

THREE NEW AFRICAN FICUS SPECIES AND A COMMENT ON FICUS GNAPHALOCARPA (MORACEÆ)

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ABSTRACT : Three new species are described from the Cameroun-Gabon-area : *Ficus abscondita* C. C. Berg, *F. oresbia* C. C. Berg and *F. subsagittifolia* Mildbraed ex C. C. Berg. A key to these and related species is given. *F. gnaphalocarpa* (Miq.) A. Rich. is reduced to a subspecies of *F. sycamorus* L.

RÉSUMÉ : Description de trois espèces nouvelles du Cameroun et du Gabon : *Ficus abscondita* C. C. Berg, *F. oresbia* C. C. Berg et *F. subsagittifolia* Mildbraed ex C. C. Berg. Une clé de détermination de ces espèces et des espèces voisines est proposée. *F. gnaphalocarpa* (Miq.) A. Rich. est considéré comme une sous-espèce de *F. sycamorus* L.

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In the course of a revision of *Ficus* for the floras of Cameroun and Gabon three new species were recognized in the material studied. All belong to subgenus *Urostigma* (Gasp.) Miquel sect. *Galoglychia* (Gasp.) Endl. (= subg. *Bibracteata* Mildbr. & Burret), and within this subgenus to a group of species which can be designated as the *Ficus conraui-lyrata* group, comprising the majority of the species of sect. *Cyathistipula* Mildbraed & Burret (1911). The representatives of this group are usually epiphytic, often more or less lianescent shrubs or small trees, but may develop into large trees. The stipules are mostly persistent. The leaves are subglabrous and more or less firmly coriaceous. The figs are often relatively large and sessile, or, if pedunculate, then mostly with a stipitate receptacle. The fruits are distinctly bicolorous, the outer layer of the upper part is often mucilaginous; the anthers are often apiculate. The species of this group are distinctly associated with rain forests and often occur in swampy or periodically flooded riverside forests. The pollinators hitherto described belong to the genus *Agaon* (cf. WIEBES, 1974, 1976). The *Ficus conraui-lyrata* group probably comprises 19 species of which 14 are known from Cameroun and Gabon. Five species, *F. crassicosta* De Wildeman (= *F. epiphytica* De Wildeman), *F. scott-elliottii* Mildbraed & Burret, *F. kirkii* Hutchinson, *F. ardisioides* Warburg, and *F. arcuato-nervata* Hutchinson, are not found in the floristic region studied, and their presumed relationships with the 14 species studied have not been established.

***Ficus abscondita* C. C. Berg, sp. nov.**

Frutices epiphytici vel epilithici. Rami foliosi in sicco excavati. Lamina obovata vel oblanceolata, 28 ad 40 cm longa, 8 ad 15 cm lata, (sub)coriacea, apice acuminata, basi acuta vel truncata vel cordata, utraque pagina glabra, venis lateralibus 6- ad 8-jugatis, petiolis 2 ad 8 cm longis; stipulae 2.5 ad 6.5 cm longae, persistentes. Syconia sessilia axillaria vel infra folia inserta, saepe stipulis persistentibus plus minusve abscondita; receptaculum in vivo ca. 1 ad 2.5 cm, in sicco 0.7 ad 1.5 cm diam., apice crateriformi vel interdum valde tumido.

TYPUS : *Leeuwenberg 8769, Cameroun, Bakaka forest, 3 km E of Eboné, km 11 on the road Nkongsamba — Loum (holo-, WAG).*

ADDITIONAL MATERIAL : *Hallé 3158, 3235, Gabon, Bélinga, P; Jacques-Félix 2487, Cameroun, Ndiki, P; Leeuwenberg & Berg 9758, along the Dibombé river, near bridge in the road Loum — Solé, WAG; Bouquet 1059, Congo, Bouba, P.*

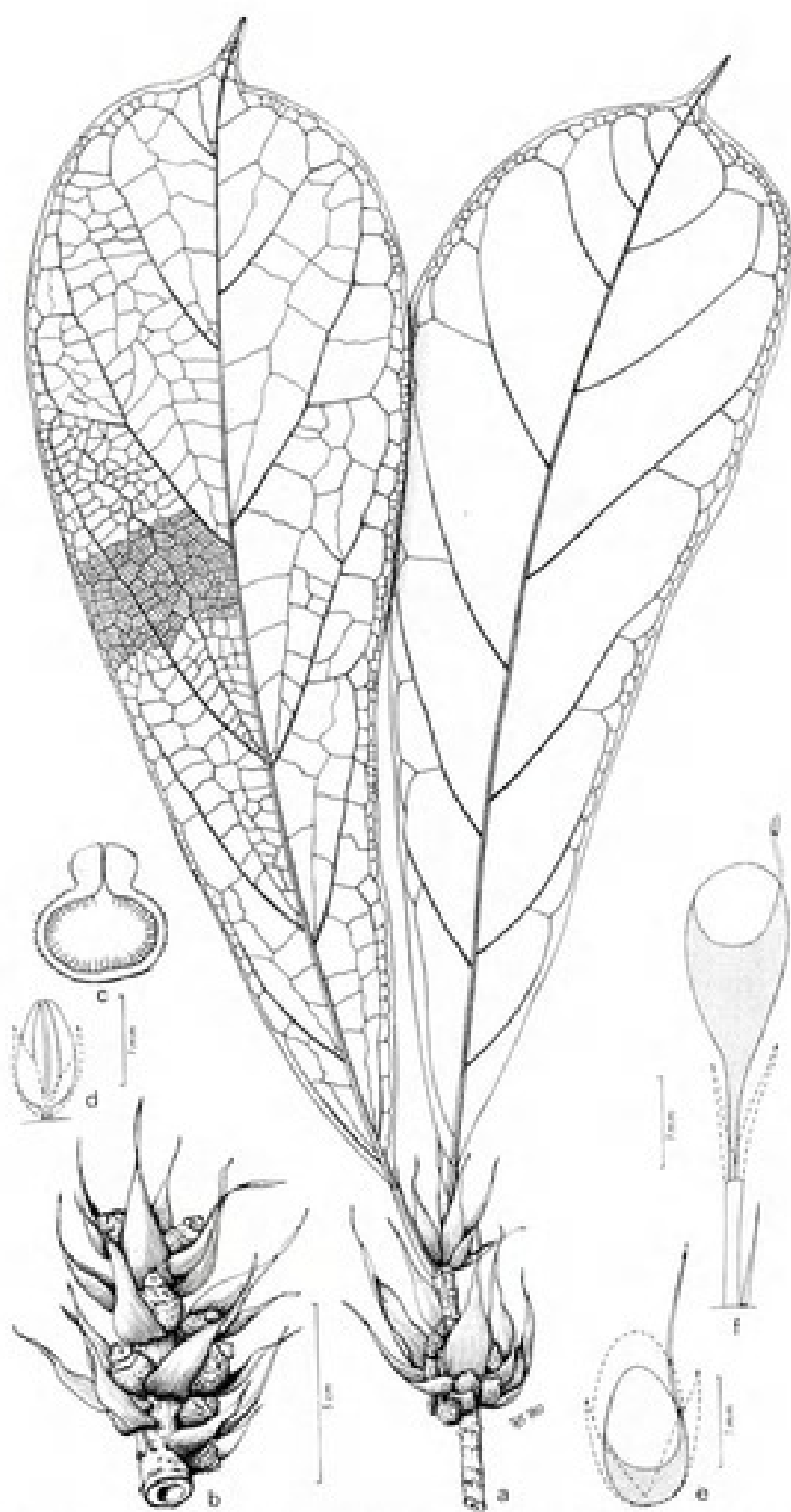
Epiphytic or epilithic, sometimes lianescent shrubs up to 3 m tall. Leafy twigs 5-10 mm thick, glabrous or sparsely puberulous, when dry pale- to dark-brown, hollow.

Leaves in spirals; lamina obovate to oblanceolate, 28-40 cm long, 8-15 cm broad, (sub)coriaceous to coriaceous, apex abruptly and more or less sharply acuminate, base acute to subobtuse to truncate or to cordate; margin entire; both surfaces glabrous; the veins above almost plane, the midrib slightly impressed, beneath especially the midrib and lateral veins prominent; 6-8 pairs of lateral veins, including 1-3 basal pairs, lateral veins loop-connected 3-8 mm from the margin, venation dark-green or red to purplish beneath; glandular spot at the base of the midrib beneath inconspicuous; petiole 2-8 cm long, 2-4 mm thick, glabrous or puberulous, periderm peeling off; stipules free, 2.5-6.5 cm long, glabrous or sparsely puberulous, persistent.

Figs in the leaf axils or just below the leaves and often (entirely) hidden by the persistent stipules, sessile; basal bracts 2, broadly ovate, ca. 1 mm long, sparsely puberulous; receptacle oblongoid to subglobose or ovoid, when fresh up to 2.5 cm, when dry 0.7-1.5 cm in diameter, when fresh up to 3 cm, when dry 1-1.8 cm long, blackish, sparsely puberulous to hirtellous; wall when dry ca. 0.5 mm thick; ostiole slit-shaped in a crateriform or sometimes strongly swollen apex of the receptacle.

Pistillate flowers with 3(-4), basally fused, 1-1.5 mm long tepals; seed flowers sessile, style 2-2.5 mm long; gall flowers sessile or up to 1.5 mm long pedicellate, style ca. 1 mm long; fruits ellipsoid, 1-1.5 mm long, including the mucilaginous layer over the upper part 1.5-2 mm long; "gall fruits" oblongoid, 2-3(-3.5) mm long, often up to 1.5 mm long stipitate; fruits distinctly bicolorous; staminate flowers (sub)sessile, perianth with 3, basally fused, ca. 1 mm long tepals, filament very short, anther 1-1.2 mm long; interfloral bracts to 1.5 mm long.

F. abscondita is characterized by its relatively small figs hidden by the long stipules, and therefore probably often not observed to be fertile.



Pl. 1. — *Ficus abscondita* C. C. Berg : a, twig with leaves and figs (*N. Hallé* 3235); b, twig with stipules and figs; c, fig; d, staminate flower; e, seed flower (in fruit); f, gall flower (in "fruit"). (*Lecouwenberg* 8769).

The crateriform or swollen apex of the fig is another distinctive feature. Sterile specimens might be confused with *F. preussii*, but the latter has solid leafy twigs when dry, these being hollow in *F. abscondita*.

***Ficus oresbia* C. C. Berg, sp. nov.**

Arbor. Lamina subobovata vel oblanceolata, 15 ad 25 cm longa, 5 ad 9 cm lata, coriacea, apice breviter acuminata, basi acuta vel obtusa utraque pagina glabra, venis lateralibus 7- ad 8- jugatis, petiolis 1.5 ad 5 cm longis; stipule 0.5 ad 2 cm longæ, caducæ. Syconia axillaria, sessilia; receptaculum subglobosum, in sicco 2 ad 2.5 cm diam., corrugatum, ostiolum leviter umbonatum. Flores masculi pedicello 1 ad 3 mm longo; bracteae interflorales carentes (?).

TYRUS : *Letouzey 12965*, Cameroun, massif of Mbepit, alt. 1980 m, 30 km SW of Foumban, mountain forest (holo-, P).

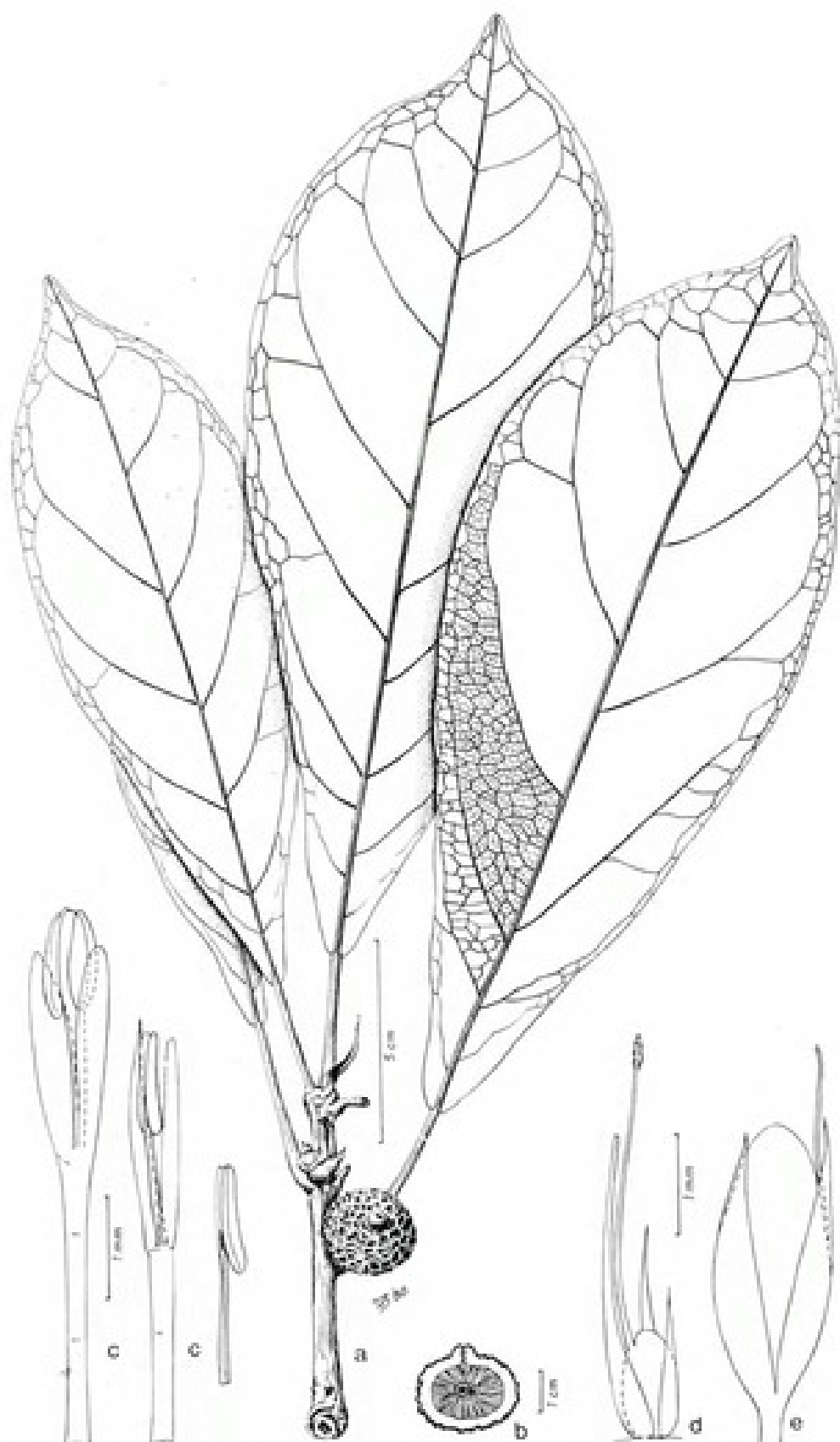
Tree. Leafy twigs 6-10 mm thick, white-puberulous with partly retrorse hairs, brown when dry, solid.

Leaves in spirals; lamina subobovate to oblanceolate, 15-25 cm long, 5-9 cm broad, coriaceous, apex shortly acuminate, base subacute to obtuse, margin entire; both surfaces glabrous; veins above almost plane, midrib slightly impressed, beneath especially the midrib and lateral veins prominent; 7-8 pairs of lateral veins, including 1-2 pairs of small basal veins, lateral veins departing from the midrib at acute angles, often furcate far from the margin, loop-connected 2-3 mm from the margin; glandular spot at the base of the midrib beneath inconspicuous; petiole 1.5-5 cm long, 2-3 mm thick, glabrous, periderm may peel off on the lower part of the petiole; stipules free, 0.5-2 cm long, sparsely to densely white or pale-yellow-puberulous, partly with retrorse hairs, caducous.

Figs in pairs or solitary in the leaf axils, sessile; basal bracts broadly ovate, 8-10 mm long, rather sparsely white-puberulous; receptacle (sub-)globose, when fresh 2-2.5 cm, when dry ca. 2 cm in diameter, puberulous, at maturity purplish, when dry wrinkled, ostiole (in dry material) more or less umbonate, slit-shaped.

Pistillate flowers with 3, acute, free, (1.5)-2-3 mm long tepals; seed flowers sessile, style 3-4 mm long; gall flowers up to 0.5 mm long pedicellate, style 2-2.5 mm long; well-developed fruits unknown; staminate flowers 1-3 mm long pedicellate, perianth with 3, acute, (almost) free, 1.5-2.5 mm long tepals; filament 1-1.5 mm long, anther ca. 1.3 mm long; interfloral bracts wanting (?).

F. oresbia appears to be closely related to the lowland species *F. wilde-
maniana*.



Pl. 2. — *Ficus oresbia* C. C. Berg : a, twig with leaves and fig; b, fig; c, staminate flowers and stamen; d, seed flower; e, gall flower. (Letouzey 12965).

***Ficus subsagittifolia* Mildbraed ex C. C. Berg, sp. nov.**

Frutices epiphytici vel arborea parva. Lamina subpandurata vel lanceolata vel oblonga, 16 ad 40 cm longa, 3 ad 15 cm lata, coriacea, apice acuminata, basi cordata, utraque pagina (sub)glabra; venae laterales 9- ad 15-jugatae; petiolus 1 ad 5.5 cm longus; stipulae 1 ad 8 cm longae, persistentes. Syconia axillaria, sessilia; receptaculum plus minusve depresso globosum, in sicco 2.5 ad 3.5 cm diam., corrugatum; ostiolum planum, fissuriforme.

TYPUS : Zenker 446 (= 2519), Cameroun, Bipinde (holo-, U; iso-, B, P, WAG).

ADDITIONAL MATERIAL : *Bos* 4108, Cameroun, 3 km S of Longji, WAG; *Bos* 4468, Cameroun, 2 km S of Kribi, WAG; *Chevalier* 26985, Gabon, Bokoué river, P; *Klaine* 1556, Gabon, near Libreville, P; *Michaloud* 537, Gabon, Makokou, U; *Mildbraed* 7654, Cameroun, between Ebolowa and Yaoundé, HBG; *Mildbraed* 8285, Cameroun, ca. 120 km NE of Yaoundé, HBG; *Thollon s.n.*, Gabon, Ndjolé, P; *Trilles* 40, Gabon, Libreville, P.

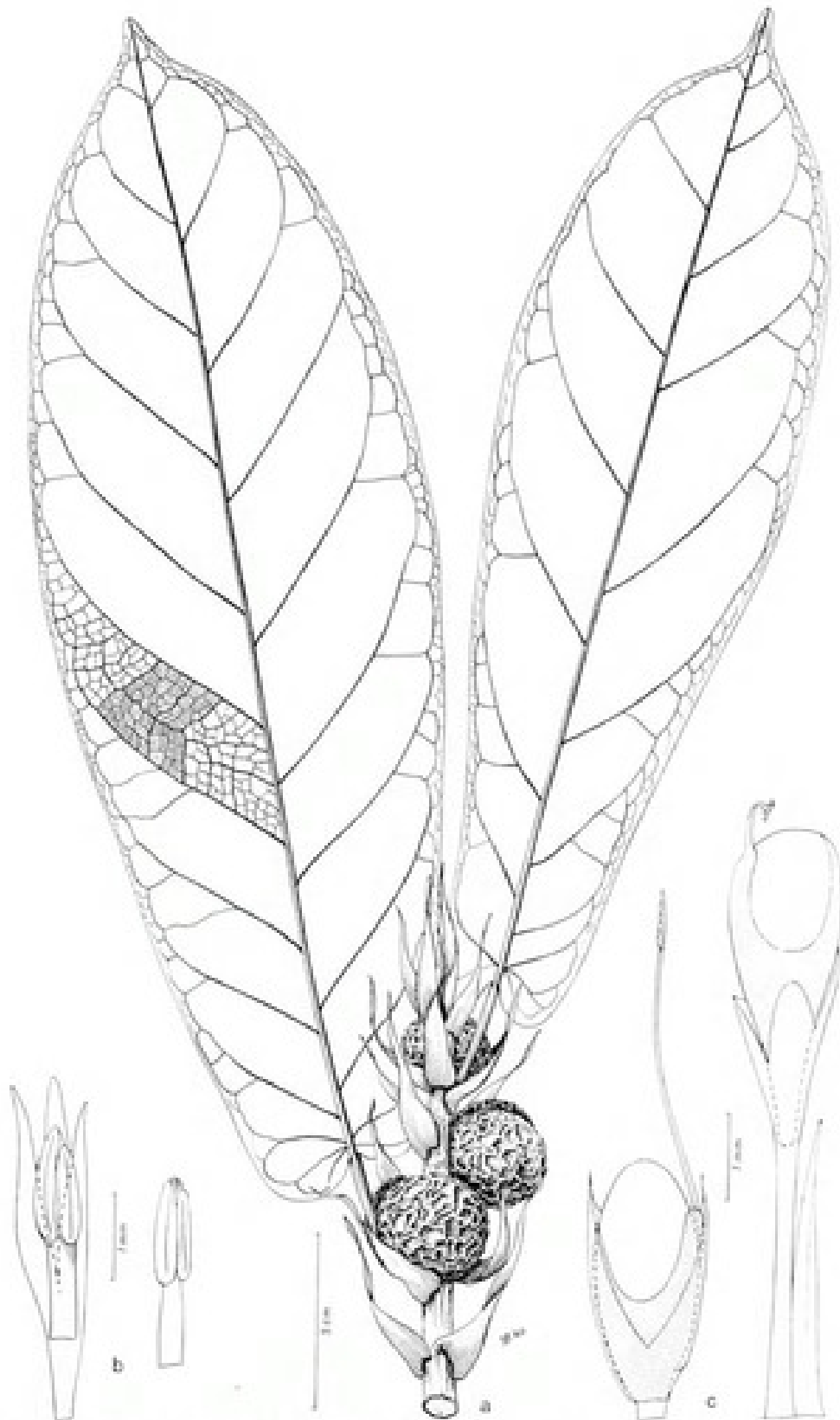
Epiphytic shrubs or small tree up to 5 m tall. Leafy twigs 7-15 mm thick, glabrous or rather sparsely hirtellous, brown when dry solid.

Leaves in spirals; lamina subpandurate or lanceolate to oblong, 16-40 cm long, 3-15 cm broad, (thickly) coriaceous, apex more or less sharply acuminate, base more or less deeply cordate (the lobes often longer than 1 cm) to truncate, margin sometimes faintly repand below the constriction of the lamina; both surfaces glabrous or sparsely puberulous on the basal part of the midrib beneath; the veins above slightly prominent to plane or the main veins somewhat impressed, beneath the midrib and often the lateral veins very prominent, the other veins more or less prominent; 9-15 pairs of lateral veins, including (2-) 3-4 basal pairs; glandular spot at the base of the midrib beneath usually rather conspicuous; petiole 1-5.5 cm long, 3-6 mm thick, glabrous or (rather) sparsely hirtellous, periderm peeling off; stipules free, 1-8 cm long, usually strigillose, persistent.

Figs solitary or in pairs in the leaf axils, sessile; basal bracts semi-circular to broadly ovate, 3-5 mm long, puberulous or glabrous; receptacle often more or less depressed-globose, when dry 2.5-3.5 cm in diameter and often wrinkled, puberulous to hirtellous, (at maturity?) medium-green with white spots to black-maroon with pale brown spots, ostiole plane, slit-shaped.

Pistillate flowers with a 2-3-fid (-parted) perianth ca. 2.5 mm high; seed flowers sessile or up to 1.5 mm long pedicellate, style 2.5-4 mm long; gall flowers to 3 mm long pedicellate, style 1-1.5 mm long; fruits oblongoid, ca. 3 mm long, narrowed towards the base; "gall fruits" ca. 3.5 mm long, to the base narrowed to slightly stipitate; fruits distinctly bicolorous; staminate flowers up to 1 mm long, pedicellate, perianth 3(-4)-parted, 2.5-3 mm high, filament ca. 1 mm long, anther ca. 1.5 mm long; interfloral bracts to 3 mm long.

F. subsagittifolia resembles *F. sagittifolia* but differs in its broader leaves, the (almost) entire margin of the lower part of the lamina, and in its larger figs. MILD BRAED already recognized this species as new and provisionally named it on several herbarium sheets.



Pl. 3. — *Ficus subsagittifolia* Mildbraed ex C. C. Berg : a, twig with leaves and figs; b, staminate flower and stamen; c, seed flower (in fruit); d, gall flower (in " fruit "). (*Bos 4108*).

KEY TO THE REPRESENTATIVES OF THE *FICUS CONRAUI-LYRATA* GROUP IN CAMEROUN
AND/OR GABON

1. Figs pedunculate (or occasionally subsessile), normally stipitate (or if not so, then the receptacle pyriform)..... 2
1. Figs sessile (or occasionally subsessile), occasionally shortly stipitate..... 4
2. Figs 1-1.5 cm in diameter when dry, often ellipsoid; peduncle up to 4 mm long *F. densistipulata* De Wildeman
2. Figs 2-3 cm in diameter when dry, mostly (sub)globose; peduncle 3-9 or 5-25 mm long 3
3. Stipules persistent; wall of the fig spongy, ca. 3-5 mm thick when dry; peduncle 5-25 mm long *F. cyathistipula* Warburg
3. Stipules caducous (or subpersistent); wall of the fig not spongy, 1-2 mm thick when dry; peduncle 3-9 mm long. *F. cyathistipuloides* De Wildeman
4. Lamina with a distinctly cordate base and /or stipules caducous 5
4. Lamina with an acute to truncate base; stipules (normally) persistent..... 12
5. Stipules persistent 6
5. Stipules caducous..... 12
6. Stipules up to 8 cm long; figs smooth, when dry mostly wrinkled or the apex crateriform or strongly swollen..... 7
6. Stipules 0.5-2.5 cm long; figs often scabridulous, when dry not wrinkled, apex plane, umbonate or (pronouncedly) apiculate 11
7. Leafy twigs hollow when dry; apex of the fig crateriform or strongly swollen *F. abscondita* C. C. Berg
7. Leafy twigs solid when dry; apex of the fig plane to slightly umbonate..... 8
8. Lamina broadly pandurate, with 6-7 pairs of lateral veins *F. lyrata* Warburg
8. Lamina (rather) narrowly pandurate to lanceolate or oblong, with at least 9 pairs of lateral veins 9
9. Figs ca. 1.5 cm in diameter when dry; margin of the lamina mostly (sub)dentate *F. sagittifolia* Mildbraed & Burret
9. Figs 2.5-3.5 cm in diameter when dry; margin of the lower part of the lamina entire or faintly repand *F. subsagittifolia* C. C. Berg
10. Petiole ca. 4 mm thick; figs 2-3 cm in diameter when dry *F. preussii* Warburg
10. Petiole 1-2.5 mm thick; figs ca. 1.5 cm in diameter when dry *F. subcostata* De Wildeman
11. Lamina with 7-8 pairs of lateral veins; staminate flowers with a pedicel of 1-3 mm long; mountain species... *F. oresbia* C. C. Berg
11. Lamina with 8-14 pairs of lateral veins; staminate flowers with a pedicel of ca. 0.5 mm; lowland species... *F. wildemantiana* Warburg

12. Lamina with 9-15 pairs of lateral veins; figs 2.5-3.5 cm in diameter when dry, ostiole plane and slit-shaped.....*F. subsagittifolia* C. C. Berg
12. Lamina with 6-9 pairs of lateral veins; figs less than 2 cm in diameter when dry, if 2-3 cm in diameter, then the ostiole very prominent 13
13. Petiole ca. 4 mm thick; figs 2-3 cm in diameter when dry. *F. preussii* Warburg
13. Petiole 1-2.5 mm thick; figs mostly to 2 cm in diameter 14
14. Lamina (normally) ovate to subovate, its base truncate to rounded *F. subcostata* De Wildeman
14. Lamina subovate to oblong or to elliptic, its base acute to rounded 15
15. Lamina of medium size (10-15 cm long) with 4-6 pairs of lateral veins; leafy twigs often hollow when dry ..
..... *F. camptoneura* Mildbread
15. Lamina of medium size (10-15 cm long) with 6-8 or 8-10 pairs of lateral veins; leafy twigs solid when dry 16
16. Lamina of medium size (10-15 cm long) with 6-8 pairs of lateral veins; periderm of the petiole when dry mostly peeling off. *F. pringsheimiana* Braun & K. Schum.
16. Lamina of medium size (10-15 cm long) with 8-10 pairs of lateral veins; periderm of the petiole when dry persistent, not readily peeling off. *F. conraui* Warburg

REDUCTION OF *F. GNAPHALOCARPA* (MIQ.) A. RICHARD TO A SUBSPECIES OF *F. SYCOMORUS* L.

The only morphological difference to be found between *F. gnaphalocarpa* and *F. sycomorus* is the position of the figs on the tree: solitary (or occasionally in pairs) on the young branches, mostly just below the leaves, in *F. gnaphalocarpa*, and on special leafless branches on the older wood in *F. sycomorus*. Such special fig-bearing branches are also found in *F. mucoso* Ficalho, *F. sur* Forssk. (= *F. capensis* Thunb.), and in *F. vogeliana* (Miq.) Miq., even more pronouncedly than in *F. sycomorus*. But even in *F. sur* figs may occur on normal leafy twigs. An intermediate position of the figs was found in several specimens assigned to *F. sycomorus* (or *F. gnaphalocarpa*). The nature of the difference between *F. gnaphalocarpa* and *F. sycomorus* does not justify separation on the specific level. The form recognized as *F. gnaphalocarpa* ranges from West Africa to Ethiopia and through East Africa to southern Africa (Angola, Republic of South Africa, and South-West Africa). The form with special fig-bearing branches ranges from Egypt through East Africa to South Africa. In the area where the two forms occur together, no local or ecological separation seems to be present. WHITE (1962) suggested uniting the two taxa because of the absence of reliable differentiating characters. PALMER & PITMAN (1972) reduced *F. gnaphalocarpa* to a synonym of *F. sycomorus*. AWEKE (1979) did not commit himself by provisionally separating the two forms at the specific level, although being aware of the presence of the same fig wasps in the two taxa (cf. WIEBES 1968, 1969).

The best solution appears to be to reduce *F. gnaphalocarpa* to a subspecies of *F. sycomorus*:

Ficus sycomorus L. subsp. **gnaphalocarpa** (Miquel) C. C. Berg, *comb. & stat. nov.*

- *Sycomorus gnaphalocarpa* MIQUEL, London Jour. Bot. 7 : 113 (1848).
— *Ficus gnaphalocarpa* (MIQUEL) A. RICHARD, Tent. Fl. Abyss. 2 : 270 (1851).

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WIEBES, J. T., 1969. — Preliminary report on a collection of fig insects (Hymenoptera, Chalcidoidea) from *Ficus gnaphalocarpa*, *Mém. Inst. fond. d'Afrique noire* 84 : 401-402.
WIEBES, J. T., 1974. — Species of *Agaon* Dalman and *Allotriozone* Grandi from Africa and Malagasy (Hymenoptera, Chalcidoidea), *Zool. Meded. Leiden* 48 : 123-143.
WIEBES, J. T., 1976. — A new species of *Agaon* from Nigeria, and some additional records (Hymenoptera, Chalcidoidea, Agaonidae), *Ent. Ber. Amsterdam* 36 : 124-127.

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