiform, branched appendages, while *Wrightia* species have no or 5 much shorter, unbranched appendages located in the same positions. The mouth of the corolla tube is pubescent in *Pleioceras* but glabrous in *Wrightia*.

SCHUMANN assigned *Stephanostema* to the subfamily *Echitoideae* (now *Apocynoideae*) and he considered the genus to occupy a rather isolated position because of the presence of a toothed corona, not previously observed in the *Apocynaceae*. PICHON (1950) discussed the genus very briefly and on the basis of SCHUMANN's description, which indicated that the hairs of the seed coma pointed towards the base of the fruit, he included it in the subtribe *Wrightiinae* of the tribe *Nerieae*. The present author is in agreement with this view. *Stephanostema* and *Pleioceras* are evidently closely related and are very similar especially in growth habit, flowers and fruit. The most important difference is in the flowers – the occurrence of a toothed corona in *Stephanostema* and a corona composed of a set of appendages in *Pleioceras*. In *Pleioceras* and *Stephanostema*, as well as *Wrightia*, the corolla lobes in the bud overlap to the left. The writer concludes that the three closely knit genera are conveniently placed together as the subtribe *Wrightiinae* of the tribe *Nerieae*.

GENUS DIAGNOSIS OF PLEIOCERAS

Pleioceras Baill., Bull. Soc. Linn. 1: 759. 1888; Hist. Pl. 10: 210. 1889; K. Schumann in Engler & Prantl, Nat. Pflanzenf. 4.2:186. 1895; Stapf, Fl. Trop. Afr. 4.1:165. 1902; Vollesen, Bot. Tidskr. 75: 59. 1980.

Type species: *P. barteri* Baill.

Shrubs, lianas or trees up to 9 m high, with white latex in bark and leaves (unknown for *P. afzelii*). Branches unarmed with pale lenticels; branchlets terete, often sulcate when dry. Leaves opposite, those of a pair equal or subequal, shortly petiolate, with colleters in one or two rows in the axils; blade rounded or cuneate at the base, acuminate at the apex, entire. Inflorescences terminal, paniculate, several- to many-flowered, lax. Lower bracts leafy; other narrowly oblong, acute at the apex, with colleters in the axils. Flowers 5-merous, except for the sometimes slightly unequal sepals actinomorphic, small. Calyx persistent

under the fruit; sepals green, connate at the base, ovate, imbricate, outside pubescent or glabrous, entire, ciliate, inside glabrous and furthermore at the base near the edge with 0–1 triangular or ovate colleters (in whole flower 3–10). *Corolla* approximately salver-shaped; yellow and violet or dark-red, ventricose in the middle, outside glabrous at the base and minutely pubescent at the apex, inside at the apex just below the appendages with a narrow pilose zone; lobes yellow with brownish-violet, in the bud contorted and overlapping to the left, elliptic, rounded, entire, ciliate, outside minutely pubescent, inside with a set of appendages. Appendages bright yellow, in a set of 1–3 short truncate or filiform, glabrous or pubescent, and 2–4 long filiform glabrous ones. *Stamens* inserted below the corolla mouth, exerted, but covered by the appendages; filaments short, filiform, outside glabrous, inside hispid towards the apex and with a triangular swelling on the base of the connective; anthers introrse, sagittate at the base, apiculate and pilose at the apex, furthermore glabrous, fertile for 0.3 of the length just below the apex; cells 2, discrete, parallel, dehiscent throughout by a longitudinal slit. *Pistil* glabrous or sometimes with a few papils; ovary superior, subglobose; carpels two, free, rounded; disk none; style inserted just below the apex of the carpels, filiform, split at the base; clavuncula with a thin ring at the base, almost cylindrical, covered by the anthers and inside with the triangular swellings of the connectives adnate to the clavuncula; stigma minute, 2-lobed. Placentas adaxial; ovules numerous, in several rows. *Fruit* composed of two spreading almost free mericarps, which are follicular, pendulous, slender, dehiscent along an adaxial line of dehiscence, glabrous; wall thinly coriaceous, striate, grooved when dry, glabrous outside, inside pale yellow-green, smooth, glabrous. *Seeds* numerous, in two or more rows, linear to very narrowly oblong, finely grooved, glabrous, with a more or less dense tuft of hairs at the apex, directed towards the base of the fruit; embryo large, surrounded by very scanty whitish endosperm; cotyledons broad, complicate, larger than the short straight radicle.

Distribution: 5 species in tropical continental Africa.

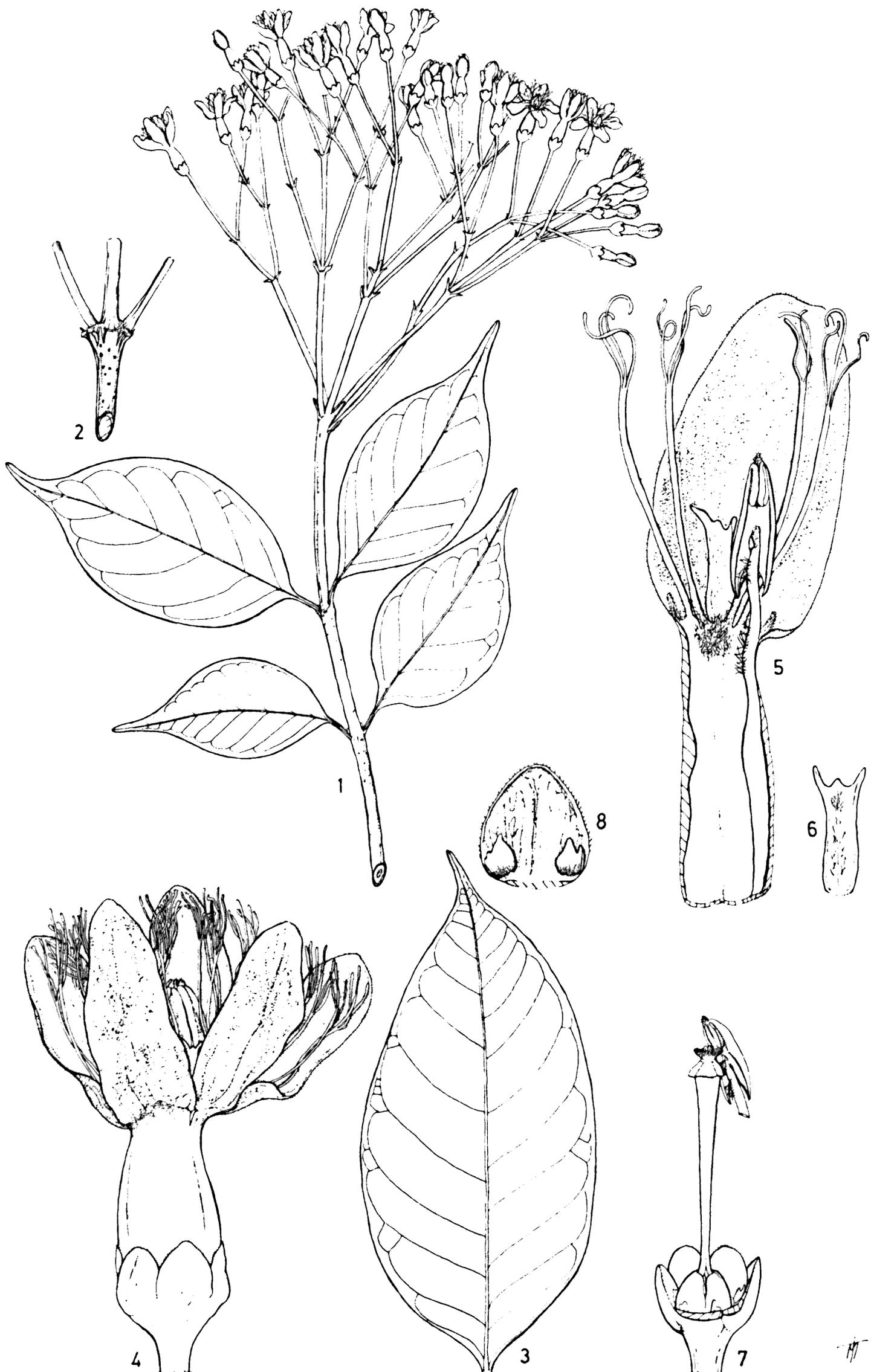


FIG. 1. *Pleioceras afzelii* (K. Schum.) Stapf: 1. flowering branch, $2/3 \times$; 2. branching with colleters in the axils, $2/3 \times$; 3. leaf, $2/3 \times$; 4. flower, $4 \times$; 5. part of the corolla showing a set of appendages and a stamen, $\times 6$; 6. the short truncate appendages, $8 \times$; 7. pistil, part of calyx, $\times 4$; 8. sepal with colleters of the base, $8 \times$. - (1-2, 4-8. Lane-Poole 217; 3. Deighton 4745).

KEY TO THE SPECIES

1. Inflorescences several-flowered; corolla 11.5–20 mm long; tube 3.5–9 mm long 2
 Inflorescence many-flowered; corolla 6–10 mm long, tube 1.4–4.5 mm long 3
2. Glabrous shrub or small tree; corolla 11.5–13 mm long, tube 5.5–6 mm; Guinea, Sierra Leone, Liberia **1. P. afzelii**
 Hairy tree; corolla 13.5–20 mm long, tube 6–9 mm long; Tanzania, Moçambique **4. P. orientale**
3. Leaves beneath densely pubescent on the main veins and less hairy or glabrous in between; tertiary veins conspicuous; the central appendages of the set of appendages branched into two lobes at the apex, glabrous 4
 Leaves beneath glabrous or evenly hairy; tertiary veins inconspicuous; the central appendages of the set of appendages, rounded at the apex, pubescent **3. P. gillettii**
4. Leaves densely pubescent on the main veins, furthermore less so; colleters inside the calyx large, 0.5–1.0 × 0.2–0.8 mm **2. P. barteri**
 Leaves densely pubescent on the main veins only; colleters inside the calyx small, 0.3–0.4 × 0.1–0.2 mm **5. P. zenkeri**

1. Pleioceras afzelii (K. Schum.) Stapf in Fl. Trop. Afr. 4.1: 166. 1902.

Fig. 1; Map 1

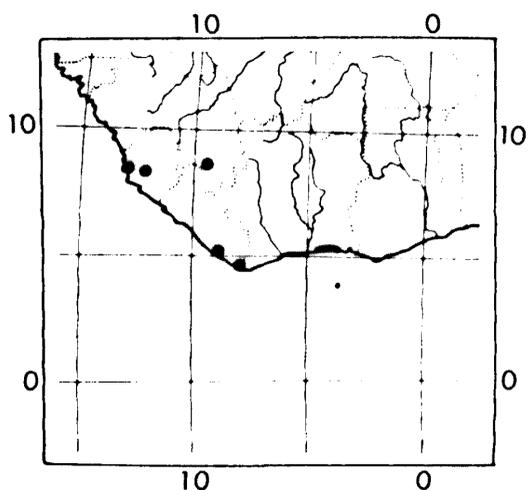
Basionym: *Wrightia afzelii* K. Schum. in Engler, Bot. Jahr. 23: 231. 1896.

Type: Sierra Leone: sin. loc., *Afzelius 129* (UPS, holotype).

Heterotypic synonym: *P. whytei* Stapf in Fl. Trop. Afr. 4.1: 604. 1904. Type: Liberia: Grant's farm on the Sinoe R. *Whyte anno 1904* (K. holotype; isotype: BM).

Shrub or small tree, about 9 m high; bark dark brown. *Branches* pale to dark brown when dry; branchlets glabrous. *Leaves*: petiole 2–4 mm long, glabrous; blade ovate or elliptic, 1.8–3.3 × as long as wide, 3.5–9.5 × 1.2–4.5 cm, subcoriaceous when dry, glabrous on both sides; secondary veins 7–8 at each side, tertiary veins conspicuous. *Inflorescences* several-flowered, 7.5–10.5 × 7–9 cm. Bracts 6–8 mm long, glabrous on both sides. Peduncle 2.5–5 cm long, glabrous; pedicels 15–20 (27) mm long, glabrous. *Sepals* 1.2–1.6 × as long as wide, 2.8–3.2 × 2–2.3 mm, outside glabrous, inside glabrous or papillose and furthermore at the base near the edge with 0–1 colleters (in whole flower 3–5 in total). Colleters small, triangular, 1.5 × as long as wide, 0.3 × 0.2 mm. *Corolla* red outside, inside yellow (teste: *Dinklage 1959*), 3.6–4.4 × as long as the calyx, 11.5–13 mm long, tube 1.6–2 × as long as the calyx, 5.2–6 mm long, where ventricose 2–3.8 mm in diameter, inside below the pilose zone glabrous; lobes 1.2–1.4 × as long as the tube, 1.8–2 × as long as wide, 6.5–7 × 3.2–3.8 mm,

outside minutely pubescent, inside papillose. The set of appendages composed of 7 of which the 1st and the 7th very small, the 2nd and 3rd broom-like, the 4th, the central, much shorter, truncate and bearing three narrowly oblong lobes on and in between the edges, the 5th and the 6th again broom-like. The broom-like appendages long, filiform, 5–6 mm long, sparsely pubescent to glabrous, branched from 4–4.4 mm above the base into 3–4 branches; the central one oblong, 2.8–3.6 × 0.3–0.4 mm, branched from 1.7–2 mm above the base into 3 branches, pubescent; the very small ones filiform, 0.5 × 0.2 mm, pubescent. *Stamens* inserted 1.5–1.6 mm below the corolla-mouth; filaments 3.2–3.9 × 0.2–0.5 mm; anthers 2.8–3.2 × 1–1.1 mm. *Pistil* 7.5–9 mm long; ovary 1.2–1.8 × 1.2–1.5 × 1 mm, glabrous; style 6–6.5 × 0.2–0.3 mm, glabrous or with a few papils, especially towards the apex; clavuncula 0.4–0.9 × 0.5 mm; stigma 0.1–0.3 mm long. Ovules about 200 in each carpel. *Fruit* dark green; follicles 30–60 cm long (teste: *Dinklage 1959*).



MAP 1. *Pleioceras afzelii* (K. Schum.) Stapf

Distribution: Tropical West Africa, Guinea, Sierra Leone and Liberia.
Ecology: Forest, bush.

Specimen examined:

GUINEA (Conakry): Macenta, *Diawara 1–15* (WAG).

SIERRA LEONE: Newton (fl. Mar.) *Lane-Poole 217* (K); *ibid.* (fl. Feb.) *Deighton 5000* (K, P), (fl. Apr.) *4745* (K); Taiama (fl. June) *Deighton 3127* (K, P); *sin. loc. Afzelius 129* (UPS, type); *Smeathman s.n.* (BM, MO).

LIBERIA: Sinoe R., Grant's farm, *Whyte anno 1904* (BM, K, type of *P. whytei*); Grand-Bassa, *Dinklage 1959* (B).

2. *Pleioceras barteri* Baill., Bull. Soc. Linn. Paris 1: 759. 1888; Hist. Pl. 10: 210. 1889; K. Schumann in Engler & Prantl, Nat. Pflanzenf. 4. 2: 186. 1895; Stapf, Fl. Trop. Afr. 4. 1: 166. 1902; Aubréville, Fl. For. Côt. Iv. 3: 198. 1959.

Fig. 2; Phot. 1; Map 2

Type: Nigeria: Lagos State, Lagos, *Barter 2170* (P, holotype; isotypes GH, K, the K sheet is the holotype of *Wrightia parviflora*).

Homotypic synonym: *Wrightia parviflora* Stapf, Kew Bull. 88: 121. 1894.

Shrub, treelet or small liana, 1.5–3.5 m high. Trunk 1–2.5(–5) cm in diameter; bark dark brown; wood soft, pale yellow. *Branches* pale to dark brown; branchlets pubescent. *Leaves*: petiole 2–5 mm long, pubescent; blade narrowly ovate or obovate 1.4–4 × as long as wide, 4.5–9 × 2–7 mm, subcoriaceous when dry, sparsely and minutely pubescent to glabrous above, beneath pubescent on the



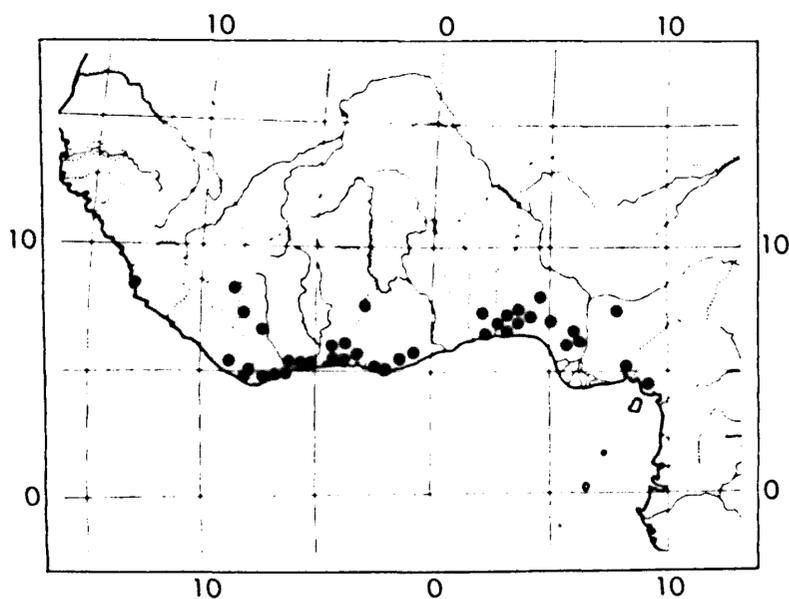
PHOT. 1. *Pleioceras barteri* (Barink 67, phot. LEEUWENBERG).

main veins and mostly less so in between; secondary veins 6–12 at each side; tertiary veins conspicuous. *Inflorescences* many-flowered, 4.5–13.5 × 3.5–14.5 cm. Bracts 0.9–3 mm long, outside pubescent, inside glabrous. Peduncle 1–3.5 cm long, sparsely pubescent; pedicels 5–10 mm long, pubescent. *Sepals* 0.9–1.5 × as long as wide, 1.2–2.2 × 1.3–2 mm, outside pubescent, inside glabrous and furthermore at the base near the edge with 0–1 colleters (in whole flower 3–10 in total). Colleters large, triangular, 1.4–2.7 × as long as wide, sometimes divided into 3–4 slender parallel erect parts, 0.5–1 × 0.2–0.8 mm. *Corolla* 2.8–7.5 × as long as the calyx 6–8 mm long; tube dark red or violet, 0.9–2.1 × as long as the calyx, 1.8–3 mm long, where ventricose 1.5–2.5 mm in diameter, inside below the pilose zone papillose or very minutely pubescent; lobes dark red or violet, yellow at the apex, 2.4 × as long as the tube, 1.4–2.5 × as long as wide, 2.8–5.2 × 1.5–2.9 mm, outside minutely pubescent, inside papillose or minutely pubescent. The set of appendages composed of 7 of which the 2nd and the 6th may be absent or may fuse with those of the neighbouring



FIG. 2. *Pleioceras barteri* Baill.: 1. flowering branch, $2/3 \times$; 2. flower, $6 \times$; 3. opened flower showing two sets of appendages, two stamens, the pistil and colleters inside the sepals, $6 \times$; 4. part of corolla showing a stamen and a set of appendages, $10 \times$; 5. fruit, $2/3 \times$; 6. seed, $2/3 \times$. - (1-2. Leeuwenberg 11064; 3-4. Leeuwenberg 12154; 5. Beentje 253; 6. de Koning 369).

corolla lobe and show the shape of the central appendix. The 4 odd numbers are broom-like, while the central is much shorter, truncate and bearing two narrowly oblong lobes at the edges. The broom-like appendages long, filiform 2.2–5.3 mm long, glabrous, branched from 1–3.5 mm above the base into 3–4 branches; the central one oblong, 1.5–3 × 0.2–0.5 mm, branched from 0.6–1.3 mm above the base into two lobes, glabrous; the 2nd and the 6th appendages, filiform to oblong, 0.7–1.5 × 0.1 mm, or – if fused – 0.3 mm wide, glabrous. *Stamens* inserted 0.1–1.0 mm below the corolla mouth; filaments 0.8–2 × 0.1–0.3 mm; anthers 1.5–1.8 × 0.5–0.8 mm. *Pistil* 3.7–6 mm long; ovary 0.5–1 × 0.5–1 × 0.5–1 mm, glabrous; style 2.2–4.6 × 0.2–0.5 mm, glabrous or with a few papils, especially towards the base; clavuncula 0.4–0.8 × 0.2–0.8 mm; stigma minute, 0.1–0.3 mm long. Ovules 45–70 in each carpel. *Fruit* dark green; follicles 26–65 cm long, 5 mm in diameter. *Seeds* 13–27 × 2 × 1–2 mm, pale yellow, with a dense 30–70 mm long tuft of hairs at the apex; cotyledons 6–13 × 5–10 mm; embryo 12–25 mm long; rootlet 6–12 mm long.



MAP 2. *Pleioceras barteri* Baill.

Distribution: West tropical Africa from Sierra Leone to Cameroun.

Ecology: Forest, bush or open places, mostly near the coast. Flowering the whole year. Alt. 0–250 m.

Uses: The fruits of *P. barteri* are used in Nigeria to procure abortion or, just before birth, to ensure that the head of the baby is correctly positioned – hence the name *pari ômôda* (Yoruba) (pa ori ômô dà = ‘cause child’s head to turn’) (Dalziel 1937).

Vernacular names: GHANA: *Bljtodjjnzima* (Ntwa) (teste: *Irvine 2347*); *Pari ômôda* (Yoruba) (ex *Dalziel 1937*).

IVORY COAST: *Abobo libi* (Abouré) (ex *Dalziel 1937*); *Adouta* (Ashanti) (ex *Dalziel 1937*); *Ayabu* (Ebrié) (ex *Dalziel 1937*).

A selection of the about 175 specimens examined:

SIERRA LEONE: Middleton, *Afzelius s.n.* (BM, UPS).

LIBERIA: Webo Distr., Mnanulu, *Baldwin 7027* (K, MO).

IVORY COAST: Mt. Momi For., *Aké Assi 9133* (UCJ); S.W. of Tiénoula Country, *Bernardi Feb. 1962* (G); Cavally basin, Lepo Country, Graba, *Chevalier 19731* (P); San Pedro, Thoiré 254 (P); Sassandra, *Chevalier 17956* (P); 1 km W. of Pointe Brouko, *Leeuwenberg 12152* (UCJ*, WAG); E. of Dakpadou, *Geerling & Bokdam 783* (BR, WAG); 55 km E.N.E. of Sassandra, about 10 km

N. of Fresco, *Leeuwenberg* 3070 (COI, K, L, UCJ, WAG); 18 km W. of Abidjan, *Bokdam* 2734 (BR, MO, WAG); Adiopodoumé, 17 km W. of Abidjan, *Bernardi* 8563 (G, P, WAG); *ibid.*, *Ybert* 292 (ABJ); *ibid.*, *W. de Wilde* 329 A (BR, K, P, UC, WAG); *ibid.* *Barink* 67 (UCJ, WAG), 68 (UCJ, WAG), 78 (UCJ, WAG); Vridi-Lac Braké Road, *Miège* 65 (G); *ibid.* *Garnier* 165 (K); Banco For. Res., *de Koning* 1537 (WAG), 1678 (WAG), 3709 (WAG), 6891 (WAG), 2838 (WAG); Anonkoa, Abidjan-Adzopé Road km 17, *Bamps* 2512 (BR); near Abobo, *Leeuwenberg* 10710 (WAG); Port Bouet, *J. & A. Raynal* 13587 (BR, K, P); Bingerville, *Chevalier* 16013 (P), 19486 (P); Adzopé, *Chevalier* 17903 (P); Grand-Bassam-Port Bassam Road, *Chevalier* 34240 (P); Moussou, *Aké Assi* 15132 (UCJ, WAG); Nganda-Nganda Res., 5 km S. of Adiaké, *de Koning* 369 (WAG); near Mafere, *Breteler* 7452 (WAG).

GHANA: Ayeldu near Mankesim, *Enti & Boating FE* 1944 (MO); Assini, *Vigne* 2837 (FHO); *ibid.*, *Chipp* 267 (K); just S. of Axim, *Morton GC* 8480 (K, WAG); 5 km from Princetown, *Morton GC* 6617 (K); Awabo, *Irvine* 2347 (K); Dixcove-Bushua junction, *Morton A* 268 (K); Ankaful For. Res., *Hall* 42586 (P); Foso, *Enti R* 1051 (K, MO); N. of Abakrampa, *Kirial* 1604 (E, K, MO); Assuantsi Road, *Fishlock* 26 (BM); Pra Sunien For. Res., *Deaw SP* 360 (WAG); Assuantsi, *Irvine* 1543 (K); Mankesim-Swedru Road, between Techiman and Eshiam, *Leeuwenberg* 11064 (GC*, WAG).

BENIN REPUBLIC: Zagnanado, between Dogba For. and Affamé, *Chevalier* 23297 (P), 23301 (P); Hoenbo Nago, 20 km E. of Sakété, *van der Zon* 206 (WAG); Ouando, near Porto-Novo, *van der Zon* 178 (WAG); Cohoué, between Porto-Novo lagoon and the sea, *Chevalier* 22785 (P); Porto-Novo, *Chevalier* 22734 (P), 22842 (P); Dogba, *le Testu* 129 (BM, P).

NIGERIA: Oyo State: Gambari For. Res., *Bernardi* 872 (G); W. Gambari, *van Eijnatten* 1182 (WAG), 1286 (WAG); Yorubaland, Ichagama, *Schlechter* 13008 (BM, G, K, L, P, Z); Yorubaland, *Millson Sept.* 1980 (K); Ibadan, *Keay & Jones FHI* 13783 (K, P); *ibid.*, *Meikle* 899 (BR, K, P); Ibadan, Ife Road, *Emwioghon* 48052 (FHO, K); Ife, *Guile* 2739 (MO). Ogun State: E. of Iju Otta, along Otta-Ilaske Road, *Leeuwenberg* 11338 (FHI*, WAG); Ijebu, edge of the Res., *Daramola & Ighanesebhor* 70306 (K, WAG). Lagos State: near Owode, *Russel* 25656 (K); Ipake For. Res., *Eimunjese & Ehwuno* 67982 (K); Ikeja, *van Eijnatten* 1660 (WAG); Lagos, Bot. Station, *Millen* 103 (K), *Millen* 177 (K); Lagos, Ikoyi, *Bels* 68 (BR, NY), Lagos, Isolo, *Leeuwenberg* 11210 (FHI*, WAG); Lagos Yaba, *Keay & Jones FHI* 13852 (FHO); Lagos, *Barter* 2170 (GH, K, P, type), *ibid.*, *Chevalier* 14007 bis (P); *ibid.*, *Moloney Oct.* 1883 (K); *ibid.*, *Dalziel* 1017 (BM, C, K, MO); *ibid.* *Rowland* 57 (K); Epe, *Gillet* 15273 (K, P); Epe Distr., Onochie *FHI* 20655 (FHO). Ondo State: Idame, Akure, Orusum Mt., *Brenan* 8696 (BM, FHO, K, P); Idame Hills, *Keay FHI* 25502 (K, P); Ondo, *Kennedy* 2586 (A, FHO). Bendel State: Benin city, *Kennedy* 1943 (FHO); Sapoba, *Jamieson R.*, *Kennedy* 1880 (FHO); Ehor For., 6 km N. of Ehor, *Leeuwenberg* 11268 (FHI*, WAG); Niger R., *Barter* 3278 (P). Benue State: Abinsi, *Dalziel anno* 1912 (MO). Cross River State: Adiabo, *Holland* 56 (K).

CAMEROUN: Kumba, Banga-Victoria Road, *Binuyo & Daramola Mar.* 1956 (K).

* Specimens marked with an asterisk were seen by Dr. A. J. M. Leeuwenberg, not by M. M. Barink.

3. *Pleioceras gilletii* Stapf in Fl. Trop. Afr. 4. 1: 167. 1902. **Fig. 3; Map 3**

Type: Zaïre: Prov. Bas-Zaïre: Kisantu, *Gillet* 537 (BR, holotype; isotype: K).

Heterotypic synonyms: *P. glaberrima* Wernham, *Journ. Bot.* 52: 26. 1914.

Type: Nigeria: Cross River State: Eket, *Talbot* 3038 (BM, holotype).

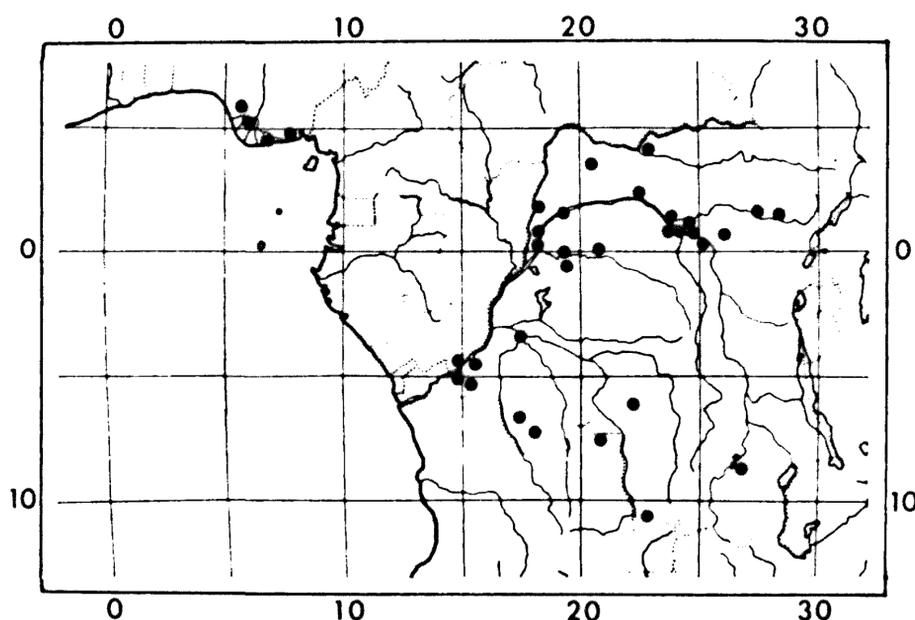
P. stapfiana Wernham, l.c. 27. Type: Nigeria: Cross River State: Eket, *Talbot* 3390 (BM, holotype).

Shrub or small liana, 1–2 m high. Trunk 2 cm in diameter; bark pale to dark brown. *Branches* pale to dark brown when dry; branchlets pubescent or glabrous. *Leaves*: petiole 3–7 mm long, pubescent or glabrous; blade elliptic, obo-



FIG. 3. *Pleioceras gillettii* Stapf: 1. flowering branch, $2/3 \times$; 2. flower, $4 \times$; 3. opened flower showing two sets of appendages, two stamens and the pistil, $4 \times$; 4. part of corolla showing a stamen and a set of appendages, $6 \times$; 5. stamen $12 \times$; 6. sepals with colleters at the base $8 \times$; 7. fruit, $2/3 \times$; 8. seed, $2/3 \times$. - (1-6. Bequart 2172; 7-8. Louis 12996).

vate or narrowly so, $1.8-3.3 \times$ as long as wide, $5-15 \times 2-7.5$ cm, subcoriaceous when dry, glabrous or sparsely and minutely pubescent above, beneath glabrous or subglabrous; secondary veins 6-9 at each side, tertiary veins inconspicuous. *Inflorescences* many-flowered, $2.5-8 \times 3-10$ cm. Bracts 0.5-1 mm long, outside pubescent, inside glabrous. Peduncle 3-4 cm long, pubescent; pedicels 2-5 mm long, pubescent. *Sepals* $0.7-1.3 \times$ as long as wide, $1.5-2.5 \times 0.9-2.2$ mm, outside pubescent to sparsely pubescent, inside glabrous and furthermore at the base near the edge with 0-1 colleters (in whole flower 3-5 in total). Colleters small, ovate, $1-1.3 \times$ as long as wide, $3-4 \times 2-3$ mm. *Corolla* $3-4.8 \times$ as long as the calyx, 7-10 mm long; tube yellow, dark red or violet at the apex, $1-1.5 \times$ as long as the calyx, 1.9-4 mm long, where ventricose 1-1.5 mm in diameter, inside below the narrow pilose zone, glabrous; lobes inside yellow, dark red or violet at the base, $1.2-2.6 \times$ as long as the tube, $1.6-2.3 \times$ as long as wide, $4.5-7 \times 2.2-3$ mm, outside minutely pubescent, inside minutely pubescent or papillose. The set of appendages composed of 5 which the 1st and the 2nd broomlike, the 3rd, the central much shorter and leaf-like and the 4th and the 5th again broom-like. The broom-like appendages long, filiform, 3.5-6.5 mm long, glabrous, branched from 2.5-4.5 mm above the base into 4 branches, which are thickened at the apex into minute globes; the central one oblong, $1-3.2 \times 0.5-1.3$ mm, adnate to the lobe for 50-75% of their length, rounded, entire, sparsely pubescent inside, at the apex and at the base, in between with a central zone of hairs which may be entirely or only basally absent. *Stamens* inserted 0.2-0.5 mm below the corolla mouth; filaments $0.9-1.3 \times 0.1-0.2$ mm; anthers $1.6-2 \times 0.6-0.7$ mm. *Pistil* 4.5-6.2 mm long; ovary $0.8-1 \times 0.5-1$ mm, glabrous or with a few papils especially towards the apex; style $2.2-4.7 \times 0.2$ mm, glabrous or with a few papils, especially towards, the apex; clavuncula $0.2-0.6 \times 0.2-0.5$ mm; stigma 0.1-0.2 mm long. Ovules 30-50 in each carpel. *Fruit* green; follicles 16.5-40 cm long, 1-1.7 cm in diameter. *Seeds* $12-25 \times 2 \times 1$ mm, greenish, with a dense, 20-60 mm long tuft of hairs at the apex; embryo 10-23 mm long; rootlet 7-15 mm long; cotyledons $3-8 \times 2-6$ mm.



MAP 3. *Pleioceras gillettii* Stapf

Distribution: West and Central tropical Africa, Nigeria, Congo, Zaïre and Angola.

Ecology: Forest, especially along rivers. Flowering the whole year, Alt. about 470 m.

Vernacular names: ZAÏRE: *Besi* (Mongandu) (teste: *Louis* 339); *Inada a libobo* (Turumbu) (teste: *Germain* 192); *Libobo* (Turumbu) (test.: *Germain* 8170, *Louis* 862 and 11 more numbers of his); *Libobo linenu* (Turumbu) (teste: *Germain* 4758); *Lilombo* (Turumbu) (teste: *Germain* 192); *Yoyo* (Turumbu) (teste: *Louis* 6071).

Specimens examined:

NIGERIA: Bendel State: Sapoba For. Res., *Emwiogbon* 45335 (K); Jamieson R., *Kennedy* 1954 B (FHO), 2736 (BM). River State: Ahoada, Sombreiro R., *Akpata FHI* 3918 (FHO). Cross River: Eket, *Latilo* 47780 (K); *ibid.*, *Talbot* 3038 (BM, type of *P. glaberrima*), 3390 (BM, type of *P. stapfiana*).

CONGO: Chutes de la Foulakari, Plateau des Catarades, *Sita* 1852 (P).

ANGOLA: Lunda: Dundo near Luachima R., *Young* 578 (A, S); *ibid.*, *Gossweiler* 13565 (K); *ibid.*, *Carrisso & Mendonça* 134 (COI).

ZAÏRE: Kinshasa: Kimuenza, Lukaya R., *Breyne* 3223 (BR); Bandundu: Maluku Country, Bombo R., *Breyne* 3000 (BR); Mayombe, Makaba, *Sita* 3125 (P); Djuma R. basin, *Gentil* July 1902 (BR); *ibid.* *Gillet* 2812 (BR); Wombali, *Vanderijst* 1859 (BR), 1866 (BR); Nseke, Mbisi, Mpese, *Callens* 3764 (BR, MO, P). Bas-Zaïre: Thijsville, Mfuatu, Noki-Zongo Road, *Compère* 1611 (BR); Kisantu, *Gillet* 537 (BR, K, type), 2230 (BR), 3690 (BR); Kisantu, Kikonka, *Vanderijst* 33413 (BR), 34748 (BR); Ndijli R., *Allard* 431 (BR). Haut-Zaïre: Uele R., *Dewulf* 349 (BR); W. Basoka, Longa R. basin, *Germain* 4758 BR, P); Between Isangi and Liléko, Etembo Island, *Germain* 192 (BR); Yahahondo, Lanami R. *Germain* 8170 (BR, P); Yangambi, *Louis* 339 (BR), 862 (BR), 5972 (BR), 6071 (BR), 6092 (BR), 7935 (BR), 8690 (BR), 9218 (BR), 10593 (BR), 12822 (BR), 12983 (BR), 12996 (BR, C, K), 13701 (BR, K), 13756 (BR, C, K), 13895 (BR, K), 14303 (BR); *ibid.*, *Leonard* 669 (BR); Kisangani, *Lisowski* 16771 (BR, K), 46201 (BR); *ibid.*, *Bokdam* 3098 (WAG); *ibid.* *Germain* 4588 (BR); Kawa For., *Claessens* 280 (BR), 287; Avakubi For., *Bequaert* 2036 (BR), 2060 (BR); Penge For., *Bequaert* 1918 (BR), 2172 (BR); *sin. loc.*, *Krukoff* 239 (NY). Kasai Occidental: Kazumba, Miao R., *Liben* 3415 (BR, WAG). Kasai Oriental: Bumba, *Goossens* 3013 (BR), *ibid.*, *Linder* 1854 (A, K); Monga, Bile R., *Lebrun* 2262 (BR). Equateur: Ngondo, Ngiri, *Evrard* 5908 (BR, K); Between Selenge and Lutholiki, *Goossens* 5060 (BR); Eala, Ruki R., *Evrard* 3084 (BR); Mahanza, *de Giorgi* 257 (BR), 617 (BR); Tshuapa, Banu near Buriva, *Dubois* 292 (BR); Gbo-Sassa For., Gbo R., *Evrard* 557 (BR), Bolomba, Ikelemba R., *Evrard* 2738 (BR); Lolengi, Ekekeli R., *Evrard* 3513 (K, BR). Shaba: Mbang, Ngangu, Muale R., *Nsimundele* 530 (WAG).

4. *Pleioceras orientale* Vollesen, Bot. Tidsskr. 75: 59. 1980.

Fig. 4; Map 4

Type: Tanzania: T8: Malemba Thicket, *Vollesen* 4783 (C, holotype, not seen; isotypes seen K, WAG, not seen BR, EA, LISC).

Tree, 5–8 m high; bark pale brown. *Branches* pale to dark brown when dry; branchlets densely pilose. *Leaves*: petiole 3–5 mm long, densely pilose; blade narrowly ovate or obovate, 2.6–3.5 × as long as wide, 3.5–14.5 × 1–5.5 cm, subcoriaceous when dry, puberulous above, beneath tomentose on the main veins and mostly less so in between; secondary veins 7–10 at each side, tertiary veins conspicuous. *Inflorescences* several-flowered, 4.5–6.5 × 4–8.5 cm. Bracts 2.2–3 mm long, pubescent or glabrous on both sides. Peduncle 1–2 cm long, tomentose, rarely subglabrous; pedicles 7–15 mm long, tomentose, rarely sub-

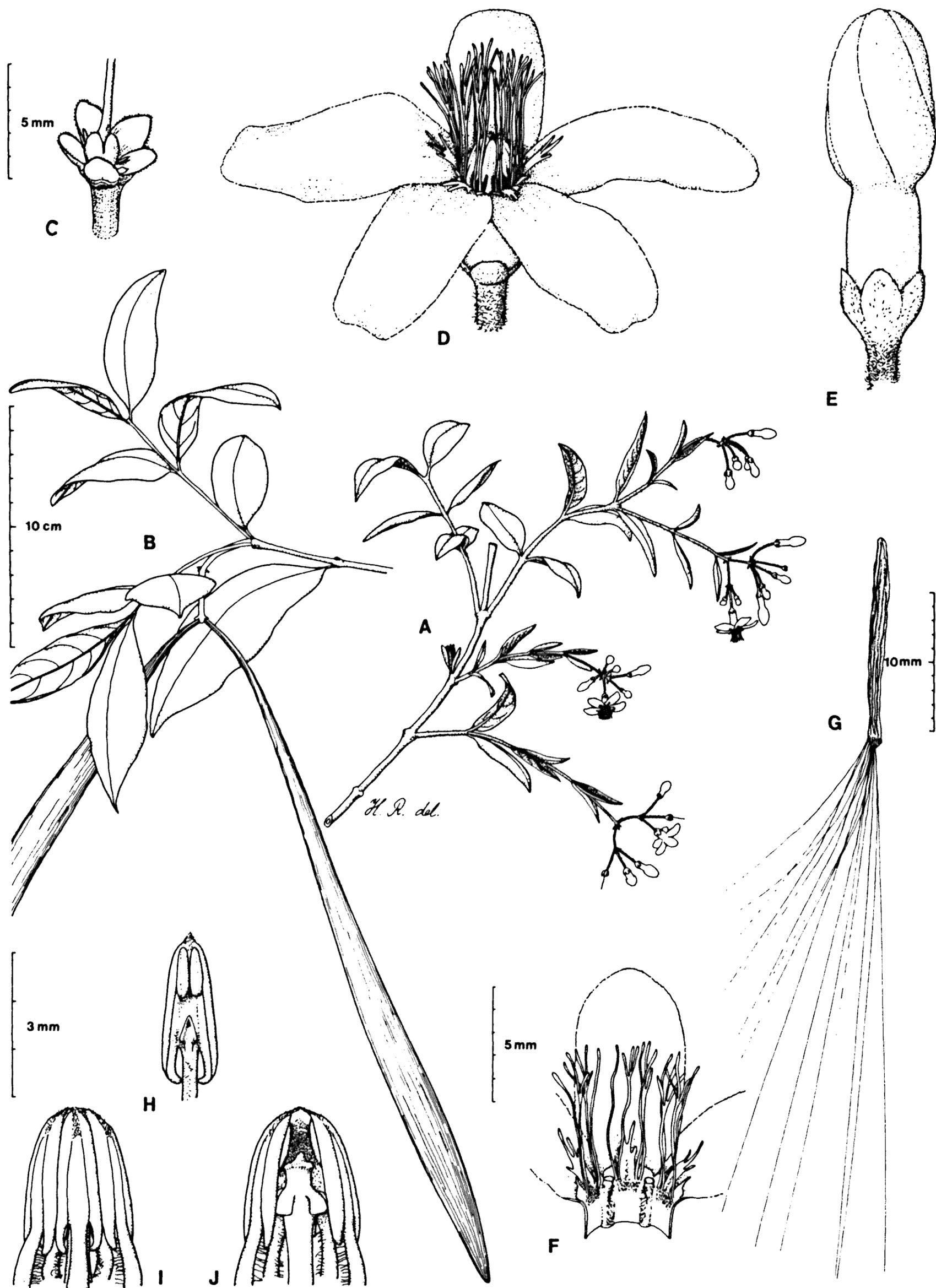
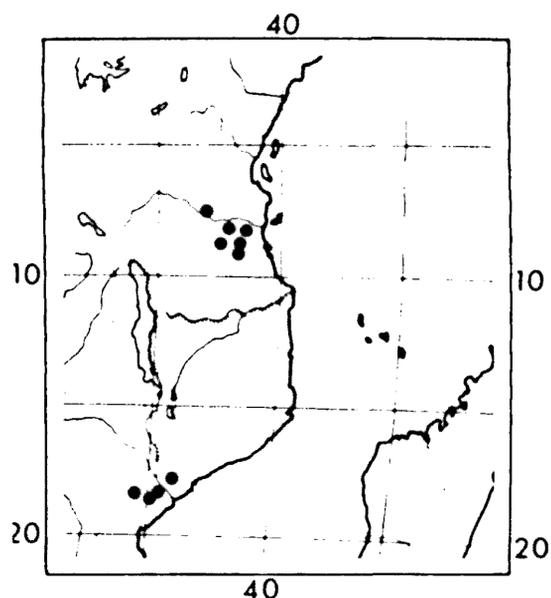


FIG. 4. *Pleioceras orientale* Vollesen: A. habit, $2/3 \times$; B. habit, $3 \times$; C. part of calyx and pistil, $5 \times$ (newly designed, as the original contained several errors); D. flower, $2 \times$; E. bud, $2 \times$; F. petals with three sets of appendages, $3 \times$; G. seed, $2/3 \times$; H-J. anthers and stigma, $10 \times$. - (A, D-E, H-J. Vollesen 4783; C. Muller & Pope 1924; F. Vollesen 4222; B. G. Simao 724).

labrous. *Sepals* 1–1.7 × as long as wide, 2–3 × 1–2 mm, outside sparsely pubescent, inside glabrous and furthermore at the base near the edge with 0–1 colleters (in whole flower 3–5). Colleters large, triangular, 2.5 × as long as wide, 1 × 0.4 mm. *Corolla* 6–7 × as long as the calyx, 13.5–20 mm long; tube dark violet, 3–4 × as long as the calyx, 6–9 mm long, where ventricose 2.5–4 mm in diameter, inside below the pilose zone glabrous; lobes yellow, brownish-violet at the apex, 1.2–1.8 × as long as the tube, 1.8–2 × as long as wide, 7.5–11 × 4–6 mm, outside minutely pubescent, inside papillose. The set of appendages composed of 7 of which the 1st and the 7th small, the 2nd and 3rd broom-like, the 4th, the central, much shorter, truncate and bearing three narrowly oblong lobes on the edges and in between the edges, the 5th and the 6th again broom-like; the small ones oblong, 0.5–1.5 × 0.5 mm, ciliate, glabrous; the broom-like appendages long, filiform, 7–9 mm long, glabrous, branched from 5–6 mm above the base into 1–3 branches; the central one oblong, 2–3 × 0.3 mm, branched from 1.3–1.8 mm above the base into 3 branches, sparsely pubescent. *Stamens* inserted 1.5–1.6 mm below the corolla mouth; filaments 2.2–3 × 0.2 mm; anthers 2.5–3.2 × 1 mm. *Pistil* 8–9 mm long; ovary 1–1.5 × 0.6–0.8 × 0.5–1 mm, glabrous; style 6–8 × 0.2–0.3 mm, glabrous; clavuncula 0.8–1 × 0.9–1 mm; stigma 0.2–0.3 mm long. Ovules 120–150 in each carpel. *Fruit* dark green; follicles 20–30 cm long, 5–7 mm in diameter. *Seeds* 10–18 × 1 × 0.2 mm, greenish, with a dense, 35 mm long tuft of hairs at the apex. Embryo 9–15 mm long; rootlet 3–6 mm long; cotyledons 6–9 × 4–8 mm.



MAP 4. *Pleioceras orientale* Vollesen

Distribution: Tanzania and Moçambique.

Ecology: Lowland dry evergreen forest, deciduous coastal forest on sand and deciduous coastal thicket on sand. Alt. 0–400 m.

Specimens examined:

TANZANIA: T6: Magombera For. Res. (fl. Feb.) *Vollesen 4402* (C); Kilwa Distr., Selous Game Res., Malemba (fr.) *Rodgers May 1970* (K); Kichi Hills (fl. Dec.) *Vollesen 4248* (C). T8: Nadanga Hill (fl. Dec.) *Vollesen 4199* (WAG); Tundu Hills, Selous Game Res. (fr. Dec.) *Ludanga 1189* (K); Malemba Thicket (fl. Nov.) *Vollesen 4783* (K, WAG, type), (fl. Dec.) *4222* (WAG).

MOÇAMBIQUE: Zambezia: 20 km from Mopeia, *Torre 4463* (LISC). Manica e Sfala: Inhamitanga (fr. July) *Simao 724* (K); ibid. (fr. Aug.) *Earle PA 220* (SRGH); 25 km from Lacerdonia, N. of new railway (fl. Dec.) *Müller & Pope 1924* (C, K, LISC, SRGH, WAG); sin. loc., *Pedro 5223* (K).



FIG. 5. *Pleioceras zenkeri* Stapf: 1. flowering branch, $2/3 \times$; 2. flower $6 \times$; 3. opened flower showing two sets of appendages and two stamens and the pistil, $6 \times$; 4. part of corolla showing a stamen and a set of appendages, $6 \times$; 5. fruit, $2/3 \times$; 6. base of the fruit, $2/3 \times$; 7. seed, $2/3 \times$. - (1. Zenker 157; 2-4. Mildbread 5876; 5-7. Zenker 2920).

5. Pleioceras zenkeri Stapf in Fl. Trop. Afr. 4. 1: 167. 1902.

Fig. 5; Map 5

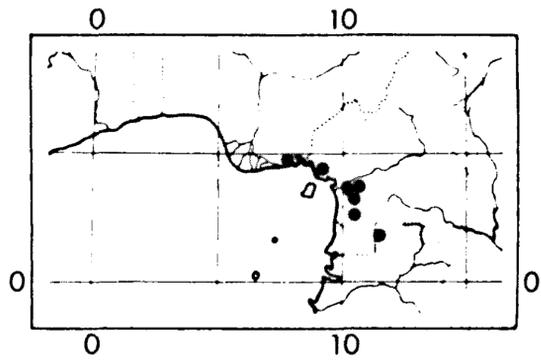
Type: Cameroun: Bipindi, *Zenker 2307* (K, lectotype; isotypes: BM, BR, G, GOET, HBG, L, M, P, S, W, WU, Z).

Homotypic synonym: *P. barteri* var. *zenkeri* (Stapf) Huber, Kew Bull: 438. 1962.

Heterotypic synonyms: *P. talbotii* Wernham, Journ. Bot. 52: 26. 1914. Type: Cross River State: Oron-Eket road, *Talbot 3008* (BM, holotype).

P. oblonga Wernham, l.c. 26–27. 1914. Type: Nigeria: Cross River State: Oron-Eket road, *Talbot 3111* (BM, holotype).

Shrub or small liana, 3–4 m high. Trunk 9 cm in diameter; bark brown. *Branches* pale to dark brown when dry; branchlets glabrous. *Leaves*: petiole 3–7 mm long, pubescent or glabrous; blade elliptic, obovate or narrowly so, 2.2–3 × as long as wide, 4.5–13 × 1.2–7 cm, subcoriaceous when dry, glabrous above, beneath pubescent on the main veins and glabrous in between; secondary veins 6–8 at each side; tertiary veins conspicuous. *Inflorescences* many-flowered, 4.5–9 × 6.5–11.5 cm. Bracts 2–4 mm long, pubescent on both sides. Peduncle 2.5–4.5 cm long, glabrous or sparsely and minutely pubescent; pedicels 3–7 mm long, pubescent. *Sepals* 0.9–1.3 × as long as wide, 1.6–2.2 × 1.5–2 mm, outside pubescent, inside glabrous and furthermore at the base near the edge with 0–1 colleters (in whole flower 3–5 total). Colleters small, triangular, 2–3 × as long as wide, 0.3–0.4 × 0.1–0.2 mm. *Corolla* 2.7–5 × as long as the calyx, 6–10 mm long; tube yellow, dark violet or red at the apex, 0.7–2.3 × as long as the calyx, 1.4–4.5 mm long, where ventricose, 1.2–2.8 mm in diameter, inside below the pilose zone glabrous; lobes yellow, dark red or violet at the base, 0.8–1.8 × as long as the tube, 1.7–2.8 × as long as wide, 3–5.5 × 1.5–2.5 mm, minutely pubescent on both sides. The set of appendages composed of 5 of which the 1st and the 2nd broom-like, the 3rd, the central truncate and bearing two narrowly oblong lobes at the edges and the 4th and 5th again broom-like. The broom-like appendages long, filiform, 3–5.8 mm long, glabrous, branched from 0.7–1.7 mm above the base into 2–4 branches; the central one oblong, 1.1–2.5 × 0.2–0.5 mm, branched from 0.7–1.7 mm above the base into two lobes. *Stamens* inserted 0.8–1.2 mm below the corolla mouth; filaments 1.2–2.3 × 0.2–0.3 mm; anthers 1.1–2.1 × 0.4–0.8 mm. *Pistil* 3.4–6.5 mm long; ovary 0.8–1.1 × 0.5–1.2 × 0.4–1 mm, glabrous; style 2.1–5 × 0.2–0.4 mm, glabrous or with a few papils, especially towards the base; clavuncula 0.2–0.6 × 0.3–0.5 mm; stigma 0.1–0.2 mm long. Ovules 50–80 in each carpel. *Fruit* dark yellow to brown; follicles 50–75 cm long, 5–10 mm in diameter. *Seeds* 21 × 2 × 1 mm, pale yellow, with a dense 80–85 cm long tuft of hairs at the apex; embryo about 19 mm long; rootlet about 7 mm long; cotyledons about 12 × 10 mm.



MAP 5. *Pleioceras zenkeri* Stapf

Distribution: Nigeria, Cameroun and Gabon.

Ecology: Forest, bush or open places. Alt. 90–200 m.

Specimens examined:

NIGERIA: Cross River State: Oron-Eket Road (fl. Jan.) *Talbot* 3008 (BM, type of *P. talbotii*), 3111 (BM, type of *P. oblonga*).

CAMEROON: Southern Bakundu For., *Olorunfemi* FHI 30735 (K); Bipindi, *Zenker* 157 (C, G, GH), 1204a (WU, G, K), 1954 (A, BM, BP, BR, E, G, GOET, HBG, K, L, M, MO, P, S, W, WU, Z), 2307 (BM, BR, G, GOET, HBG, K, L, M, P, S, W, WU, Z), 2441 (E, G, HBG, MO, K, P, W, WU, Z), 2920 (BM, E, G, HBG, K, W, WU, Z), 3908 (BM, BR, E, G, GOET, HBG, K, L, LE, M, MO, W, WU), 4712 (B, BM, BP, BR, COI, G, GOET, HBG, K, L, LE, M, P, S, W, WAG, Z), *anno 1905* (FHO), *anno 1910* (UC); between Douala and Edea, Razel Road (fl. May) *Mpom* 329 (P); Fenda, 58 km E. of Kribi, *Mildbraed* 5876 (HBG).

GABON: Woleu Ntem, Oyem (fl. Feb.) *le Testu* 9475 (BM, BR, LISC, P); sin. loc., (fl.) *N. Hallé* June 1963 (P).

STEPHANOSTEMA

Stephanostema K. Schum. in Engler, Bot. Jahr. 34: 325. 1904.

Type species: *S. stenocarpum* K. Schum.

Distribution: A single species in tropical East Africa.

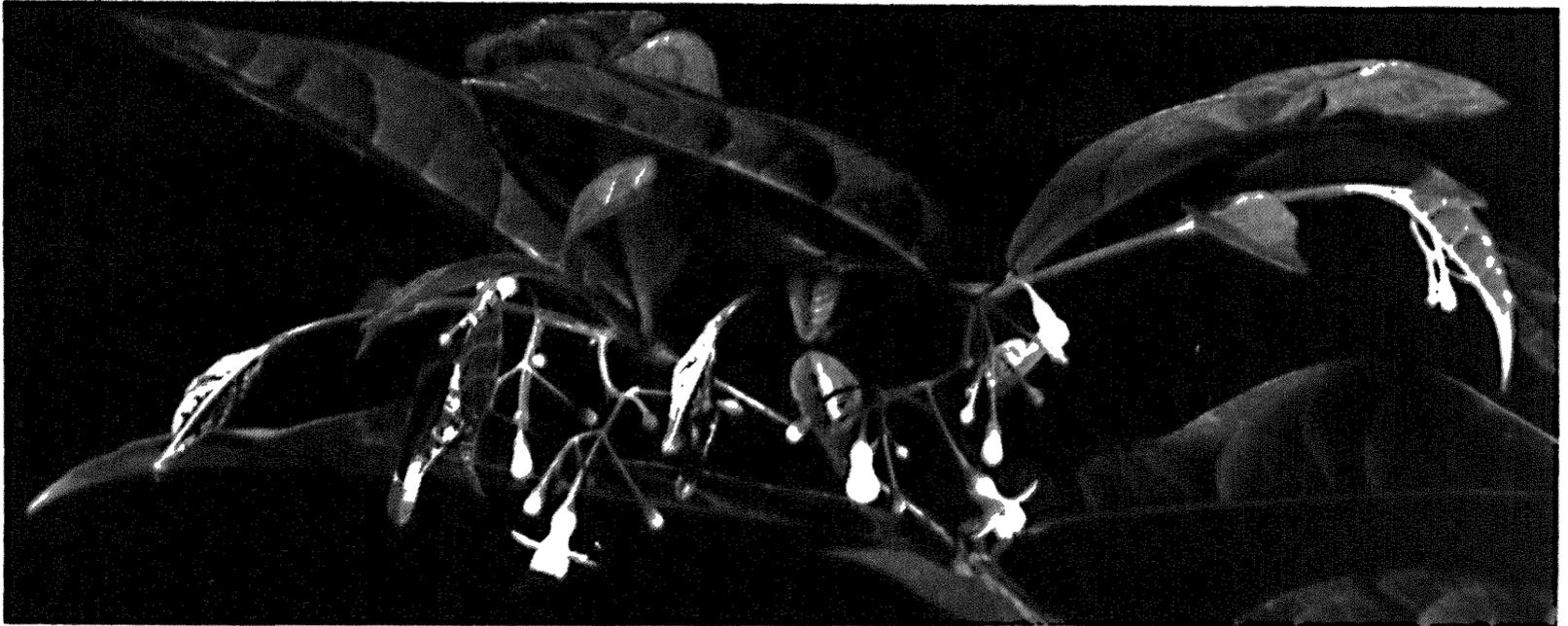
Stephanostema stenocarpum K. Schum., l.c. **Fig. 6; Phot. 2, 3, 4, 5; Map 6**

Types: Tanzania: Sachsenwald, near Dar-es-Salaam, *Engler* 2156 (B, holotype, destroyed); *ibid.*, *Wingfield* 4224 (K, neotype!; isoneotypes not seen; DSM, EA, MO, designated here).

Erect *shrub* 0.25–1.60 m, with white latex; bark rough, dark brown with pale lenticels; wood soft, pale yellow. *Branches* terete, grey to brown, with pale lenticels, glabrous; branchlets red to brown, terete, often sulcate when dry, sparsely and minutely pubescent. *Leaves* opposite, those of a pair equal or subequal, petiolate, petiole 2–3 mm long, sparsely pubescent on the margins, with colleters in one row in the axils; blade ovate, obovate or elliptic, 1.7–3.6 × as long as wide, 4.8–9.5 × 1.7–3.7 mm, acuminate at the apex, rounded or cuneate at the base, entire, subcoriaceous when dry, glabrous on both sides; secondary veins 5–9 at each side; tertiary venation conspicuous. *Inflorescences* paniculate,

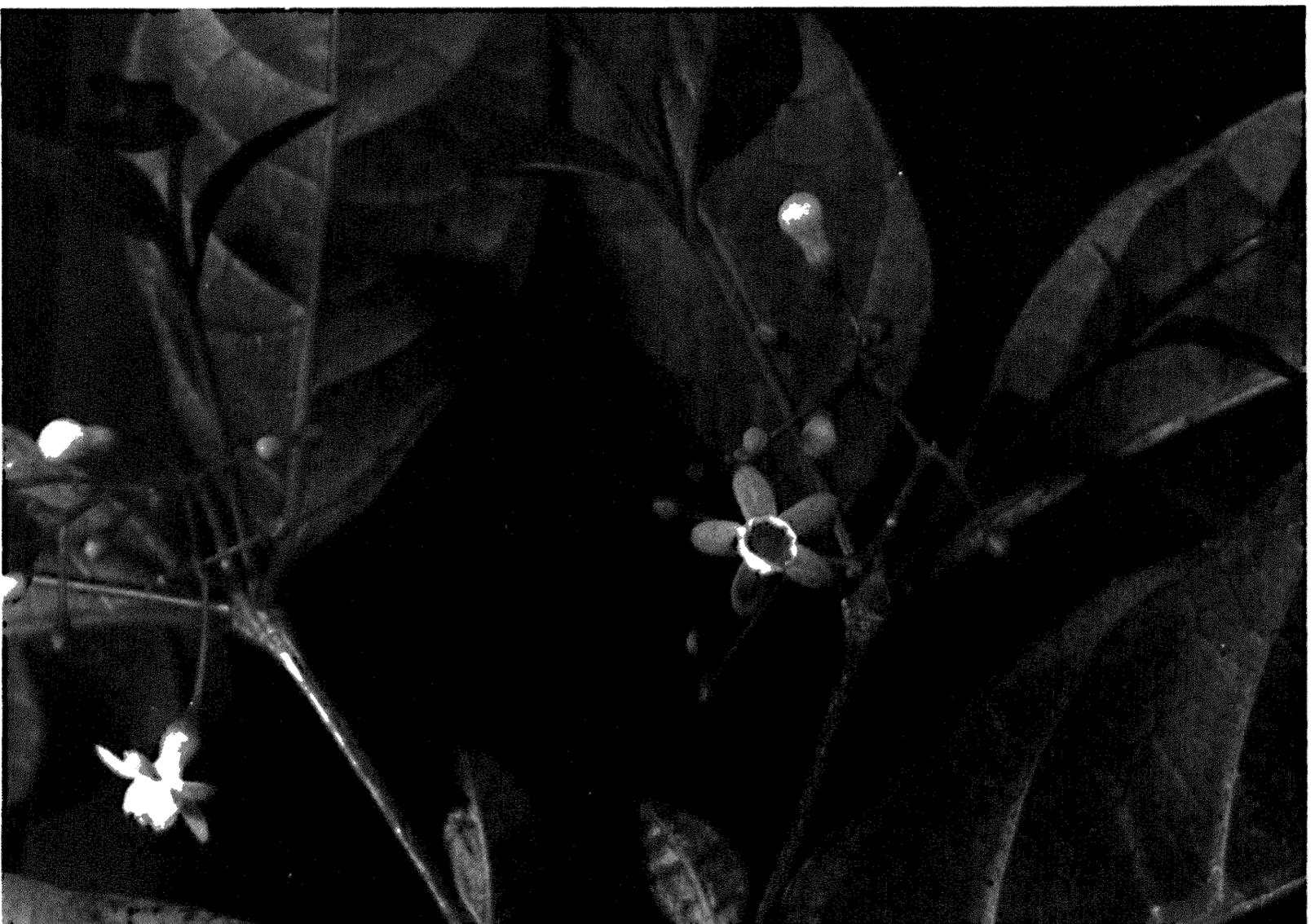


FIG. 6. *Stephanostema stenocarpum* K. Schum.: 1. flowering branch, $2/3 \times$; 2. branching with colleters in the axils, $4 \times$; 3. flower, $4 \times$; 4. opened flower showing part of the corona, two stamens and the pistil, $4 \times$; 5. part of corolla showing part of corona and 3 stamens, $10 \times$; 6. pistil and part of stamen, $10 \times$; 7. fruit, $2/3 \times$. - (1,7. Wingfield 4224; 2. Harris 3071; 3-6. Wingfield 3616).

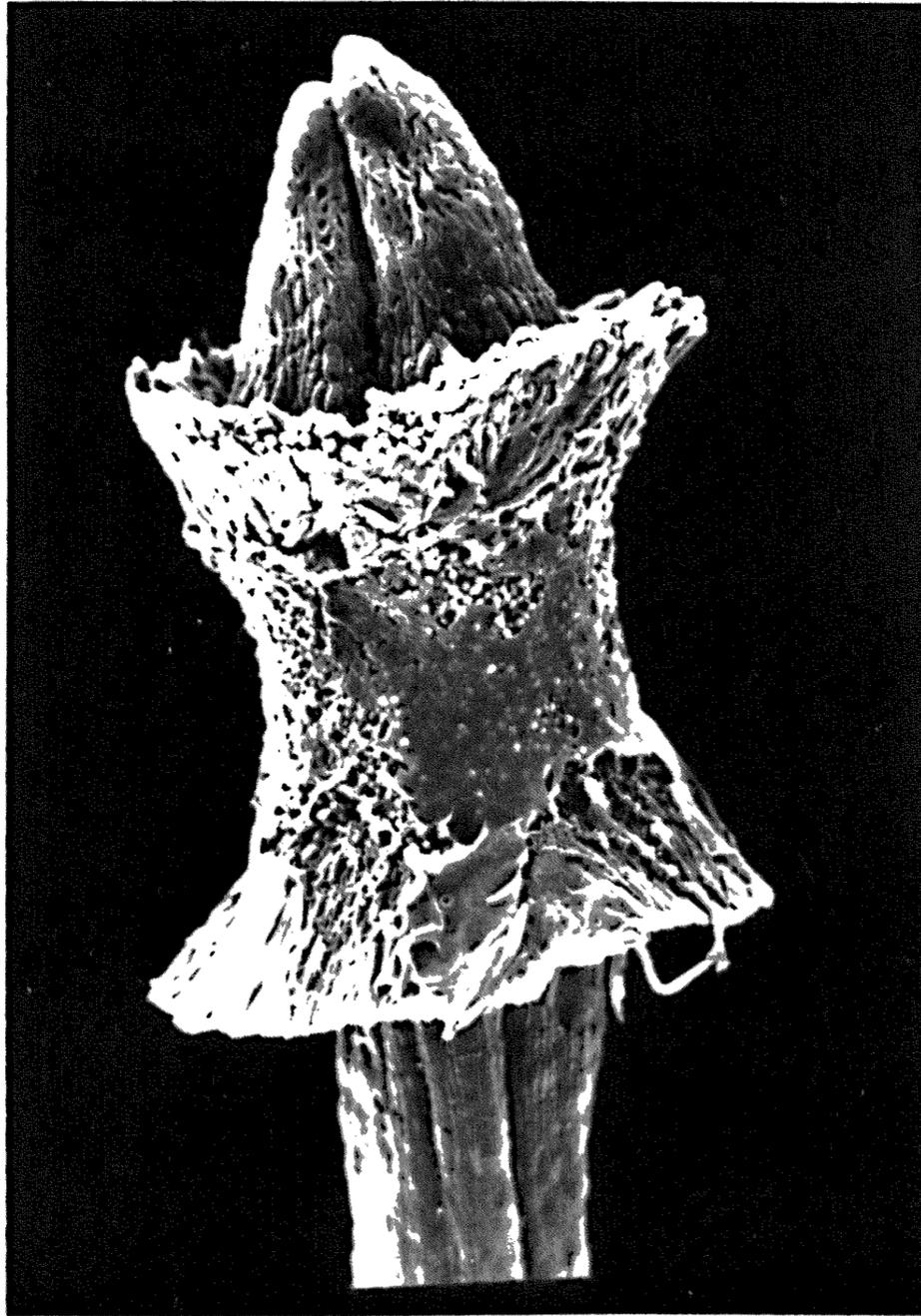


PHOT. 2. *Stephanostema stenocarpum* (Van Dilst 1, phot. MUGGE).

lax, terminal and in the axils of the upper leaves, 1.5–2 × 3–4 cm. Bracts narrowly oblong, up to 2 mm long, acute, glabrous on both sides, with colleters in the axils. Peduncle 2.5–3 mm long, glabrous; pedicels 5–9 mm long, glabrous. *Flowers* 5-merous, actinomorphic, except for the sometimes slightly unequal sepals. *Sepals* green, connate at the base, sometimes slightly unequal, ovate, acute, entire, 0.8–1.3 × as long as wide, 0.8–1.5 × 1.2–2 mm, outside glabrous, inside glabrous and furthermore at the base near the edge, with 0–1 colleters (in whole flower 0–5 in total). Colleters small, 3–5 × as long as wide, triangular, 0.3–0.5



PHOT. 3. *Stephanostema stenocarpum* (Van Dilst 1, phot. MUGGE).



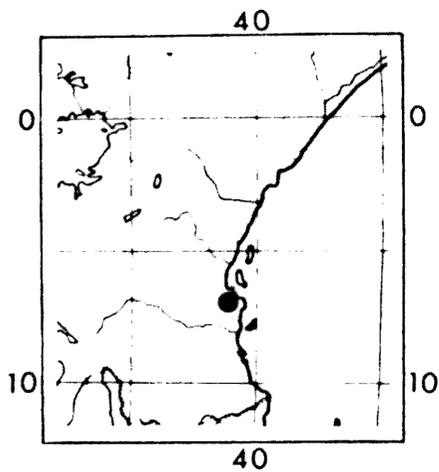
PHOT. 4. *Stephanostema stenocarpum* (pistil head, 110 × ; phot. S. NILSSON).

× 0.1 mm, glabrous. Corolla 5–5.4 × as long as the calyx, salver-shaped; tube yellow, urceolate, 1.7–2.7 × as long as the calyx, 3–4 mm long, 2.6–2.8 mm in diameter, outside glabrous, inside between the anthers with a narrow pilose zone, furthermore glabrous; lobes yellow, 1.1 × as long as the tube, 4.2–5 × 2.5–2.8 mm, in the bud overlapping to the left, rounded, entire, ciliate, especially towards the apex, outside glabrous, inside glabrous or nearly so and with a corona. Corona white, 3 mm long, undulate. *Stamens* inserted 1.2–1.5 mm below the corolla mouth; filaments filiform 0.8–1 × 0.1–0.2 mm, outside glabrous, inside hispid towards the apex; anthers 0.8–2.2 × 0.5–0.8 mm, rounded at the base, apiculate and pilose at the apex, fertile for 0.7 of their length from the apex. *Pistil* 4–4.5 mm long; ovary ellipsoid 0.8 × 0.5 × 0.5 mm, glabrous, composed of two free rounded carpels; style inserted just below the apex of the carpels, filiform, 2.2 × 0.2 mm, glabrous; stigma minute, 2-lobed, about 0.1–0.3 mm long; placentas adaxial; ovules about 18 in each carpel. *Fruits* pale green to grey, composed of two slender almost free follicles; follicles pendulous, 10–15 cm long, 3–5 mm in diameter, dehiscent along an adaxial line of dehiscence, grooved when dry, glabrous. Seeds 9–10 × 1.5–2 × 1 mm, with a 18–20 mm long tuft of hairs at the apex, directed towards the base of the fruit; testa pale



PHOT. 5. *Stephanostema stenocarpum* (Van Dilst 1, phot. MUGGE).

yellow, outside striate, grooved, glabrous, inside smooth; endosperm whitish, scanty, smooth; embryo 7–8 mm long; radicle short, straight, 4 mm long; cotyledons 6 × 3 mm, complicate, ovate.



MAP 6. *Stephanostema stenocarpum* K. Schum.

Distribution: Only known from one locality in Tanzania.

Ecology: Forest, bush.

Specimens examined:

TANZANIA: T6: Dar-es-Salaam, airport, Uzaramo Distr. (fl. Aug.) *Harris 3071* (K); 14.5 km W.S.W. of Dar-es-Salaam, Congalambota Cemetery, Uzaramo Distr. (fl., fr. Sept.) *Wingfield 4224* (K, neotype).

Cultivated: GREAT BRITAIN: Kew Gardens, *Wingfield 3616* no herbarium specimen seen; cutting cultivated in Wageningen: *van Dilst 1* (WAG).

Notes: WINGFIELD adds the following field observations to his herbarium collection no 4224: the flowers are open mostly in the morning, generally one in each inflorescence. The flowers are pollinated by a bee-like fly. The writer had noted that with the living plant in the greenhouse at WAG the flowers fall very soon, usually one day, after they open.

SCHIZOZYGIA

HISTORY OF THE GENUS

The genus *Schizozygia* was described by BAILLON in 1888 with one species, *S. coffaeoides*. BOIVIN was the first to collect the plant, during a journey to Zanzibar in 1847. So far, the genus has remained monotypic.

GEOGRAPHICAL DISTRIBUTION AND ECOLOGY

Schizozygia is found in tropical Central and East Africa. It is a small shrub or tree occurring generally in the undergrowth of the forest or bush and flowering throughout the year.

RELATIONSHIP WITH OTHER GENERA

BAILLON placed *Schizozygia* in the *Nerieae* because of the shape of the stamens. SCHUMANN disagreed, considering the genus to be more closely related to *Tabernaemontana*, and PICHON put it in the *Tabernaemontaneae*. *Schizozygia* is distinguished from other genera in the tribe by the corolla lobes in the bud overlapping to the right and by the dry dehiscent capsules. Fleshy dehiscent fruits are known in *Tabernaemontana* and *Voacanga*. The writer follows PICHON's view, since the forked branching, the position of the inflorescences in the forks, and the flowers are all in keeping with the tribe *Tabernaemontaneae*.

GENUS DIAGNOSIS OF SCHIZOZYGIA

Schizozygia Baill., Bull. Soc. Linn. Paris 1: 752. 1888; Hist. Pl. 10: 202. 1889; K. Schumann in Engler & Prantl Nat. Pflanzenfam. 4. 2: 109. 1895.

Type species: *S. coffaeoides* Baill.

Distribution: Central and East Africa and Comoro Islands.



FIG. 7. *Schizozygia coffaeoides* Baill.: 1. flowering branch, $2/3 \times$; 2. leaf, $2/3 \times$; 3. flower, $6 \times$; 4. opened corolla showing the stamens, $6 \times$; 5. part of calyx with pistil, $6 \times$; 6. fruits, $1 \times$; 7. transverse section of fruit, $4 \times$; 8-9. detail seed both sides, $4 \times$; 10. embryo, $6 \times$. - (1,3-5. Peter 58268, Stolz 1693; 2,7. Boivin annis 1847-1852; 6, 8-10. Bamps 6301).

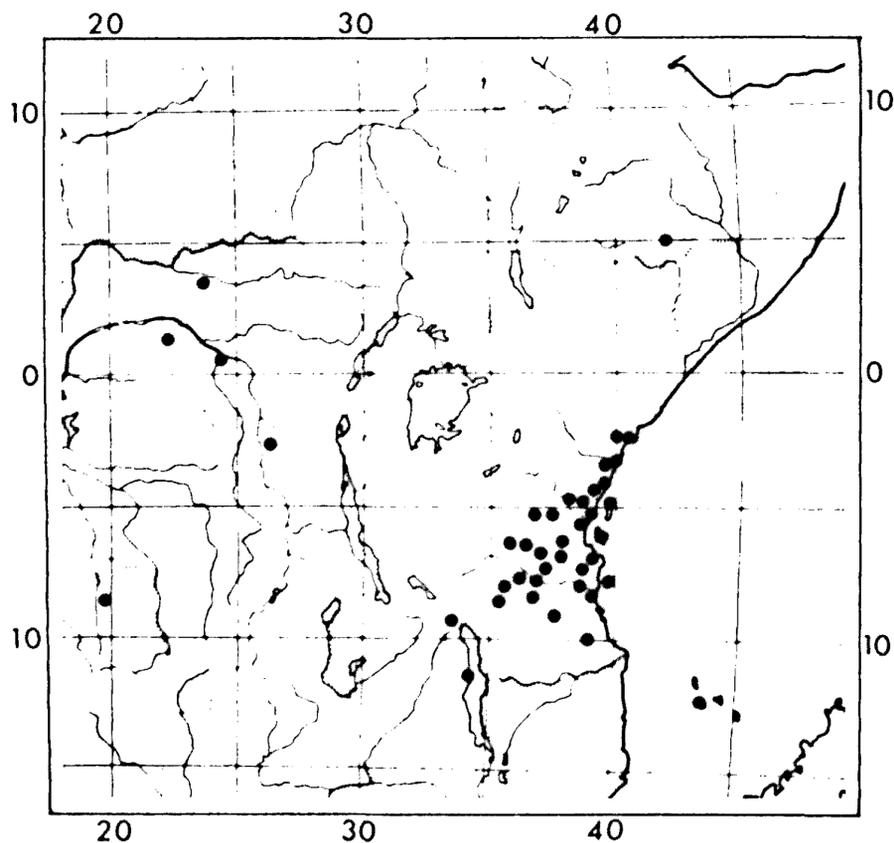
SPECIES DIAGNOSIS OF SCHIZOZYGIA

Schizozygia coffaeoides Baill. l.c. and l.c.; K. Schumann, l.c.; Renner, *Lloydia* 27: 406–415. 1964. **Fig. 7; Map 7**

Type: Tanzania: Zanzibar, Boivin annis 1847–1852 (P, holotype; isotypes: BM, BR).

Shrub or tree (1–4(–8) m high, repeatedly dichotomously branched and with 2 inflorescences in each fork, with white latex. Bark rough, brown, with pale lenticels, inside red; wood soft, pale yellow. *Branches* yellow to dark brown, lenticellate; branchlets terete, yellow to dark brown, often sulcate when dry, glabrous. *Leaves* opposite, those of a pair equal, petiolate; petiole 0.5–9 mm long, glabrous, with colleters in one or two rows in the axils; blade obovate 1.1–4.4 × as long as wide, 2.4–25 × 1.1–11 cm, acuminate at the apex, cuneate at the base, entire, subcoriaceous when dry, glabrous on both sides; secondary veins conspicuous. *Inflorescences* two together in the forks, congested, 7–15 × 12–18 mm. Bracts narrowly oblong, 3–5 mm long, acute, glabrous on both sides. Peduncle very short, up to 3 mm long, glabrous; pedicels 2–3 mm long, glabrous. *Flowers* 5-merous, fragrant, actinomorphic except for the sometimes slightly unequal sepals. *Sepals* green, free, subequal, imbricate, elliptic, acute or acuminate at the apex, entire, 1.2–3.3 × as long as wide, 3.1–6 × 1.5–3.9 mm, outside glabrous, inside glabrous and furthermore with 5–10 colleters near the base, at the edges of each sepal 0–2. Colleters 0.5–1.8 × as long as wide, 0.3–2 × 0.2–3 mm, almost divided into 3–5 slender parallel erect parts. *Corolla* 1.3–4.7 × as long as the calyx, 6.5–9.5 mm long, salver-shaped; tube yellow, cylindrical or urceolate, 0.8–3.3 × as long as the calyx, 4–5.2 mm long and 1.8–2.5 mm in diameter, outside glabrous, inside around the anthers with a small pilose zone and furthermore glabrous; lobes creamy to yellow, 0.4–0.8 × as long as the tube, obliquely obovate to nearly hook-shaped, curved to the right, 2.5–4 × 2–4 mm, in the bud overlapping to the right, entire, spreading, glabrous on both sides. *Stamens* inserted 1.5–3 mm below the corolla mouth; anthers sessile, 2.1–2.7 × 0.8–1 mm, triangular, sagittate at the base, acute at the apex, introrse, glabrous or sometimes papillose; upper two thirds fertile and dehiscent throughout by a longitudinal slit. *Pistil* 2.5–5 mm long; ovary subglobose, 0.8–1.3 × 1–1.2 × 0.5–1.5 mm; composed of two free rounded carpels, glabrous or with a few papils; disk glabrous, adnate to the ovary for 70–75% of his length; style inserted just below the apex of the carpels, filiform, 1–3 × 0.2 mm, glabrous; clavuncula cylindrical 0.4–0.9 × 0.3–0.6 mm; stigma minute, 2-lobed, about 0.2 mm long; placentas adaxial; ovules 8–15 in each carpel. *Fruits* yellow to orange, composed of two ellipsoid almost free follicles; follicles laterally compressed 7–15 × 5–10 × 3–5 mm, dehiscent along an adaxial line of dehiscence; wall thinly coriaceous, irregularly striate, grooved when dry, glabrous. *Seeds* surrounded by a thin pulpy red or orange aril, dark brown, obliquely ellipsoid, 5–6 × 3–5 × 2–3 mm, with a deep groove to the middle at the hilar side and shallowly grooved at the other, with minute warts; endosperm

white, copious, ruminant, starchy; embryo white, spatulate, almost straight, 4.7–5.2 mm long; cotyledons ovate or broadly ovate, rounded at the apex and the base, 2–2.7 × 2–2.1 mm; rootlet 2–3 × 0.5–0.6 mm, with an obtuse tip.



MAP 7. *Schizogygia coffaeoides* Baill.

Distribution: Angola, Zaïre, Somalia, Kenya, Tanzania, Malawi and Comoro Islands.

Ecology: Forest understory or bush on sandy or loamy soils. Flowering the whole year. Alt. 0–1500 m.

Uses: Grated root with coconut oil is used against inflammation (test.: *Graham 73, 272*). An infusion of the roots is taken against dizziness (teste: *Haerdi 342*). Inflamed eyes are treated by exposing them to the steam from boiled leaves (test.: *Tanner 3944, 3955*).

Vernacular names:

KENYA: *Mpelepele* (Kiswahili) (test.: *Graham 73, 272*); *Mwango* (Kiswahili) (test.: *Gardner 1437, Graham 73, 272*).

TANZANIA: *Begobego* (Kibena) (teste: *Haerdi 168/89*); *Kibaru baru* (Nguru) (teste: *Wig 1416*); *Kilebeti* (Kimbunga, Kipogoro) (teste: *Haerdi 168/89*); *Lenguhuli* (Kibena) (teste: *Haerdi 168/89*); *Maaika* (Kishamba) (teste: *Williams 645*); *Mbaika* (Bondei, Sambaa) (testibus: *Semsei 1968, Tanner 3484, 3694, 3944, 3955*); *Ndenia* (Kimbunga) (teste: *Haerdi 168/89*); *Ndenyadenya* (Kimbunga, Kipogoro) (teste: *Haerdi 168/89*).

ZAÏRE: *E banga banga lo lowe* (Turumbu) (teste: *Louis 1523*).

A selection of the about 180 specimens examined:

ANGOLA: Monda, *Sthulmann 301* (HBG).

ZAÏRE: Haut-Zaïre: La Kula, *van den Brande 458 bis* (BR). Equateur: Djombo, *Collaer 30*

(BR); Yangambi, *Louis 1523* (BR). Kivu: Kundu, moyengo, *Leonard 5890* (WAG).

SOMALIA: Rer Country, *Brichetti* (FI).

KENYA: K 7: Witu, Lamu Distr., *Rawlins 319* (K); near Wema, Tana River Distr., *Gillett & Kibuwa 19955* (BR, FJ, MO, P); about 3 km N. of Jilore village, Kilifi Distr., *Spjut & Ebsor 2777* (BR, FI, K, UC); Malindi, Kilifi Distr., *Tweedie 1050* (B, BR, FI, K, P, S); Mombasa, Mombasa Distr., *Burt Davy 22723* (FHO); Vena R., Kwale Distr., *Kässner 129* (BM); Marere For., Kwale Distr., *Perdue & Kibuwa 10222* (FI, K); Digo Country, about 70 km S. of Mombasa, Kigombero Flats, Kwale Distr., *Bally 13732* (G); Buda For., W. of Msambweni, Kwale Distr., *Saufferer 747* (WAG); Shimba Hills, Makadara For., Kwale Distr., *Bamps 6301* (BR, K, WAG).

TANZANIA: T 3: Korogwe, Lushoto Distr., *Tanner 3944* (BR, K, UC); Muheza-Amani Road, Lushoto Distr., *Renvoize & Abdallah 1520* (BR, K, P); Usambara Mts. Lushoto Distr., *Peter 58268* (B, WAG); Handei Country, Longuza, Lushoto Distr., *Peter 58161* (B, WAG); Minga Mt., Lushoto Distr., *Peter 58245* (B); E. Usambara Mts., Magrotto Mt., Tanga Distr., *Grote 5080* (MO); Kigombe For., Tanga Distr., *Geilinger 1011* (K, Z); Handeni, Handeni Distr., *Semsei 3022* (K); Msaraga, Pangani Distr., *Tanner 3007* (B, BR, K, UC); *ibid. Tanner 3011* (BR, K, UC). T 5: Ugogo, border Dodoma/Mpwapwa Distr., *Peter 45578* (B, WAG). T 5/T 6: Ussagara Country, Mpwapwa/Kilosa Distr., *Peter 32560* (B, WAG). T 6: Ukaguru Mts., Jakula R., Kilosa Distr., *Mabberley 1372* (BR, P); Chakwale, Kilosa Distr., *Greenway & Kanuri 15, 162* (MO); Magomeni- Mikumi- Dar-es-Salaam Road. Kilosa Distr., *Mwasumbi 10347* (BR); Mahenge Country, Tabora, Ulange Distr., *Schlieben 1570* (B, BR, LISU, M, MO, SRGH); Ifakara, Ulanga Distr., *Haerdi 342* (BR, G, P, WAG); Kidatu-Sonjo Road, Ulanga Distr., *Harris & Pocs 4291* (BR); Nguru Mts., Morogoro Distr., *Drummond & Hemsley 1833* (B, BR, FI, K, LISC, S, SRGH); Morogoro, Ngerenge R., Morogoro Distr., *Peter 32044* (B, WAG); Mtibwa, Turiami, Morogoro Distr., *Wigg FH 1416* (FHO); Morogoro, Morogoro Distr., *Semsei FH 1968* (FHO, K); W. Uluguru Mts., Morogoro Distr., *Pocs 6544/A* (BP, K); Kimboza For., *Kabuye 264* (BR, K); Nunge For., Chazi, about 80 km N.W. of Morogoro, Morogoro Distr., *Welch 616* (BR, K, LISC); Ruvu R., Uzaramo Distr., *von Brehmer anno 1913* (HBG); Kisarawe, Vikiwu For. Res. Uzaramo Distr., *Paulo 131* (K); Rufiji Distr., *Murh (?) 33* (K); Mafia Island, Rufiji Distr., *Schlieben 2602* (BM, BR, G, LISC, M, P, S, Z); Kigogo, near Dar-es-Salaam, Iringa Distr., *Harris 2032* (K, WAG); Kidatu, Iringa Distr., *Mhoro 164* (K, UPS, WAG); between Kinga and Lake Nyasa, *Goetze 132* (K); near Great Ruaka R., 11 km W. of Kidatu, Iringa Distr., *Thulin & Mhoro 401* (K, UPS); Kyimbila, N. of Lake Nyasa, *Stolz 1693* (A, BM, BR, BOL, C, FHO, K, MO, P, UPS, Z), *1966* (A, BM, BR, K, MO, P, Z). T 8: Selous Game Res., Kilwa Distr., *Ludanga 1368* (K); 40 km W. of Lindi, Mirola, Lindi Distr., *Schlieben 5875*. (B, BM, BR, G, LISC, M, P, Z). Pemba Island: Verani, *Greenway 1464* (K). Zanzibar: *Faulkner 2513* (B, BR, K, LISC, S); *Boivin annis 1847-1852* (BM, BR, P, type).

MALAWI: Sanga, Nkhata Bay Distr., *Paweck 6102* (SRGH, UC).

COMORO ISLANDS: Moheli, Mirongoni, St. Antoine, *Schlieben 11221* (B, HBG, MO).

Cultivated: GREAT BRITAIN: *anonymus*, no herbarium specimen seen; cutting cultivated in Wageningen; FRANCE: Green House Paris, *Allorge s.n.* (WAG, spirit coll.).

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PHYTOCHEMISTRY OF PLEIOCERAS AND STEPHANOSTEMA

N. G. BISSET

Only a little information is available. The seeds of *P. barteri* are reported to be highly toxic to white mice. Small amounts of alkaloids occur in the root bark, fruit pericarp, and seeds, while 0.6% free ursolic acid has been isolated from the leaves. *P. aff. gillettii* appears to have saponins and mucilage in its leaves and alkaloids and tannins in its bark and roots; on the other hand, tests for flavonoids, quinones, and cyanogenic glycosides were negative.

Nothing is known about the chemical constituents of *Stephanostema*.

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PHYTOCHEMISTRY OF SCHIZOZYGIA

N. G. BISSET

The fruits of *S. coffaeoides* are stated to be very poisonous. The roots, twigs, and leaves all contain schizozygine as principal alkaloid, together with a group of mostly similar minor alkaloids. These compounds are *N*-acylindoline alkaloids of a type that has not so far been found elsewhere in the Apocynaceae, but they are related to certain alkaloids which occur in *Hunteria* and *Aspidosperma* species. Saponins may be present in the roots.

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REGISTER

Synonyms are in *italics*. Page numbers of principal entries in **bold face**; those of figures, maps and photographs in *italics*.

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