

***FICUS* SPECIES IN THE SANGHA TRINATIONAL, CENTRAL AFRICA**

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Twenty-seven species and two subspecies of *Ficus* are reported from one study site in central Africa. Characters for identification are explained. An identification key, illustrations, descriptions and habitats are provided. The species-level diversity of *Ficus* in tropical forests is discussed.

Keywords. Characters, forest, habit, habitat, identification, key, primates.

INTRODUCTION

Ficus L. comprises about 750 species worldwide, of which 51 are found in the central African region (Berg & Corner, 2005). Some members of the genus have been identified as keystone species in tropical rain forests across Asia and the Americas (Leighton & Leighton, 1983; Terborgh, 1986; Lambert & Marshall, 1991; Sreekar *et al.*, 2010). However, there is very little evidence that *Ficus* species play a similar role in the forests of Africa (Gautier-Hion & Michaloud, 1989).

Taxonomic studies of *Ficus* in the central African region were carried out by the late Cees Berg and his collaborators (Berg *et al.*, 1984, 1985; Berg, 1990; Berg & Wiebes, 1992). However, their descriptions of some species contain question marks or statements such as “colour not known from fresh material”, because of the limited herbarium material that they had at their disposal. In addition, several species were not illustrated in the main floristic accounts for the region, that is, *Flore du Cameroun* and *Flore du Gabon*. These taxonomic studies also have, as one would expect, many unresolved species-level questions that often reflect difficulties in separating ecological from genetically determined variation. To contribute to the understanding of taxonomy and ecology of *Ficus* in the central African region, we present habit and habitat information for individual species; provide new diagnostic characteristics for

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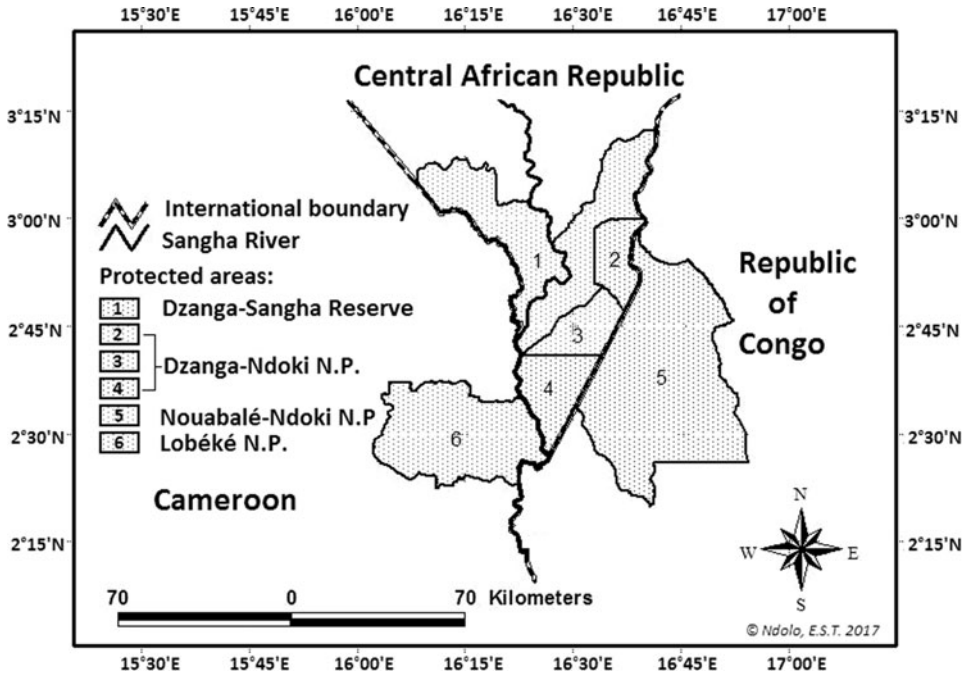


FIG. 1. Map of the Sangha Trinational in central Africa.

some species; and give identification tools in the form of a key and illustrations for all species we have found in the Sangha Trinational. This will allow future researchers to investigate the role of *Ficus* species in one of the few protected forests with a full complement of flora and fauna in the second largest block of tropical forest in the world.

MATERIAL AND METHODS

Study area

The study site is the Sangha Trinational, which is a network of protected areas in the north-west of the Congo River Basin, where the three countries Cameroon, the Central African Republic and the Republic of the Congo meet at the Sangha River. The Sangha Trinational is called 'Trinational de la Sangha' in French and is referred to by the acronym 'TNS'. It covers three contiguous national parks and has an area of 746,309 hectares. These are Lobéké National Park (Cameroon), Dzanga-Ndoki National Park (Central African Republic) and Nouabalé-Ndoki National Park (Republic of the Congo). The area also includes a Forest Reserve and a buffer zone (see Fig. 1 for map).

Methods

This study represents a compilation of research in the Sangha Trinational by the authors, each of whom has spent more than ten years at the study site. The work is

TABLE 1. Habits of *Ficus* species from the Sangha Trinational

Habit	Species
Climber	<i>F. asperiifolia</i>
Tree	<i>F. exasperata</i> , <i>F. mucoso</i> , <i>F. sur</i> and <i>F. variifolia</i>
Hemiepiphyte	<i>F. adolfi-friderici</i> , <i>F. ardisioides</i> subsp. <i>ardisioides</i> , <i>F. barteri</i> , <i>F. burretiana</i> , <i>F. calyprata</i> , <i>F. conraui</i> , <i>F. craterostoma</i> , <i>F. cyathistipula</i> subsp. <i>cyathistipula</i> , <i>F. dryepontiana</i> , <i>F. elasticoides</i> , <i>F. kamerunensis</i> , <i>F. lingua</i> subsp. <i>lingua</i> , <i>F. lutea</i> , <i>F. natalensis</i> subsp. <i>leprieurii</i> , <i>F. natalensis</i> subsp. <i>natalensis</i> , <i>F. ovata</i> , <i>F. polita</i> subsp. <i>polita</i> , <i>F. preussii</i> , <i>F. recurvata</i> , <i>F. sansibarica</i> subsp. <i>macrosperma</i> , <i>F. subcostata</i> , <i>F. thonningii</i> and <i>F. wildemania</i>

based on herbarium specimens that were collected in the study area and identified at different periods from 1992 to 2013. The collections were made, as part of a general inventory of all flowering plants (Harris, 2002), during primate feeding ecology studies (Ndolo Ebika, 2010) and ecological studies focusing on *Ficus* (Ndolo Ebika *et al.*, 2015). We identified our specimens by using collections from different herbaria (BM, E, K, L and P) and key references for central Africa (Berg *et al.*, 1984, 1985; Berg, 1990; Berg & Wiebes, 1992). Specimens of most species collected in the area were shown to Cees Berg in 1993, but all identifications were made by Ndolo Ebika and Harris. Herbarium specimens were deposited at the National Herbarium in Brazzaville (IEC) and the Royal Botanic Garden Edinburgh (E). Some additional duplicates were distributed to Naturalis (WAG) and Kew (K).

RESULTS

In the Sangha Trinational, we recorded 27 species of *Ficus*, one of the species with two subspecies. Three habits (tree, hemiepiphyte and climber; Table 1) are reported for the genus in the study site. An important division of habitat in the Sangha Trinational is the separation of terra firma forest from seasonally or permanently flooded forest. Most *Ficus* species occur in terra firma forest (Table 2). Three of these, all of them trees (*Ficus exasperata*, *F. mucoso* and *F. sur*) are restricted to disturbed sites; one other tree species (*F. variifolia*) appears to be restricted to undisturbed sites. The remaining terra firma species occur in both disturbed and undisturbed forests (see Table 2).

In this article, the identification of *Ficus* species is based on morphological characters including habit, glandular spots, figs (location, number and colour at a given stage), basal and ostiolar bracts, ostiole shape, stipules, leaf shape and venation. A subset of this list (colour and smell) is available for fresh material only.

Glandular spots

Glandular spots are shiny, oil-like marks sometimes present on the petiole, at the base of the midrib or in the axils of the basal pair of lateral veins. These spots are

TABLE 2. Habitats of *Ficus* species from the Sangha Trinational

Species	Terra firma	Wet sites
<i>F. adolfi-friderici</i>	Yes	
<i>F. ardisioides</i> subsp. <i>ardisioides</i>	Yes	
<i>F. asperifolia</i>		Yes
<i>F. barteri</i>	Yes	
<i>F. burretiana</i>	Yes	
<i>F. calyptrata</i>	Yes	
<i>F. conraui</i>	Yes	
<i>F. craterostoma</i>	Yes	
<i>F. cyathistipula</i> subsp. <i>cyathistipula</i>		Yes
<i>F. dryepontiana</i>	Yes	
<i>F. elasticoides</i>	Yes	
<i>F. exasperata</i>	Yes	
<i>F. kamerunensis</i>	Yes	
<i>F. lingua</i> subsp. <i>lingua</i>	Yes	
<i>F. lutea</i>	Yes	
<i>F. mucoso</i>	Yes	
<i>F. natalensis</i> subsp. <i>leprieurii</i>	Yes	Yes
<i>F. natalensis</i> subsp. <i>natalensis</i>	Yes	
<i>F. ovata</i>	Yes	
<i>F. polita</i> subsp. <i>polita</i>	Yes	Yes
<i>F. preussii</i>	Yes	
<i>F. recurvata</i>	Yes	
<i>F. sansibarica</i> subsp. <i>macrosperma</i>	Yes	
<i>F. subcostata</i>		Yes
<i>F. sur</i>	Yes	
<i>F. thonningii</i>	Yes	
<i>F. variifolia</i>	Yes	
<i>F. wildemaniana</i>	Yes	

either solitary or in pairs. They are obvious on fresh material but less conspicuous on dried specimens (Fig. 2), therefore it is important to record such spots in the field. Glandular spots are inconspicuous or absent on *Ficus adolfi-friderici*, *F. burretiana* and *F. variifolia*.

A solitary glandular spot is located at the base of the midrib on the lower surface of the lamina (Fig. 3) on most hemiepiphytic *Ficus* species that start their life as epiphytes (Berg & Wiebes, 1992). However, there are some exceptions, namely *Ficus recurvata* and *F. lutea*. In *Ficus recurvata*, the spot is at the base of the lower surface of the petiole (Fig. 2A). *Ficus lutea* has a spot at the base of the midrib on the upper surface of the lamina (Fig. 2B) in addition to the one on the lower surface (Fig. 2C).

Paired glandular spots are usually located in the axils of the basal pair of lateral veins on the lower surface (Fig. 3E). This is the case for two *Ficus* trees (*F. mucoso* and *F. sur*) and one climber (*F. asperifolia*). Occasionally in *Ficus polita* subsp. *polita*, the

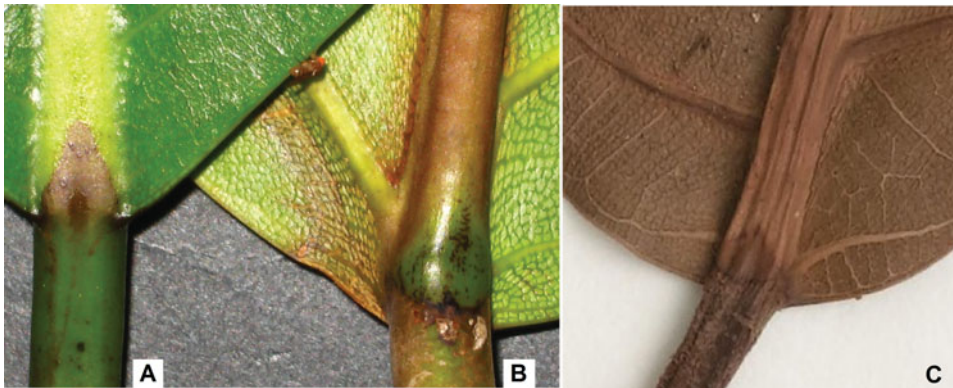


FIG. 2. Difference in the appearance of glandular spots between fresh and dried material. A, A single spot at the base of the midrib on the upper surface; B and C, a single spot at the base of the midrib on the lower surface. (A–C, *Ficus lutea*, Ndolo Ebika, S.T. 308.)

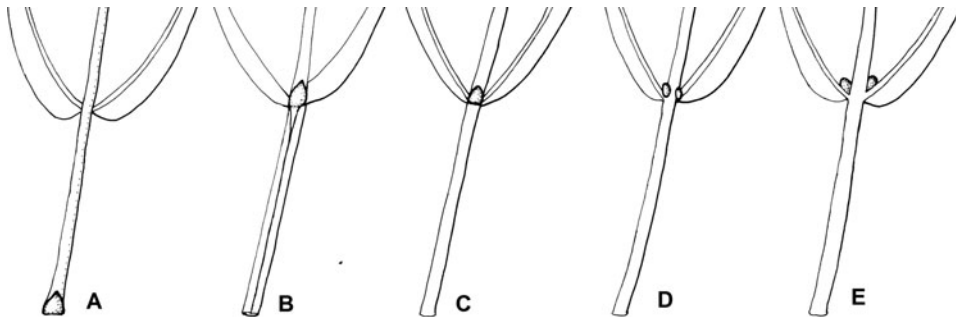


FIG. 3. Location and number of glandular spots. A, A single spot at the base of the petiole on the lower surface; B, a single spot at the base of the midrib on the upper surface; C, a single spot at the base of the midrib on the lower surface; D, a pair of the spots at the junction of the midrib with the basal pair of the lateral veins on the lower surface; E, the axils of the basal pair of lateral veins on the lower surface.

pair of glandular spots is located at the junction of the midrib with the basal pair of lateral veins on the lower surface (Fig. 3D).

Location of figs

There are four main locations where figs can be found in the species from this study area: at the base of the trunk, on the upper part of the trunk, on the main branches or in the leaf axils (Fig. 4). On the upper part of the trunk, figs can be born on special branches (as in *Ficus sur*, Fig. 4B) or occasionally on spurs that are very short shoots bearing figs (in *F. polita* subsp. *polita*, Fig. 4C). On the main branches, figs can be born on special branchlets (*Ficus mucuso*, Fig. 4A; *F. sur*, Fig. 4B) or on spurs (*F. polita* subsp. *polita* and *F. sansibarica* subsp. *macrosperma*, Fig. 4C). The leaf axil fig position

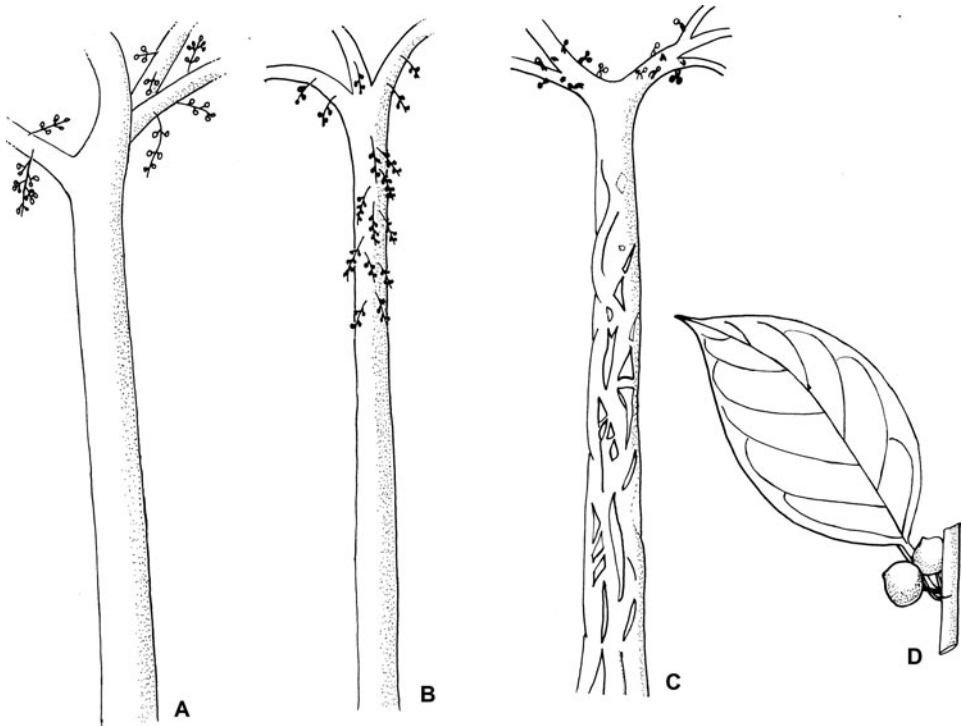


FIG. 4. Location of figs. A, On special branchlets on the main branches; B, on special branchlets on the upper part of the trunk and on the main branches; C, on spurs on the main branches; D, in the leaf axil.

(Fig. 4D) is the most common location for many *Ficus* species treated in this article, representing approximately 85% of the total number of species. In *Ficus exasperata*, figs appear to be on twigs where there are no leaves, but the position corresponds to the axils of fallen leaves.

Bracts and ostiole

Bracts of figs are appendages located either at the base of the receptacle (basal bracts, Fig. 5A,C) or at the orifice of the receptacle (ostiole), where they are called ostiolar bracts (Fig. 5G,H). Basal bracts are persistent if they do not fall off when the fig is mature, otherwise they are caducous. Presence or absence and number of bracts are of taxonomic importance. For example, *Ficus burretiana* and *F. elasticoides* look the same in terms of leaf shape but basal bracts are caducous in the former species and persistent in the latter. The ostiole plays an important role in pollination, because it serves as an entrance for the pollinators (fig wasps). In species in which the ostiole does not have any bracts, it can be a pore (hollow-shaped, Fig. 5E) or a slit (a narrow incision with two lips, Fig. 5F).

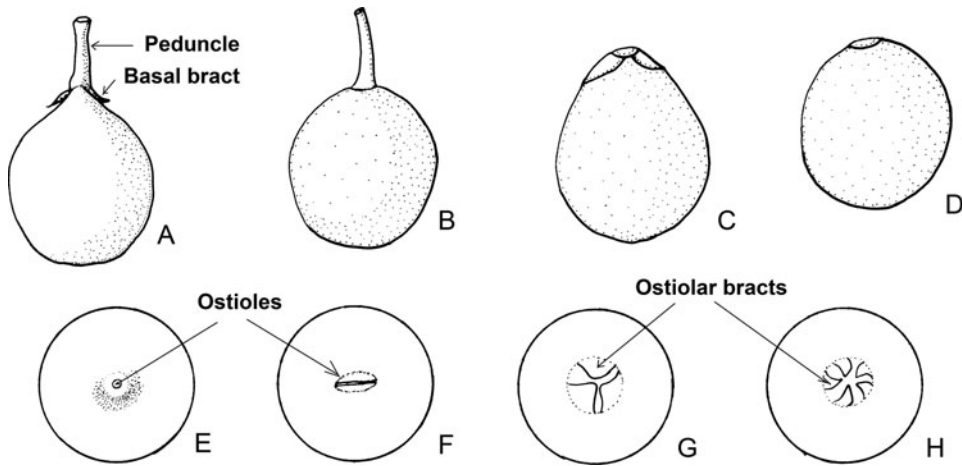


FIG. 5. Bracts and ostiole. A, A pedunculate fig with two persistent basal bracts; B, a pedunculate fig without basal bracts (they are caducous); C, a sessile fig with two persistent basal bracts; D, a sessile fig without basal bracts; E, ostiole a round pore; F, ostiole a slit; G, ostiole circular with three ostiolar bracts; H, ostiole circular with five ostiolar bracts.

Colour of figs

Figs' colours play an important role in determining and attracting a range of vertebrate frugivores that can act as seed dispersers (Lomáscolo *et al.*, 2008). Some *Ficus* species do not change their colour when ripe, whereas others do. An example of a species that does not change colour is *Ficus recurvata*, although mature figs of *F. recurvata* differ from unripe ones in being softer and emitting a distinctive smell. In species that change colour (e.g. *Ficus mucuso*), the fig is initially green, becoming yellow and then orange when ripe. As in the previous case, this category of figs will also soften and give off a characteristic smell when ripe, in addition to changing colour.

Key to sections and species of Ficus in the Sangha Trinational

- 1a. Trees, shrubs or lianas _____ (sect. *Oreosycea*, *Sycidium*, *Sycomorus*) 2
- 1b. Hemiepiphytes _____ 6 (sect. *Galogychia* – 22 spp. in area) 6

- 2a. Glandular spot, 1, at the base of the midrib below; lenticels present on the upper part of internodes _____ (sect. *Oreosycea* – 1 sp. in area) **1. F. variifolia**
- 2b. Glandular spots, 2, in the axils of basal pair of veins; no lenticels on the upper part of internodes _____ 3 (sect. *Sycidium*, *Sycomorus*)

- 3a. Stipule semiamplexicaul; figs in pairs in the leaf axils
(sect. *Sycidium* – 2 spp. in area) 4
- 3b. Stipule fully amplexicaul; figs usually on special leafless branches
(sect. *Sycomorus* – 2 spp. in area) 5

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- 4a. Liana; lamina elliptic, toothed at margin; glandular spots in the axils of the basal pair of the veins and in the axils of the lateral and other veins _____ **2. *F. asperifolia***
- 4b. Tree; lamina ovate to broadly elliptic, crenulated at margin; glandular spots only in the axils of the basal pairs of veins _____ **3. *F. exasperata***
- 5a. Petiole hairy; lamina ovate, scabrous, ciliated at margin; midrib and lateral veins hairy _____ **4. *F. mucuso***
- 5b. Petiole glabrous or sparsely hairy; lamina broadly elliptic or oblanceolate, smooth, toothed at margin; midrib and lateral veins glabrous _____ **5. *F. sur***
- 6a. Lamina cordate (including minutely cordate) at base _____ 7
- 6b. Lamina not cordate at base _____ 22
- 7a. Lamina less than 3 cm long _____ **6. *F. lingua* subsp. *lingua***
- 7b. Lamina more than 3 cm long _____ 8
- 8a. Lamina oblong _____ 9
- 8b. Lamina not oblong _____ 11
- 9a. Figs pedunculate on spurs on main branches _____ **7. *F. dryepontiana***
- 9b. Figs sessile in the leaf axils _____ 10
- 10a. Lateral veins in 5–8 pairs, figs more than 1.5 cm in diameter _____ **8. *F. subcostata***
- 10b. Lateral veins in 12–18 pairs, figs less than 1 cm in diameter _____ **9. *F. kamerunensis***
- 11a. Lateral veins in fewer than 10 pairs _____ 12
- 11b. Lateral veins in at least 10 pairs _____ 15
- 12a. Apex of lamina rounded; figs less than 2 cm in diameter _____ **10. *F. calyptrata***
- 12b. Apex of lamina acuminate; figs at least 2 cm in diameter _____ 13
- 13a. Figs on spurs on main branches _____ **11. *F. polita* subsp. *polita***
- 13b. Figs in the leaf axils _____ 14
- 14a. Lamina broadly elliptic; figs shortly pedunculate, ovoid to oblong _____ **12. *F. ovata***
- 14b. Lamina oblanceolate; figs sessile, globose _____ **13. *F. preussii***
- 15a. Lower surface of the lamina and venation hairy _____ 16
- 15b. Lower surface of the lamina and venation glabrous _____ 18
- 16a. Glandular spot at base of petiole on the lower surface; figs pedunculate _____ **14. *F. recurvata***
- 16b. Glandular spot at base of midrib on the lower surface; figs sessile or subsessile (shortly pedunculate) _____ 17

- 17a. Lamina broadly elliptic; figs shortly pedunculate _____ **12. F. ovata**
 17b. Lamina lanceolate, oblanceolate or elliptic; figs sessile _____ **15. F. lutea**
- 18a. Lamina leathery, up to 53 cm (or more) in length; figs sessile _____ **16. F. wildemaniana**
 18b. Lamina papery, 13 cm in length maximum; figs pedunculate _____ 19
- 19a. Margin of the lamina revolute, tertiary venation not crowded _____ **17a. F. natalensis** subsp. **leprieurii**
 19b. Margin of the lamina not revolute, tertiary venation crowded _____ 20
- 20a. Midrib not reaching the apex of the lamina; lamina obtriangular; figs sessile _____ **18. F. craterostoma**
 20b. Midrib reaching the apex of the lamina or not occasionally doing so; lamina elliptic or oblanceolate sometimes obtriangular; figs pedunculate _____ 21
- 21a. Figs less than 8 mm in diameter, peduncle 6 mm long _____ **19. F. thonningii**
 21b. Figs more than 8 mm in diameter, peduncle 3–5 mm long _____ **17b. F. natalensis** subsp. **natalensis**
- 22a. Midrib not reaching apex of lamina _____ 23
 22b. Midrib reaching apex of lamina _____ 25
- 23a. Lamina less than 3 cm long and 1.5 cm wide; figs less than 5 mm in diameter when fresh (sessile) _____ **6. F. lingua** subsp. **lingua**
 23b. Lamina more than 3 cm long and 1.5 cm wide; figs more than 5 mm in diameter when fresh (sessile or pedunculate) _____ 24
- 24a. Lamina obtriangular–oblong; figs sessile _____ **18. F. craterostoma**
 24b. Lamina elliptic to obtriangular–ovate; figs pedunculate _____ **17a. F. natalensis** subsp. **leprieurii**
- 25a. Lateral veins in fewer than 8 pairs _____ 26
 25b. Lateral veins in 8 or more pairs _____ 30
- 26a. Figs on spurs on main branches _____ 27
 26b. Figs in the leaf axils _____ 28
- 27a. Lamina elliptic or oblanceolate _____ **20. F. sansibarica** subsp. **macrosperma**
 27b. Lamina ovate or broadly elliptic _____ **11. F. polita** subsp. **polita**
- 28a. Figs sessile, oblong _____ **15. F. lutea**
 28b. Figs pedunculate, globose _____ 29

- 29a. Stipules persistent; figs more than 1 cm in diameter when dry
21. *F. cyathistipula* subsp. *cyathistipula*
- 29b. Stipules caducous; figs less than 1 cm in diameter when dry
22. *F. ardisioides* subsp. *ardisioides*
- 30a. Lamina oblong _____ 31
- 30b. Lamina elliptic _____ 32
- 31a. Lateral veins in 9–12 pairs; figs pedunculate _____ **23. *F. barteri***
- 31b. Lateral veins in 12–18 pairs; figs sessile _____ **9. *F. kamerunensis***
- 32a. Figs sessile _____ 33
- 32b. Figs pedunculate _____ 35
- 33a. Petiole more than 4 mm wide; figs more than 2 cm in diameter
16. *F. wildemaniana*
- 33b. Petiole less than 4 mm wide; figs up to 2 cm in diameter _____ 34
- 34a. Lateral veins in 8–14 pairs; figs hairy, 2–2.2 cm in diameter _____ **24. *F. conraui***
- 34b. Lateral veins in 9 pairs; figs glabrous, 0.6–0.8 cm in diameter
25. *F. adolfi-friderici*
- 35a. Apex of lamina with distinct acumen, more than 1 cm long; lamina more than 10 cm long _____ **23. *F. barteri***
- 35b. Apex of lamina without distinct acumen, if present less than 1 cm long; lamina less than 10 cm long _____ 36
- 36a. Lamina oblanceolate to narrowly elliptic — **17b. *F. natalensis* subsp. *natalensis***
- 36b. Lamina broadly elliptic _____ 37
- 37a. Lamina more than 4 cm wide; glandular spot at base of midrib on lower surface of lamina; figs more than 1.3 cm in diameter _____ **26. *F. elasticoides***
- 37b. Lamina up to 4 cm wide; glandular spots absent; figs less than 1.2 cm in diameter _____ **27. *F. burretiana***

Section *Oreosycea* Berg *et al.*, Fl. Cam. 28: 144 (1985); Berg & Wiebes 15 (1992).

Tree or shrub. *Lenticels* on the upper part of the internodes. *Lamina* scabrous to smooth above, margin entire, lobed pinnate to split; basal pairs of veins strongly or weakly obvious; tertiary venation parallel to slightly reticulate. *Glandular spot(s)* at the base of the midrib. *Stipule* fully amplexicaul and free. *Figs* pedunculate, in pairs in the leaf axils. *Basal bracts* 3, often in whorls, rarely penducular or lateral. *Ostirole* rounded, with 3 bracts. *Interfloral bracts* absent. *Male flowers* with 1 bract, perianth

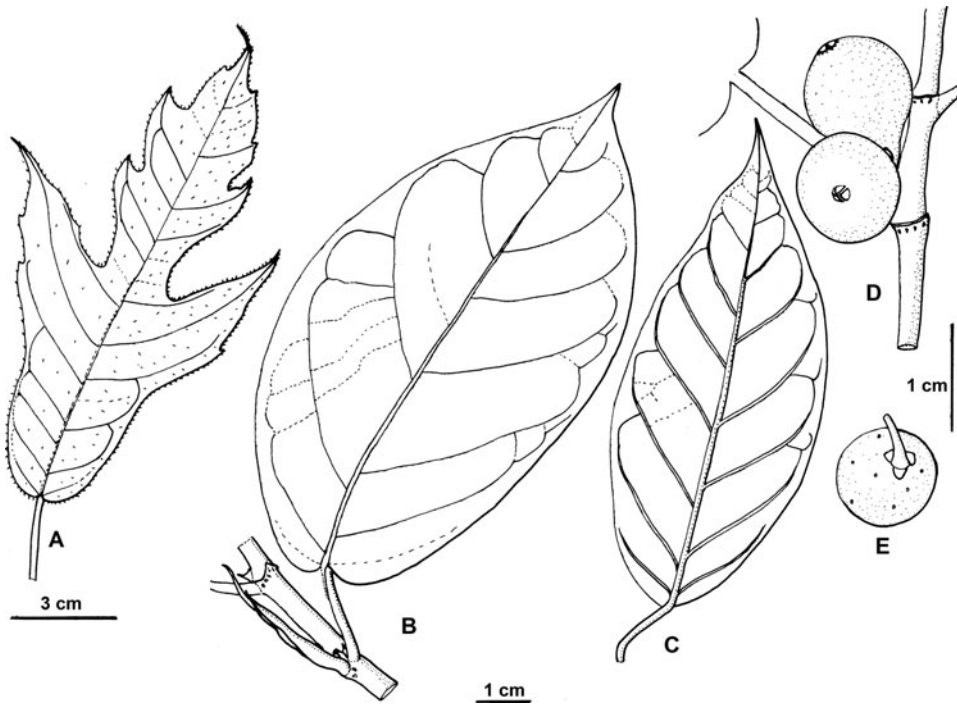


FIG. 6. *Ficus variifolia* Warb. A, Lobed leaf from the young shoot; B, twig with a leaf and two stipules still attached; C, leaf seen from the lower surface; D, twig with axillary figs; E, fig seen from below. (A–D, Ndolo Ebika, *S.T.* 309.)

tubular, bilobed, 1–3 stamens. *Gall flowers and seed flowers* distinct, perianth tubular, 2- or 3-lobed, glabrous. *Stigmas* 2.

In Africa, the section *Oreosyce* has two species: *Ficus variifolia* and *F. dicranostyla* (not treated in this article). These two species are morphologically close to each other, but the former occurs in forest areas where it is represented by big trees with buttresses whereas the latter is found in savannah and has individuals that are shrubs or small trees (usually no more than 20 m tall). In Madagascar and Comoros, there are other species belonging to the section *Oreosyce*, such as *Ficus assimilis*, which resemble the two species found in Africa.

1. *Ficus variifolia* Warb., Fig. 6.

Berg *et al.*, *Fl. Gabon* 26: 143 (1984); Berg & Wiebes 85 (1992); Gillet & Doucet 18 (suppl.) (2012); Ndolo Ebika 58 (2010).

Tree 25 m high. *Base* with buttress. *Latex* white on leafy twigs but colourless on the trunk. *Lenticels* present on the upper part of internodes. *Stipules* oblong, 2.8–3 × 0.5–0.6 cm, soon caducous, glabrous, pale green. *Leaves* entire (young shoots often

with lobed and hairy leaves), alternate. *Petiole* scabrous, 0.9–2.3 × 0.1 cm, channelled above. *Lamina* elliptic, 5.5–13.5 × 2.8–6.6 cm, scabrous; base cordate or rounded; apex acuminate (0.5–1.5 cm long). *Lateral veins* in 8–15 pairs (including 1 or 2 basal pairs), looping at 3 mm from the margin. *Glandular spots* absent. *Figs* in the leaf axils, in pairs, pedunculate, globose, 1 cm in diameter when fresh, 0.6–0.7 cm when dry, yellow to brown with green dots when ripe. *Peduncle* shortly hairy, 3–6 mm long. *Basal bracts* 3, persistent. *Ostiolar bracts* 3. *Ostiole* prominent, circular.

Habitat. Mixed-species terra firma forest.

Specimen. Ndolo Ebika, S.T. 309.

Section *Sycidium* Berg *et al.*, Fl. Cam. 28: 120 (1985); Berg & Wiebes 15 (1992).

Trees, large and small, lianas. *Lamina* like sandpaper above, toothed or lobed; basal pairs of veins obvious; tertiary venation reticulate. *Glandular spots* in the axils of the basal pair. *Stipule* semiamplexicaul. *Figs* pedunculate, in pairs in leaf axils, under the leaves or on short shoot. *Basal bracts* often lacking, presence of bracts on the peduncle (peduncular bracts) and also on the fig (lateral bracts). *Ostiolar bracts* numerous. *Receptacles* each containing either male flowers and gall flowers, or seed flowers only. *Male and female flowers* may be on different individuals.

Fig species belonging to the section *Sycidium* include *Ficus asperifolia* (occurring in wet places in forest areas), *F. capreifolia* Delile (not treated in this article), *F. exasperata* (on terra firma) and *F. pygmaea* Welw. ex Hiern (not treated).

2. *Ficus asperifolia* Miq., Fig. 7.

Berg *et al.*, Fl. Cam. 28: 124 (1985); Berg & Wiebes 68 (1992); Gillet & Doucet 18 (suppl.) (2012); Harris 141 (2002).

Liana 1 m high. *Latex* yellowish. *Stipules* caducous. *Leaves* toothed, alternate. *Petiole* scabrous, 1 cm long. *Lamina* asymmetric, elliptic, 20.5 × 8.6 cm, scabrous beneath; base asymmetric, rounded; apex acuminate, up to 1.8 cm long. *Lateral veins* in 8 pairs. *Tertiary veins* parallel (to more or less perpendicular) to the lateral veins. *Glandular spots* in the axils of the basal pair of veins and in the axils of the lateral and other veins. *Figs* in the leaf axils, solitary or in pairs, pedunculate, (sub)globose, 1.2–2 cm in diameter, hairy or glabrous, green and sometimes with brown spots when unripe, yellow when ripe, smooth when dry. *Peduncle* up to 6 mm long. *Basal bracts* 3. *Ostiolar bracts* 7. *Ostiole* circular.

Habitat. Seasonally flooded forest, and occasionally secondary forest growing on old fields.

Specimens. Harris, D.J. 893, 1110, 1716, 1736; Ndolo Ebika, S.T. 942, 1387.

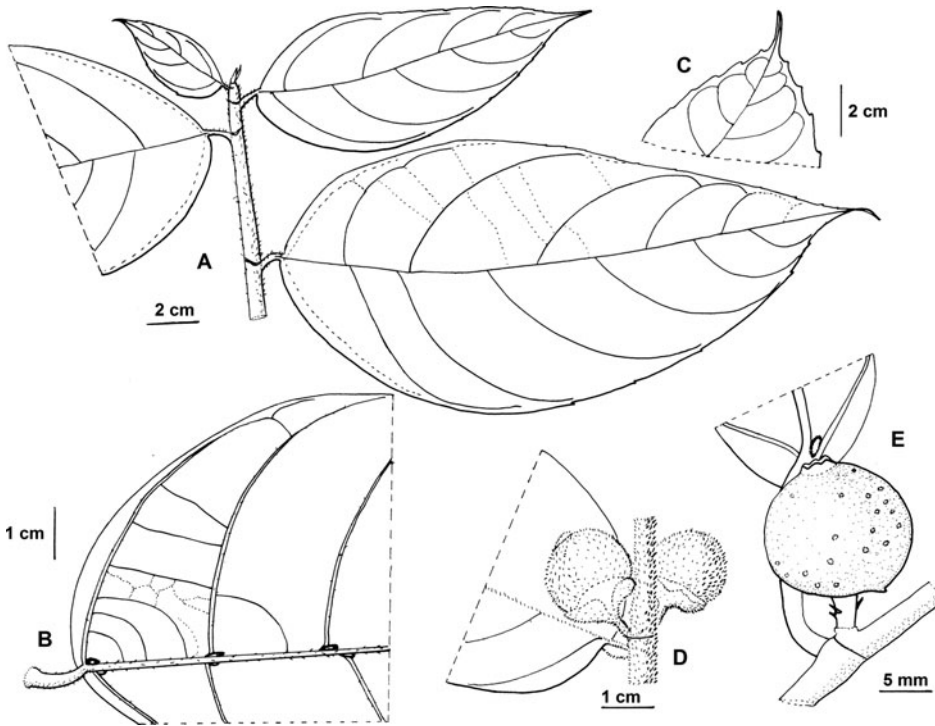


FIG. 7. *Ficus asperifolia* Miq. A, Leafy twig; B, section of the bottom part of the leaf with glandular spots in the axils of the basal pair and other lateral veins; C, section of the upper part of the lamina; D, hairy and paired figs in the leaf axils; E, glabrous and solitary fig in the leaf axils. (A, B and D, *Ndolo Ebika*, S.T. 942; C and E, *Ndolo Ebika*, S.T. 1387, from photograph, no specimen).

3. *Ficus exasperata* Vahl, Fig. 8.

Berg & Wiebes 65 (1992); Gillet & Doucet 18 (suppl.) (2012); Moutsamboté *et al.* 284 (1994).

Tree 10 m high; diameter at breast height, 20 cm. *Stipule* caducous. *Leaves* crenulated, opposite to alternate. *Petiole* unequal on the same node, 0.6–7 cm long. *Lamina* ovate to broadly elliptic, 7–15.5 × 4–8 cm, scabrous (sandpapery in texture) on both surfaces; base slightly cordate to rounded. *Lateral veins* in 5–7 pairs, including the basal pair, which reaches the margin at or above half of the length of the lamina. *Tertiary veins* perpendicular to the midrib and to the lateral veins. *Glandular spots* only in the axils of the basal pairs of veins. *Figs* just under the leaves inserted above the scars of petioles of recently fallen leaves, in pairs, pedunculate, globose, 1.3–1.7 cm in diameter, greenish when unripe, yellow then red when ripe. *Peduncle* 6–9 mm long. *Basal bracts* caducous. *Ostiolar bracts* more than 3. *Ostiole* circular.

Habitat. Villages, roadsides, old fields, logged forest.

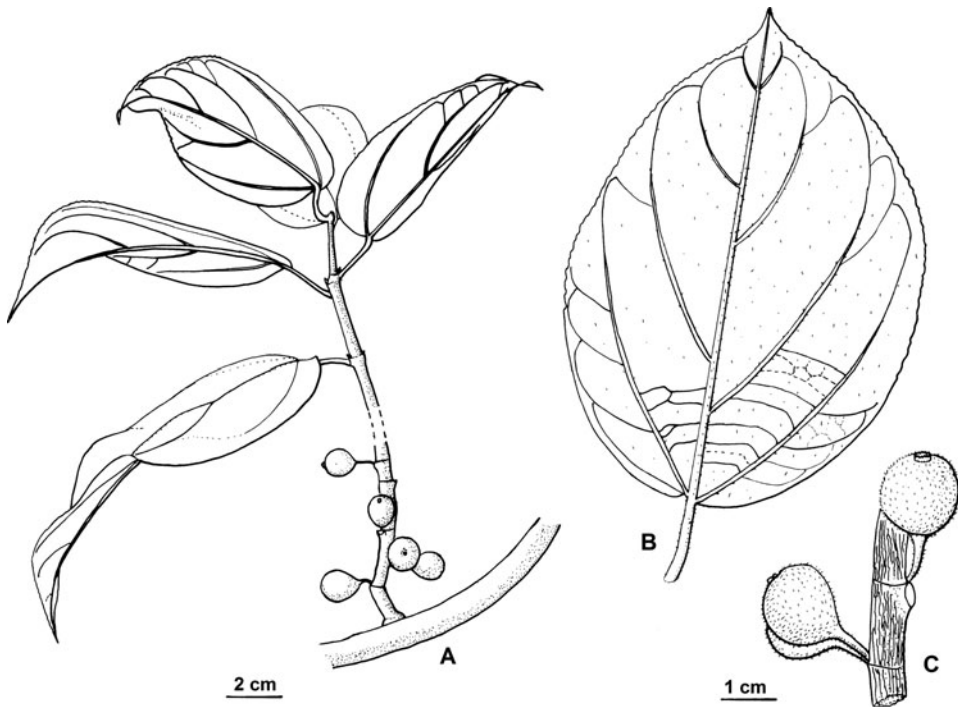


FIG. 8. *Ficus exasperata* Vahl. A, Twig with leaves and figs; B, lower surface of the leaf; C, figs. (A–C, Ndolo Ebika, S.T. 826.)

Specimens. Fay, M.J. 8701; Harris, D.J. 9291, 9393; Ndolo Ebika, S.T. 826; Nzolani Silaho, F.O. 455.

Section *Sycomorus* Berg *et al.*, Fl. Cam. 28: 128 (1985); Berg & Wiebes 15 (1992).

Tree without aerial roots. *Lamina* scabrous or smooth above, margin usually \pm toothed; basal pairs of veins strongly obvious; tertiary venation parallel to slightly reticulate. *Glandular spots* in the axils of the basal pair of veins. *Stipule* fully amplexicaul and free. *Figs* pedunculate, solitary in leaf axil or on leafless twigs \pm branched on the trunk and/or the main branches. *Basal bracts* 3 and in whorls, often lacking. *Ostiole* rounded, covered by several bracts appearing raised when dry. *Interfloral bracts* absent among female flowers. *Male flowers* surrounded by 2 (or 3) bracteoles, perianth tubular, bilobed, 1–3 stamens. *Gall flowers and seed flowers* distinct, perianth 2–6 tepals, free or partially fused.

Five species belong to the section *Sycomorus*: *Ficus mucoso*, *F. sur*, *F. sycomorus* L. subsp. *gnaphalocarpa* (Miq.) C.C.Berg, *F. vogeliana* (Miq.) Miq., all having figs on special leafless twigs, and *F. vallis-choudae* Delile, which has solitary figs in the leaf axils. Of these five species, only the first two are treated in this article.

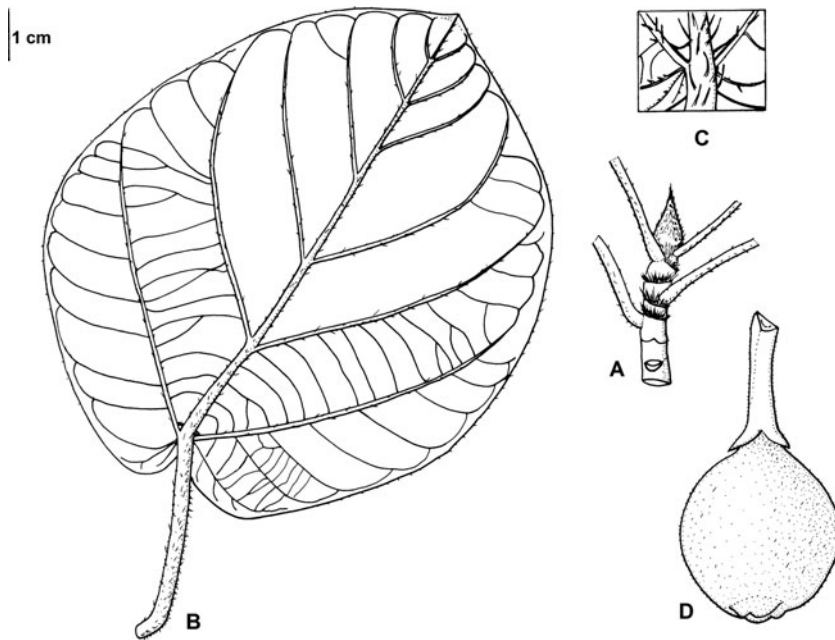


FIG. 9. *Ficus mucuso* Welw. ex Ficalho. A, Section of a leafy twig; B, leaf seen from the lower surface; C, enlarged section of the base of the leaf, showing long and short hairs and the spots in the axils of the two basal lateral veins; D, fig. (A–D, *Ndolo Ebika*, S.T. 919.)

4. *Ficus mucuso* Welw. ex Ficalho, **Fig. 9.**

Berg & Wiebes 76 (1992); Gillet & Doucet 18 (suppl.) (2012); Harris & Wortley 78 (2008).

Tree 20 m high; diameter at breast height, 80 cm. *Latex* yellowish. *Stipules* caducous with a ring of hairs remaining at the location of the fallen stipules. *Terminal bud* persistent, hairy. *Petiole* with long and short hairs, 2.5–10.5 cm long. *Lamina* ovate, 9–15.5 × 9–12 cm, scabrous (sandpapery in texture) above; margin of the lamina ciliated. *Midrib and lateral veins* with long and short hairs. *Lateral veins* in 4–7 pairs. *Tertiary veins* parallel between them and nearly perpendicular to the lateral veins. *Figs* borne on special hanging branches on the main branches of the tree, pedunculate, globose, 3–3.2 cm in diameter, green when unripe, yellow then red when ripe, shortly hairy. *Peduncle* shortly hairy, 1.7–2.5 cm long. *Basal bracts* 3, persistent or caducous. *Ostiolar bracts* more than 3. *Ostiole* with more than 3 prominent bumps.

Habitat. Villages, roadsides, logged forest.

Specimens. Fay, M. 8565; Harris, D.J. 1215, 5204; *Ndolo Ebika*, S.T. 919; *Nzolani Silaho*, F.O. 564.

Deciduous. We have not yet found this species in undisturbed forest.

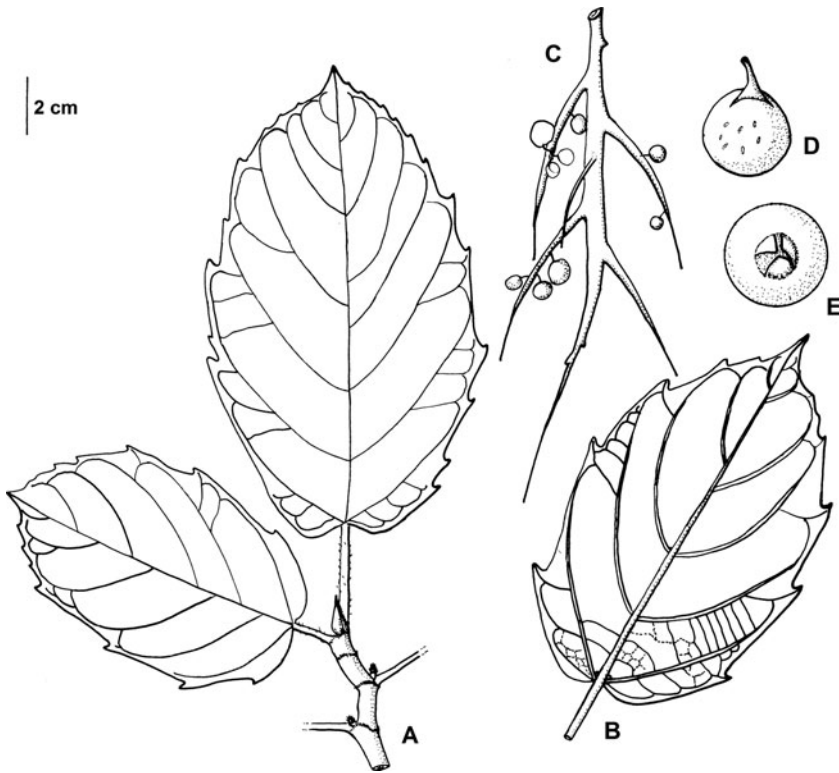


FIG. 10. *Ficus sur* Forssk. A, Leafy twig; B, leaf seen from the lower surface; C, special branchlet bearing the figs; D, fig seen from the side; E, ostiole. (A–E, *Ndolo Ebika, S.T. 1.*)

5. *Ficus sur* Forssk., Fig. 10.

Berg & Wiebes 77 (1992); Gillet & Doucet 18 (suppl.) (2012); Harris 145 (2002); Harris & Wortley 81 (2008).

Tree 15 m high. *Latex* white. *Stipules* caducous, leaving hairy scars on the stem. *Terminal bud* persistent, hairy. *Leaves* toothed, alternate. *Petiole* with sparse white hairs or glabrous, 1.4–14 × 0.2–0.3 cm. *Lamina* broadly elliptic or oblanceolate, 9.5–25 × 5–13 cm; base cordate or rounded; apex acuminate (up to 5 mm long) to rounded. *Midrib* glabrous. *Lateral veins* in 5–9 pairs (including the basal pair), hairy or glabrous. *Glandular spots* in the axils of the basal pair of the lateral veins on the lower surface. *Figs* borne on special pendent branches up to 60 cm long on the trunk and main branches of the tree, pedunculate, globose, up 3 cm in diameter when fresh, 1–2 cm in diameter when dry, green with white spots when unripe, red when ripe, hairy or glabrous. *Peduncle* 0.6–1.5 cm long. *Basal bracts* 3, persistent. *Ostiolar bracts* 3. *Ostiole* circular.

Habitat. Secondary forest, village.

Specimens. Fay, *M.J.* 8334, 8622, 8736; Harris, *D.J.* 492, 532, 5952; *Ndolo Ebika, S.T. 1,* 1035.

We have not yet found this species in undisturbed forest.

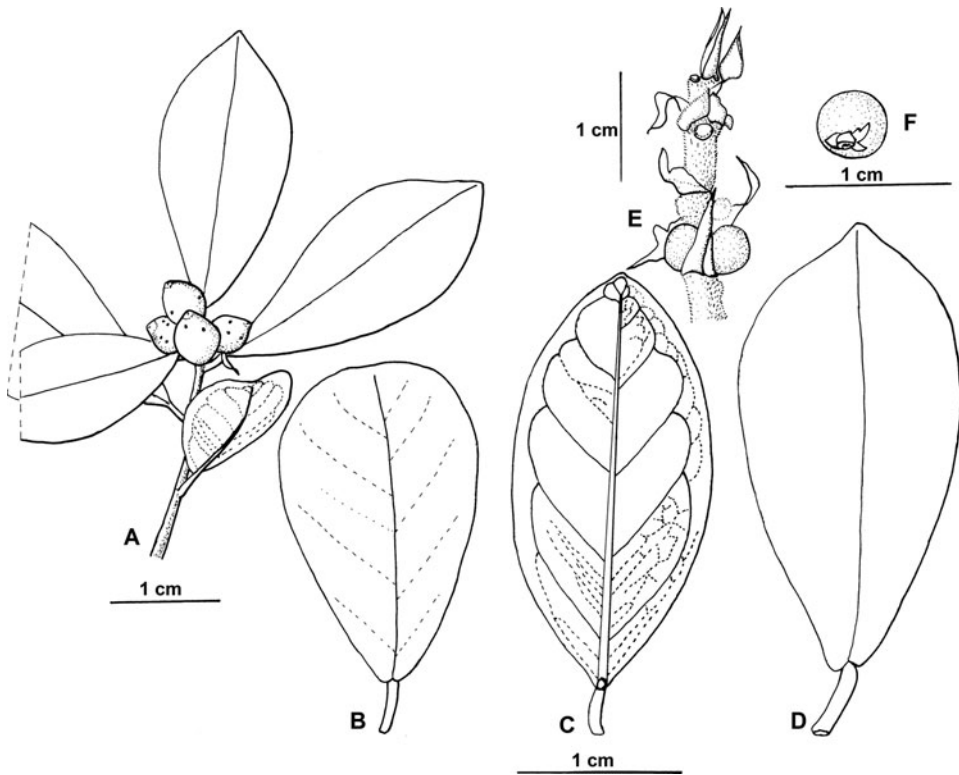


FIG. 11. *Ficus lingua* De Wild. & T.Durand subsp. *lingua*. A, Twig with leaves and figs; B–D, variation in leaf shape and size; E, twig with stipules and figs; F, fig. (A–E, Ndolo Ebika, S.T. 1172.)

Section *Galoglychia* Berg *et al.* Fl. Cam. 28: 156 (1985)

Hemiepiphyte, with adventive and aerial roots. *Lamina* margin entire, sometimes lobed; basal pairs of veins obvious or not; tertiary venation often reticulate. *Glandular spot*: only one at the base of the midrib. *Stipule* fully amplexicaul and free. *Figs* pedunculate or sessile, in pairs in leaf axils or just below the leaves, or on spurs below leaves on main branches and trunk. *Basal bracts* usually 2, sometimes 3. *Ostiole* split, with 2 bracts. *Male flowers* 1 stamen. *Gall flowers and seed flowers* distinct or hardly distinct, perianth 2–4 tepals free or fused at the base.

Of the 65 species found in Africa, 45 are in Cameroon and 31 in Gabon. Of these 65, 22 are treated in this article.

6. *Ficus lingua* De Wild. & T.Durand subsp. *lingua*, Fig. 11.

Berg & Wiebes 120 (1992); Harris & Wortley 76 (2008).

Hemiepiphyte. *Latex* white. *Stipules* persistent, 3 × 2 mm. *Leaves* entire, alternate. *Petiole* 0.2–0.5 cm long. *Lamina* elliptic, oblanceolate or obtriangular, 1.1–3 × 0.5–1.5 cm;

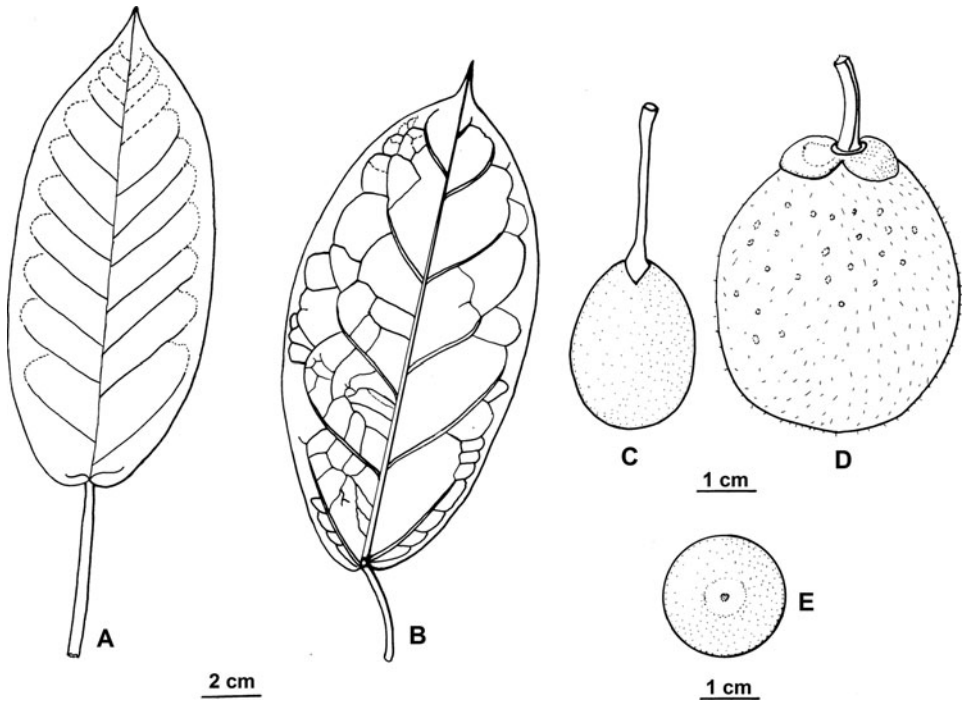


FIG. 12. *Ficus dryepontiana* Gentil ex De Wild. A, Leaf, upper surface; B, leaf, lower surface; C and D, figs; E, ostiole. (A, C and E, *Ndolo Ebika*, *S.T.* 360; D, *Harris* 1297.)

base cuneate or minutely cordate; apex rounded or obtuse. *Midrib* reaching or not reaching the apex of the lamina. *Lateral veins* in 5–8 pairs. *Glandular spots* at the base of the midrib on the lower surface. *Figs* in the leaf axils, in pairs, sessile, 5 mm in diameter, green with yellowish spots when unripe, yellow with orange spots when ripe. *Basal bracts* 3, persistent. *Ostiolar bracts* absent. *Ostiole* an elongated slit.

Habitat. Mixed species terra firma forest; *Gilbertiodendron dewevrei* (De Wild.) J.Léonard forest on terra firma.

Specimens. *Harris*, *D.J.* 4921, 5387; *Ndolo Ebika*, *S.T.* 1125, 1172.

7. *Ficus dryepontiana* Gentil ex De Wild., **Fig. 12.**

Berg et al. *Fl. Cam.* 28: 222 (1985); *Berg & Wiebes* 163 (1992); *Harris* 142 (2002); *Ndolo Ebika* 49 (2010).

Hemiepiphyte 12 m high. *Latex* yellowish and translucent. *Stipules* 2.8 cm long, caducous. *Leaves* entire, spirally arranged. *Petiole* glabrous, 3–9 × 0.1–0.2 cm, channelled above. *Lamina* oblong to broadly elliptic, 8.2–22 × 3.5–9 cm, glabrous; base cordate; apex acuminate, 0.6–1.8 cm long. *Lateral veins* in 7–14 pairs including the basal pair, looping at 2–5 mm from the margin. *Glandular spot* at the base of the

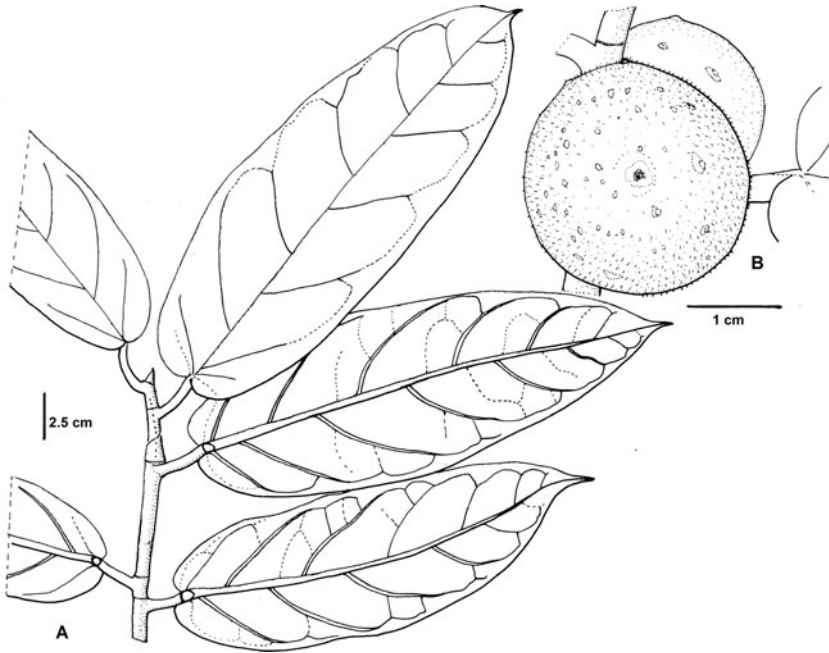


FIG. 13. *Ficus subcostata* De Wild. A, Leafy twig; B, figs. (A and B, *Ndolo Ebika*, S.T. 1386, from photograph, no specimen.)

midrib. Figs on spurs on main branches, in groups of at least 4, pedunculate, oblong (3.5×2.5 cm) to subglobose (4 cm in diameter) when fresh, 2–2.5 cm in diameter when dry, hairy or glabrous, green when unripe, yellow with red spots when ripe; fig wall white, 3–8 mm thick. Peduncle 1.5–3.5 cm long. Basal bracts 2, caducous, leaving an oblique scar at the base of the fig. Ostiolar bracts absent. Ostiole an elongated slit and located in a depression.

Habitat. Mixed-species terra firma forest.

Specimens. Harris, D.J. 1297; *Ndolo Ebika*, S.T. 360.

Deciduous. Young leaves pale yellow.

8. *Ficus subcostata* De Wild., Fig. 13.

Berg *et al.* Fl. Cam. 28: 252 (1985); Harris 144 (2002) (although specimen cited by Harris, 2002, is not this species).

Hemiepiphyte up to 4 m high. Branches producing aerial roots at the internodes. Stipule $2.5\text{--}4.5 \times 0.5\text{--}1$ cm, caducous on old wood. Leaves entire, alternate. Petiole $1.5\text{--}2.7 \times 0.2\text{--}0.3$ cm. Lamina leathery, oblong, $10\text{--}26.5 \times 3.4\text{--}8.8$ cm; base cordate; acumen 0.8–1 cm long; margin of the lamina revolute. Median midrib yellowish to reddish on the lower surface when fresh. Lateral veins in 5–8 pairs, looping from

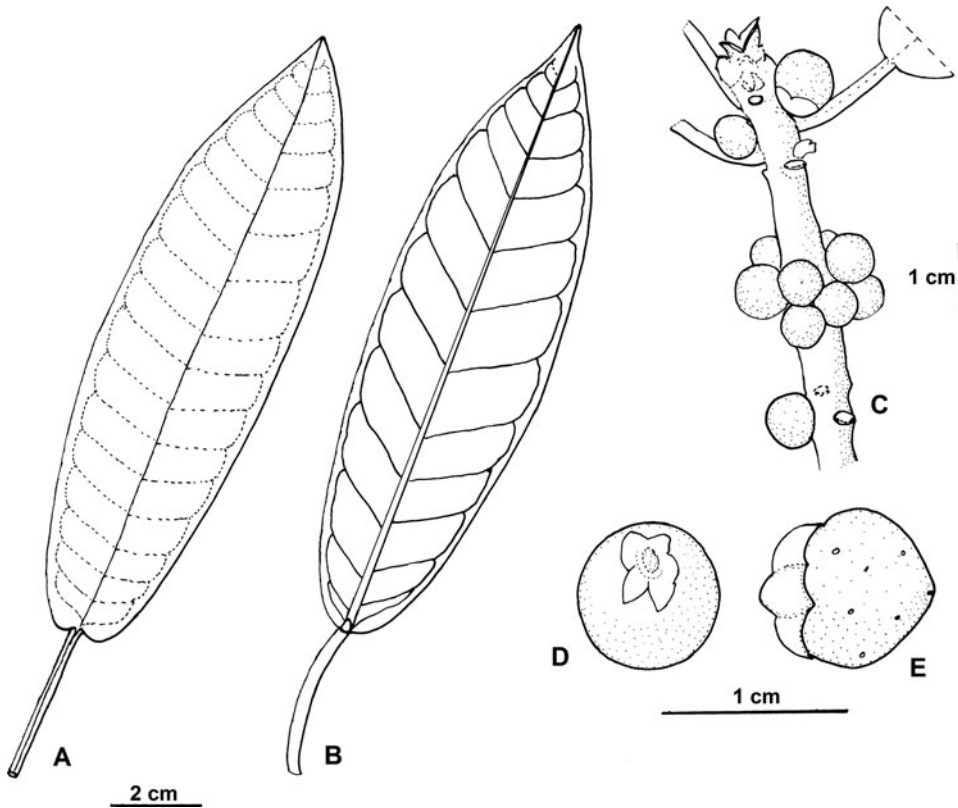


FIG. 14. *Ficus kamerunensis* Warb. ex Mildbr. & Burret. A and B, Leaves, upper and lower surfaces respectively; C, twig with figs; D, fig seen from below; E, fig seen from the side. (A–D, Ndolo Ebika, S.T. 345.)

2–5 mm from the margin. *Tertiary and quaternary veins* faintly reticulate, scale-like. *Glandular spot* at the base of the midrib on the lower surface. *Figs* in the leaf axils, in pairs, sessile, globose, 1.5–2.3 cm in diameter, when unripe green with prominent pale green spots. *Basal bracts* 2 and 2 mm long, persistent. *Ostiolar bracts* absent. *Ostiole* an elongated slit.

Habitat. Riparian forest.

Specimens. Ndolo Ebika, S.T. 1386, 1518.

9. *Ficus kamerunensis* Warb. ex Mildbr. & Burret, Fig. 14.

Berg *et al.* Fl. Gabon 26: 165 (1984); Harris & Wortley 76 (2008); Ndolo Ebika, 52 (2010).

Hemiepiphyte 12 m high. *Latex* white. *Stipules* more or less triangular, 0.8–1 × 0.4 cm, soon caducous. *Leaves* entire, alternate. *Petiole* glabrous, 1–3 × 0.1 cm, slightly channelled above. *Lamina* oblong, 5.5–14 × 2–4 cm, glabrous; base rounded or slightly

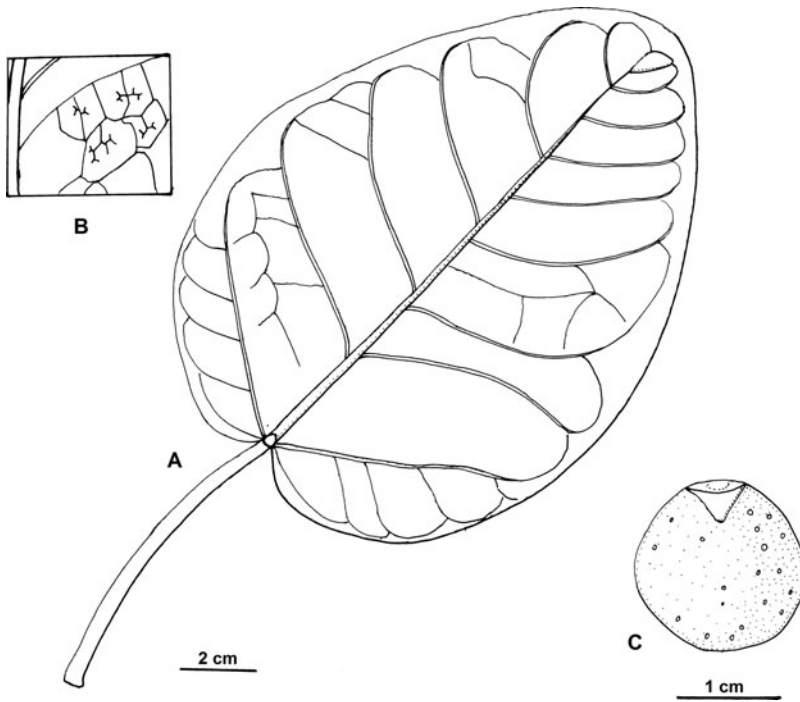


FIG. 15. *Ficus calyprata* Vahl. A, Leaf seen from the lower surface; B, portion of the lower surface of the lamina, showing the quaternary veins ending in open branches; C, fig. (A–C, from unnumbered photograph by Ndolo Ebika.)

cordate; apex slightly rounded to shortly acuminate (c.4 mm long). *Lateral veins* in 12–18 pairs, parallel and almost perpendicular to the midrib, looping at 2 mm from the margin. *Tertiary veins* parallel to the lateral. *Glandular spot* at the base of the midrib. *Figs* in leaf axils, solitary or grouped together onto a compact mass, sessile, globose, 4–9 mm in diameter, green when unripe and yellow with orange spots when ripe. *Basal bracts* 2, fused into a crown. *Ostiolar bracts* absent. *Ostiole* an elongated slit.

Habitat. Mixed-species terra firma forest, *Gilbertiodendron dewevrei* forest on terra firma.

Specimens. Harris, D.J. 4559, 7745, 9411; Ndolo Ebika, S.T. 345, 1186.

A deciduous *Ficus* species. Young leaves red, yellowish then pale green.

10. *Ficus calyprata* Vahl, Fig. 15.

Berg & Wiebes 116 (1992); Gillet & Doucet 18 (suppl.) (2012); Harris & Wortley 74 (2008); Ndolo Ebika 47 (2010).

Ficus mallotoides Mildbr. & Hutch., Berg & Wiebes 116 (1992).

Hemiepiphyte 20 m high. *Latex* white. *Stipules* lanceolate, 1.5–1.8 cm long and 1 cm wide at the base, hairy inside, persistent to caducous. *Leaves* entire, spirally arranged.

Petiole glabrous, 3.4–8.5 × 0.3–0.5 cm. *Lamina* ovate, 8.2–20.5 × 7.8–14.7 cm; base cordate; apex rounded to slightly acuminate. *Lateral veins* in 6–9 pairs including the basal pair, looping at 4 mm from the margin. *Tertiary veins* reticulate. *Quaternary veins* branched, ending in a Y shape inside the network of the tertiary veins. *Glandular spot* at the base of the midrib. *Figs* in the leaf axils, in pairs or more than two, sessile, (sub)globose, 1–1.7 cm in diameter, yellowish when unripe and orange, red with orange or darker red spots when ripe, shortly hairy. *Basal bracts* 2, persistent. *Ostiolar bracts* absent. *Ostiole* an elongated slit.

Habitat. Mixed-species terra firma forest, *Gilbertiodendron dewevrei* forest on terra firma. Edge of marshy clearing and riparian forest.

Specimens. Harris, D.J. 4861, 7529, 9299.

Deciduous. Figs often seen when the canopy is totally without leaves and also during the appearance of young leaves.

11. *Ficus polita* Vahl subsp. *polita*, Fig. 16.

Berg & Wiebes 159 (1992); Gillet & Doucet 18 (suppl.) (2012); Harris & Wortley 79 (2008); Ndolo Ebika 55 (2010).

Hemiepiphyte becoming a free-standing strangler up to 20 m high. *Base* with buttresses. *Latex* white. *Stipules* caducous. *Leaves* entire, spirally arranged. *Petiole* glabrous, 2.8–9 × 0.2–0.4 cm. *Lamina* ovate or broadly elliptic, 8–21.5 × 4.6–11.8 cm, glabrous; base cordate or rounded; apex shortly acuminate (0.5–1.5 cm long). *Lateral veins* in 5–8 pairs (including the basal pair), looping at 3 mm from the margin. *Tertiary veins* parallel between them and almost perpendicular to the lateral veins. *Quaternary veins* forming a very tight network. *Glandular spots* either in pairs or single at the base of the midrib on the lower surface of the lamina. *Figs* on spurs on the trunk and on the main branches, in groups of up to 6, pedunculate, globose, 3.5–6 cm in diameter when fresh, 2–2.5 cm and wrinkled when dry, remaining green or yellowish with greenish spots when ripe, cuneate at the base. *Peduncle* shortly hairy, 1–4.5 × 0.8 cm. *Basal bracts* 2. *Ostiolar bracts* absent. *Ostiole* an elongated slit and located in a depression.

Habitat. Mixed-species terra firma forest, *Gilbertiodendron dewevrei* forest on terra firma, one individual on cleared land in village beside river.

Specimens. Harris, D.J. 1429, 1886, 5359, 8022; Ndolo Ebika, S.T. 105, 536, 823, 837.

Deciduous, with stipules falling off just before leaves appear.

12. *Ficus ovata* Vahl, Fig. 17.

Berg & Wiebes 165 (1992); Gillet & Doucet 18 (suppl.) (2012); Harris & Wortley 79 (2008).

Hemiepiphyte 15 m high, with white latex. *Stipules* caducous. *Leaves* entire, alternate. *Petiole* 4.5–6.5 cm long, hairy. *Lamina* broadly elliptic, 15.5–21.5 × 10–12.5 cm,

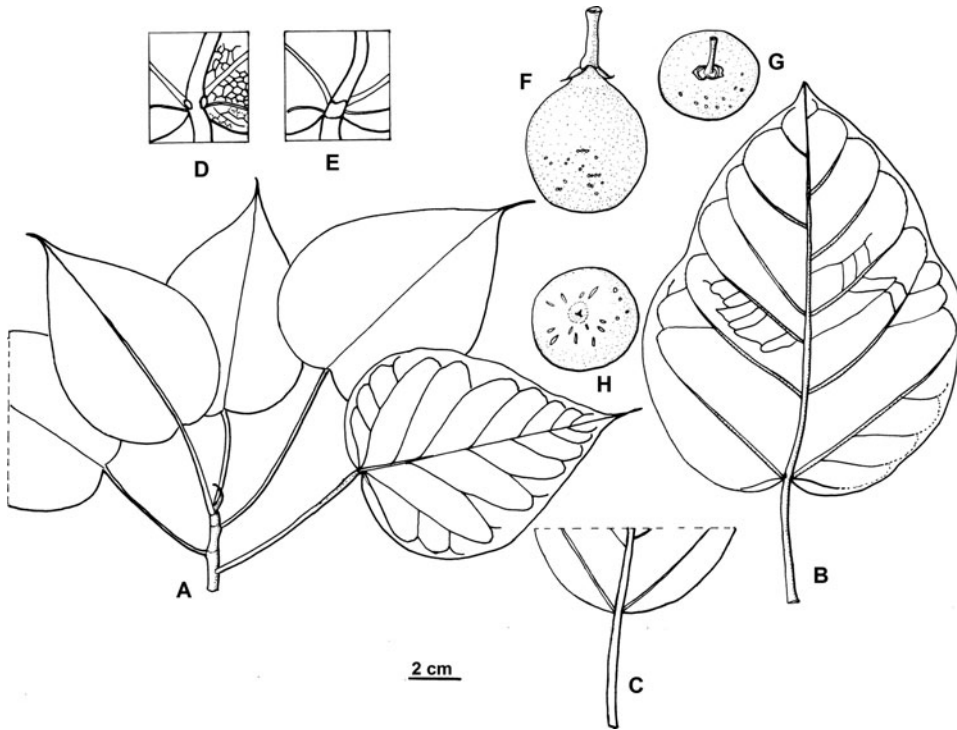


FIG. 16. *Ficus polita* Vahl subsp. *polita*. A, Leafy twig; B, leaf, lower surface; C, section of the lower surface of the leaf; D, enlarged section of the base of the lower surface of the lamina, showing two glandular spots at the junction of the midrib and the basal pair of lateral veins. The section also shows fine network formed by quaternary veins; E, enlarged section of the base of the lamina with a glandular spot at the base of the midrib on the lower surface; F, fig seen from the side; G, fig seen from below; H, ostiole. (A and G, *Ndolo Ebika*, S.T. 536; B–F and H, *Ndolo Ebika*, S.T. 105.)

glabrous above, hairy beneath; base cordate or rounded; apex with acumen up to 1.5 cm long. *Lateral veins* in 9–12 pairs (including 1 basal pair), looping at 3 mm from the margin. *Figs* in leaf axils, shortly pedunculate, oblong, 3.8×2 cm, hairy, green with whitish spots. *Peduncle* 5 mm long. *Basal bracts* 3. *Ostiole* an elongated slit.

Habitat. Mixed-species terra firma forest.

Specimens. Fay, J.M. 8732; Harris, D.J. 3628; *Ndolo Ebika*, S.T. 581, 1196.

13. *Ficus preussii* Warb., Fig. 18.

Berg *et al.*, Fl. Gabon 26: 229 (1984); Berg *et al.*, Fl. Cam. 28: 242 (1985); *Ndolo Ebika* 57 (2010).

Hemiepiphyte 10 m high. *Latex* white. *Stipules* persistent, $2.9\text{--}4 \times 0.8\text{--}1$ cm. *Leaves* entire, spirally arranged. *Petiole* glabrous, $1.3\text{--}4.8 \times 0.4\text{--}0.6$ cm, red once the periderm

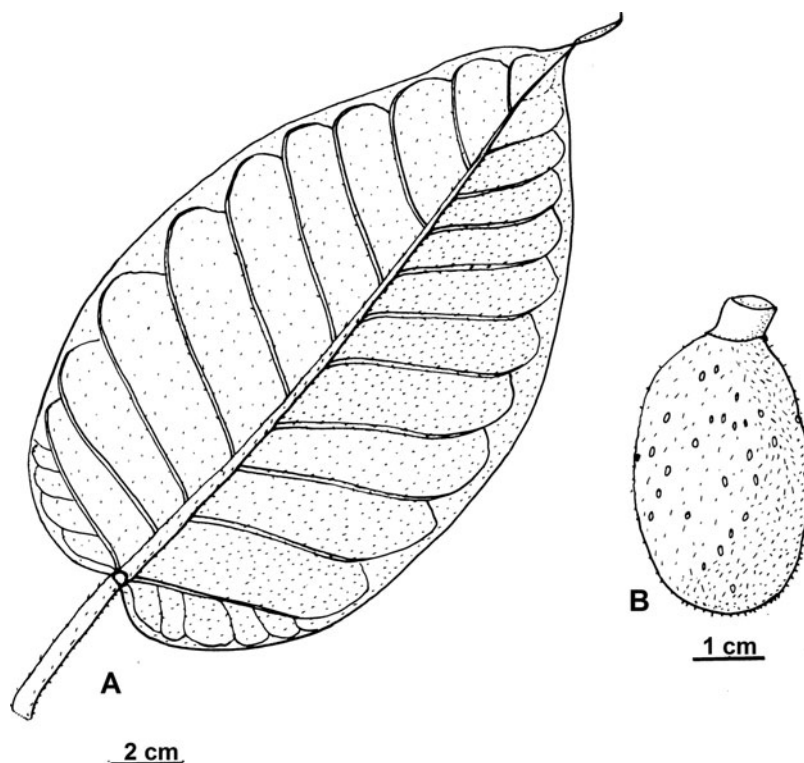


FIG. 17. *Ficus ovata* Vahl. A, Leaf, lower surface; B, fig. (A and B, *Ndolo Ebika*, S.T. 581.)

has flaked off when dry. *Lamina* oblanceolate, 11.3–34 × 4.8–12.8 cm, glabrous, leathery; base cordate; apex acuminate. *Lateral veins* in 5–7 pairs (including the basal pair), looping at 2 mm from the margin. *Figs* in the leaf axils, in pairs, sessile, globose, 5–6 cm in diameter when fresh, 3–5 cm when dry, hairy, green with prominent yellow spots. *Basal bracts* 2 (?). *Ostiole* an elongated slit.

Habitat. Mixed-species terra firma forest, *Gilbertiodendron dewevrei* forest on terra firma.

Specimens. Harris, D.J. 5537, 7743, 7744, 7747; *Ndolo Ebika*, S.T. 325.

According to the description in Berg & Wiebes (1992: 142, 150), *Ficus preussii* Warb. is close to *F. subsagittifolia* Mildbr. ex C.C.Berg in shape. The diagnostic characters of the two species are as follows. *Ficus preussii*: petiole 2.5–8.5 cm long; lateral veins in 6–8 (or 9) pairs; figs globose with yellow spots, 2.5–5 cm in diameter when fresh and 2–3 cm when dry, apex up to 5 mm protruding. *Ficus subsagittifolia*: petiole 1–5.5 cm long; lateral veins in 9–15 pairs; figs ± depressed-globose with white spots, 2.5–3.5 cm when dry, wall often wrinkled, apex plane.

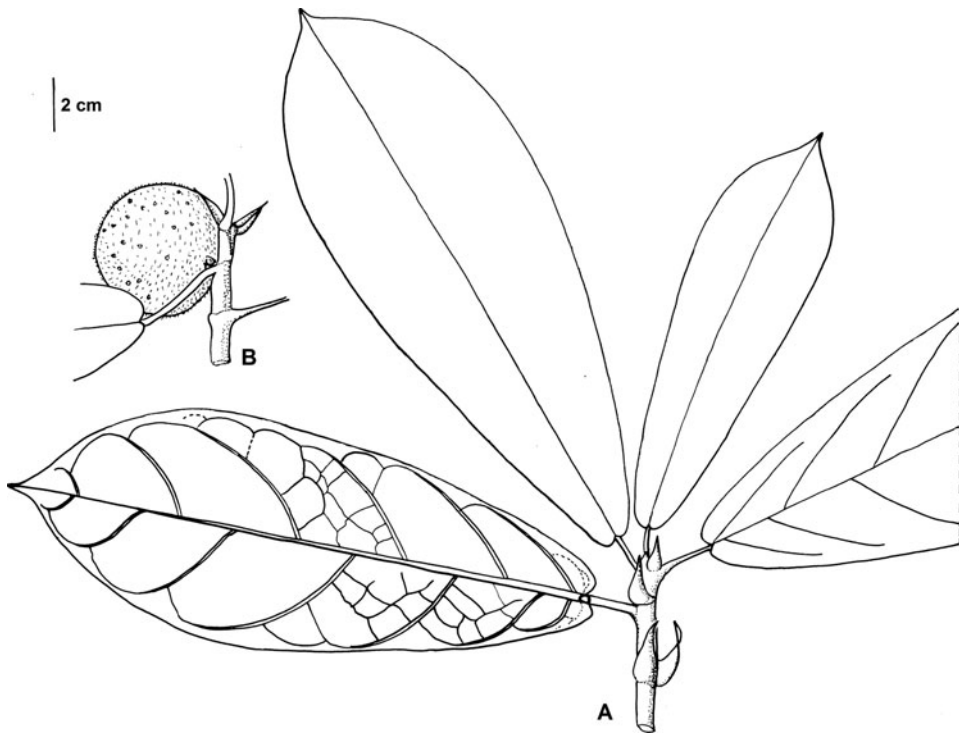


FIG. 18. *Ficus preussii* Warb. A, Leafy twig with persistent stipules; B, twig with a fig. (A and B, Ndolo Ebika, S.T. 325.)

14. *Ficus recurvata* De Wild., Fig. 19.

Berg & Wiebes 103 (1992); Harris & Wortley 80 (2008); Gillet & Doucet 18 (suppl.) (2012); Moutsamboté *et al.* 284 (1994); Ndolo Ebika 57 (2010).

Hemiepiphyte becoming a free-standing strangler 20 m high. *Base* with buttresses extending at ground level on snake-like roots. *Slash* brownish with white latex. *Stipules* caducous. *Leaves* entire, spirally arranged at the end of twigs. *Petiole* 4.5–11 × 0.3–0.4 cm, hairy, sometimes glabrous in old leaves. *Lamina* broadly elliptic, 10.5–22 × 7.5–13 cm, hairy on both surfaces but becoming glabrous above on old leaves; base cordate; apex rounded. *Lateral veins* in approximately 11 pairs including 2 basal pairs, looping at 1 mm from the margin. *Tertiary veins* parallel between them and almost perpendicular to the laterals. *Glandular spot* at the base of the petiole on the lower surface. *Figs* in leaf axils, in pairs, pedunculate, globose, 2–3 cm in diameter, hairy or glabrous. *Peduncle* hairy, 1.5–2.2 × 0.2 cm. *Basal bracts* 3 (4). *Ostiolar bracts* absent. *Ostiole* an elongated slit.

Habitat. Mixed-species terra firma forest, *Gilbertiodendron dewevrei* forest on terra firma.

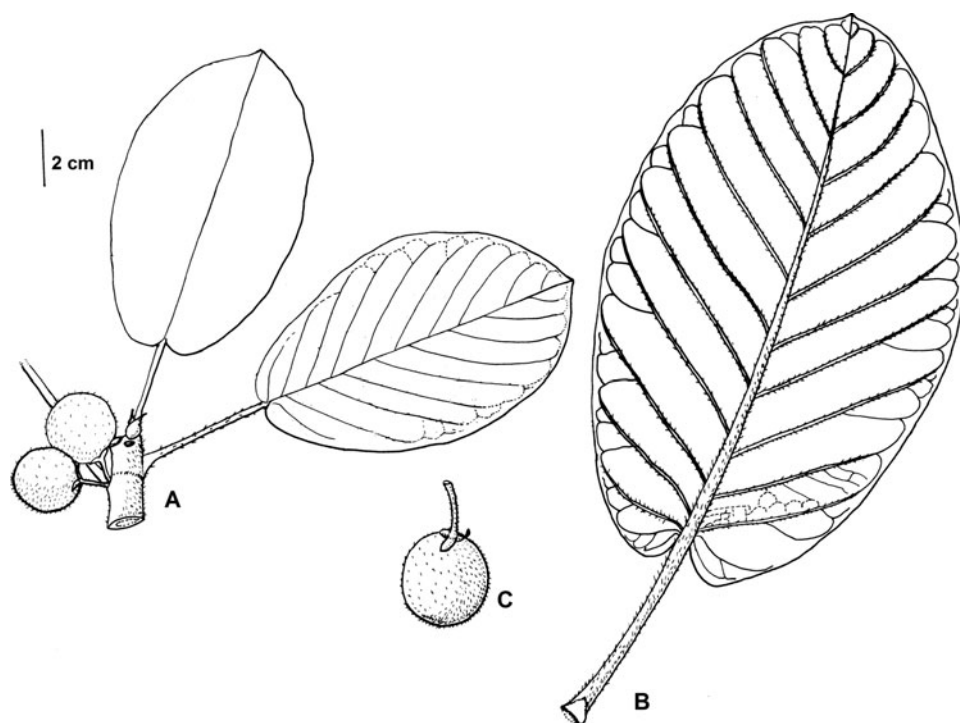


FIG. 19. *Ficus recurvata* De Wild. A, Leafy twig with axillary figs; B, leaf, lower surface with a glandular spot at the base of the petiole; C, fig. (A–C, *Ndolo Ebika*, S.T. 13.)

Specimens. Fangounda, J. 509; Fay, M.J. 8633; Harris, D.J. 4792, 5876, 6546, 8428; *Ndolo Ebika*, S.T. 13, 17, 1173.

Deciduous, with stipules falling off just before leaves appear.

15. *Ficus lutea* Vahl, Figs 2 and 20.

Berg & Wiebes 99 (1992); Harris 143 (2002); Harris & Wortley 77 (2008); *Ndolo Ebika* 53 (2010).

Hemiepiphyte becoming a free-standing strangler 20 m high. *Base* with buttresses extending at ground level on snake-like roots. *Latex* white. *Stipules* triangular, 4.5 × 1 cm, soon caducous, reddish on the outer surface and pale yellow on the inner surface. *Leaves* entire, spirally arranged. *Petiole* hairy to glabrous, 2.5–12 × 0.3–0.4 cm. *Lamina* lanceolate, elliptic or oblanceolate, 10.5–27.5 × 6.5–12 cm, leathery, glabrous; base rounded, cuneate or cordate; apex rounded to acute. *Midrib* sometimes not reaching the apex. *Lateral veins* prominent below, yellowish, in 7–13 pairs, looping at 2 mm from the margin. *Tertiary veins* reticulate. *Glandular spot* at the base of midrib on both surfaces: triangular and pinkish above; green and shiny beneath. *Figs* in leaf axils, in pairs, sessile, hairy or glabrous, oblong, 2 cm high and 1.5–2 cm wide when fresh, 0.6–1.9 cm in diameter when dry, green when unripe, yellow and then red when ripe. *Basal bracts* 4, fused. *Ostiolar bracts* absent. *Ostiole* a round pore.

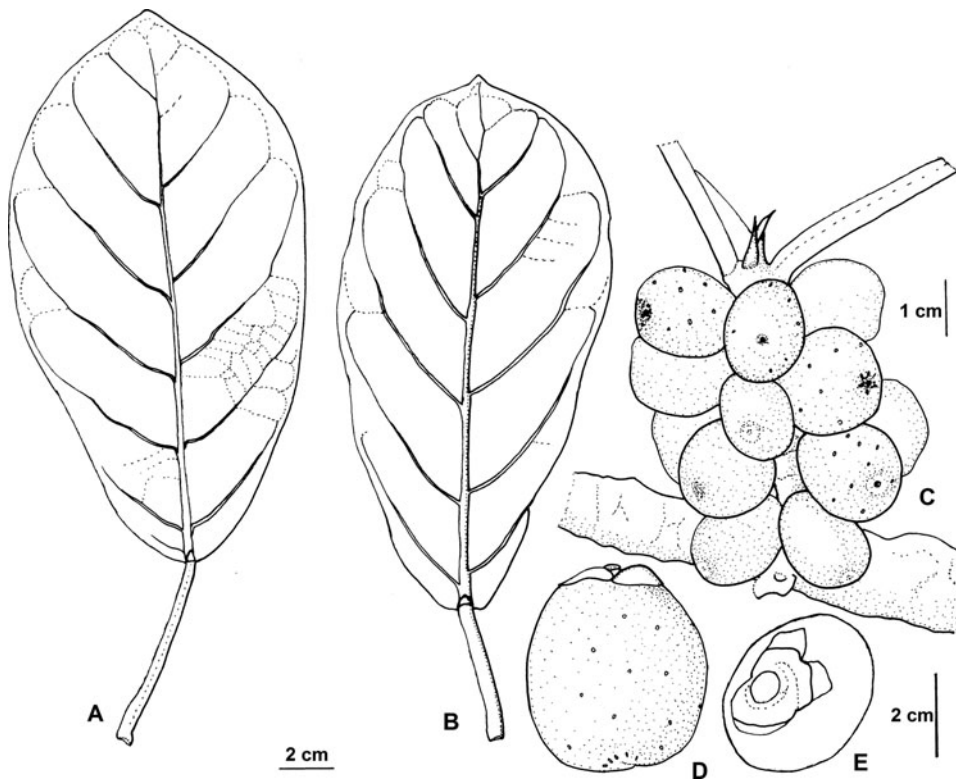


FIG. 20. *Ficus lutea* Vahl. A, Leaf from above with a glandular spot at the base of the midrib; B, leaf seen from below with a glandular spot at the base of the midrib; C, twig with figs; D, fig seen from the side; E, fig seen from below. (A–D, Ndolo Ebika, S.T. 308.)

Habitat. Mixed-species terra firma forest, *Gilbertiodendron dewevrei* forest on terra firma.

Specimens. Harris, D.J. 1529, 5301, 5331; Ndolo Ebika, S.T. 308, 967.

Deciduous, with stipules falling off just before leaves appear.

16. *Ficus wildemaniana* Warb., Fig. 21.

Berg & Wiebes 150 (1992); Harris 145 (2002); Harris & Wortley 82 (2008); Gillet & Doucet 18 (suppl.) (2012); Ndolo Ebika 61 (2010).

Hemiepiphyte becoming a free-standing strangler 10 m high. *Latex* white oxidising to yellowish. *Stipules* triangular, 7–11 × 3–3.5 cm, dark red on the outer side, whitish with red spots on the inner surface, glabrous, soon caducous. *Leaves* entire, spirally arranged at the end of twigs. *Petiole* 0.5–8 × 0.4–1.3 cm, glabrous. *Lamina* elliptic, 11.3–53 × 4–16.5 cm, glabrous, leathery; base cuneate or cordate; apex shortly acuminate. *Lateral veins* in 8–14 pairs. *Glandular spot* at the base of the midrib on the lower surface. *Figs* in the leaf axils, in pairs, sessile, subglobose, 1.5–5.2 cm in diameter, hairy, dark green

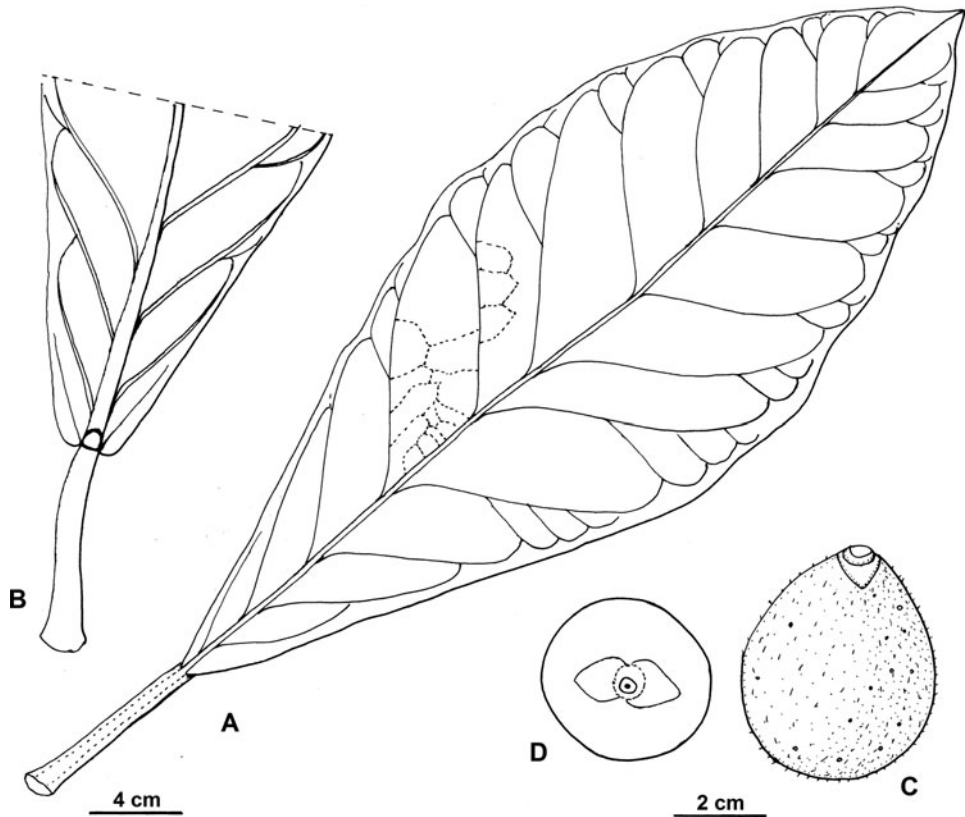


FIG. 21. *Ficus wildemaniana* Warb. A, Leaf, upper surface; B, section of the bottom part of the leaf seen from below; C, fig seen from the side; D, fig seen from below. (A–D, *Ndolo Ebika, S.T. 12.*)

with red spots when unripe, red when ripe, wrinkled when dry. *Basal bracts* 2, persistent. *Ostiole* a round pore.

Habitat. Mixed-species terra firma forest, *Gilbertiodendron dewevrei* forest on terra firma.

Specimens. *Fay, M.J.* 8559; *Harris, D.J.* 1982, 4284, 6108, 7531, 7674, 7723; *Ndolo Ebika, S.T.* 12, 14, 88, 855, 1187.

A deciduous *Ficus* species with stipules falling off just before leaves appear. Young leaves red, yellowish then pale green.

17a. *Ficus natalensis* Hochst. subsp. *leprieurii* (Miq.) C.C.Berg. Fig. 22.

Berg & Wiebes 122 (1992); Harris 143 (2002); Harris & Wortley 78 (2008).

Hemiepiphyte up to 12 m high. *Latex* white. *Stipules* caducous. *Leaves* opposite, in whorls or pseudowhorls of 3, sometimes alternate. *Petiole* 0.5–2 cm long. *Lamina*

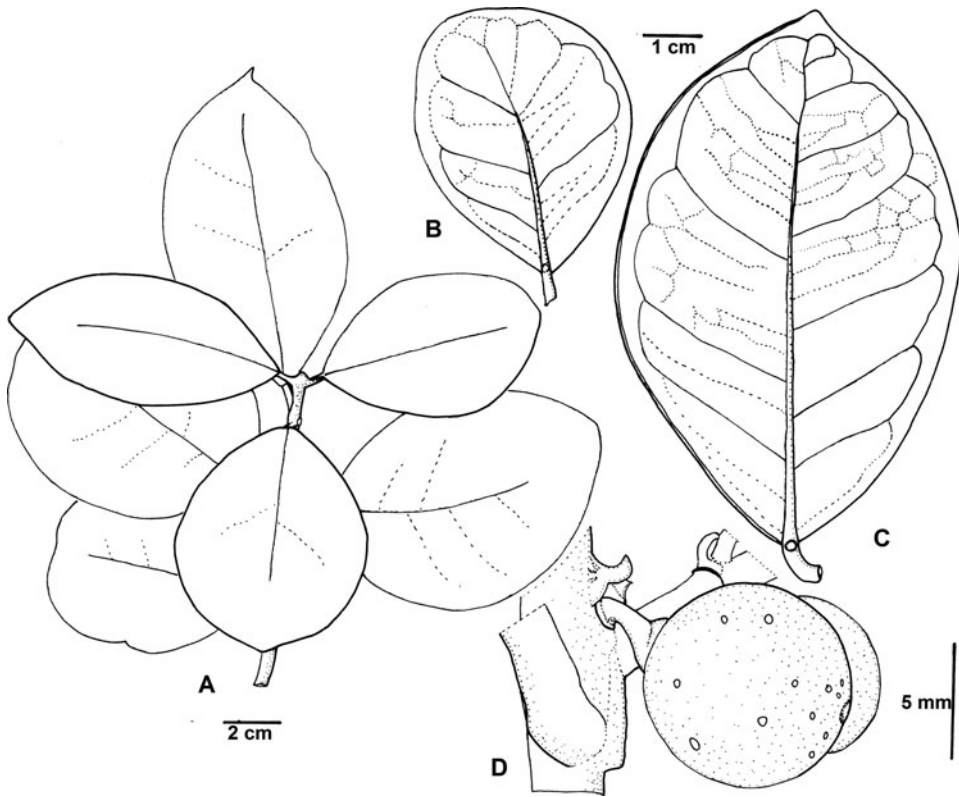


FIG. 22. *Ficus natalensis* Hochst. subsp. *leprieurii* (Miq.) C.C.Berg. A, Leafy twig; B and C, variation in shape and size of leaves; D, twig with figs. (A–D, *Ndolo Ebika*, S.T. 1093.)

broadly elliptic or obtriangular, 3–11 × 2–5.5 cm; base rounded or minutely cordate; apex rounded or obtuse; margin revolute. *Midrib* not reaching the apex of the lamina. *Lateral veins* in 5–9 pairs, nearly perpendicular to the midrib, looping at 3 mm from the margin. *Tertiary veins* parallel and branched between the lateral veins. *Glandular spot* at the base of the midrib. *Figs* in leaf axils, in pairs, pedunculate, globose, 6–8 mm in diameter, yellow with orange spots when unripe, red when ripe, wrinkled when dry. *Peduncle* 0.4–0.7 cm long. *Basal bracts* caducous. *Ostiolar bracts* absent. *Ostiole* a round pore.

Habitat. Mixed-species terra firma forest, swamp, riparian forest.

Specimens. Harris, D.J. 286, 892, 4943; *Ndolo Ebika*, S.T. 1093.

Ficus natalensis subsp. *leprieurii* differs from *F. natalensis* subsp. *natalensis* in having a revolute margin, a wider and less crowded space between adjacent lateral veins and an angle of 70–90° between the midrib and lateral veins.

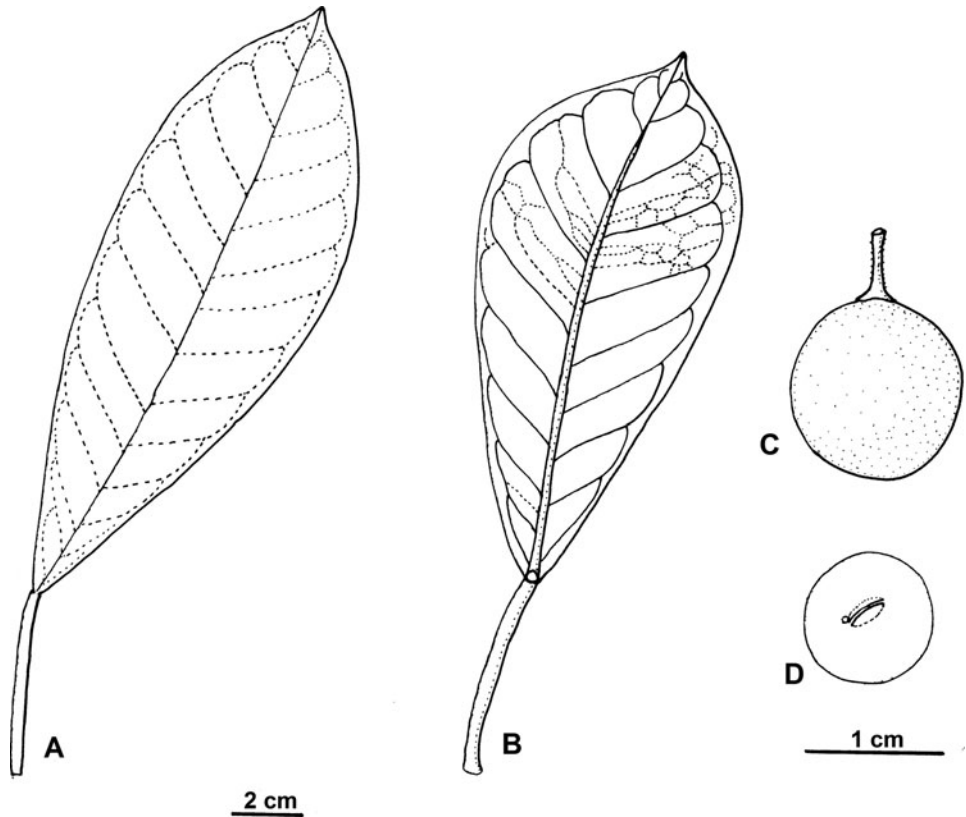


FIG. 23. *Ficus natalensis* Hochst. subsp. *natalensis*. A and B, Leaves, upper and lower surfaces, respectively; C, fig; D, ostiole.

17b. *Ficus natalensis* Hochst. subsp. *natalensis*, Fig. 23.

Berg & Wiebes 121 (1992); Ndolo Ebika 53 (2010).

Hemiepiphyte 25 m high. *Latex* white. *Stipules* caducous. *Leaves* spirally arranged. *Petiole* glabrous, 1.6–3 × 0.2 cm, channelled above. *Lamina* elliptic, oblanceolate, sometimes obtriangular, 6.8–11 × 2.2–5.5 cm; base cuneate or minutely cordate; apex rounded to acute. *Midrib* sometimes not reaching the apex of the lamina. *Lateral veins* in 9–13 pairs, looping at c.2 mm from the margin. *Glandular spot* at the base of the midrib on the lower surface. *Figs* in the leaf axils, solitary or in pairs, pedunculate, globose, 1.2–1.8 cm in diameter, green when unripe, yellow with a few yellowish spots when ripe. *Peduncle* 0.3–0.5 cm long. *Basal bracts* 3, soon caducous. *Ostiolar bracts* absent. *Ostiole* an elongated slit.

Habitat. Mixed-species terra firma forest; *Gilbertiodendron dewevrei* forest on terra firma.

Specimens. Ndolo Ebika, S.T. 80, 285, 476, 816, 839, 850, 1119.

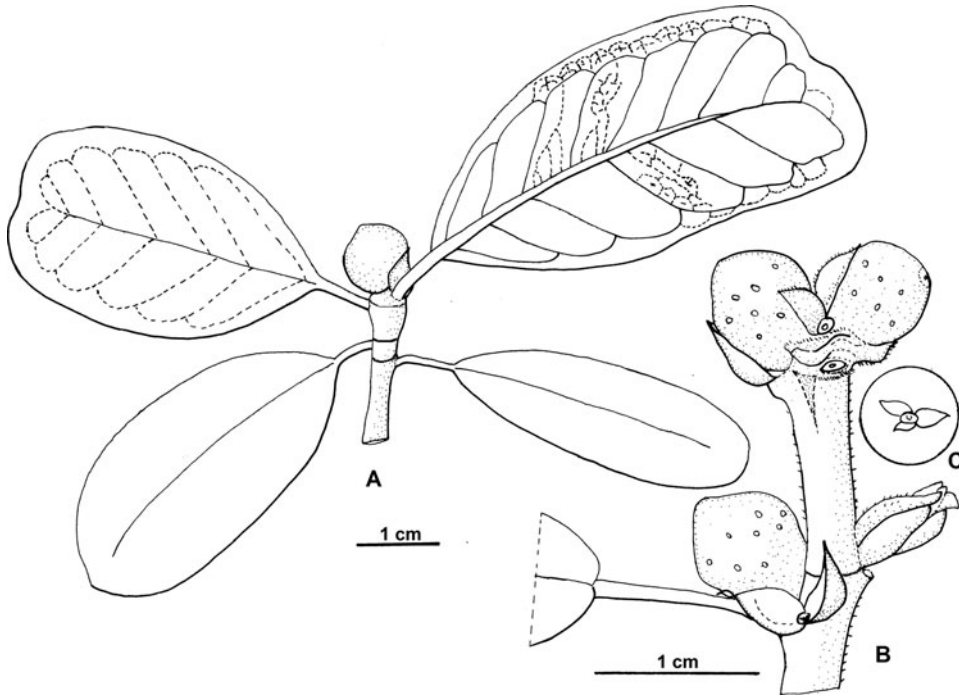


FIG. 24. *Ficus craterostoma* Warb. ex Mildbr. & Burret. A, Leafy twig with a fig; B, twig with axillary figs and calyprate bud covers; C, fig seen from below. (A–C, Ndolo Ebika, S.T. 312.)

Ficus natalensis subsp. *natalensis* differs from *F. natalensis* subsp. *leprieurii* in not having a revolute margin, having a narrower and more crowded space between adjacent lateral veins, and having an angle of 20–70° between the midrib and lateral veins.

18. *Ficus craterostoma* Warb. ex Mildbr. & Burret, Fig. 24.

Berg *et al.*, Fl. Gabon 26: 170 (1984); Gillet & Doucet 18 (suppl.) (2012); Ndolo Ebika 48 (2010).

Hemiepiphyte 20 m high. *Latex* white. *Stipules* persistent, hairy. *Leaves* entire, spirally arranged. *Petiole* glabrous, 1–1.8 × 0.1 cm. *Lamina* obtriangular to elliptic, 3.8–8.9 × 2.5–3.2 cm; base cuneate; apex emarginate or acute. *Midrib* not reaching the apex of the lamina. *Lateral veins* in 8–14 pairs, looping at 2–3 mm from the margin. *Glandular spots* absent. *Figs* in leaf axils, sessile, in pairs, subglobose, up to 0.6 cm in diameter, wrinkled when dry, shortly hairy, green when unripe with yellow spots. *Basal bracts* 3, shortly hairy, 8 mm long. *Ostiolar bracts* absent. *Ostiole* a prominent and elongated slit.

Habitat. Mixed-species terra firma forest.

Specimens. Ndolo Ebika, S.T. 312, 1125.

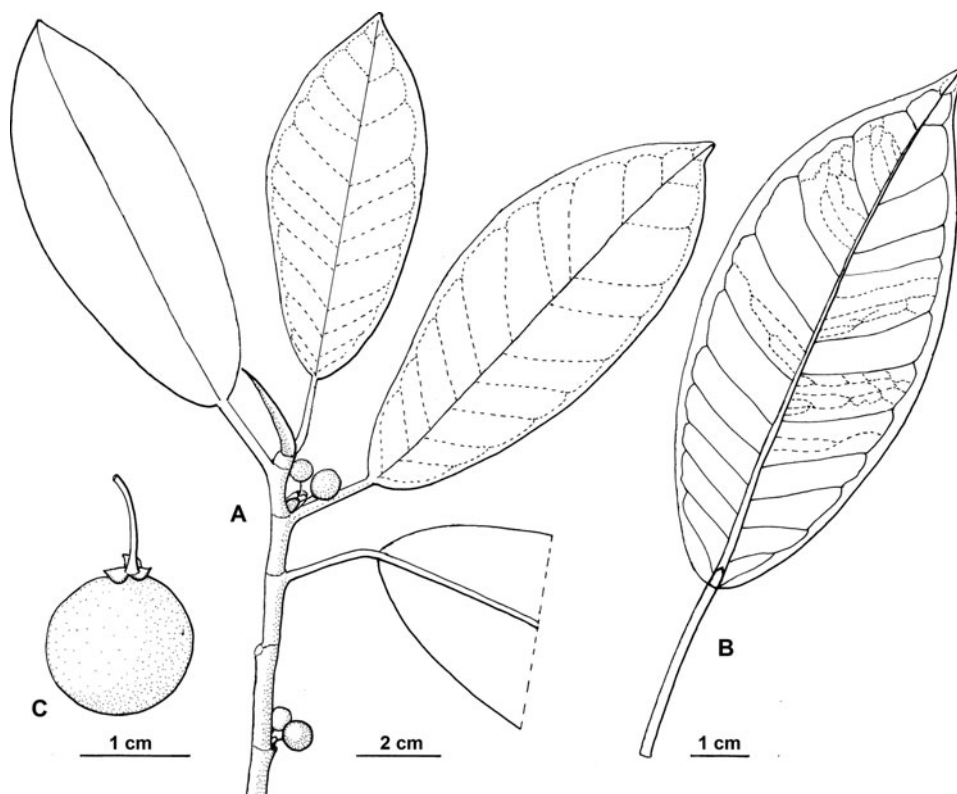


FIG. 25. *Ficus thonningii* Blume. A, Leafy twig with axillary figs; B, leaf, lower surface; C, fig. (A–C, *Ndolo Ebika, S.T.* 819.)

Deciduous. Young leaves reddish, pink and yellowish.

19. *Ficus thonningii* Blume, Fig. 25.

Berg & Wiebes 127 (1992); Gillet & Doucet 18 (suppl.) (2012); Harris 145 (2002); Moutsamboté *et al.* 284 (1994).

Hemiepiphyte up to 15 m high. *Latex* white. *Stipules* caducous. *Terminal bud* persistent, glabrous. *Leaves* entire, spirally arranged. *Petiole* 1.5–3.5 cm long, channelled above. *Lamina* elliptic, 7–13 × 3–4.7 cm; base rounded or cordate; apex shortly acuminate. *Lateral veins* in 10–15 pairs. *Tertiary veins* reticulate. *Quaternary veins* ending in terminal open branches. *Glandular spot* at the base of the midrib on the lower surface. *Figs* in leaf axils, in pairs or up to 4 together, pedunculate, globose, 7 mm in diameter, yellowish when ripe. *Peduncle* 6 mm long. *Basal bracts* 3, persistent. *Ostiolar bracts* absent. *Ostiolar pore* a round pore.

Habitat. Mixed-species terra firma forest.

Specimens. Fay, *J.M.* 8609; *Ndolo Ebika, S.T.* 819.

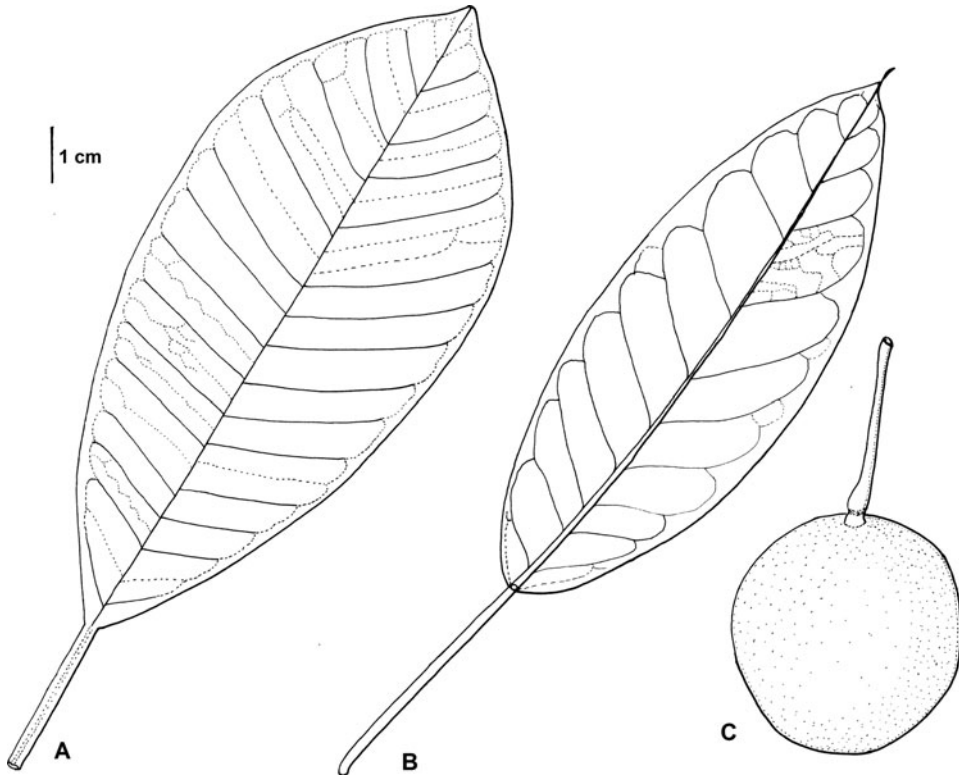


FIG. 26. *Ficus sansibarica* subsp. *macrosperma* (Warb. ex Mildbr. & Burret) C.C.Berg. A, Leaf, upper surface; B, leaf, lower surface; C, fig. (A, *Ndolo Ebika*, S.T. 421; B and C, *Ndolo Ebika*, S.T. 851.)

20. *Ficus sansibarica* subsp. *macrosperma* (Warb. ex Mildbr. & Burret) C.C.Berg, Fig. 26.

Berg 94 (1988); Berg & Wiebes 162 (1992); Harris & Wortley 80 (2008).

Ficus macrosperma Warb. ex Mildbr. & Burret, Berg & Wiebes 162 (1992).

Hemiepiphyte 20 m high. *Latex* white. *Stipule* linear, 5.7×0.7 cm, soon caducous. *Leaves* entire, spirally arranged. *Petiole* $1.3\text{--}4.5 \times 0.2$ cm long. *Lamina* elliptic or oblanceolate, $6.5\text{--}15.5 \times 3\text{--}6.4$ cm; base rounded; apex rounded or acuminate. *Lateral veins* in 7–14 pairs, looping at 2 mm from the margin. *Glandular spots* at the base of the midrib on the lower surface. *Figs* on spurs on the main branches, in pairs or in groups of more than 4, pedunculate, globose, 4–6 cm when fresh, 3–3.5 cm when dry, remaining green when ripe, hairy. *Peduncle* hairy, 2–3.5 cm long. *Basal bracts* caducous. *Ostiolar bracts* absent. *Ostiole* a round pore.

Habitat. Mixed-species terra firma forest.

Specimens. Harris, D.J. 3601, 4791; *Ndolo Ebika*, S.T. 421, 851.

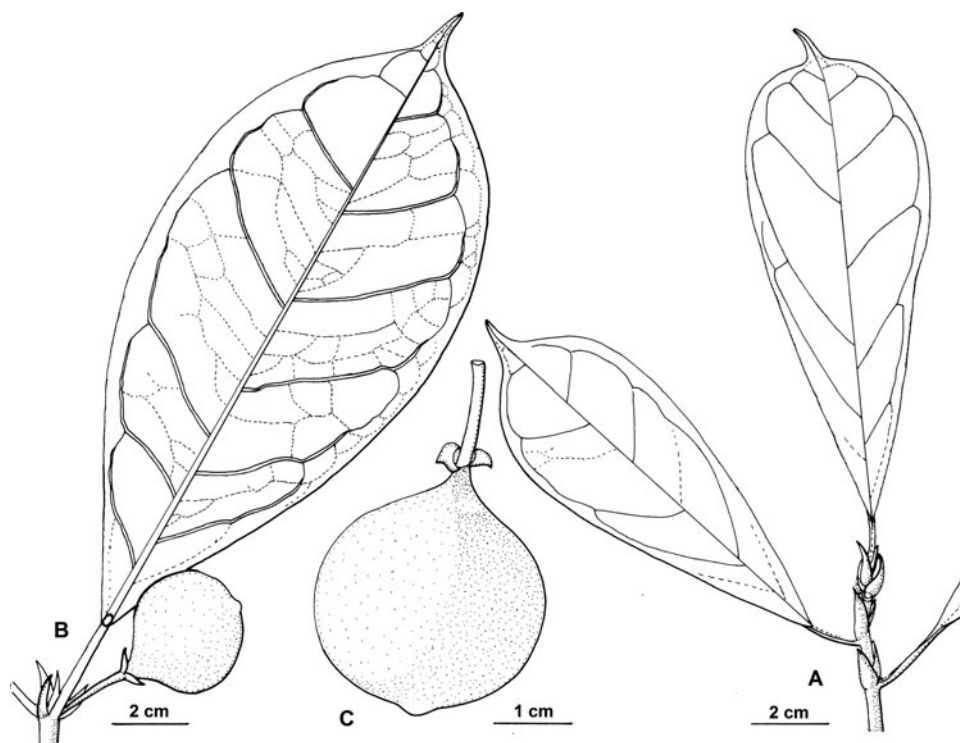


FIG. 27. *Ficus cyathistipula* Warb. subsp. *cyathistipula*. A, Leafy twig; B, fig in the leaf axils; C, fig. (A, Harris 1151; B and C, Harris 7748.)

Deciduous, with stipules falling off just before leaves appear.

21. *Ficus cyathistipula* Warb. subsp. *cyathistipula*, Fig. 27.

Berg & Wiebes 143 (1992); Harris 142 (2002); Harris & Wortley 75 (2008).

Hemiepiphyte. *Stipules* forming a sheath around the twig, 1.2–2.2 cm long, persistent. *Leaves* entire, alternate. *Petiole* 0.8–4 cm long, slightly channelled above. *Lamina* elliptic to oblanceolate, 6.5–18 × 2.7–8 cm, leathery; base acute; apex acuminate, 0.5–1.3 cm long, straight to curved on one side. *Lateral veins* in 5–7 pairs, looping 1–5 mm from the leaf margin. *Tertiary veins* reticulate. *Quaternary veins* scaliform. *Glandular spot* at the base of the midrib. *Figs* in leaf axils, solitary, pedunculate, globose, 2.6–3.5 cm in diameter, cuneate (3 mm long) at the base, green, soft and spongy. *Peduncle* 1.6–1.9 cm long. *Basal bracts* 2, persistent. *Ostiolar bracts* absent. *Ostiole* a prominent round pore.

Habitat. Riparian forest with *Uapaca heudelotii* Baill. and *Irvingia smithii* Hook.f.

Specimens. Harris, D.J. 1151, 7748, 7876.

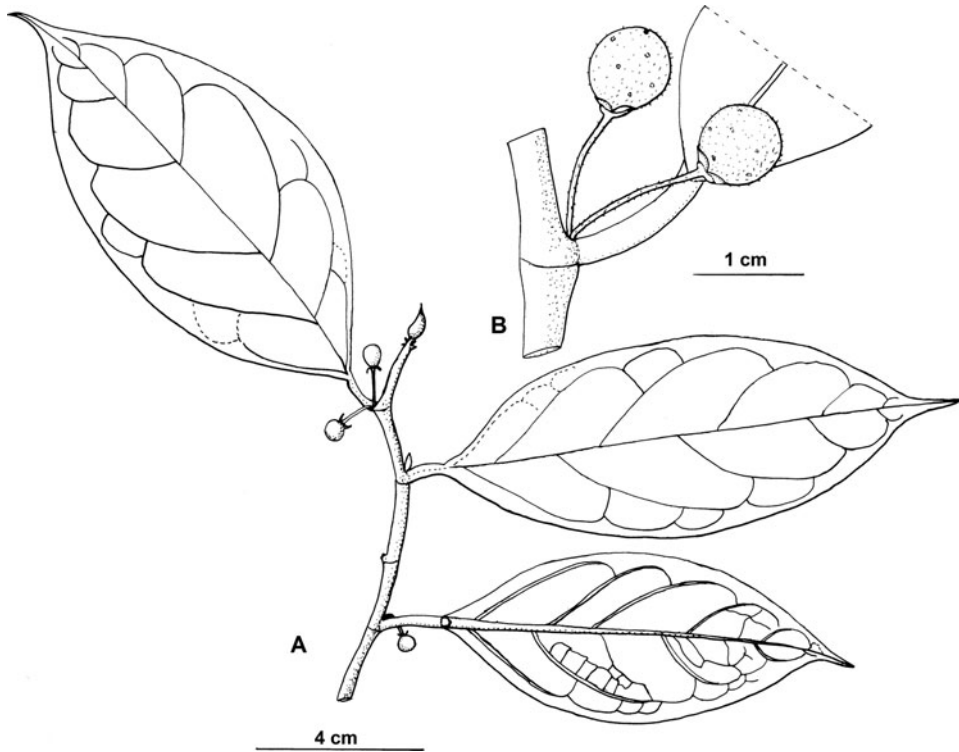


FIG. 28. *Ficus ardisioides* Warb. subsp. *ardisioides*. A, Leafy twig; B, figs in the leaf axils. (A and B, Ndolo Ebika, S.T. 358.)

Young leaves pinkish.

22. *Ficus ardisioides* Warb. subsp. *ardisioides*, Fig. 28.

Berg & Wiebes 141 (1992); Ndolo Ebika 46 (2010).

Hemiepiphyte 8 m high. *Sap* clear, oxidising to yellow. *Stipules* caducous. *Leaves* entire, alternate. *Petiole* glabrous, 1.2×0.3 cm. *Lamina* variable in shape: asymmetric, broadly elliptic or subovate, $9.3\text{--}15 \times 4.2\text{--}6.1$ cm, leathery; base unequal or cuneate; apex acuminate. *Lateral veins* in 5 or 6 pairs. *Tertiary veins* less conspicuous below, reticulate with greenish spots in each network. *Glandular spot* at the base of the midrib. *Figs* in leaf axils, in pairs or triplets, shortly hairy, pedunculate, globose, 7 mm in diameter when fresh, 5 mm and smooth when dry, yellow with red spots when ripe. *Peduncle* 1.3 cm long. *Basal bracts* 2. *Ostiolar bracts* absent. *Ostiole* an elongated slit.

Habitat. Mixed-species terra firma forest.

Specimen. Ndolo Ebika, S.T. 358.

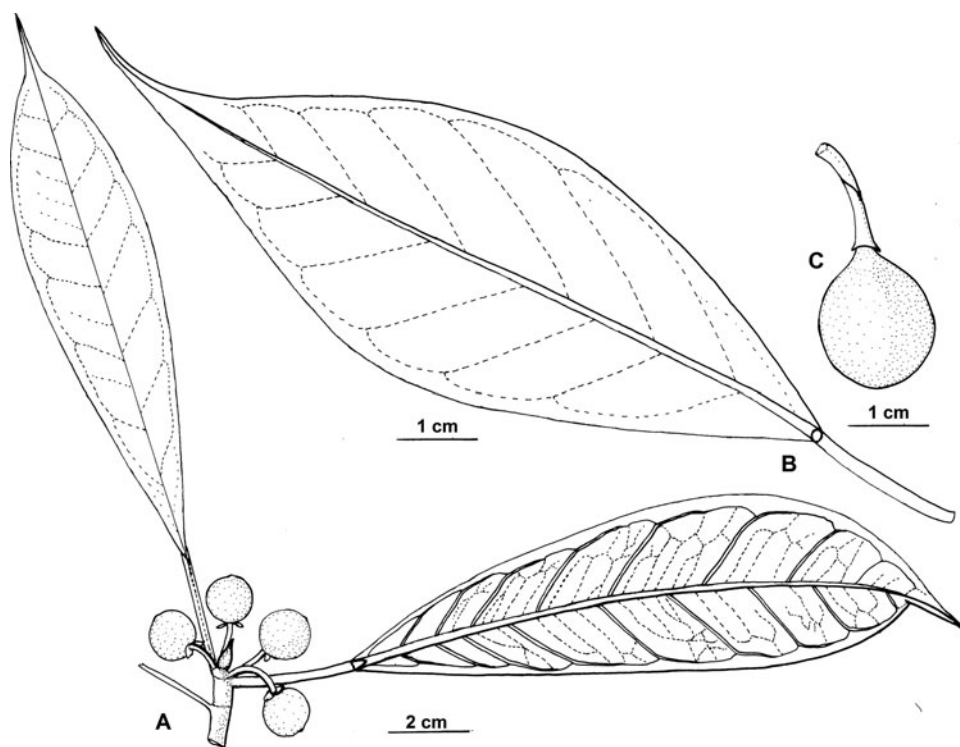


FIG. 29. *Ficus barteri* Sprague. A, leafy twig with axillar figs; B, leaf, lower surface; C, fig. (A, Harris 1848; B and C, Ndolo Ebika, S.T. 473.)

23. *Ficus barteri* Sprague, Fig. 29.

Berg *et al.*, Fl. Cam. 28: 190 (1985); Gillet & Doucet 18 (suppl.) (2012); Harris & Wortley 73 (2008); Moutsamboté *et al.* 284 (1994).

Hemiepiphyte. Latex white. Stipules caducous. Leaves entire, spirally arranged. Petiole glabrous, 2.2–3 cm long, slightly channelled above. Lamina narrowly elliptic-oblong to elliptic, 10–16 × 2.5–6 cm, leathery; base cuneate; apex acuminate, 1–1.5 cm long. Lateral veins in 9–12 pairs, looping at 2–3 mm from the margin. Tertiary veins parallel to the lateral and reticulate. Glandular spot at the base of the midrib. Figs in the leaf axils, in pairs, pedunculate, globose, 1.1–1.5 cm in diameter, yellow with red dots when ripe, smooth when dry. Peduncle 0.8–1.5 cm long. Basal bracts 2, 2 mm long and 4 mm wide at base, persistent or caducous leaving circular ring. Ostiolar bracts absent. Ostiole a prominent, elongated slit.

Habitat. Mixed-species terra firma forest, riparian forest with *Uapaca heudelotii* and *Irvingia smithii*.

Specimens. Harris, D.J. 1848, 5133; Ndolo Ebika, S.T. 473.

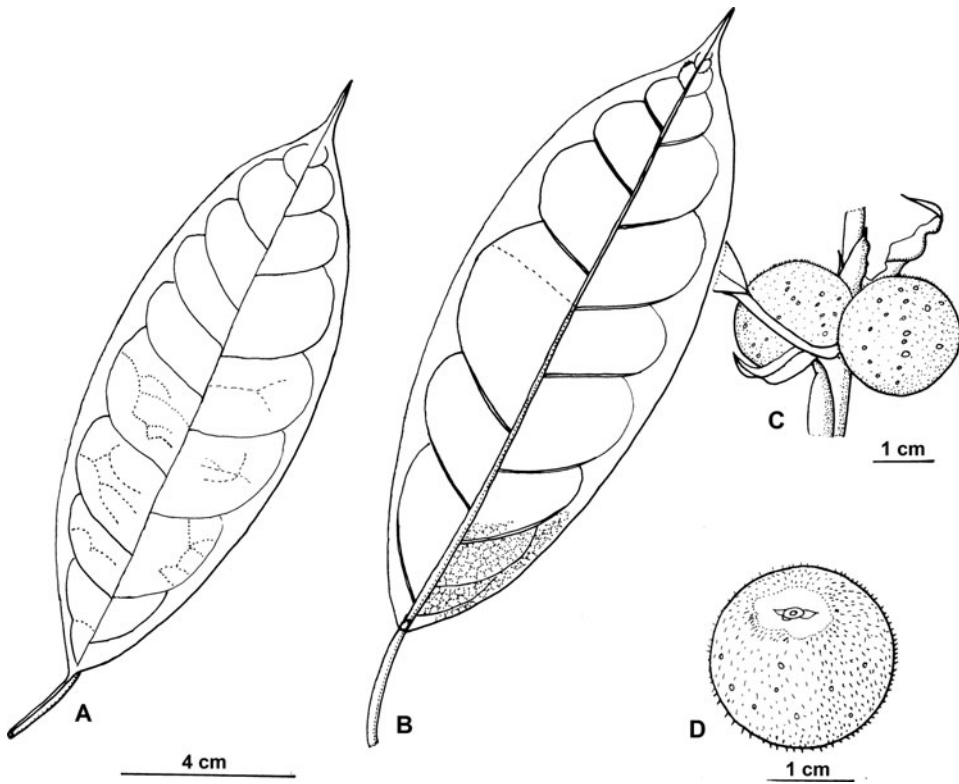


FIG. 30. *Ficus conraui* Warb. A and B, Leaves, upper and lower surfaces, respectively; C, portion of a twig with persistent stipules and axillary figs; D, fig seen from below. (A–D, Ndolo Ebika, S.T. 849.)

24. *Ficus conraui* Warb., Fig. 30.

Berg & Wiebes 139 (1992); Harris & Wortley 74 (2008).

Hemiepiphyte. *Latex* white. *Stipules* triangular, 2×0.7 cm, persistent. *Leaves* entire, spirally arranged. *Petiole* 2–4 cm long. *Lamina* elliptic, $11\text{--}25 \times 3.5\text{--}8.7$ cm, leathery; base cuneate or rounded; apex acuminate, 1.5–2.4 cm long. *Lateral veins* in 8–14 pairs, more or less perpendicular to the midrib, looping at 4–6 mm from the margin. *Tertiary veins* parallel to the lateral veins. *Quaternary veins* forming a small network. *Figs* in leaf axils, in pairs, sessile, hairy, globose, 2–2.2 cm in diameter, green with pale green spots, remaining green when ripe. *Basal bracts* 3, persistent. *Ostiolar bracts* absent. *Ostiole* a round pore.

Habitat. Mixed-species terra firma forest.

Specimens. Harris, D.J. 4738; Ndolo Ebika, S.T. 849.

25. *Ficus adolfi-friderici* Mildbr., Fig. 31.

Berg & Wiebes 137 (1992); Ndolo Ebika 45 (2010).

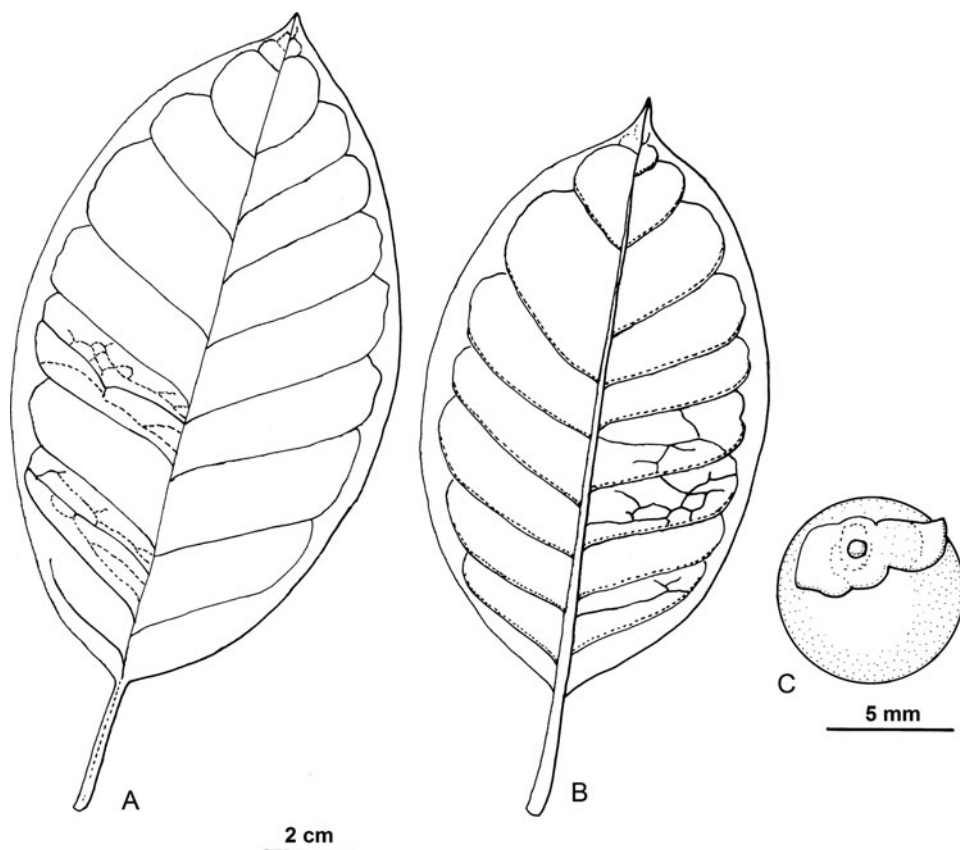


FIG. 31. *Ficus adolfi-friderici* Mildbr. A and B, leaves, upper and lower surfaces, respectively; C, fig. (A–C, *Ndolo Ebika*, S.T. 208.)

Hemiepiphyte. *Latex* white. *Stipules* 5–8.5 × 1.1–1.5 cm, milky white, shiny on the inner surface, soon caducous. *Leaves* entire, spirally arranged. *Petiole* channelled above, 1.7–3.5 × 0.2–0.3 cm, glabrous. *Lamina* elliptic, 7.3–17.5 × 4.5–9 cm, leathery; base rounded; apex shortly acuminate. *Lateral veins* in 9 pairs. *Glandular spots* absent. *Figs* in leaf axils, sessile, glabrous, subglobose, 8 mm in diameter when fresh, 6 mm and smooth when dry, yellow when ripe. *Basal bracts* 2, persistent. *Ostiolar bracts* absent. *Ostiole* an elongated slit.

Habitat. Mixed-species terra firma forest.

Specimen. *Ndolo Ebika*, S.T. 208.

Deciduous, with stipules falling off just before leaves appear. Young leaves pale green to yellowish.

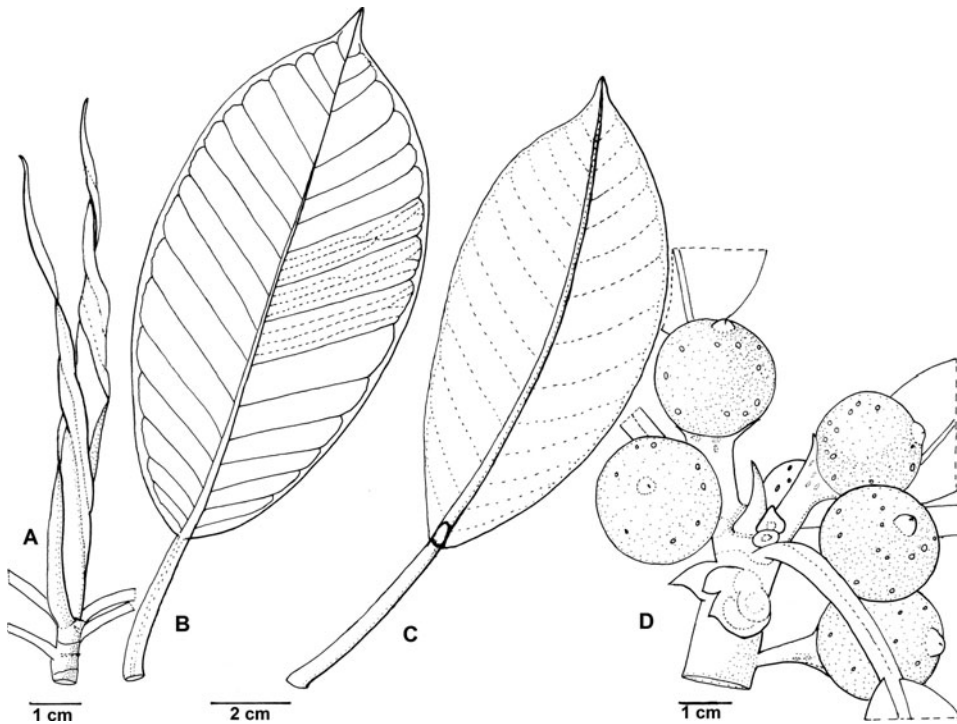


FIG. 32. *Ficus elasticoides* De Wild. A, A young twig with two stipules; B and C, leaves, upper and lower surfaces, respectively; D, twig with axillary figs. (A–D, *Ndolo Ebika*, S.T. 11.)

26. *Ficus elasticoides* De Wild., Fig. 32.

Berg & Wiebes 133 (1992); Gillet & Doucet 18 (suppl.) (2012); Harris & Wortley 75 (2008); Moutsamboté *et al.* 284 (1994); Ndolo Ebika 51 (2010).

Hemiepiphyte becoming a free-standing strangler 25 m high. *Base* often with small buttresses. *Latex* white oxidising to yellowish. *Stipule* reddish on the outer surface and whitish on the inner, 4–10 × 0.4–1.5 cm, soon caducous. *Leaves* entire, spirally arranged. *Petiole* glabrous, 2–6.2 cm long, 4 mm broad. *Lamina* elliptic, 8.2–22 × 4.7–9.5 cm; base rounded to cuneate; apex acuminate, 6–8 mm long. *Lateral veins* in 16–21 pairs, looping at 2 mm from the margin. *Tertiary veins* parallel to the lateral and sometimes poorly distinguished from the laterals. *Glandular spot* at the base of the midrib below, sometimes inconspicuous. *Figs* in the leaf axils, in pairs, pedunculate, globose, 3 cm in diameter when fresh and 1.4–2.5 cm when dry, green when unripe and yellowish to reddish with yellow spots when ripe. *Peduncle* 0.8–1.2 × 0.4 cm long. *Basal bracts* 3, persistent. *Ostiolar bracts* absent. *Ostiole* a prominent elongated slit.

Habitat. Mixed-species terra firma forest, *Gilbertiodendron dewevrei* forest on terra firma.

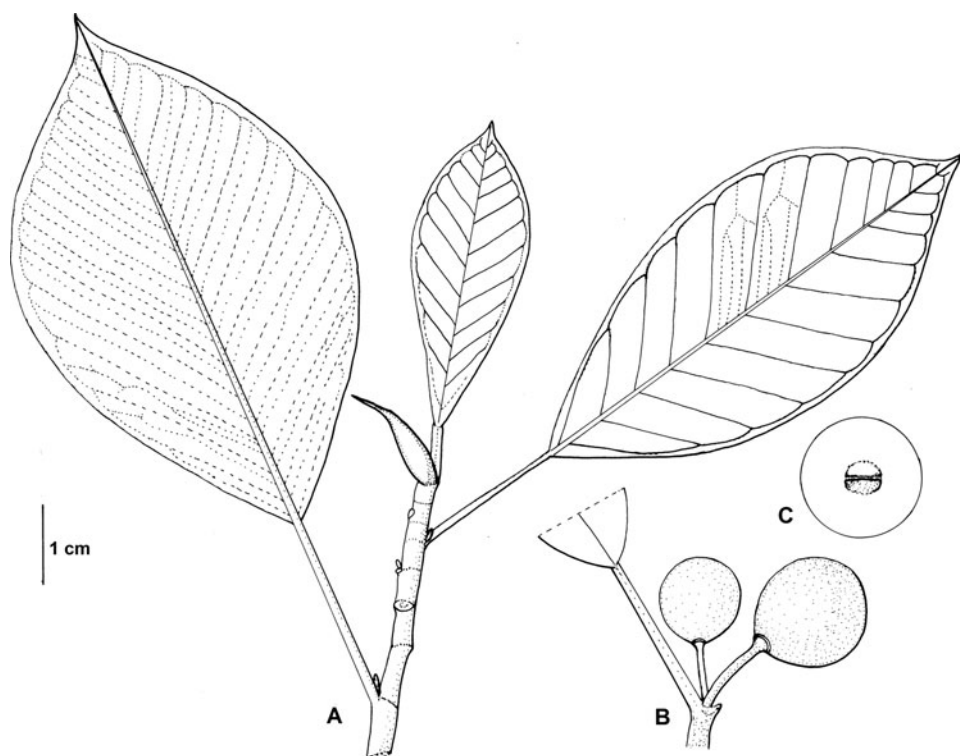


FIG. 33. *Ficus burretiana* Mildbr. & Hutch. A, Leafy twig; B, figs in the leaf axils; C, ostiole. (A–C, *Ndolo Ebika*, S.T. 456).

Specimens. Harris, D.J. 4612, 4778, 5837, 6101, 6692; Moukassa, G. 1579; *Ndolo Ebika*, S.T. 11, 297; *Nzolani Silaho*, F.O. 3305, 3464.

Deciduous, with stipules falling off just before the leaves appear. Young leaves pale green.

27. *Ficus burretiana* Mildbr. & Hutch., Fig. 33.

Berg & Wiebes 134 (1992); *Ndolo Ebika* 46 (2010).

Hemiepiphyte becoming free-standing strangler, 25 m high. *Base* with buttresses. *Latex* white. *Stipules* caducous. *Leaves* entire, alternate to spirally arranged. *Petiole* glabrous, 1–3.5 × 0.1 cm long, slightly channelled above. *Lamina* elliptic, 5–8.5 × 2.4–4 cm, glabrous; base rounded to cuneate, slightly cordate or faintly asymmetric; apex shortly acuminate; margin sometimes pale yellow when dry. *Lateral veins* in 11 or 12 pairs, looping at 1 mm from the margin. *Tertiary veins* parallel to the lateral. *Glandular spots* absent. *Figs* in leaf axils, in pairs, pedunculate, globose, 0.6–1.2 cm in diameter, wrinkled when dry, green when unripe and yellowish when ripe. *Peduncle* 0.4–1.2 cm long. *Basal bracts* 2, caducous. *Ostiolar bracts* absent. *Ostiole* an elongated slit.

Habitat. Mixed-species terra firma forest, *Gilbertiodendron dewevrei* forest on terra firma.

Specimens. Fay, J.M. 8637; Harris, D.J. 714, 7007; Ndolo Ebika, S.T. 20, 125, 293, 456, 1171; Nzolani Silaho, F.O. 2618.

Deciduous. *Ficus burretiana* looks like *F. elasticoides* in shape and venation but the leaves and figs are smaller and there are no glandular spots at all.

DISCUSSION

Compared with other speciose genera of vascular plants in the Sangha Trinational study area, the number of species is much higher in *Ficus* (27 spp.) than the others: *Drypetes* (20 spp.), *Psychotria* (18 spp.) and *Aframomum* (14 spp.). From our targeted herbarium specimen collection, observation of primates feeding on *Ficus*, and our plot-based sampling (not reported here), it is clear that, at this study site, individual *Ficus* species are very rare in the forest – sufficiently rare for most species not to have been recorded in plots. In addition, although very rare locally, the species of *Ficus* at our study site are distributed widely across central Africa. This phenomenon of extreme rarity at a given site combined with a wide geographical range has been clearly demonstrated to be a pantropical phenomenon in *Ficus* by Harrison (2005) and requires further study to be fully understood.

It is unclear how many more species of *Ficus* remain to be collected in the Sangha Trinational, although we expect no more than ten. This is because it appeared to us that the concentrated collecting effort that went into actively looking for new species of *Ficus* resulted in a slow and steady accumulation that has started to slow down, and therefore the species accumulation curve can be assumed to be approaching an asymptote. To understand the distribution of *Ficus* species in the study site, we need to move from inventory and herbarium specimen collection to concentrate on quantitative sampling of the genus.

When comparing the number of species in our study site with those in other African forests, we found only one lowland forest site with a similar number of *Ficus* species. This was the Ituri Forest (Democratic Republic of the Congo), also with 27 species (Makana *et al.*, 2004). This figure of 27 species from these two sites probably reflects the geographically focused research in these forests rather than an excessive diversity compared with other sites. It may be that a similar level of species diversity occurs across the whole of the Congo Basin forest block. A total of 45 species of *Ficus* is recorded from Gabon (267,667 km²) (Sosef *et al.*, 2005).

Compared with other tropical forests, we find that Brunei (5765 km²) has 63 species of *Ficus* (Coode, 1996); Ducke Reserve, Brazil, has 19 species (Ribeiro *et al.*, 1999); Barro Colorado Island, Panama, has 17 species (Croat, 1978); and Iquitos, Peru, has 30 species (Vásquez Martínez, 1997). These figures suggest to us that species diversity for *Ficus* is probably higher in Asian than in African or tropical American forests.

This is the first time to our knowledge that forest species of *Ficus* have been reported as restricted to vegetation disturbed by humans while not occurring in adjacent undisturbed forest. It is interesting to note that all three species restricted to this habitat (*Ficus exasperata*, *F. mucoso* and *F. sur*) are true trees and not hemiepiphytic species. Of the total of approximately 450 tree species occurring in the area (Harris & Wortley, 2008), only a very few are restricted to areas disturbed by humans. These obligate ruderals include *Musanga cecropioides* R.Br. ex Tedlie and an as-yet unidentified species of *Anthochliasta*. It is noteworthy that these non-*Ficus* ruderals are not so clearly restricted to vegetation suffering disturbance by humans elsewhere in their range. It appears that this obligate nature of habitat preference for these three *Ficus* species is also site-specific.

The three habits (tree, climber and hemiepiphyte) recorded in this area are a subset of the six main types of habit (tree, shrub, hemiepiphyte, climber, creeping shrub and rheophytic shrub) described for *Ficus* by Berg & Corner (2005).

The taxonomy of *Ficus* in Africa appears to us to require further study despite the great advances made by Cees Berg. We say this because of the large number of infraspecific taxa and the variation in characters that are more consistent in other genera. An example of such variation that we have observed in the Sangha Trinational is in specimens that we have identified as *Ficus polita* subsp. *polita*, which can be separated into two groups. Specimens from the Sangha River (Harris 1429, 1886; Harris & Moutsamboté 9725; Ndolo Ebika 536) seem to have more elongate tips to the leaves than terra firma specimens (Harris & Fay 105, 5539; Harris 8022; Ndolo Ebika 823, 837).

We predict that further ecological and taxonomic study of *Ficus* will reveal significant differences in niches occupied by species in this fascinating genus.

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