

# The African genus *Sorindeia* (Anacardiaceae): A synoptic revision

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## ABSTRACT

**KEY WORDS**  
*Sorindeia*,  
Anacardiaceae,  
Africa.

The African genus *Sorindeia* is revised. Nine species are recognized. A key to the species is given together with illustrations to facilitate its use. As far as they are known, the male and female flowers and the fruits of all species are illustrated and their distribution maps are presented.

## RÉSUMÉ

**MOTS CLÉS**  
*Sorindeia*,  
Anacardiaceae,  
Afrique.

*Le genre africain Sorindeia (Anacardiaceae) : révision synoptique.*

Le genre africain *Sorindeia* est révisé. Neuf espèces sont reconnues. Une clé de détermination, accompagnée de quelques illustrations pour faciliter son usage, est donnée. Lorsqu'elles sont connues, les fleurs mâles et femelles ainsi que les fruits de toutes les espèces sont illustrés et leurs cartes de répartition sont présentées.

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## INTRODUCTION

The genus *Sorindeia* is confined to tropical Africa, including Madagascar, the Comoro Islands and the Mascarene Islands. It was described by DU PETIT THOUARS in 1806. He based it on the only species from Madagascar, which was named *S. madagascariensis* by DE CANDOLLE in 1825. More than 80 species have been described in the genus: 32 by ENGLER, in part with the co-authors KRAUSE and VON BREHMER, 5 each by DE WILDEMAN and VAN DER VEKEN, the remaining by 18 other authors.

BOUROBOU-BOUROBOU and the present author added two new species from Gabon in 1997 and 1999.

The genus has never been revised for its entire area, but only for the different major flora's namely the Flora of West Tropical Africa (KEY 1958), the Flore du Congo Belge et du Ruanda-Urundi (VAN DER VEKEN 1960), the Flora of Tropical East Africa (KOKWARO 1986), Flora Zambesiaca (R. & A. FERNANDEZ 1966) and the Flore de Madagascar et des Comores (PERRIER DE LA BATHIE 1946). Of the 32 African species described by ENGLER and his co-authors almost

all the holotypes in Berlin have been lost. For some names duplicate material in other herbaria could be designated as lectotypes, but in 14 cases a neotype had to be chosen. Only *Sorindeia albi-flora* Engl. & Krause remains a doubtful species. Thirteen species belonged to other genera, of which 5, possibly 6, belong to *Trichoscypha* (Anacardiaceae). The *Sorindeia* species based on material from Tropical America have been transferred to the Andean genus *Mauria* (Anacardiaceae).

## DESCRIPTION OF THE GENUS *SORINDEIA*

Trees, shrubs or lianas. Exudate light. Leaves alternate, usually imparipinnate, more rarely simple (unifoliolate). Inflorescence a panicle usually many-flowered, terminal or subterminal, axillary or borne just below the leaves or on the trunk. Flowers unisexual, dioecious (possibly very rarely monoecious), small ( $\geq 6$ –8) mm long, 5-merous, shortly pedicelled. Sepals united in lower half only or for more than half their length. Petals  $\pm$  free, 2–4(–5) times as long as the sepals, imbricate or valvate, (sub)erect or spreading. Male flowers with 10–20 stamens; filaments often shorter than the anthers; pistillode absent. Female flowers with 5–10 staminodes; pistil glabrous or pubescent; ovary  $\pm$  ovoid, 1-locular, with one pendulous ovule; style short, stigma 3-lobed to subcapitate. Fruits up to  $3.5 \times 2$  cm, drupaceous, 1-seeded.

TYPE. — *Sorindeia madagascariensis* DC.

## MORPHOLOGICAL NOTES

Variation in habit, from shrub or tree to liana, can be considerable in some *Sorindeia* species, notably so in *S. grandifolia* and, to a lesser extent, in *S. juglandifolia*. Often linked with variation in habit there is a great variation in the number, size, shape and hairiness of the leaflets. These elements offer little value for specific distinction. An exception is found in *S. winkleri* with its impressed midrib on the upper surface of the

leaflet. The presence of a ‘collecting nerve’ (see Fig. 2C) is a useful character to distinguish most specimens of *S. africana* and *S. juglandifolia* from *S. madagascariensis* and some material of *S. grandifolia* where this nerve is missing (see Fig. 2D).

The inflorescence can be borne on the leafy shoot, either axillary or terminal, or just below the leaves, or on the trunk or main stem. *Sorindeia batekeensis* and *S. oxyandra* are cauliflorous, cauliflory is usual in *S. madagascariensis*, quite common in *S. grandifolia* (in lianescent forms), and it is rather exceptional in *S. juglandifolia*. Of the remaining species *S. africana*, *S. gabonensis*, and *S. winkleri* all have axillary and / or terminal inflorescences, whereas *S. calantha* is rami- or cauliflorous.

The flowers, within the same species, are very variable in color. Mostly, at least when in bud, red flowers have been reported, but also pale green to purplish or red-purplish, while open flowers more often as white, yellow or greenish-yellow. Sometimes more precise observations are made, saying that the corolla is red at the base, fading to yellow at tip, or red outside and yellow inside, or even orange-yellow with deep red base. The red, pink or purplish color of the inflorescence in general and of the flowers in particular, may be related to the position of the inflorescence, whether fully exposed or in shade. A relation between flower color and other characteristics of the various species has not been found. It is therefore incomprehensible, that VAN DER VEKEN (1960) used the color of the flowers as the leading character in his key to the species. Very often fieldnotes do not mention the color of the flowers and in the dried state it can hardly be determined. How VAN DER VEKEN (1959) for instance managed to establish the flower color of *S. submontana* for which the holotype label does not give any information, is a mystery. The same holds for *S. gossweileri* Exell. A consequence of the emphasis on flower color in VAN DER VEKEN’s key is that some of his species are widely separated on this basis, whereas they would key out next to each other if based on other morphological characters. An example is *S. sparanoi* and *S. claessensii*, both synonyms of *S. juglandifolia*.

The male and the female flowerbuds are usually slightly different in shape. The female buds are subovoid whereas the male buds have a more

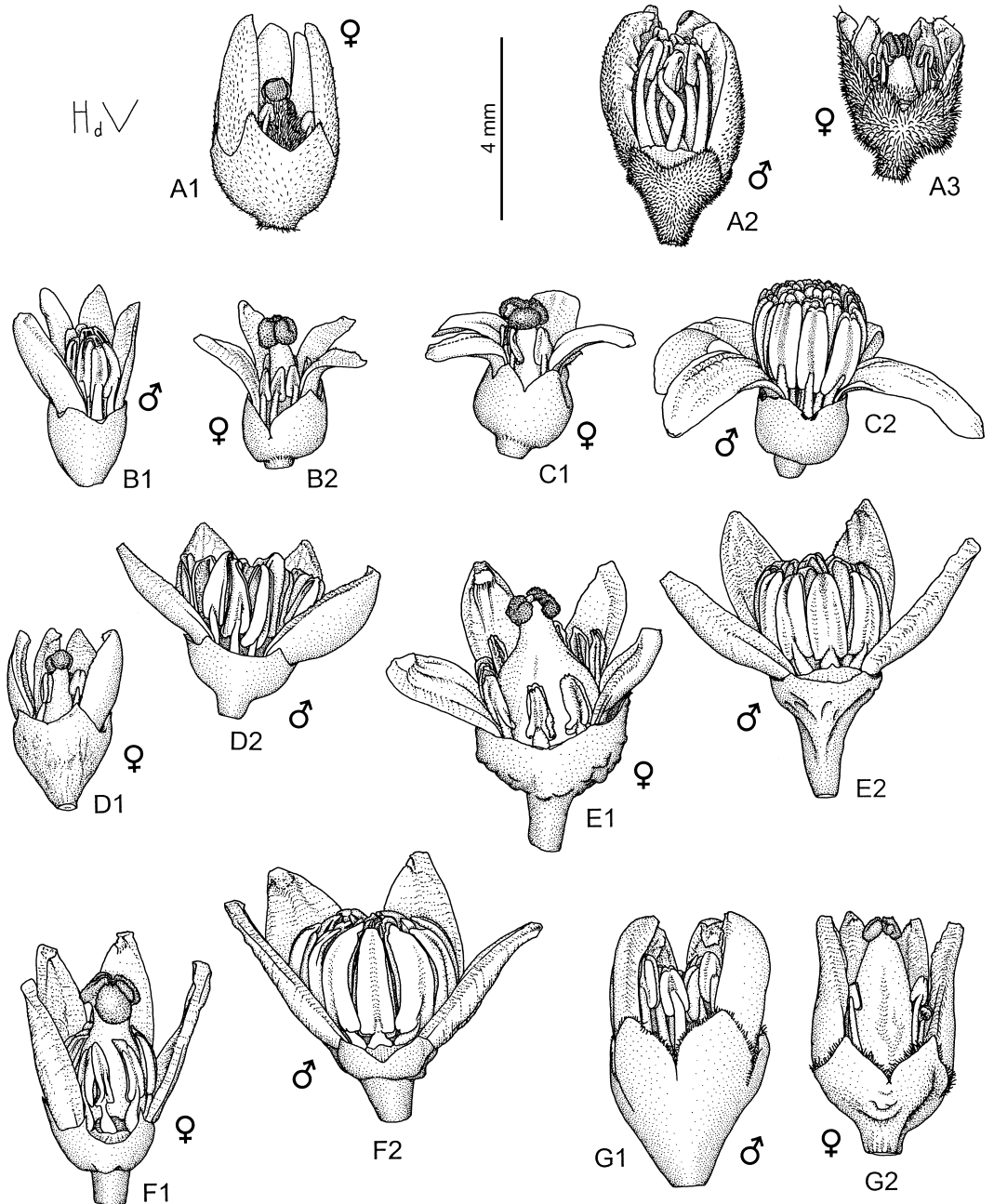


Fig. 1. — Flowers of *Sorindeia* species, one petal removed: **A**, *S. africana* (Engl.) Van der Veken; **B**, *S. gabonensis* Bouroubou & Breteler; **C**, *S. grandifolia* Engl.; **D**, *S. juglandifolia* (A. Rich.) Planch. ex Oliv.; **E**, *S. madagascariensis* DC.; **F**, *S. oxyandra* Bouroubou & Breteler; **G**, *S. winkleri* Engl. (A1, Reitsma et al. 2525; A2, Breteler & Jongkind 10225; A3, Louis et al. 1208; B1, Breteler & Jongkind 10730; B2, Breteler et al. 8731; C1, Leeuwenberg 9265; C2, Leeuwenberg 8854; D1, Breteler et al. 8735; D2, Morton SL692; E1, Jongkind et al. 3206; E2, Rabevohitra & Breteler 3899; F1, Breteler & de Wilde 51; F2, Breteler & de Wilde 50; G1, Breteler & de Wilde 518; G2, Breteler & de Wilde 632). Drawing by H. DE VRIES.

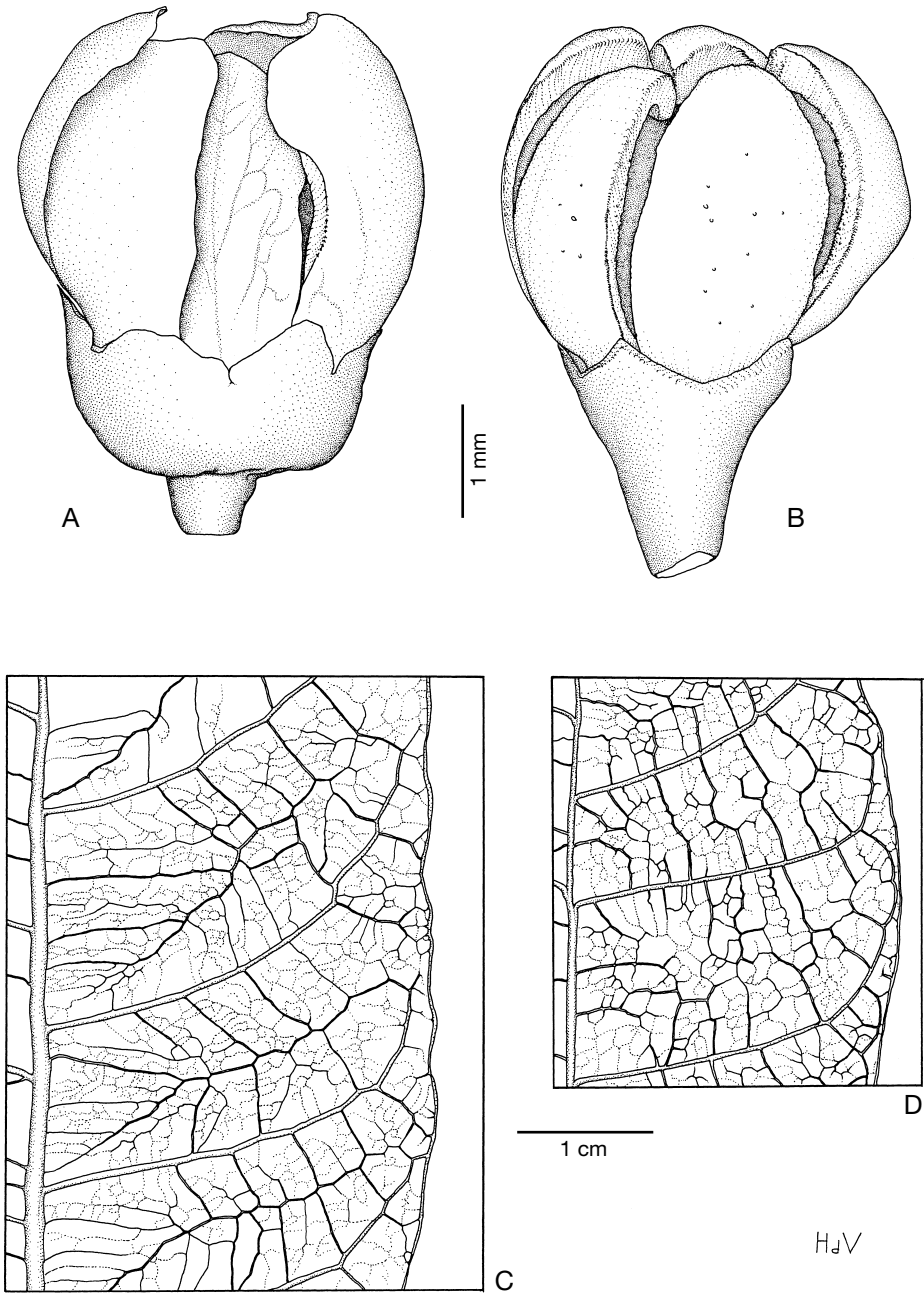


Fig. 2. — *Sorindeia grandifolia* Engl.: **A**, flower showing imbricate petals. — *S. juglandifolia* (A. Rich.) Planch. ex Oliv.: **B**, flower showing valvate petals; **C**, part of leaf showing 'collecting nerve' between the main lateral nerves. — *S. madagascariensis* DC.: **D**, part of leaf, 'collecting nerve' absent. (A, *Leeuwenberg 8854*; B-C, *Breteler et al. 8558*; D, *Lovett et al. 1002*). Drawing by H. DE VRIES.

globose to depressed globose shape, especially so in *S. juglandifolia*.

The immature dried fruits are often finely ribbed length-wise, which is not observed in mature dried fruits.

## GEOGRAPHICAL NOTES

The nine species of *Sorindeia* can more or less be classified according to the size of their area of distribution. Four species have a narrow distribution: *S. batekeensis*, *S. gabonensis*, *S. oxyandra*, in western Central Africa (Fig. 5), and *S. calantha* that occupies a very restricted area in Kenya and Tanzania (Fig. 4). Two species viz *S. africana* (Fig. 4) and *S. winkleri* (Fig. 9) have a wider distribution that is, however, mainly restricted to Central Africa. *Sorindeia grandifolia* and *S. juglandifolia* are most widely distributed, occurring in Upper - and Lower Guinea as well as in Congolia. It is remarkable that *S. grandifolia* (Fig. 7) has only been collected north of the equator.

Disregarding the single collection from southern Mozambique, the distribution of *S. juglandifolia* (Fig. 8) is widely disjunct. It occurs in two separate areas in Upper Guinea, does not occur in Nigeria and reappears in Cameroun. Species with disjunct areas are not uncommon, but an area cut in three separate parts is rarely seen in a lowland species. The geography of *Keayodendron brideioides* Leandri (BRETÉLER 1993) is different, but it is another rare example of this.

The area of *S. winkleri* (Fig. 9) is also disjunct. A large majority of the specimens originate from the Cameroun - Gabon area which is widely separated from the few collections from eastern Congo (Kinshasa) and from Burundi and western Tanzania. A more or less similar disjunct distribution has been observed in *Dichapetalum dewildei* Breteler (BRETÉLER 1978) and in *Penianthus Zenkeri* (Engl.) Diels (DEKKER 1983).

The type species *S. madagascariensis* (Fig. 9) is widely spread, occurring in East Africa and Madagascar.

## Key to the species of *Sorindeia*

1. Midrib of leaflets distinctly impressed above; calyx rather deeply lobed, ciliate (see Fig. 1G). From eastern Nigeria to Burundi and western Tanzania ..... 9. *S. winkleri*
- 1'. Midrib of leaflets prominent, at least plane above; calyx not as above (see Figs. 1A-F, 6A) ..... 2
2. Flowering and fruiting branches with unifoliolate leaves only. Gabon ..... 4. *S. gabonensis*
- 2'. Flowering and fruiting branches usually with pinnate leaves, sometimes with trifoliolate, or (rarely) with unifoliolate leaves, but then pinnate, at least trifoliolate leaves usually present as well ..... 3
3. Petals, at least the apical part, imbricate in bud (see Fig. 2A). West and Central Africa, north of the equator ..... 5. *S. grandifolia*
- 3'. Petals valvate in bud \* (see Fig. 2B) ..... 4
4. Flowers 6-7(-8) mm long. Small tree or shrub from upland rain forest in Kenya and Tanzania ..... 3. *S. calantha*
- 4'. Flowers 3-4(-5) mm long. Trees, shrubs, or lianas ..... 5
5. Upper part of pedicel and calyx hairy, densely to sparsely so (see Fig. 1A), also in fruit (see Fig. 3A). From Nigeria to Central African Republic and Angola ..... 1. *S. africana*
- 5'. Upper part of pedicel and calyx glabrous \*\* (see Fig. 1B-F), margin of calyx may show a few hairs ..... 6
6. Pistil hairy (see Fig. 3B). Congo (Brazzaville) ..... 2. *S. batekeensis*
- 6' Pistil glabrous ..... 7
7. Calyx lobes equal in length or longer than tube; petals 4-5 mm long; anthers 2-2.5 mm long. Cauliflorous tree. Equatorial Guinea and Gabon ..... 8. *S. oxyandra*
- 7'. Calyx lobes shorter than tube; petals 3-3.5 mm long; anthers  $\pm$  1.5 mm long. Trees, shrubs, or lianas, cauliflorous or not ..... 8

\* It is supposed that *S. batekeensis*, of which complete flowers are unknown, belongs here.

\*\* Exceptionally, the upper part of the pedicel and / or calyx may be sparsely puberulous in *S. juglandifolia* (observed on *Angus 426* from Zambia) and in *S. oxyandra*.

8. Tertiary nerves collected into an oblique nerve directed towards the angle between the midrib and the main lateral nerves (see Fig. 2C) (This nerve not always present in material from Sierra Leone previously assigned to *S. collina*). West and Central Africa, extending to the areas of Flora Zambesiaca and Flora of Tropical East Africa ..... 6. *S. juglandifolia*
- 8'. Tertiary nerves not as described above (see Fig. 2D). East Africa, Madagascar, Comores and Mascarene Islands ..... 7. *S. madagascariensis*

### 1. *Sorindeia africana* (Engl.) Van der Veken

- Bull. Jard. Bot. État 29: 42 (1959); Fl. Congo Belge et Ruanda-Urundi 9: 92 (1960) — *Thyrsodium africanum* Engl., Bot. Jahrb. Syst. 16: 106 (1892). — Type: *Pogge 717*, Congo (Kinshasa), Mukenge, Mar. 1882, ♂ fl. (syn-, B, delet.; lecto-, K, designated here).
- Sorindeia africana* (Engl.) Van der Veken var. *lastoursvillensis* (Pelleg.) Van der Veken, Flore du Congo Belge & Ruanda-Urundi 9: 93 (1960). — Type: see below under *S. lastoursvillensis*.
- Sorindeia nitidula* Engl., Bot. Jahrb. Syst. 36: 221 (1905); Keay in Hutch. & Dalziel, Fl. West Trop. Afr., ed. 2, 1: 737 (1958). — Type: *Zenker 802*, Cameroun, Yaoundé, fl. Mar. (holo-, B, delet.; lecto-, Z, designated here; isolecto-, G, K, P).
- Sorindeia gillettii* De Wild., Ann. Mus. Congo sér. 5, Bot. 1: 281, t. 66 (1906); Van der Veken, Fl. Congo Belge & Ruanda-Urundi 9: 96 (1960). — Type: *Ch. Gérard in Gillet 1925*, Congo (Kinshasa), Lukaya R., fr. Jan. (holo-, BR).
- Sorindeia kimuenzae* De Wild., Ann. Mus. Congo sér. 5, Bot. 1: 281, t. 72 (1906). — Type: *Gillet 1935*, Congo (Kinshasa), Kimuenza, fr. (lecto-, BR, designated here).
- Sorindeia crassifolia* Engl. & Krause, Bot. Jahrb. Syst. 46: 338 (1911). — Type: *Ledermann 6153*, Cameroun, between Ndonge and Bare, fl.b. Nov. (holo-, B, delet.). Neotype (designated here): *Leeuwenberg 9575*, Cameroun, 1 km S of Manengouba village, fl.b. Apr. (WAG; iso-, BR, K, LISC, MO, P, PRÉ, UPS, YA).
- Sorindeia lamprophylla* Engl. & Krause, Bot. Jahrb. Syst. 46: 340 (1911). — Type: *Zenker 3567*, Cameroun, Makao, fl.b. (holo-, B; iso-, BM, BR, G, GOET, HBG, MO, P, Z).
- Sorindeia ochracea* Engl., Bot. Jahrb. Syst. 46: 339 (1911). — Type: *Zenker 3875*, Cameroun, Bipindi, fl. Mar. (holo-, B, delet.; lecto-, K, designated here; isolecto-, BM, BR, G, GOET, HBG, K, MO).
- Sorindeia tessmannii* Engl., Bot. Jahrb. Syst. 46: 340 (1911). — Type: *Tessmann 400, 408*, Equatorial Guinea, Nkolentangan, fl. May (syn-, B, delet.). Neotype: *J.M. & B. Reitsma*, Gabon, Ovang, fl. Sep. (WAG; iso-, LBV, MO), see note.
- Sorindeia lemairei* De Wild., Bull. Jard. Bot. État. 4: 371 (1914). — Type: *Lemaire 403*, Congo (Kinshasa), Mobwasa, ♂ fl. June (lecto-, BR, designated here).

- Sorindeia revoluta* Engl. & v. Brehmer, Bot. Jahrb. Syst. 54: 312 (1917). — Type: *Mildbraed 3113*, Congo (Kinshasa), Marabi on Ituri R., fl. Apr. (holo-, B, delet.; lecto-, HBG, designated here).
- Sorindeia letestui* Pelleg., Bull. Mus. Hist. Nat. (Paris) 28: 313 (1922). — Type: *Le Testu 1649*, Gabon, Issala, fl. Oct. (holo-, P; iso-, BM, BR).
- Sorindeia tchibangensis* Pelleg., Bull. Mus. Hist. Nat. (Paris) 28: 314 (1922). — Type: *Le Testu 1625*, Gabon, Tchibanga, fl. Sep. (holo-, P; iso-, A, BM, BR, Z).
- Sorindeia maxima* Vermoesen, Man. Ess. For. Congo Belge: 251 (1923). — Type: *De Briey 145*, Congo (Kinshasa), Buku-Dungu, fl., fr. (holo-, BR).
- Sorindeia lastoursvillensis* Pelleg., Bull. Soc. Bot. France 102: 330 (1956). — Type: *Le Testu 7879*, Gabon, Lastoursville, fl. Jan. (holo-, P; iso-, WAG).
- Sorindeia befalensis* Van der Veken, Bull. Jard. Bot. État 29: 243 (1959); Fl. Congo Belge & Ruanda-Urundi 9: 95 (1960). — Type: *Évrard 3644*, Congo (Kinshasa), Befale, fl. Mar. (holo-, BR).
- Sorindeia multifoliolata* Van der Veken var. *multifoliolata*, Bull. Jard. Bot. État 29: 248 (1959); Fl. Congo Belge & Ruanda-Urundi 9: 94 (1960). — Type: *A. Léonard 3256*, Congo (Kinshasa), Bunyakiri, fl.b. Mar. (holo-, BR; iso-, K).
- Sorindeia multifoliolata* Van der Veken var. *watsaensis* Van der Veken, Bull. Jard. Bot. État 29: 250 (1959); Fl. Congo Belge & Ruanda-Urundi 9: 95 (1960). — Type: *Noël 19*, Congo (Kinshasa), Watsa, ♀ fl.b. (holo-, BRLU; iso-, BR).
- Sorindeia ferruginea* Engl., Bot. Jahrb. Syst. 46: 341 (1911), *nom. illeg.* (not *S. ferruginea*, Mar. 1869). — Type: *Ledermann 29*, Congo (Kinshasa) Kondue (holo-, B, delet.). Neotype not designated.

Shrub or tree up to 33 m tall and 40 cm d.b.h. Branches ± glabrous to distinctly (brown-) hairy. Leaves (1-)-7-13(-19)-foliolate; folioles papery to coriaceous, very variable in size, (5-)-10-20(-28) × (2-)-4-6(-10) cm, rounded to cunate and unequal-sided or not at base, acuminate at apex, ± glabrous to distinctly (brown-) hairy; lateral nerves (10-)-11-14(-16) pairs, the collecting nerve usually distinct. Inflorescence up to c. 50 cm long, pubescent to puberulous, the indumentum

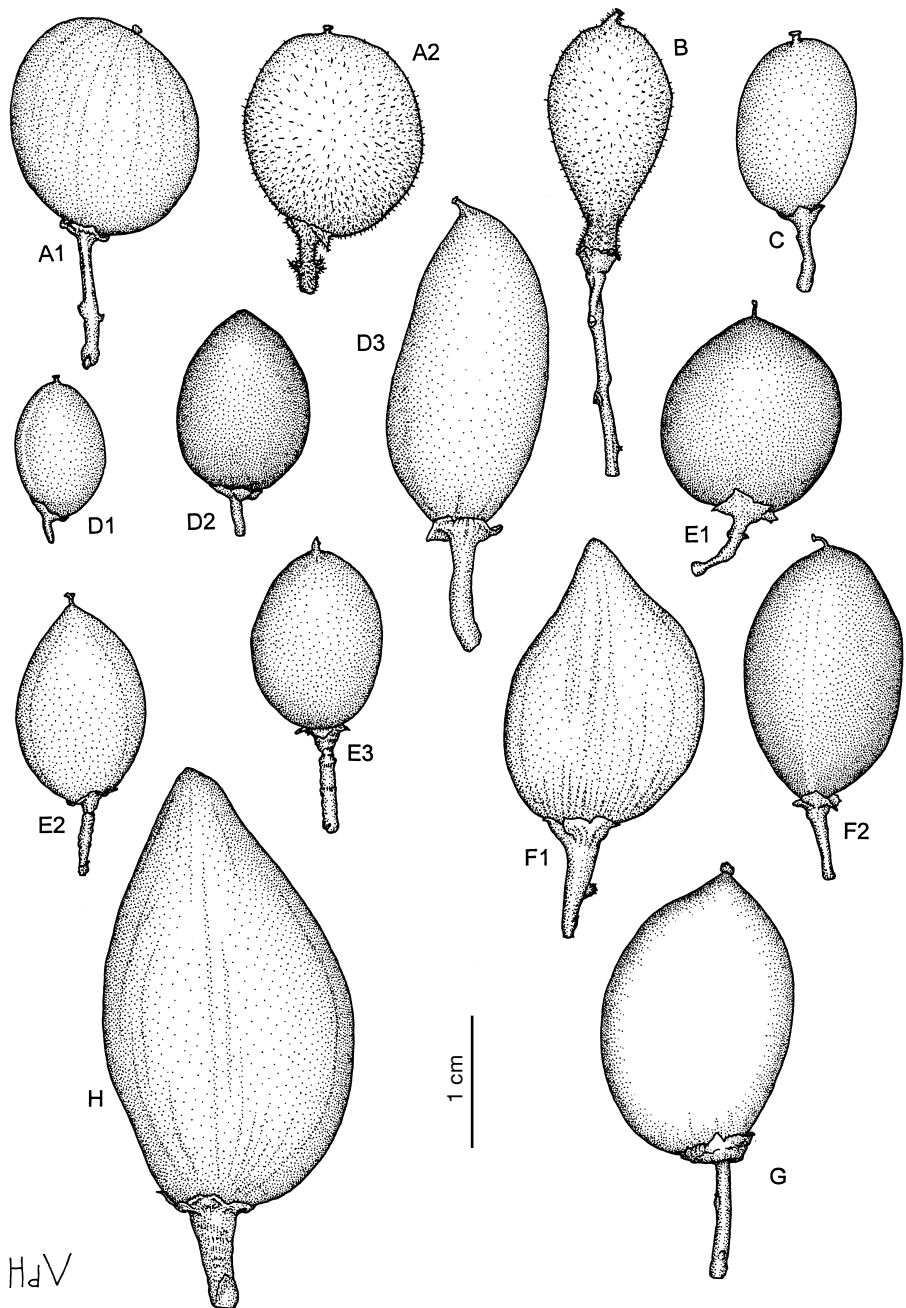


Fig. 3. — Fruits of *Sorindeia* species: **A**, *S. africana* (Engl.) Van der Veken; **B**, *S. batekeensis* Lec.; **C**, *S. gabonensis* Bourobou & Breteler; **D**, *S. grandifolia* Engl.; **E**, *S. juglandifolia* (A. Rich.) Planch. ex Oliv.; **F**, *S. madagascariensis* DC.; **G**, *S. oxyandra* Bourobou & Breteler; **H**, *S. winkleri* Engl. (A1, Breteler et al. 14735; A2, Breteler et al. 15033; B, Thollon 576; C, Breteler et al. 14754; D1, Meyer 15086; D2, J.J. de Wilde 8008; D3, Thomas 7023; E1, Reitsma et al. 2596; E2, Breteler & van Raalte 5626; E3, Devred 2554; F1, Jongkind et al. 3206; F2, Chapman 9358; G, Breteler & de Wilde 51; H, J.J. de Wilde 8850). Drawing by H. DE VRIES.

extending beyond the articulation in the pedicel on the calyx and often on the petals as well. Flowers (Feb.-Dec.), the male with 11-16 stamens, the female with 5(-7) staminodes; pistil glabrous to puberulous. Fruits (Nov.-Feb., May-July) up to 20 × 16 × 14 mm, yellow to orange at maturity, glabrous to puberulous. — Figs. 1A, 3A, 4.

**HABITAT AND DISTRIBUTION.** — Rain forest from eastern Nigeria to Angola and Central African Republic. Alt. up to c. 1500 m.

**SELECTED SPECIMENS.** — **ANGOLA:** *Luna de Carvalho* 37, Dundo, fl.b. Aug. (BR); *Gossweiler* 14017, Dundo, fl. May (BM). — **CAMEROUN:** *Bates* 1608, Bitey, fl. Feb. (BM, MO, Z); *Breteler* 1347, Djang, fl. May (K, P, WAG); *Breteler* 2708, Oveng, fl.b. Mar. (A, G, K, MO, P, WAG, Z); *W. de Wilde c.s.* 2393, Nanpé, fl. May (P, WAG); *W. de Wilde c.s.* 2851, 70 km W of Eséka, fr. July (P, WAG); *Etuge & Thomas* 164, Bakossi Mts., fr. June (K, WAG); *Fleury* 33192, Douala, fl.b. June (P); *Leeuwenberg* 9575, Manengouba village, fl. Apr. (K, P, UPS, WAG); *Letouzey* 11231, Bandonga, fl. Feb. (HBG, K, P, WAG); *Maitland* 671, Buea, fl. (K, P); *Mildbraed* 8239, 115 km NE of Yaoundé, fl.b. Feb. (K); *Thomas* 8260, Toko, fl. Mar. (MO); *Zenker* 802, Yaoundé, fl.b. (G, K, P, Z). — **CENTRAL AFRICAN REPUBLIC:** *Thomas & Fay* 7268, 30 km S of Libongo, fr. July (MO); *Tisserant Equipe* 2414, fl. Apr. (BM, P). — **CONGO (Brazzaville):** *Cusset* 1296, Dimonika, fl., fr. Dec. (P); *Koechlin* 5256, Kinkala, fl. Sep. (P, WAG); *Sita* 2604, near Brazzaville, y.fr. Oct. (P). — **CONGO (Kinshasa):** *Bamps* 605, Yangambi, fl. Apr. (BR, K, WAG); *Breyne* 287, Tshela, fl.b. Aug. (BR); *Compère* 1085, Zaza, fl.b. Dec. (BR); *Davio* 28, Mvuazi, fr. Dec. (A, BR, K); *Delvaux* 349, fl.b. July (BR); *Delvaux* 362, Kabinda, fl. July (BR); *Desenfans* 1957, Mapanda, fl.b. Aug. (BR); *Devred* 2549, Kiyaka, fr. Sep. (BR, MO); *Detchuvi* 968, Botsima, fl.b. Mar. (BR); *Donis* 1669, Luki, fr. Jan. (BR, FHO, K, P); *Dubois* 684, Tshuapa, fr. May (BR); *Evrard* 2796, Monkoto, ster. Oct. (Br, K); *Evrard* 3644, Befale, fl.b. Mar. (BR); *Evrard* 5714, Yalisanga, fl. Feb. (BR, K); *Evrard* 5777, Djolu-Befori, fl.b. Feb. (BR); *Evrard* 6092, Bolengambi, fl.b. Apr. (BR, K); *Evrard* 6210, Yalisenga, fr. Apr. (BR); *Gailliez-Mahin* 47, km 37 Elundu-Kindu, fl.b. Sep. (BR); *Gérard* 1752, Tukpwo, fr. June (BR); *Gérard* 2807, Madabu, fl. Apr. (BR, K); *Gérard* 4862, Bambesa, fl.b. Mar. (BR); *Gillardin* 593, Mukumari, fl. June (BR); *Hart* 173, Epulu, fl.b. Dec. (BR); *E & M. Laurent s.n.*, Munungu, fr. Nov. (BR); *Lebrun* 2969, Angodia, fl. May (BR, G, WAG); *Lebrun* 6113, Katako Kombe, fl.b. Sep. (BR); *Lebrun* 6330, Kole, fl.b. Oct. (A, BR, K); *Lebrun* 6535, Bumbuli, fl.b. (BR, K); *Leemans* 642,

*Eala*, fl. (BR, K, L, WAG); *A. Léonard* 1846, Kabunga, ster. Nov. (BR, FHO); *A. Léonard* 3256, Bunyakiri, fl. Mar. (BR, K); *A. Léonard* 6018, Kamisuku, y.fr. Aug. (BR, FHO, K); *Lescrauwaet* 225, Foa Lake, fr. Sep. (BR); *Liben* 1684, Dimbelenge, fr. Oct. (BR); *Liben* 3510, Musoko, fl.b. Aug. (BR, WAG); *Liben* 3553, Gandajika, fl.b. July (BR, K); *Louis* 14144, Opala, fr. Feb. (BR); *Luja s.n.*, Sankuru, fl.b. June (BR); *Michelson* 157, Pangi, fl.b. June (BR); *Mildbraed* 3113, Kasanga, fl. Apr. (HBG); *Noel* 19, Watsa, fl. (BRLU); *Pogge* 717, Mukenge, fl. Mar. (K); *Vanderijst* 12413, Bampunu, fr. Oct. (BR); *Wagemans* 748, Gimbi, fr. Dec. (BR, L, WAG). — **GABON:** *Bos et al.* 10744, Bélinga, Babiél Sud, fr. July (K, LBV, MO, WAG); *Breteler et al.* 9930, 30 km NE Lastoursville, fr. Apr. (LBV, WAG); *Breteler & Jongkind* 10225, Rabi-Kounga, fl. Oct. (LBV, WAG); *Breteler et al.* 13298, 6 km E of Ndambi, fl. Oct. (WAG); *Breteler et al.* 14735, Makandé, fr. Jan. (LBV, WAG); *Florence* 1786, 120 km Makokou-Libreville, fr. Mar. (P); *Hladik* 1785, Ipassa, fl. Dec. (P); *Le Testu* 1625, Tchibanga, fl. Sep. (A, BM, BR, P, Z); *Le Testu* 1649, Issala, fl. Oct. (BM, BR, P); *Le Testu* 2097, Malemba, fl. Aug. (BM, P); *Le Testu* 9167, Oyem, fl. June (BM, P); *Mimvoul*, fl. June (BM, P); *A. Louis et al.* 1208, Bikélé, fl. Dec. (BR, LBV, MO, P, WAG); *McPherson* 15629, Lopé-Okanda Reserve, W of Offoué R., fr. Dec. (LBV, MO); *Reitsma c.s.* 1199, Oveng, ster. June (LBV, WAG); *Reitsma c.s.* 1420, Doudou Mts., fl.b. Aug. (LBV, WAG); *Reitsma c.s.* 3112, Ekobakoba, ster. Feb. (LBV, WAG). — **NIGERIA:** *Daramola FHI* 31281, Ishan, fl. Apr. (FHO, K); *Kennedy* 2382, Sapoba, fr. (FHO); *Latilo FHO* 30983, Ikom, fl.b. May (K); *Talbot* 1714, Oban, fl.b. (BM); *van Meer* 1302, Oban Group F.R., fl. Apr. (BR, WAG).

**NOTES.** — *Sorindeia africana* is a variable species. This is reflected by the large number of synonyms. This variation concerns the indumentum, from almost glabrous in the former *S. letestui* to very hairy in the former *S. lastoursvillensis*, and the number of leaflets, 3 in the former *S. befalensis* to many in VAN DER VEKEN'S *S. multifoliolata*. Also the indumentum of the ovary is variable: thus *S. multifoliolata* var. *watsaensis* with glabrous ovaries is distinguished from the typical form.

Whether the petals are keeled inside or not, seems to be related to the number of stamens in the male flower: many stamens with ± flat petals, few stamens with keeled petals. In the female flowers, usually with 5 staminodes only, the petals are mostly distinctly ridged.

Both *S. africana* and *S. juglandifolia* more or less fit the original description of *S. tessmanni*,



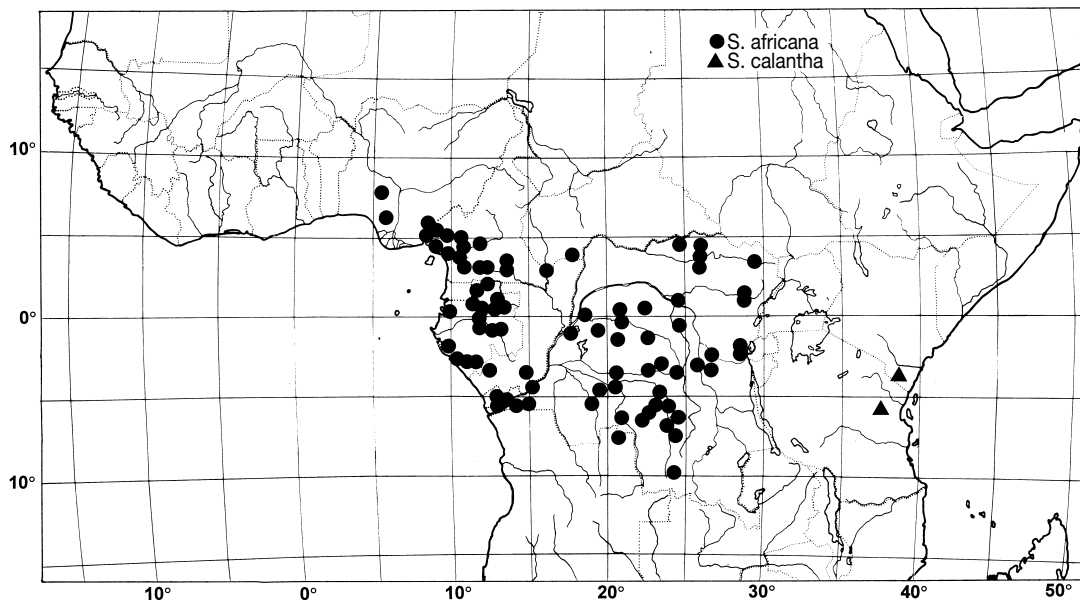


Fig. 4. — Distribution of *Sorindeia africana* (Engl.) Van der Veken and *S. calantha* Mildbr.

and they probably both occur in Equatorial Guinea. Unfortunately all the material that I have seen from that country which represents these species, is sterile. On account of the following elements of this description: '*calyx brevis ad medium usque in lobes late ovatos divisus*' and '*staminum filamenta tenuia, antherae anguste oblongae filamentis paulum breviores*', however, I have placed *S. tessmannii* in synonymy of *S. africana* and selected the neotype accordingly.

I have followed VAN DER VEKEN as regards the synonymy of *Sorindeia maxima* Verm. The type material is sterile which implies that its identification is however doubtful.

## 2. *Sorindeia batekeensis* Lecomte

Bull. Soc. Bot. France 55: 181 (1908). — Type: *Thollon 576*, Congo (Brazzaville), Alima river bank, y.fr. July (lecto-, P, designated here).

Tree. Leaves (17-)19-23-foliolate; rachis and petiolule puberulous; leaflets  $\pm$  oblong, (3-)7-11(-13)  $\times$  2-2.5(-3) cm with numerous  $\pm$  parallel nerves, unequal-sided, caudate-acuminate.

Inflorescence a narrow panicle, cauliflorous, 8-18 cm long, sparsely puberulous. Male and complete female flowers unknown. Upper part of pedicel and calyx glabrous in fruit. Fruit (immature) obovoid, sparsely puberulous. — Figs. 3B, 5.

HABITAT AND DISTRIBUTION. — Gallery forest, Batéké Plateau, Congo (Brazzaville).

SPECIMENS EXAMINED. — CONGO (Brazzaville): *Thollon 576*, Alima river bank, y.fr. July (P, type); *Thollon 36*, Diélé (Batéké), y.fr. Sep. (P).

NOTES. — LECOMTE described his species with axillary, glabrous, inflorescences. The two collections on which he based *S. batekeensis*, however, show separate leaves and (puberulous) inflorescences, which suggests strongly that the latter have been taken from a trunk.

The description of the collecting localities of the two specimens are imprecise. Therefore the geographical localization of *S. batekeensis* on Fig. 5 is an approximation. As these localities are both situated on the Batéké Plateau, they are represented by a single point.

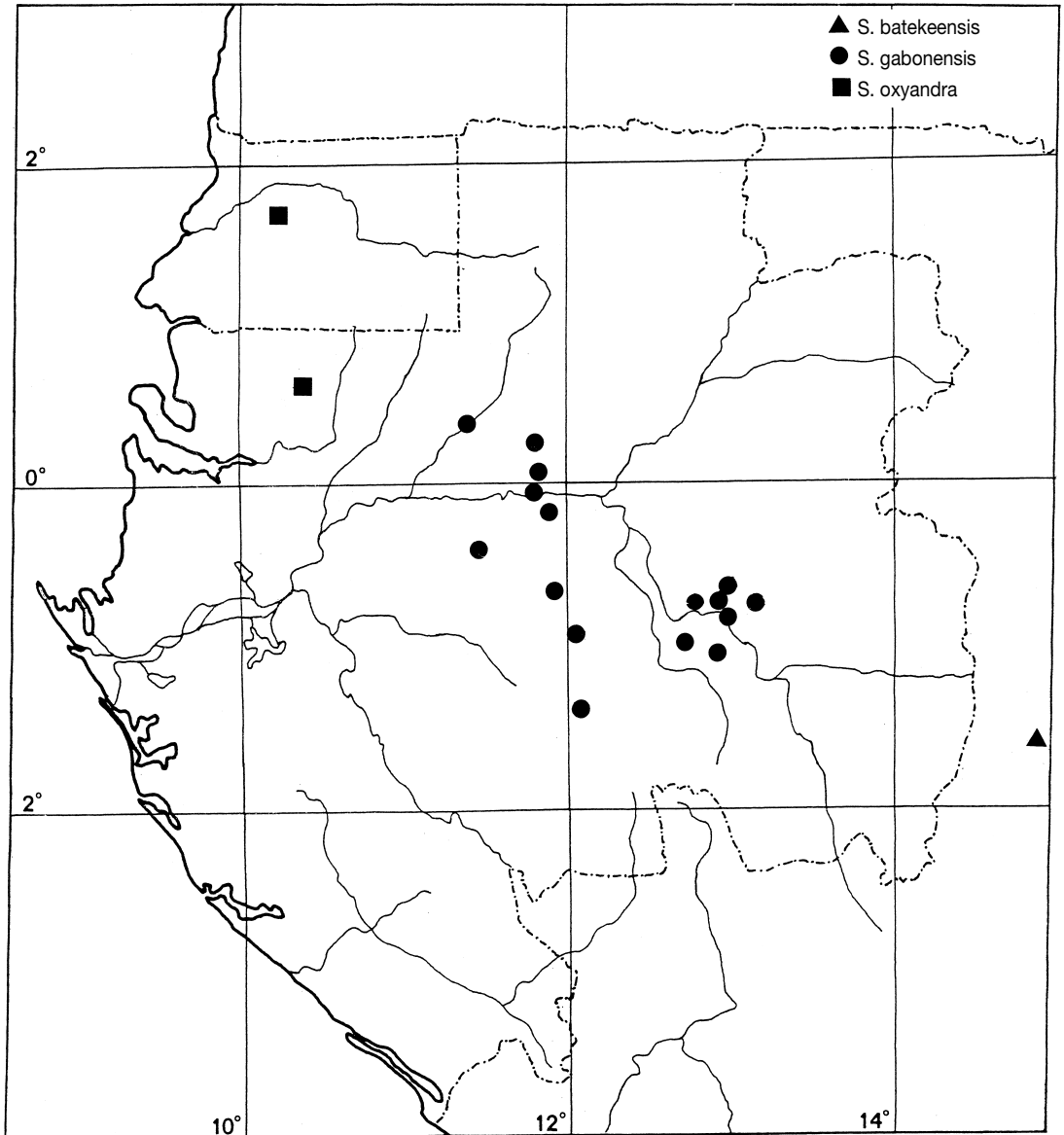


Fig. 5. — Distribution of *Sorindeia batekeensis*, *S. gabonensis* and *S. oxyandra*.

### 3. *Sorindeia calantha* Mildbr.

Notizbl. Königl. Bot. Gart. Berlin 12: 85 (1934);  
Kokwaro in Fl. Trop. E. Afr., Anacardiaceae: 48  
(1986). — Type: *Schlieben 4181*, Tanzania, Nguru  
(Unguru) Mts., Mesumba (Messumba), fl. July (holo-

B, delet.; lecto-, BM, designated here; isoleccto-, BR,  
G, HBG, P, Z).

Shrub or small tree to 10 m tall. Branchlets  
glabrous. Leaves 3-7(-11)- foliolate, glabrous or  
glabrescent; folioles (6-)10-16(-22) × (3-)4-

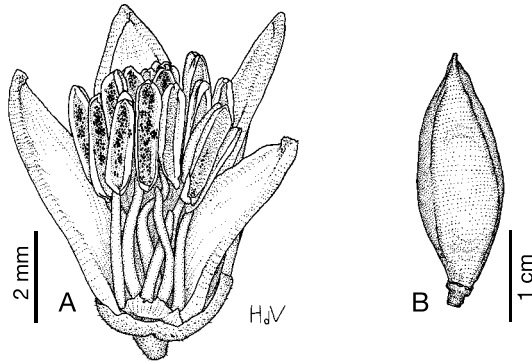


Fig. 6. — *Sorindeia calantha* Mildbr.: **A**, male flower, one petal removed; **B**, fruit. (A, Drummond & Hemsley 1909; B, Luke 4135). Drawing by H. DE VRIES.

6(-9) cm, with 8-11(-12) pairs of main lateral nerves, the collecting nerve distinct or not. Inflorescence borne on the main stem, well below the leaves, axillary, or (sub)terminal. Male flowers white or red, 6-7(-8) mm long, glabrous or with puberulous calyx; stamens 13-20; filaments 2-2-3.5 mm long, anthers 2-2.5 mm long. Female flowers unknown. Fruits ellipsoid,  $\pm 3 \times 1$  cm, glabrous. — Figs. 4, 6.

**HABITAT AND DISTRIBUTION.** — Upland rain forest in Kenya and Tanzania. Alt. 1200-2000 m.

**SPECIMENS EXAMINED.** — **KENYA:** *P.A. & W.R.O Luke 4135*, Kasigau, fr. Nov. (K). — **TANZANIA:** *Drummond & Hemsley 1909*, Turiani,  $\sigma$  fl. Mar. (B, BR, K); *Schlieben 4181*, Mesumba,  $\sigma$  fl. July (holo-, B, delet.; lecto-, BM (designated here); isolecto-, BR, G, HBG, P, Z).

#### 4. *Sorindeia gabonensis* Bourobou & Breteler

Bull. Jard. Bot. Belg. 66: 342 (1997). — Type: *Breteler, Jongkind & Wieringa 11231A*, Gabon, 30 km E of Lastoursville,  $\sigma$  fl. May (holo-, WAG; iso-, BR, K, LBV, MO, P).

Shrub or treelet up to 3.5 m tall. Leaves unifoliate, very rarely 3-5-foliate on non-flowering shoots; leaflets rigidly papery to coriaceous, (7-)15-20(-25)  $\times$  (3-)4-7(-11) cm, acuminate. Inflorescence an axillary or pseudoterminal, slen-

der, loose panicle, up to 25 cm long, puberulous. Flowers (Apr.-May, Aug.-Jan.),  $\sigma$  with 6-12 stamens,  $\rho$  flowers with 5 staminodes, pistil glabrous. Fruits (May-Aug., Nov.-Jan.) orange to dark red at maturity, 10-18  $\times$  5-11 mm, glabrous. — Figs. 1C, 3C, 5.

**HABITAT AND DISTRIBUTION.** — Rain forest of Central Gabon. Alt. up to c. 600 m.

**SELECTED SPECIMENS.** — **GABON:** *Breteler & de Wilde 421*, 10 km NE of La Lara, fl. Sep. (K, LBV, MO, WAG); *Breteler et al. 8731*, Djidji, fl. Apr. (LBV, MO, WAG); *Breteler et al. 8910*, Koumaméyong, fl. Apr. (K, WAG); *8910 A* (LBV, WAG); *Breteler et al. 10003*, 30 km NE Lastoursville, fl. Apr. (WAG); *Breteler & Jongkind 10606*, 30 km E of Lastoursville, fr. Nov. (LBV, MO, WAG); *Breteler & Jongkind 10730*, 10 km E of Lastoursville, fl. Nov. (WAG); *Breteler & Jongkind 10746*, 30 km E of Lastoursville, fl.b. Nov. (LBV, MO, P, WAG); *Breteler et al. 11231*, Bambié, fr. May (WAG); *Breteler et al. 11231A*, Bambié, fl. May (BR, K, LBV, MO, P, WAG), type; *Breteler et al. 12210*, fl. Nov. (K, LBV, P, WAG); *Breteler et al. 13296*, 6 km E of Ndambi, y.fr. Oct. (WAG); *Breteler & Leal 14160*, Bambié, fr. Oct. (WAG); *Breteler et al. 14742*, Makandé, fl. Jan. (LBV, WAG); *Breteler et al. 14754*, Makandé, fr. Jan. (WAG); *Breteler et al. 15593*, near Bambié, fr. Aug. (LBV, WAG); *Floret et al. 1779*, La Nké, fl. Oct. (P); *Le Testu 7772*, Ngoma, fl.b. Dec. (P, WAG); *Le Testu 8237*, Mavanga, fl. Aug. (P, WAG); *Le Testu 8565*, Lissacho, fl.b. Dec. (P, WAG); *A.M. Louis 36*, Offoué, fl. Nov. (WAG); *A.M. Louis et al. 626*, near Booué, fl.b. Nov. (WAG); *A.M. Louis et al. 725*, 50 km SE of Achouka, fl., fr. Nov. (BR, K, LBV, MO, P, WAG); *Van der Maesen et al. 5621*, 11 km E of Lastoursville, fl.b. Nov. (LBV, MO, P, WAG); *Van der Maesen et al. 5914*, 51 km Lastoursville-Moanda, fl. Nov. (LBV, WAG) and *5920*, fl. Nov. (LBV, WAG); *White 160*, Lopé-Okanda Res., fl.b. Oct. (LBV, MO); *Wieringa et al. 3772*, 33 km ENE of Lastoursville, fl.b. Nov. (BR, LBV, MO, P, WAG); *Wieringa et al. 4074*, Makandé, fl. Jan. (WAG); *Wieringa et al. 4085*, Makandé, fr. Jan. (WAG).

#### 5. *Sorindeia grandifolia* Engl.

Bot. Jahrb. Syst. 26, Beibl. 26: 7 (1890); Exell, Cat. Vasc. Pl. S. Tomé: 144 (1944); Keay in Hutch. & Dalziel, Fl. West Trop. Afr., ed. 2, 1: 738 (1958). — Type: *Quintas 67*, Sao Tomé, Angolares, fl. Jan. (holo-, COI n.v.; iso-, K).

*Sorindeia acutifolia* Engl., Bot. Jahrb. Syst. 26, Beibl. 26: 6 (1890). — Type: *Moller s.n.*, Sao Tomé, fl.b. (holo-, COI n.v.).

- Sorindeia schweinfurthii* Engl., Bot. Jahrb. Syst. 36: 220 (1905); Andrews, Flow. Pl. Anglo-Egyptian Sudan, 2: 351 (1952). — Type: *Schweinfurth 100*, Sudan, Dar Fertit, fl. Jan. (holo-, B, delet.). Neotype (designated here): *Le Testu 3647*, Central African Republic, between Yalinga and Said Bandassi, fl. Jan. (P, iso-, WAG).
- Sorindeia warneckeii* Engl., Bot. Jahrb. Syst. 36: 221 (1905); Keay in Hutch. & Dalziel, Fl. West Trop. Afr., ed. 2, 1: 738 (1958); Aubréville, Fl. For. Côte d'Ivoire, ed. 2, 2: 206 (1959). — Type: *Warnecke 52*, Togo, Lomé, fl., fr. Feb. (holo-, B, delet.; lecto-, K, designated here; isolecto-, BR, L, P, Z).
- Sorindeia zenkeri* Engl., Bot. Jahrb. Syst. 36: 20 (1905); Van der Veken, Fl. Congo & Ruanda-Urundi 9: 101 (1960). — Type: *Zenker 528*, Cameroun, Yaoundé, fl. Dec. (holo-, B, delet.; lecto-, K, designated here).
- Sorindeia ledermannii* Engl. & Krause, Bot. Jahrb. Syst. 46: 336 (1911). — Type: *Ledermann 1809*, Cameroun, Djutitsa, fl. Dec. and *Ledermann 2075*, Cameroun, between Ntem & Ngom, fl. Jan. (syn-, B, delet.). Neotype (designated here): *Jacques-Félix 3131*, Cameroun, Mbapit Mt., fl. Feb. (P; iso-, WAG).
- Sorindeia protioides* Engl. & Krause, Bot. Jahrb. Syst. 46: 336 (1911). — Type: *Ledermann 1986*, Cameroun, Babessi, fl. Dec., *Ledermann 2209*, Cameroun, Banjo, fl. Jan., *Ledermann 2680*, Cameroun, Tchape, fl. Feb., and *Ledermann 5477*, Cameroun, Ngaoundéré, fl. Oct. (syn-, B, delet.). Neotype (designated here): *W.J. de Wilde c.s. 3996*, Cameroun, 10 km S of Meiganga, fl. Nov. (WAG; iso-, BR, K).
- Sorindeia schroederi* Engl. & Krause, Bot. Jahrb. Syst. 46: 335 (1911). — Type: *Schröder 211*, Togo, now in Ghana, near Ho, fl. Feb. (holo-, B, delet.). Neotype (designated here): *Jenik & Hall 1109*, Togo Hills, Shiare, y.fr. Dec. (K).
- Sorindeia longipetiolum*, Engl. & v. Brehmer, Bot. Jahrb. Syst. 54: 309 (1917). — Type: *Ledermann 1356*, Cameroun, Bare, fl. Nov. (holo-, B, delet.). Neotype (designated here): *Leeuwenberg 9265*, Cameroun, Manengouba Mts., fl. Jan. (WAG; iso-, B, BR, C, FHI, HBG, M, MO, P, PRE, UPS, USC, YA).
- Sorindeia reticulata* Engl. & v. Brehmer, Bot. Jahrb. Syst. 54: 310 (1917). — Type: *Ledermann 1279*, Cameroun, Bare, fl. Nov. (holo-, B, delet.). Neotype (designated here): *W.J. de Wilde c.s. 2330*, Cameroun, Bamena, fr. Apr. (WAG; iso-, BR, K, P, YA).

Shrub or tree to 30 m tall and 45 cm d.b.h., or liana or lianescent shrub. The branches may exude a little white latex. Branches and leaf axis (sub)glabrous to pubescent. Leaves (1-)-3-7(-9)-foliolate; folioles opposite or subopposite, papery to coriaceous, ± elliptic, (3-)-10-20(-30) × (2-)-4-

8(-15) cm, with 8-13(-15) pairs of main lateral nerves, midrib prominent on upper side, the collecting nerve distinct or not, (sub)glabrous to pubescent, rounded to cuneate at base, usually acuminate at apex. Flowers (Oct.-Mar.) in ± narrow panicles up to 60 cm long, axillary or on the older wood or stem below the leaves, glabrous to puberulous, the indumentum not extending beyond the articulation in the pedicel (upper part of pedicel and calyx glabrous). Calyx lobes broadly rounded, thin-edged. Petals imbricate. Stamens 13-17 in the male flowers, female flowers with 5-10 staminodes, pistil glabrous. Fruits (Dec.-May) subellipsoid, (10-)-15-25 × 8-15 mm, glabrous, orange (red?) at maturity, ± ribbed when immature, smooth when ripe. — Figs. 1C, 2A, 3D, 7.

HABITAT AND DISTRIBUTION. — Rain forest and gallery forest. Alt. up to 1600 m, from Guinea to Southern Sudan, also in Saô Tomé.

SELECTED SPECIMENS. — **BENIN:** *Adjanohoun 341*, Ouidah, ster. Sep. (K, P); *Aké Assi 12309*, Bassila, fl. Dec. (K); *Chevalier 23039*, Ketou, fl. Feb. (P); *Chevalier 23455*, Ouidah, fr. Apr. (K, P); *van Eijnatten 2206*, Porto Novo, fl. Nov. (WAG). — **CAMEROUN:** *Asonganyi 163*, Nanga Eboko, y.fr. (P); *Bates 1708*, Bitey, fl. Jan. (FHO, K, P); *Brenan & Onochie 9464*, Barombi Lake, fl. Mar. (BM, BR, FHO, K, P); *Breteler 1069*, Bétaré Oya, fr. Feb. (BR, K, P, WAG); *Breteler et al. 2229*, Félé Mt., fl. Dec. (B, BR, P, WAG); *Brunt 304*, W of Bamessi, fr. Apr. (K); *Cable et al. 1118*, Kupé Mt., fr. Feb. (WAG); *J.J. de Wilde*, Nkoumvone, fr. Feb. (MO, WAG); *W. de Wilde 1828*, 15 km S of Eséka, fr. Feb. (WAG); *W. de Wilde 2330*, Bamena, fr. Apr. (BR, K, P, WAG); *W. de Wilde 3996*, 10 km S of Meiganga, fl. Nov. (BR, K, WAG); *W. de Wilde 4357*, Tison Lake, fl. Nov. (WAG); *Jacques-Félix 3131*, Mbapit Mt., Feb. (P, WAG); *Leeuwenberg 7412*, between Ebaka and Belabo, fr. Dec. (K, MO, P, WAG); *Leeuwenberg 9265*, Manengouba Mts., fl. Jan. (BR, HBG, P, UPS, WAG); *Letouzey 3151*, Djal, y.fr. Feb. (BR, HBG, K, P, WAG); *Letouzey 3480*, Tamera Mt., fl. Feb. (P, WAG); *Letouzey 5612*, Mang, 50 km ENE Lomié, fl. Aug. (P); *Letouzey 13209*, Nkambe, fl. Nov. (P); *Letouzey 13538*, Ejaham Lake, fr. May (P, WAG); *Letouzey 13597*, 45 km SW Mamfe, fr. May (K, P); *Nkongmeneck 295*, Nyabidi, fr. Apr. (P); *Raynal 10666*, Banda, fr. Apr. (P); *Thomas 4529*, Takamanda F.R., fl. Mar. (MO); *Zenker 528*, Yaoundé, fl. B. (K). — **CENTRAL AFRICAN REPUBLIC:** *Descoings 12562*, fl. Jan. (P); *Le Testu 3647*, between Yalinga

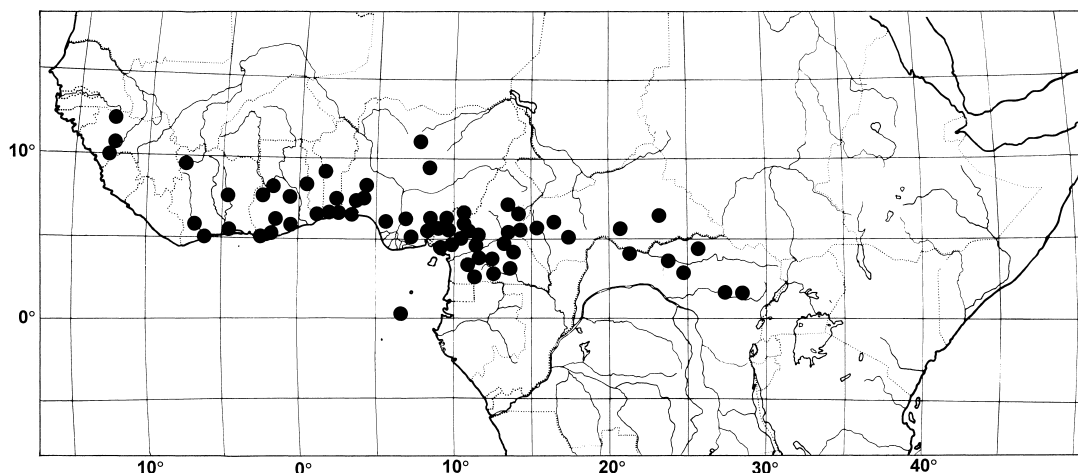


Fig. 7. — Distribution of *Sorindeia grandifolia* Engl.

and Saïd Bandassi, fl. Jan. (P, WAG); *Tisserant 459*, Bambari, y.fr. Feb. (P); *Tisserant 3009*, Bozoum, fl. Jan. (BM, P). — **CONGO (Kinshasa)**: *Bequaert 2015*, Avakubi, fl.b. Jan. (BR); *Ewango 504*, Epulu, fl. Feb. (WAG); *Gérard 2071*, Tukpwo, fl.b. Dec. (BR, K); *Lebrun 2168*, between Banzyville and Yaokoma, fl.b. Feb. (BR, K, P); *Lebrun 2445*, Bondo, fl.b. Mar. (BR, K, MO); *Lebrun 2609*, Buta, ster. Apr. (BR, L). — **COTE D'IVOIRE**: *Adam 27148*, Odienné, fr. May (MO); *Aubréville 811*, Fetekro, y.fr. Jan. (P); *Chevalier 17933*, fr. May (P); *J.J. de Wilde 826*, Adiopodoumé, fl.b. Nov. (BR, P, WAG); *J.J. de Wilde 3318*, Soubré, fl. Nov. (BR, P, WAG). — **GHANA**: *Adams 3542*, Legon Hill, fl.b. Nov. (K); *Brown 785*, Aburi, fl.b. Nov. (K); *Harris s.n.*, Kintampo, fl. Nov. (K); *Jenik & Hall 1109*, Togo Hills, Shiare, y.fr. Dec. (K); *Jongkind 2038*, Brong-Ahafo, fr. Feb. (BR, MO, UPS, WAG); *Merello et al. 1489*, Digya Nat. Park, fl. Apr. (BR, MO, WAG); *Vigne 1488*, Amentia, y.fr. Dec. (FHO); *Vigne 4818*, Axim, fl. Nov. (FHO). — **GUINEA**: *Adam 11786*, Dalaba, fr. Apr. (MO); *Schnell 4793*, Mali, ster. Mar. (P). — **NIGERIA**: *Ariwaodo et al. FHI 94769*, Manu-Gambari, y.fr. Mar. (MO); *Dalziel 1066*, Lagos, fl. Oct. (K); *Emwiogbon FHI 44761*, Mamu F.R., fr. Mar. (K, MO); *Jones FHI 5034*, Umueze, y.fr. Feb. (K); *Keay FHI 14167*, Ibadan, fl.b. Nov. (K); *Latilo FHI 40907*, Calabar, fr. Mar. (K); *Latilo FHI 45807*, Oban Group F.R., y.fr. Feb. (K); *Latilo FHI 47421*, Zaria, fr. Apr. (K, WAG); *Okafor & Emwiogbon FHI 66044*, Izicha, fl. Feb. (WAG); *Onochie FHI 27141*, Benin, fr. Feb. (K); *Sharland 365*, Kagoro, fr. Mar. (K); *Wit 1063*, Oba Hill, fl.b. Dec. (WAG). — **SAO TOMÉ**: *Chevalier 14210*, Port Allègre, fl.b. July (BR, G, K, P, WAG); *Mann s.n.*, s.loc., fl.b. (K); *Quintas 67*, Angolares, fl. Jan. (K). — **TOGO**: *Breteler (Equipe) 32*, Ouatchidomé, ster. Sep.

(WAG); *Ern 2324*, 15 km NE Tsevié, fl. Nov. (K, P); *Warnecke 52*, Lomé, fl. (BR, K, L, P, Z).

NOTES. — As *Sorindeia grandifolia* may flower and produce fruits in shaded conditions as well as with full exposure, specimens show a great variation in morphology, which is reflected by the large number of synonyms. This variation concerns the habit, from tree to liana, the indumentum of the branches, leaves, and inflorescences, as well as the size of the leaflets and their number of lateral nerves. The size of the inflorescence is also variable, from 5 to 60 cm long, and also its position from axillary to cauliflorous. The possession of imbricate petals is, however, a stable character.

The neotypes for *S. ledermanni*, *S. protioides*, *S. schroederi*, *S. longipetiolulata*, and *S. reticulata* have been chosen from the areas where the original type material was collected. For *S. schweinfurthii* a specimen from a neighbouring country had to be chosen as there was no specimen available from Sudan.

## 6. *Sorindeia juglandifolia* (A. Rich.) Planch. ex Oliv.

Fl. Trop. Afr. 1: 440 (1868); Keay in Hutch. & Dalziel, Fl. West Trop. Afr., ed. 2, 1: 737 (1958); Aubréville, Fl. For. Côte d'Ivoire, ed. 2, 2: 206 (1959); White, For. Fl. N. Rhodesia: 214 (1962). — *Dupuisia juglandifolia* A. Rich., Fl. Seneg. 1: 148, t. 38 (Sep.

- 1831). — Lectotype (designated here): *tab. 38* of the Flore de Sénégalie. See notes.
- Sorindeia poggei* Engl., Bot. Jahrb. Syst. 15: 197 (1892); Van der Veken, Fl. Congo Belge & Ruanda-Urundi, 9: 102 (1960). — Type: *Pogge 729*, Congo (Kinshasa), Mukenge, fr. Nov. (holo-, B, delet.). Neotype (designated here): *Liben 3336*, Congo (Kinshasa), Kamukugwi, fr. July (BR; iso-, MO).
- Sorindeia obtusifoliolata* Engl. var. *parvifoliolata* Engl., Pflanzenw. Ost-Afrikas, C: 244 (1895). — Type: *Stuhlmann 1143*, Tanzania, Bukoba (holo-, B, delet.). Neotype (designated here): *Bancoff 179*, Tanzania, Bukoba Distr., fl.b. May (K), see notes.
- Sorindeia thollonii* Lecomte, Bull. Soc. Bot. France 55: 180 (1908). — Type: *Thollon s.n.*, Congo (Brazzaville), s.loc., 1890-1891 (holo-, P; iso-, WAG).
- Sorindeia claessensii* De Wild., Bull. Jard. Bot. État 4: 370 (1914); Van der Veken, Fl. Congo Belge & Ruanda-Urundi 9: 99 (1960) quoad var. *claessensii*. — Type: *Claessens 388*, Congo (Kinshasa), Katakokombe, fl. Jan. (holo-, BR), see notes.
- Sorindeia sparanoi* De Wild., Bull. Jard. Bot. État 4: 371 (1914); Van der Veken, Fl. Congo Belge & Ruanda-Urundi 9: 105 (1960). — Type: *Sparano 133*, Congo (Kinshasa), Luluabourg, fl. (holo-, BR).
- Sorindeia adolfi-friederici* Engl. & v. Brehmer, Bot. Jahrb. Syst. 54: 310 (1917). — Type: *Mildbraed 5505*, Cameroun, between Dja R. and Sangmélina, fl.b. June (holo-, B, delet.; lecto-, HBG, designated here).
- Sorindeia gossweileri* Exell, Journ. Bot. 70, Suppl. Polypet.: 227 (1932); Exell & Mendonça, Consp. Fl. Angol. 2: 97 (1954); Van der Veken, Fl. Congo Belge & Ruanda-Urundi 9: 103 (1960). — Type: *Gossweiler 9313*, Angola, Zavula, fl. June (holo-, BM; iso-, K).
- Sapindus simplicifolius* G. Don, Gen. Syst. 1: 666 (Aug. 1831). — *Sorindeia simplicifolia* (G. Don) Exell, Cat. Vasc. Pl. S. Tomé: 145 (1944); Exell & Mendonça, Consp. Fl. Angol. 2: 97 (1954), *nom. illeg.*, not *Sorindeia simplicifolia* Mar. (1869). — Type: *Don s.n.*, Sierra Leone, s.loc., fl. (holo-, BM), see notes.
- Sorindeia lundensis* Exell & Mendonça, Bol. Soc. Brot., ser. 2, 26: 277 (1952); Consp. Fl. Angol. 2: 98 (1954). — Type: *Gossweiler 14017*, Angola, Dundo, fl. May (holo-, K; iso-, P).
- Sorindeia ngouniensis* Pellegr., Bull. Soc. Bot. France 102: 330 (1956). — Type: *Le Testu 6435*, Gabon, Divela, fl. Mar. (holo-, P; iso-, WAG).
- Sorindeia collina* Keay, Bull. Jard. Bot. État 26: 208 (1956); Fl. West Trop. Afr., ed. 2, 1: 737 (1958); Aubréville, Fl. For. Côte d'Ivoire, ed. 2, 2: 206 (1959). — Type: *Jones 130*, Sierra Leone, Bintimani Peak, fl. Jan. (holo-, K), see notes.
- Sorindeia katangensis* Van der Veken, Bull. Jard. Bot. État 29: 245 (1959); Fl. Congo Belge & Ruanda-Urundi 9: 98 (1960); R. & A. Fernandez, Fl. Zambesiaca 2 (2): 569 (1966). — Type: *Schmitz 2634*, Congo (Kinshasa), Keyberg, fl. Nov. (holo-, BR).
- Sorindeia mayumbensis* Van der Veken, Bull. Jard. Bot. État 29: 246 (1959); Fl. Congo Belge & Ruanda-Urundi 9: 104 (1960). — Type: *Toussaint 2445*, Congo (Kinshasa), Luki, fl. Aug. (holo-, BR; iso-, K).
- Sorindeia submontana* Van der Veken, Bull. Jard. Bot. État 29: 250 (1959); Fl. Congo Belge & Ruanda-Urundi: 106 (1960). — Type: *Pierlot 1755*, Congo (Kinshasa), Mikonzi, fl. Feb. (holo-, BR).
- Sorindeia rhodesica* R. & A. Fernandez, Bol. Soc. Brot., ser. 2, 33: 147, t. 5-7 (1965); Fl. Zambesiaca 2(2): 571 (1966). — Type: *Angus 260*, Zambia, Samfya, fl.b. Aug. (holo-, FHO; iso-, BM, K, WAG).
- Sorindeia undulata* R. & A. Fernandez, Bol. Soc. Brot., ser. 2, 33: 149, t. 8 (1965); Fl. Zambesiaca 2(2): 569 (1966). — Type: *Fanshaue 4739*, Zambia, Chienge, fl. Aug. (holo-, K; iso-, FHO, P).
- Sorindeia ripicola* Champluvier, Syst. Geogr. Pl. 69: 42 (1999). — Type: *Bamps 395* Congo (Kinshasa), Esali I., Yangambi, fl., fr. Mar. (holo-, BR; iso-, K, WAG), see notes.
- Sorindeia africana* DC., Prodr. 2: 80 (1825), *nomen (sub) nudum*, see notes.
- Sorindeia heterophylla* Hook.f., Niger Flora: 186 (1849), *nom. illeg.*, see notes.
- Sorindeia afzelii* Engl., Bot. Jahrb. Syst. 54: 313 (1917), *nom. illeg.*, not *S. afzelii* Engl. 1892 which is *Trichoscypha longifolia* (Hook.f.) Engl. — Type: *Afzelius s.n.*, Sierra Leone, s.loc. (holo-, B, delet.). Neotype not designated.

Small tree to 23 m tall and 40 cm d.b.h., or shrub or liana. Branches may exude a little, white latex. Brachlets, leaves and inflorescences (sub)glabrous to (sparsely) puberulous, or more rarely, pubescent. Leaves (1-)5-11(-15)-foliolate; folioles alternate or (sub)opposite, papery to coriaceous, elliptic to oblong, or ovate or obovate, often narrowly so, (2-)10-18(-28) × (1-)3-6(-12) cm, with (7-)10-15(-17) pairs of main lateral nerves, midrib prominent above; cuneate to rounded and often unequal-sided at base, usually acuminate at apex. Flowers (Jan.-Dec.) in axillary, or terminal ± pendant, up to 60 cm long panicles, more rarely cauliflorous, the indumentum when present not extending beyond the articulation in the pedicel (i.e. upper part of pedicel glabrous). Calyx glabrous, the lobes often sparsely ciliate. Petals valvate, glabrous. Stamens in ♂ flowers

(10-)15-16(-18), the filaments slightly shorter than the anthers or  $\pm$  equal in length; ♀ flowers with 5 staminodes, pistil glabrous. Fruits (Jan.-Dec.) (sub)ellipsoid, 12-20  $\times$  9-10 mm, smooth, orange at maturity, (immature fruits may be dark-red to purple). — Figs. 1D, 2B, 3E, 8.

**HABITAT AND DISTRIBUTION.** — Rain forest and gallery forest, from Senegal to Sudan, Zambia and Angola. Alt. up to c. 2000 m.

**SELECTED SPECIMENS.** — **ANGOLA:** *Exell & Mendonça* 958, Lunda, fl. Apr. (BM); *Gossweiler* 9313, Zavula, fl. June (BM, K); *Gossweiler* 11557, Dala, fl.b. Apr. (BM); *Gossweiler* 13626 B, Dundo, fr. Sep. (B, K, P). — **BENIN:** *Chevalier* 24241, Guilimaro, fl.b. June (P); *Poisson* 222, Kanciboba, fl.b. Jan. (P). — **BURKINA:** *Aké Assi* 11495, Banfora falls, fl. Feb. (K); *Botnounou* 226, Bereyredougou(?), fl., fr. Apr. (P); *Geerling & Bokdam* 1389, Koumi, fl. Oct. (MO, WAG). — **BURUNDI:** *Lewalle* 5866, Kumuyange, y.fr. May (K). — **CAMEROUN:** *Bates* 1700, Bitye, fl. (FHO, K, P); *Breteler* 995, Deng Deng, y.fr. Jan. (P, WAG); *J.J. de Wilde* 7982, km 24 Nkoemvone-Ambam, y.fr. Feb. (BR, K, WAG); *J.J. de Wilde* 8373, km 24 Nkoemvone-Ambam, fl. July (BR, HBG, K, MO, WAG); *Nana* 426, 100 km Bertoua-Ebaka, y.fr. Jan. (P); *Tchouto et al.* 3189, Onoyong, fr. Mar. (WAG). — **CONGO (Brazzaville):** *Attims* 128, Ngongo, fl.b. Mar. (BR, P); *Bouquet* 576, Loufini R., fl. Aug. (P); *Chevalier* 27263, Brazzaville, fl. y.fr. July (P, WAG); *de Foresta* 920, Dimonika, fl.b. Apr. (P); *de Foresta* 1013, Diosso, fl., fr. June (P); *Descoings* 8833, Alima-Likoula, fl. Aug. (P); *Koechlin* 1525, Boku-Nsitu, fr. Aug. (P); *Sita* 1354, Les Saras, fl. June (BR, P); *Sita* 4600, Niari, fl. June (WAG); *Thollon s.n.*, s.loc., fl. (P, WAG). — **CONGO (Kinshasa):** *Bamps* 395, Yangambi, fr. Mar. (BR, K, WAG); *Breyne* 184, Lovanium (Kinshasa), fl.b. Aug. (BR, WAG); *Breyne* 845, Maluku, fl. Apr. (BR, MO); *Claessens* 148, Kindu, fl.b. Feb. (BR); *Claessens* 388, Katakokombe, fl. Jan. (BR); *Compère* 132, Luki, fl.b. Aug. (BR, K); *Dacremont* 251, Matadi, fl.b. July (BR, K); *Dechamps* 142, Bena Longo, fr. June (A, BR, K); *Deffet* 15J, Port Francqui, fr. Sep. (BR, K); *Devred* 2383, Kiyaka, fr. Aug. (BR); *De Wanckel* 143, Bokondji, fr. Aug. (BR); *Dubois* 177, Wafanga, fl.b. Nov. (BR, K, WAG); *Dubois* 652, Bokungu, fr. (BR, K); *Evrard* 3886, Boende, fl. Apr. (BR); *Evrard* 4627, between Nkinki and Pomandjokou, fl. Aug. (BR); *Evrard* 6182, Bolia, fl. Apr. (BR, K); *Gérard* 5515, Bambesa, fl.b. Apr. (BR); *Gillardin* 244, Kashama, fl.b. June (BR, K); *Gillet* 2822, Djuma valley, fl.b. July (BR); *Lebrun* 5925, between Kasongo and Nyangwe, fl.b. Aug. (BR, K, WAG); *Lebrun* 6468, between Dekese and Bumbuli, fl.b. Oct. (BR, WAG); *A. Léonard* 3256, Bunyakiri, fl.b. Mar. (BR); *Liben* 2387, Tshimbao,

fl.b. Jan. (BR); *Liben* 2953, Tuzule, fl.b. May (BR, K); *Liben* 3336, Kamukugwi, fr. July (BR, MO); *Malaisse* 9634, Kafubu R., fr. Dec. (BR, WAG); *Michelson* 734, Kapanga, fl. Dec. (BR, K, L, WAG); *Pauwels* 531, Nto Mbombo, fr. Oct. (BR); *Pauwels* 3455, Kabama, fl.b. June (BR); *Pole Evans & Erens* 1895, between Libudi and Jadotville, fl.b. Aug. (K); *Thiebaud* 817, Kiala, fr. Oct. (BR, K, P, WAG); *Vanderyst* 9527, Ipamu, fl.b. June (BR). — **COTE D'IVOIRE:** *Aubréville* 2307, Ferké, y.fr. Apr. (P); *J.J. de Wilde* 3491, 17 km SE Ouango-Fétini, y.fr. Feb. (A, B, K, P, WAG); *Geerling & Bokdam* 683, Gansé, fl.b. Aug. (WAG); *Geerling & Bokdam* 1975, Kongo-Kawi, fl., fr. Feb. (MO, WAG); *Geerling & Bokdam* 1992, 10 km N of Bouin-Abri, fl., fr. Feb. (MO, WAG). — **GABON:** *Bourobou & Moussavou* 128, Iguela, fl.b. Apr. (WAG); *Breteler & van Raalte* 5626, Gamba, fr. Sep. (LBV, WAG); *Breteler et al.* 8558, 24 km N of Koumameyong, fl.b. Apr. (BR, K, WAG); *Breteler et al.* 8827, 5-10 km E of St. Germain, fl. Apr. (BR, K, LBV, MO, WAG); *Breteler & Jongkind* 10678, 30 km E of Lastoursville, fr. Nov. (LBV, WAG); *Florence* 1612, Ipassa, fr. Jan. (P); *Le Testu* 2312, Moucouma, fl.b. Mar. (BM, P); *Le Testu* 6435, Teyengué (Divela), fl. Mar. (P, WAG); *Le Testu* 8231, Comi, fl. Aug. (P); *McPherson* 15622, Lopé-Okanda Reserve, W of Offoué R., fl. Dec. (LBV, MO); *Walters et al.* 875, Batéké Plateau, Mpassa R., fr. Nov. (WAG); *Wieringa* 931, Tchimbélé, fl.b. (WAG); *Wieringa* 1155, Gamba, fr. June (WAG). — **GHANA:** *Adams* 3132, Bandai Hills F.R., fl.b. Dec. (K); *Jongkind* 2104, S of Kintampo, fl. Mar. (MO, WAG); *Jongkind & Nieuwenhuis* 2718, Jema-Kwanta, fr. Apr. (WAG). — **GUINEA:** *Adam* 2854, Mamou, fl. Dec. (MO); *Adam* 11541, Labé, fl. Mar. (MO); *Caille in Chevalier* 14734, Konkouré, fl.b. Oct. (P); *Chevalier* 12088, Iles de Los, fr. Feb. (P); *Chevalier* 12349, Labé, fl. Apr. (P); *Chevalier* 13112, Kindia, fl. Mar. (LY, P); *Chillou* 1553, Coyah, fl.b. June (P); *Pobéguin* 125, Timbo, fl.b. (P); *Pobéguin s.n.*, Boké, fr. (P). — **GUINEA BISSAU:** *Esperito Santo* 1742, Bissau, fl. Feb. (K, P). — **MALI:** *Chevalier* 377, Kouroussa(?), fr. Apr. (K, P); *Chevalier* 436, Diendiema(?), fl.b. Feb. (P); *Raynal* 21046, Fotorasso, fl. Dec. (P). — **MOZAMBIQUE:** *Mendonça* 1511, between Polana and Costa do Sol, fr. Nov. (K). — **NIGERIA:** *Gbile & Daramola FHI* 63236, Mambila plateau, y.fr. Mar. (K). — **SENEGAL:** *Adam* 19099, between Bissine and Ziguinchor, fl. Apr. (P); *Berhaut* 1528, Niokola-Koba, fr. Apr. (P, Z); *Berhaut* 5927, forêt des Kalounayes, ster. May (P); *Boudet* 4714, Diatakounda, fl. Feb. (P); *Leprieur s.n.*, Zetin(?), fl. May (P); *Perrotet* 151, s.loc., fl. (BM). — **SIERRA LEONE:** *Adam* 21298, Freetown, fl.b. Apr. (MO); *Adam* 23016, Kabala, ster. Jan. (MO); *Bakshi* 83, Torma, fl.b. Mar. (K); *Deighton* 3511, Tingi Mts., fr. Feb. (K); *Jones* 130, Bintimani, fl. Jan. (K); *Mann* 796, Bagroo R., fl. Mar. (K, P); *Morton & Gledhill* SL551, Kuru Hills, fl. Jan. (K, WAG); *Morton & Gledhill* SL2932, Kayima, fl. Dec. (K, WAG); *Small* 867, Kambui Hills, fl.b. Dec.

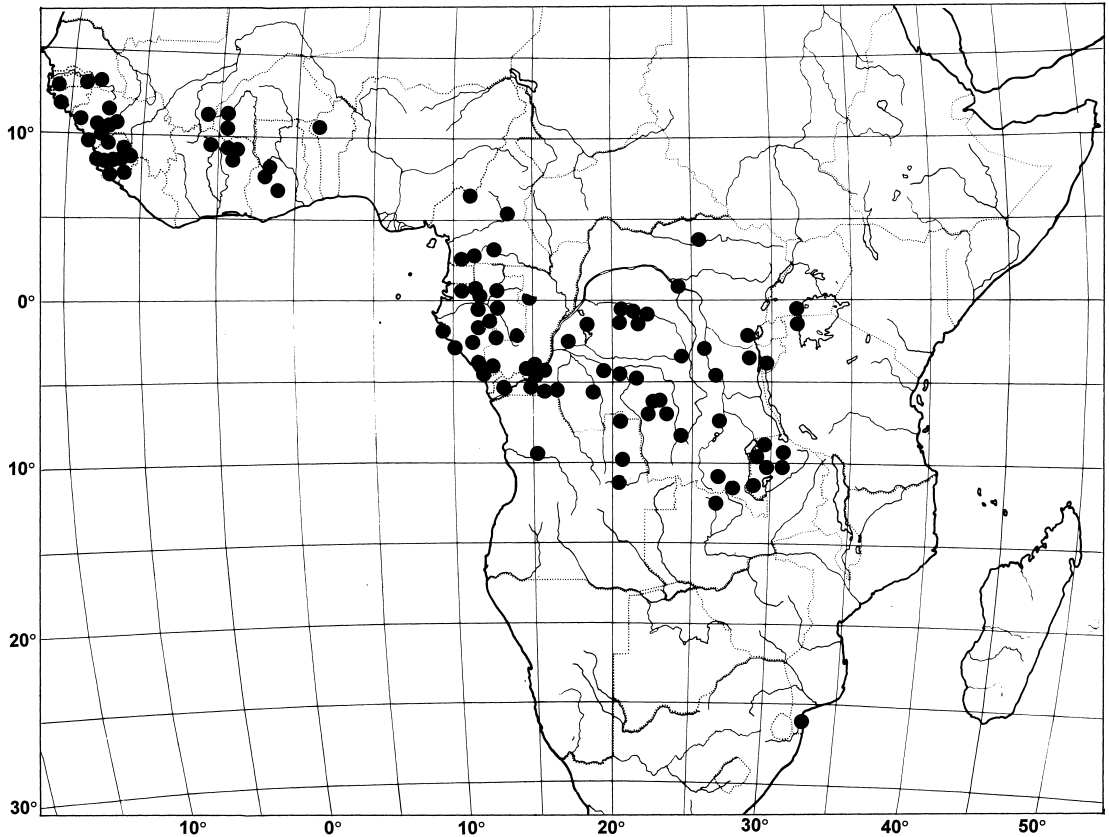


Fig. 8. — Distribution of *Sorindeia juglandifolia* (A. Rich.) Planch. ex Oliv.

(BR, K); *Thomas 5549*, Ronietta, fl. Dec. (A); *Thomas 6212*, Magbile, y.fr. Dec. (A). — **TANZANIA:** *Bancoff 179*, Bukoba, fl.b. May (K); *Gillman 273*, Kaigi, fl.b. Mar. (K). — **UGANDA:** *Dawe 306*, Masaka, fr. (K). — **ZAMBIA:** *Angus 260*, Fort Roseberry, fl. Aug. (BM, FHO, K, WAG); *Angus 426*, Solwezi, fl. Sep. (BM, FHO, K, WAG); *Fanshawe 3503*, Kawambwa, fl.b. Aug. (K); *Fanshawe 4739*, Chienge, fl. Aug. (FHO, K, P); *Fanshawe 8732*, Luwingu, fl. May (FHO, K); *Fanshawe 8819*, Solwezi, fl.b. July (FHO, K); *Holmes 976*, Mwinilunga, y.fr. Nov. (FHO, K); *Lawton 631*, Chisimba, fl. Sep. (FHO); *Lawton 650*, Chinakila, fr. Oct. (FHO); *White 3128*, Samfya Mission, fl.b. Aug. (FHO, K).

NOTES. — *Dupuisia juglandifolia*, the basionym of this species, is most probably based on collections from various sources, almost certainly on those made by LEPRIEUR and

PERROTTET. The protologue, however, does not mention any specific collection. The Paris herbarium has a LEPRIEUR collection without number that fits the description, but it was collected in flower in May, not in March or April, the time of flowering that is mentioned in the original publication. *Perrottet 151* in the British Museum herbarium, without date of collection, might have served for the original description. As it is not certain whether one or both of these specimens and/or other specimens served as a basis for the original description, the illustration (*tabula 38*) of the protologue has been designated lectotype.

I have followed VAN DER VEKEN (1959) who treated *Sorindeia africana* DC. as a *nomen nudum*, as did HOOKER (1849). Whether it is really a *nomen nudum* is debatable (see



BRUMMITT 2002), but a decision had to be taken for the purpose of this revision. Moreover, the consequences of accepting it as validly published are that *S. juglandifolia* would have to be replaced by DE CANDOLLE's name and *S. africana* (Engl.) Van der Veken by *S. nitidula* Engl.

When HOOKER published his *Sorindeia heterophylla*, he mentioned the earlier *Sapindus simplicifolius* G. Don as a synonym, which renders his name illegitimate.

The new combination *Sorindeia simplicifolia* made by EXELL in 1944 is illegitimate because it was preceded by *S. simplicifolia* March in 1896.

I see no reason to follow KOKWARO (1986), in classifying the variety *Sorindeia obtusifoliolata* Engl. var. *parvifoliolata* Engl. as a synonym of *Pseudospondias microcarpa* (A. Rich.) Engl. Why should the type, lost in Berlin, not represent the genus *Sorindeia*? This type originated from Bukoba where *Sorindeia juglandifolia*, the only species of the genus known to occur there has been collected. A collection from the Bukoba district has been designated neotype.

VAN DER VEKEN's *Sorindeia claessensii* De Wild. var. *monticola* is very different from var. *claessensii*, it belongs in *Sorindeia winkleri*.

I have not been able to maintain *Sorindeia collina* as a species distinct from *S. juglandifolia*. *Sorindeia collina* is distinguished from the latter by the place of the inflorescence, borne on the trunk or on the leafy shoot respectively. This character is not very reliable in distinguishing species in *Sorindeia*. In *Sorindeia grandifolia* for instance a single individual may be cauliflorous and ramiflorous at the same time. In *Sorindeia juglandifolia* this does occur as well, although more rarely so. A few examples are *J.J. de Wilde 7982* from Cameroun and *Wieringa 1155* from Gabon. The collecting nerve (see Fig. 2C) is not always distinct in *S. juglandifolia*, especially not in the material formerly assigned to *S. collina*.

All the material cited in CHAMPLUVIER's publication on *Sorindeia ripicola* has been examined. A constant morphological character associated with the ecological character 'riverine' has not been found, not even within the narrow scope of the material annotated and cited by the author. I have therefore placed *S. ripicola* in synonymy of *S. juglandifolia*.

## 7. *Sorindeia madagascariensis* DC.

Prodr. 2: 8 (1825); Oliv., Fl. Trop. Afr. 1: 440 (1868); Perrier de la Bâthie, Fl. de Madag. et Comores, 114<sup>c</sup> Fam.: 26 (1946); R. & A. Fernandez, Fl. Zambesiaca 2(2): (1966); Kokwaro, Fl. Trop. E. Afr., Anacardiaceae: 46 (1986). — Neotype (designated here): *Commerson s.n., no 1598* in Herb. A.L. de Jussieu (P), see notes.

*Sorindeia pinnata* (L.) Desf., Cat. Hort. Par. III: 331 (1829), as regards reference to Madagascar

*Sorindeia glaberrima* Hassk., Cat. Hort. Bog. Alt.: 245 (1844); Ding Hou, Fl. Mal., ser. 1, 8: 548 (1978). — Neotype (designated here): *No 897.365 - 32 in the Leiden Herbarium*, Cult. in the Bot. Gard. Buitenzorg (L).

*Sorindeia elongata* Blume, Ann. Mus. Bot. Lugduno-Batavum I: 205 (1850); Perrier de la Bâthie, Anacardiaceae, Fl. Madag.: 26 (1946). — Type: *Anonymus 270*, ex Herb. Mus. Par., northern Madagascar (holo-, L).

*Sorindeia obtusifoliolata* Engl. var. *obtusifoliolata*, Pflanzenw. Ost-Afrikas C: 244 (1895). — Type: *Stuhlmann s.n.*, Tanzania, Sansibar et Dar es Salaam; *Holst 2789*, Tanzania, Amboni; *Holst 2188 & 3506*, Tanzania, Usambara; *Stuhlmann s.n.*, Tanzania, Useguha (syn-, B, delet.). Lectotype (designated here): *Holst 3506*, fl.b. July (K); iso-, HBG, P, Z).

*Sorindeia usambarensis* Engl., Abh. Preuss. Akad. Wiss.: 44 (1894); Pflanzenw. Ost-Afrikas C: 244 (1895). — Type: *Holst 2292 & 3261*, Tanzania, Usambara (syn-, B, delet.). Lectotype (designated here): *Holst 3261*, fl. Aug. (K; iso-, P, Z).

*Sorindeia goudotii* Briq., Annuaire Conserv. Jard. Bot. Genève 20: 423 (1916-1919); Breteler, Adansonia, sér. 3, 19: 329 (1997). — Type: *Goudot s.n.*, Madagascar, s.loc., flower buds (lecto-, G; iso-, WAG).

*Aglaiia somalensis* Chiov., Result. Veg. Sci. Miss. Stefan.-Paoli Somal. Ital. 1. 51: 204 (1916). — *Sorindeia somalensis* (Chiov.) Chiov., Mat. Prim. Veg. Coltiv. Eritrea & Somalia: 63 (1921). — Types: *Scassellati 55*, Somalia, Uasciani; *Scassellati 64*, Somalia, Torba and *Paoli 489*, Somalia, Jubaland (syn-, FI.). Lectotype (designated here): *Scassellati 64* (FI), see notes.

Tree up to 20(-35?) m tall and 20 cm d.b.h. or shrub. Leaves mostly crowded at the top of the branches, (3)7-11(-13)-foliolate; folioles ovate-elliptic to oblong-obovate, (2-)11-20(-30) × (1-)4-6(-10) cm with 8-14 pairs of main lateral nerves, the 'collecting' nerve usually absent (see Fig. 2D), but sometimes ± distinct between the upper lateral nerves; ± cuneate and often slightly

to strongly unequal-sided at base, obtuse to acuminate at apex, the acumen up to 3 cm long; glabrous, often minutely puberulous on rachis and the midrib beneath. Flowering Aug.-Dec. Panicles usually borne below the leaves, or on the trunk (especially in continental Africa), more rarely axillary, axillary to terminal or below the leaves or on the trunk in Madagascar, up to 1 m long, up to 1.60 m long in fruit, ± glabrous. Calyx glabrous, lobes shorter than the tube, sometimes sparsely ciliate. Petals valvate, up to 4 × 2 mm, yellow to pink. Male flowers with 10-20 stamens, filaments shorter than the 1.5-2 mm long anthers. Female flowers with 5-10 staminodes; pistil glabrous. Fruit (Sep.-Jan.) yellow, subellipsoid, aciculate or not, up to 2.8 × 1.8 cm, smooth, glabrous, edible. — Figs. 1E, 2D, 3F, 9.

**HABITAT AND DISTRIBUTION.** — Riverine, coastal and upland forest of East Africa, from Somalia to Mozambique, the Comoro islands, Mayotte, Madagascar and the Mascarenes. Alt. up to c. 1800 m.

**SELECTED SPECIMENS.** — **COMORES:** *Lam & Meeuse* 6155, Moheli, ster. Dec. (L). — **KENYA:** *Abdullah* 3352, Utwani Forest, fl.b. Sep. (K); *Adamson* 131, Bura, fr. Sep. (K); *Beentje et al.* 381, Mbololo Forest, ster. May (K); *Brenan et al.* 14505, Diani, fr. Nov. (K); *Kabende* 1766, Haiwani, fl., fr. Feb. (MO); *Medly* 217, Mchelelo West, fl.b. Oct. (K); *Robertson* 3633, Mtwapa Forest, y.fr. Aug. (K, MO). — **MADAGASCAR:** *Andrianantoanina et al.* 369, South of Antsiranana, fl. Oct. (P, UPS); *Andrianantoanina et al.* 873, Antsiranana, fl.b. Sep. (P); *Antilahimena* 179, Lokobe, fl.b. Oct. (P); *Cours* 2959, between Ambila and Tamatave, ster. Oct. (P); *Humbert & Capuron* 21996, Andape, fl. Nov.-Dec. (K, P); *Jongkind et al.* 3206, Tsingy de Bemaraha, fl., fr. Nov. (WAG); *Lewis et al.* 631, Toamasina, fl.b. Jan. (UPS, WAG); *Lowry et al.* 4174, Maroantsetra, fl. Oct. (P); *McPherson* 14429, Fort Dauphin, fl.b. Nov. (K, P); *Morat* 4737, Kelifely, y.fr. Nov. (P); *Perrier de la Bâthie* 500, Firingalava, fl. Sep. (P); *Prance & Andriantiana* 30738, Antanambe, fl. Oct. (K, MO); *Robevohitra & Breteler* 3899, Masoala Penins., fl. Oct. (WAG); *Randrianjanaka et al.* 54, Moango, fr. Jan. (P); *Service Forestier SF8044*, Ampijoroa, fl. Dec. (P); *van Niek* 1866, Ambre Mt., fl. Oct. (WAG). — **MALAWI:** *Brass* 17864, Nswadzi R., fl. Sep. (K, MO); *Burt Davy* 21940, Limbe, ster. Sep. (FHO); *Chapman* 437, Mlanje Mt., y.fr. Sep. (FHO, K); *Pawek* 11758, Rumphii, fl. Sep. (K, MO, WAG). — **MAURITIUS:** *Blackburn s.n.*, s.loc., fl. (A); *Sieber s.n.*, s.loc., fl.b. (K,

L). — **MAYOTTE:** *Soumille* 973, Combani Mt., fr. Sep. (K). — **MOZAMBIQUE:** *Bandeira & Boana* 412, Megaruma R., fl.b. Oct. (MO); *Faulkner* 213, Quelimane, y.fr. (K); *Gomes de Sousa* 4487, Nangororo, fl.b. Oct. (K); *Grandvaux Barbosa & Carvalho* 4398, Alto Lingonha, fr. Oct. (K); *Groenendijk* 699, Litunde, fl. Oct. (WAG); *Mendonça* 843, Amaramba, fl. Oct. (A, WAG); *Torre* 3594, Ile, y.fr. Oct. (FHO). — **SOMALIA:** *Madany* 85/7, Jilib, fl.b. Aug. (K). — **TANZANIA:** *Archbold* 3303, Kwamkono, fl. Sep. (K); *Baagoe et al.*, Amani, fl.b. July (WAG); *Borhidi & Hedren* 84133, Mazumbai F.R., Gonja Mt., ster. Feb. (UPS); *Bridson* 639, Sanje, fl. Sep. (K); *Bruce* 137, Morogoro, fl. Nov. (BM, BR, K); *Bruce* 150, Uluguru, fl. Nov. (BM, BR, K); *Burt Davy* 4475, Dar es Salaam, ster. Apr. (K); *Burt Davy* 22391, Pemba I., Chuaka, fl. Oct. (K); *Burt Davy* 22625, Zanzibar, ster. Oct. (FHO); *Carmichael* 644, Duluti, fl.b. Sep. (K); *Dingle* 359, Manyara Lake, fr. Oct. (K); *Eggeling* 6300, Kilosa, fl.b. Oct. (FHO, K); *Engler* 390, between Muhesa and Lugusa, fl. Sep. (BM); *Frontier-Tanzania Coastal Forest Research Programme* 72, Kiwengoma Forest, fl. (MO); *Frontier-Tanzania Coastal Forest Research Programme* 1282, Mchungu Forest, fl. Aug. (MO); *Gane* 14, Ukwama, fl. Oct. (FHO, K); *Gereau & Kayombo* 3656, Lupingu, fl.b. Jan. (K, MO); *Gillet* 18018, Lindi, fr. Nov. (K, WAG); *Greenway* 2449, Mwapwa, fl. Aug. (K); *Greenway* 5183, Mafia I., Baleni, fl.b. Aug. (FHO, K); *Holst* 3261, Lutindi, fl. Aug. (K, P, Z); *Holst* 3506, Maschewa, fl.b. July (HBG, K, P, Z); *Kayombo* 857, Iringa, fl.b. Aug. (MO); *Lovett* 190, Sanje, fl.b. Aug. (K); *Mwasumbi* 16579, Nkanda, fr. Nov. (K, MO); *Paulo* 795, Manyangu F.R., fl. Sep. (K); *Scheven* 35, Ndanda, fl. Sep. (B, MO); *Schlieben* 1264, Lupembe, fl. Oct. (B, BM, G, P, Z); *Schlieben* 5403, Lutamba Lake, fl. Sep. (B, BM, G, P, Z); *Stolz* 921, Kyimbila, fl. Oct. (B, G, K, L, UPS, WAG, Z).

**NOTES.** — The first description of *Sorindeia madagascariensis* is that of DESROUSSEAUX in LAMARCK's Encyclopedie, vol. 3(2): 699 (1792), under the name *Mangier pinné*, *Mangifera pinnata* L.f. Suppl.: 156 (1781), a species from India, which is now known under the name of *Spondias pinnata* (L.f.) Kurz. Although DESROUSSEAUX identified his plant from Madagascar as *Mangifera pinnata*, he was well aware of its distinctness, saying that it should probably be classified as a distinct genus. This was done by DU PETIT THOUARS in 1806, but without providing the necessary new binomial combination for the type species, which was effected by DE CANDOLLE in 1825. There is no specimen in the Paris herbarium of DU PETIT THOUARS pertaining to *Sorindeia madagascariensis*.

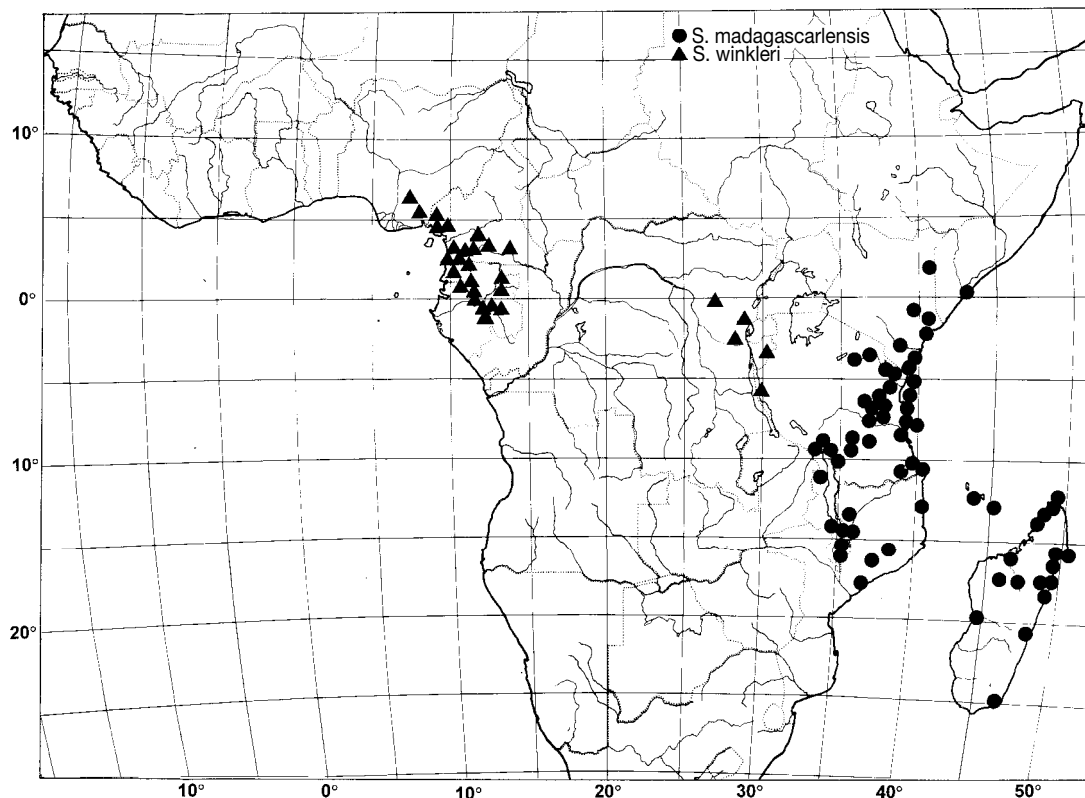


Fig. 9. — Distribution of *Sorindeia madagascariensis* DC. and *S. winkleri* Engl.

sis, nor in the DE CANDOLLE herbarium in Geneva. A collection in the JUSSIEU herbarium at P has been selected as neotype.

For *Sorindeia obtusifoliolata* Engl. var. *parvifoliolata* Engl. see under *S. juglandifolia*.

I have not seen the fruits described by CHIOVENDA in his diagnosis of *Aglaia somalensis* Chiov., the basionym of *Sorindeia somalensis* (Chiov.) Chiov. Scanned color prints of the leaves of the syntypes that have been examined match *Sorindeia madagascariensis*. One of the three syntypes *Scasellati* 64 has been designated as the lectotype.

### 8. *Sorindeia oxyandra* Bourobou & Breteler

Syst. Geogr. Pl. 69: 115 (1999). — Type: *Breteler & de Wilde* 50, Gabon, Monts de Cristal, Tchimbélé, ♂ fl. Aug. (holo-, WAG; iso-, BR, LBV, MO).

Tree up to 8 m tall. Leaves up to 18-foliolate, glabrous to sparsely puberulous; folioles papery, narrowly, oblong-lanceolate, 10-19 × 3-4 cm, rounded to cuneate at base, long-acuminate at apex, the acumen 1-2 cm long, 1-1.5 mm wide; midrib and the 14-20 pairs of main lateral nerves slightly prominent above, more distinctly so beneath, the 'collecting nerve' indistinct or absent. Flowers (Aug.) in glabrous, up to 14 cm. long panicles, borne on the stem, the male with 15-18 stamens of 2.5-3.5 mm long, the female with 10-12 staminodes and a glabrous pistil. Immature fruits (Aug.) subellipsoid, 1.5-2 × 0.8-1.3 cm, glabrous. — Figs. 1F, 3G, 5.

HABITAT AND DISTRIBUTION. — Rain forest, Monts de Cristal, Gabon and Alen Mt., Equatorial Guinea. Alt. up to c. 1000 m.

SPECIMENS EXAMINED. — **EQUATORIAL GUINEA:** *Senterre & Obiang 3817*, Alen Mt., ster. Dec. (BRLU). — **GABON:** *Breteler & de Wilde 50*, Tchimbélé, ♂ fl. Aug. (BR, LBV, MO, WAG); *Breteler & de Wilde 51*, Tchimbélé, ♀ fl., y.fr. Aug. (MO, WAG).

## 9. *Sorindeia winkleri* Engl.

Bot. Jahrb. Syst. 43: 13 (1909). — Type: *Winkler 760*, Cameroun, Campo, fr. Nov. (holo-, B, delet.; lecto-, Z, designated here).

*Sorindeia rubriflora* Engl., Bot. Jahrb. Syst. 46: 338 (1911). — Type: *Zenker 1276 & 2884*, Cameroun, Bipindi, fl. Feb.-Mar., and *Tessmann B143*, Equatorial Guinea, Nkolentangan, fl. Mar. (syn-, B, delet.). Neotype (designated here): *Tchouto et al. 3207*, Cameroun, Onoyong, ♂ fl. Mar. (WAG).

*Sorindeia immersinervia* Engl. & v. Brehmer, Bot. Jahrb. Syst. 54: 312 (1917). — Type: *Mildbraed 5382*, Cameroun, Lomié, fr. May (holo-, B, delet.; lecto-, HBG, designated here).

*Sorindeia mildbraedii* Engl. & v. Brehmer, Bot. Jahrb. Syst. 54: 311 (1917); Keay in Hutch. & Dalziel, Fl. West Trop. Afr., ed. 2, 1: 737 (1958). — Type: *Mildbraed 6243*, Cameroun, between Campo and Kribi, Longo R., fl. July (holo-, B, delet.). Neotype (designated here): *Bos 6616*, Cameroun, 28 km Kribi-Lolodorf, fl. Mar. (WAG).

*Sorindeia claessensii* De Wild. var. *monticola* Van der Veken, Bull. Jard. Bot. État 29: 244 (1959); Fl. du Congo Belge & Ruanda-Urundi 9: 100 (1960). — Type: *Michelson 808*, Congo (Kinshasa), Kimbili, ster. Dec. (holo-, BR).

Slender shrub to small tree up to 15 m tall. Leaves (1)-7-11(-13) foliolate, the main axis puberulous to glabrous; folioles alternate to opposite, firmly papery to coriaceous, ± glabrous, oblong-elliptic, often narrowly so (5)-10-18(-30) × (2)-3-6(-10) cm, with (9)-11-18(-20) pairs of main lateral nerves, 'collecting nerve' distinct, midrib impressed above; rounded to cuneate at base, acuminate at apex, abruptly so or not. Inflorescence drooping, up to 60 cm long, reddish-purple, puberulous. Flowers (Jan.-Apr., Aug.-Sep.) yellow; ♂ flower with 14-16 stamens, filaments purple, 2-3 times as long as the anthers; ♀ flower with glabrous pistil and 5-staminodes. Fruits (Apr.-July; Sep.-Dec.) yellow to orange at maturity, glabrous, ovoid-ellipsoid, usually somewhat obliquely so, slightly laterally compressed, up to c. 3.5 × 2 cm; immature fruits often whitish, 3-sided in transverse section. — Figs. 1G, 3H, 9.

HABITAT AND DISTRIBUTION. — Rain forest of eastern Nigeria, Cameroun, Equatorial Guinea, Gabon, eastern Congo (Kinshasa), Burundi, and western Tanzania. Alt. up to 1500 m.

SELECTED SPECIMENS. — **CAMEROUN:** *Asonganyi 191*, Sabou R., 65 km SE Akonolinga, fr. June (P); *Bates 1364*, Bitye, y.fr. (BM); *Bos 6616*, 28 km Kribi-Lolodorf, fl.b. Mar. (WAG); *Breteler 2658*, Oveng, fl. Mar. (BR, K, WAG); *J.J. de Wilde 7938A*, km 16 Ebolowa-Minkok, fl. Jan. (MO, WAG); *W. de Wilde c.s. 2204*, 50 km NW Eséka, fl.b. Apr. (WAG); *Leeuwenberg & Berg 9757*, km 11 Loum-Solé, fr. Apr. (BR, P, UPS, WAG); *Mildbraed 5382*, Lomié area, fr. May (HBG); *Nemba & Thomas 149*, between Kumba and Baduma, fr. July (MO); *Tchouto et al. 3207*, Onoyong, fl. Mar. (WAG); *Winkler 760*, Campo, fr. Nov. (Z). — **CONGO (Kinshasa):** *Gutzwiller 1187*, Shunga, fl.b. June (BR, K); *Lejoly 1578*, 45 km N of Lubutu, y.fr. June (BR); *Michelson 808*, Kumbili, ster. Dec. (BR). — **EQUATORIAL GUINEA:** *Van Reeth 531*, Alen Mt. Nat. Park, fl.b. Feb. (BRLU). — **GABON:** *Breteler et al. 13176*, Bambidie, fr. Oct. (WAG); *Breteler & de Wilde 77*, 25 km NE Assok, fl. Aug. (LBV, MO, WAG); *Breteler & de Wilde 518*, km 40 La Laramakou, fl. Sep. (BR, K, LBV, MO, WAG); *Breteler & de Wilde 632*, Mayebut, Ivindo R., fl. Sep. (LBV, MO, WAG); *N. Hallé & Le Thomas 178*, Bélinga, fr. July (P); *Leeuwenberg & Persoon 13565*, 33 km E of Abanga Camp (Leroy), y.fr. Sep. (WAG); *Le Testu 6306*, Ebandou, fl.b. Sep. (P); *Le Testu 7840*, Bangoussou, fr. Dec. (BM, P); *Moungazi 891*, Makandé, fr. Nov. (LBV); *Reitsma c.s. 2605*, Lopé Res., fr. Nov. (LBV, WAG); *Reitsma c.s. 2719*, Ekobakoba, fr. Dec. (LBV, WAG). — **NIGERIA:** *Ariwaodo 664*, Uwet, fr. May (MO, WAG); *Latilo FHI 41326*, Akamkpa Rubber Estate, fr. Mar. (K, P); *Onochie FHI 32906*, Ibeno, ster. May (K). — **RUANDA:** *Michel & Reed 1947*, Kininga, ster. May (BR). — **TANZANIA:** *Harley 9188*, Kabwe R., S of Pasagulu, fl.b. Aug. (UPS).

## EXCLUDED SPECIES

*Sorindeia afzelii* Engl., Bot. Jahrb. Syst. 15: 107 (1892), non *S. afzelii* Engl., Bot. Jahrb. Syst. 54: 317 (1917) = *Trychoscypha longifolia* (Hook.f.) Engl. [fide KEAY in HUTCHINSON & DALZIEL, Fl. West Trop. Afr., ed. 2, 1: 736 & 738 (1958)].

*Sorindeia albiflora* Engl. & Krause, Bot. Jahrb. Syst. 46: 341 (1911); Keay in Hutch. & Dalziel, Fl. West Trop. Afr., ed. 2, 1: 738 (1958). — Type: *Ledermann 1938*, Cameroun, between Bamenda and Babongi, fl. Dec. (holo-, B, delet.). — Note: The original material has been lost at Berlin and a duplicate has not been found. The combination of characters mentioned by ENGLER & KRAUSE in their

description does not fit any known *Sorindeia* species, it is in fact hardly admissible in this genus. *Trichoscypha* seems to be a better choice, although 5-merous flowers with ovaries with 5 stigma's, as described by the authors, are very rare in this genus and have so far not been collected in Central Africa.

- Sorindeia deliciosa* A. Chev., Expl. Bot. Afr. Occ. Fr.: 160 (1920) = *Santiria trimera* (Oliv.) Aubrév. [fide KEAY in HUTCHINSON & DALZIEL, Fl. West Trop. Afr., ed. 2, 1: 738 (1958)].
- Sorindeia doeringii* Engl. & Krause, Bot. Jahrb. Syst. 46: 339 (1911) = *Ekebergia senegalensis* A. Juss. [fide ENGLER & v. BREHMER, Bot. Jahrb. Syst. 54: 313 (1917)].
- Sorindeia lagdoensis* Engl. & Krause, Bot. Jahrb. Syst. 46: 342 (1911). — Type: *Ledermann 4375*, Cameroun, Lagdo Mts. (holo-, B, delet.) = *Lannea microcarpa* Engl. & Krause. — Note: There is no original material left to judge this *Sorindeia* species. ENGLER & KRAUSE's description, however, contains sufficient elements such as '*folia margine densiuscule breviter ciliata*' and '*antherae parvae ovoideae*' to identify their plant as *Lannea microcarpa*.
- Sorindeia longifolia* (Hook.f.) Oliv., Fl. Trop. Afr. 1: 442 (1868). — *Dupuisia? longifolia* Hook.f., Fl. Nigrit.: 287 (1849) = *Trichoscypha longifolia* (Hook.f.) Engl., Bot. Jahrb. Syst. 1: 425 (1881).
- Sorindeia mannii* Oliv., Fl. Trop. Afr. 1: 441 (1868) = *Trychoscypa acuminata* Engl., Bot. Jahrb. Syst. 1: 425 (1881). — Note: The combination *Trichoscypha mannii* is not legitimate because it is preceded by *T. mannii* Hook.f. in 1862.
- Sorindeia obliquifoliolata* Engl., Bot. Jahrb. Syst. 46: 337 (1911); Van der Veken, Fl. Congo Belge & Uranda-Urundi 9: 107 (1960). — Type: *Mildbraed 1972*, Congo (Kinshasa), Albert Lake, fr. Jan. (holo-, B, delet.) = *Pseudospondias microcarpa* (A. Rich.) Engl. — Note: There is only ENGLER's diagnosis to identify this *Sorindeia* species. His description of the leaflets, but especially of the fruits ('*apice rotundati*') point to *Pseudospondias microcarpa*, not to any *Sorindeia* species.
- Sorindeia patens* Oliv., Fl. Trop. Afr. 1: 441 (1868) = *Trichoscypha patens* (Oliv.) Engl., Bot. Jahrb. Syst. 1: 425 (1881).
- Sorindeia trimera* Oliv., Fl. Trop. Afr. 1: 441 (1868) = *Santiria trimera* (Oliv.) Aubrév., Rev. Bois & For. Trop. 4, 8: 344 (1948).

### Acknowledgements

The author is very grateful to Mr. H. DE VRIES for the excellent drawings and to his wife B.J.M.

BRETELER - KLEIN BRETELER for the electronic version of the manuscript.

### REFERENCES

- BOUROBOU-BOUROBOU H. & BRETELER F.J. 1997. — Novitates Gabonenses (31), *Sorindeia gabonensis*, a new Anacardiaceae from Gabon. *Bull. Jard. Bot. Belg.* 66: 341-345.
- BOUROBOU-BOUROBOU H. & BRETELER F.J. 1999. — Novitates Gabonenses (35), *Sorindeia oxyandra*, another new Anacardiaceae from Gabon. *Syst. Geogr. Pl.* 69: 115-117.
- BRETELER F.J. 1978. — The African Dichapetalaceae IV. *Meded. Landbouwhogeschool Wageningen* 78-10: 1-84.
- BRETELER F.J. 1993. — Novitates Gabonenses (10), *Keayodendron bridelioides* (Euphorbiaceae): its typification, correct author citation, and recent discovery in Gabon. *Bull. Jard. Bot. Belg.* 62: 187-190.
- BRUMMITT R.K. 2002. — A consideration of "nomina subnuda". *Taxon* 51: 171-174.
- DE CANDOLLE A.P. 1825. — Prodrum Systematis Universalis Regni Vegetalis, *Sorindeia* 2: 80.
- DEKKER A.J.F.M. 1983. — A revision of the genera *Penianthus* Miers and *Sphenocentrum* Pierre (Menispermaceae) of West and Central Africa. *Bull. Jard. Bot. Belg.* 53: 17-66.
- DU PETIT THOUARS A. 1806. — Genera Nova Madagascariensia: 23.
- FERNANDEZ R. & A. 1966. — Anacardiaceae: 567-571, in EXELL A.W., FERNANDEZ A. & WILD H. (eds.), *Flora Zambesiaca* 2(2). Crown Agents, London.
- HOOKE W.J. 1849. — Flora Nigritana: 286-288. Hippolyte Bailliere, London.
- KEY R.W.J. 1958. — Anacardiaceae: 737-738, in HUTCHINSON J. & DALZIEL J.M. (eds.), *Flora of West Tropical Africa*, ed. 2. Crown Agents, London.
- KOKWARO J.O. 1986. — Anacardiaceae: 45-49, in POLHILL R.M. (ed.), *Flora of Tropical East Africa*. Balkema, Rotterdam.
- PERRIER DE LA BÂTHIE H. 1946. — Anacardiaceae: 25-31, in HUMBERT H., *Flore de Madagascar et des Comores*. Imprimerie Officielle, Tananarive.
- VAN DER VEKEN P. 1959. — Anacardiaceae novae congolanae. *Bull. Jard. Bot. État* 29: 225-262.
- VAN DER VEKEN P. 1960. — Anacardiaceae: 5-108, *Flore du Congo Belge et du Ruanda-Urundi* 9. I.N.E.A.C. Bruxelles.

*Manuscript received 27 January 2003;  
revised version accepted 31 March 2003.*