

PRIMITIAE AFRICANAE X¹.

RHINOPTERYX NIEDENZU AND ACRIDOCARPUS (G. DON) GUILL. ET PERR. (MALPIGHIACEAE) UNITED

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SUMMARY

A study is made of the three described species of the genus *Rhinopteryx* Ndz. It has appeared that the type specimens, on which the descriptions were based, belong to a single species. After a close study of *Acridocarpus* Guill. et Perr. and *Rhinopteryx* the author decided to unite these genera.

HISTORY OF THE GENUS RHINOPTERYX NDZ.

In 1896 NIEDENZU described the genus *Rhinopteryx*, based on a single species: *Rh. spectabilis*. The type specimen, and only material cited, was Brown & Lester 50.

In Arb. Bot. Inst. Braunsberg 6: 57 (1915), and in Das Pflanzenreich 4, 141: 279 (1928) Niedenzu used *Rhinopterys* instead of *Rhinopteryx*. The latter spelling being the original one, is used here. Furthermore, *Rhinopteryx* is a correct transliteration of the Greek root, as also was stated by C.V. Morton in Taxon 17: 321 (1968).

Brown & Lester 50, 47 and Ozanne 5, were used by SPRAGUE to describe *Acridocarpus hemicyclopterus* (1906). The present author concluded that all specimens cited above belong to a single species. As she designated Brown & Lester 50 as the lectotype of *A. hemicyclopterus* Sprague, both names involved become even homotypic synonyms.

Some time later, in 1909, ENGLER described a new species in *Acridocarpus*, named *A. kerstingii*, and based on Kersting 507. This species NIEDENZU referred to *Rhinopteryx* in 1921: *Rh. kerstingii* (Engl.) Ndz.

¹Previous parts:

1. Acta Bot. Neerl. 5: 171-178. 1956.
2. Blumea 10: 607-624. 1960.
3. Acta Bot. Neerl. 11: 231-265. 1962.
4. Blumea 12: 209-239. 1964.
5. Acta Bot. Neerl. 13: 161-174. 1964.
6. Bull. Jard. Bot. de l'état Bruxelles 35: 411-433. 1965.
7. Journal S. Afr. Bot. 33: 269-292. 1967.
8. Acta Bot. Neerl. 19: 227-248. 1970.
9. Taxon 22(1): 57-91. 1973.

The third species distinguished in *Rhinopteryx* was described by SPRAGUE in 1922, who based it on Macleod 815: *Rh. angustifolia* Sprague.

In his monograph of the *Malpighiaceae* in Engler's *Pflanzenreich* 4 (141): 281, NIEDENZU (1928) considers this last named species as a subspecies of *Rh. spectabilis*: *Rh. spectabilis* Ndz. subsp. *angustifolia* (Sprague) Ndz.

REDUCTION OF THE GENUS RHINOPTERYX NDZ.

As is explained in the following paragraphs the present author maintains only one of the species described or combined in *Rhinopteryx*. She is of the opinion that this species should be placed in *Acridocarpus* for the following reasons:

— A close examination of the specimens cited below reveals that the flowers of *Rhinopteryx* and *Acridocarpus* are zygomorphic, except for the stamens, which are arranged regularly; they are similar in built.

Differences in the floral parts of the two genera concern their size, and the place and number of the glands of the calyx. However, these differences also exist between *Acridocarpus* species, which is shown by the following information on various species:

Kirk s.n. (type of *A. chloropterus* Oliv.; sepals ca. 4 mm long); *Zenker 2472* (type of *A. macrocalyx* Engl.; sepals ca. 7 mm long); *Brown & Lester 50* (type of *Rhinopteryx* Ndz.; sepals 4–5.5 mm long); *J. J. Bos 3130* (*A. longifolius* Hook.; petals 11–13 mm long); *Battiscombe 801* (*A. zanzibaricus* Juss.; petals 17–22 mm long); *Brown & Lester 50* (petals 11–13 mm long); *G. Don s.n.* (type of *A. longifolius* Hook.; anthers 4 mm long); *Battiscombe 801* (*A. zanzibaricus* Juss.; anthers 5–6 mm long); *Brown & Lester 50* (anthers ca. 5 mm long); *Kirk s.n.* (type of *A. chloropterus* Oliv.; styles ca. 9 mm long); *Nsôlô in coll. Bates 1816* (*A. macrocalyx* Engl.; styles ca. 15 mm long); *Brown & Lester 50* (styles ca. 10 mm long); *Balfour 272* (type of *A. socotranus* Oliv.; dorsal sepal with 2 lateral basal glands); *G. Don s.n.* (type of *A. longifolius* Hook.; 1 gland connecting the ventral sepals); *Schlieben 2427* (*A. chloropterus* Oliv.; each of the two ventral sepals with 2 glands); *Torre 6897* (*A. natalitius* Juss.; 3 glands on the two ventral sepals); *Brown & Lester 50* (mostly 3 glands on the ventral sepals).

— Differences between *Acridocarpus* and *Rhinopteryx*, concerning the form and size of the wings of the samara are insignificant. In some other genera of *Malpighiaceae* (e.g. *Heteropteris* and *Stigmaphyllon*), the shape and the size of the samara vary widely. The specimens cited below illustrate this variability:

Heteropteris Kunth: *Hinton 14078* (*H. laurifolia* Juss.; 3.5–4 × 1.25–1.5 cm, surrounding the nutlet); *Riedel 361* (*H. chrysophylla* Kunth; 5 × 2.5 cm; not surrounding the nutlet); *Regnell ser. II, 33* (*H. confertiflora* Juss.; 1.75–2 × 0.5–1 cm, not surrounding the nutlet); *De Wit s.n.* (*H. leona* Exell; 2.5–3.5 × 2–3 cm, surrounding the nutlet);

Stigmaphyllon Juss.: *Breteler 3757* (*S. fulgens* Juss.; 4.2–4.5 × 1.2–1.5 cm, not surrounding the nutlet); *Breteler 3678* (*S. splendens* Cuatr.; 3.5–4 × 1.2–1.6 cm, surrounding the nutlet) *Howard & Nerling 16996* (*S. tomentosum* Ndz.; 1–1.5 × 0.5 cm, not surrounding the nutlet); *Wagner 136* (*S. diversifolium* Juss.;

2 × 0.7 cm, surrounding the nutlet).

— According to NIEDENZU (1928), though not in the original description of *Rhinopteryx*, a difference between the two genera should be that the pedicel is not twisted in *Acridocarpus*, while the pedicels in *Rhinopteryx* are clearly twisted. The present author could not find any evidence in the material cited below, in favour of this difference. This is e.g. illustrated by the following specimens:

Kirk s.n. (type of *A. chloropterus* Oliv.; not twisted pedicels); *Zenker 2472* (type of *A. macrocalyx* Engl.; slightly or not twisted pedicels); *Balfour 272* (type of *A. socotranus* Oliv.; slightly twisted); *Battiscombe 801* (*A. zanzibaricus* Juss.; twisted pedicels).

— A last difference suggested by Niedenzu (1928), concerns the hairtypes of the two genera. *Acridocarpus* is said to have T-shaped hairs, while *Rhinopteryx* should have dichotomously branched hairs. However, not all hairs of *Rhinopteryx* are dichotomously branched as a great deal of the hairs on the outside of the calyx and on the ovary are T-shaped (all specimens studied). Furthermore dichotomously branched hairs are present on branches and/or leaves of specimens of *Acridocarpus* cited below:

Balfour 272 (type of *A. socotranus* Oliv.; both types on branchlets and on leaves); *Zenker 2472* (type of *A. macrocalyx* Engl.; both types on leaves); *Kirk s.n.* (type of *A. chloropterus* Oliv.; both types on branchlets and on young leaves).

The similarities between *Rhinopteryx* and *Acridocarpus* are best shown in *A. natalitius* Juss., *A. macrocalyx* Engl., and *A. congolensis* Sprague, because the calyces in these species carry an equal number of glands, and the bracteoles are glandless. Moreover, *A. natalitius* Juss. has a rather long inflorescence, *A. macrocalyx* has similar hairs, and both *A. congolensis* and *A. natalitius* have a more or less similar wing to the samara.

As to the flower *A. congolensis* and *A. macrocalyx* are not closely allied to *Rhinopteryx*, because their flower glands, if present, are situated dorsally, whereas the glands of *A. natalitius* are always present, and situated ventrally, as is the case in *Rhinopteryx*. In addition *A. macrocalyx* differs by the exceptional size of the floral parts. By the wings of the samaras *A. natalitius* shows the closest relationship to *Rhinopteryx*, as the wings are surrounding the nutlets, and its width approaches that of the wing of *Rhinopteryx*.

As for vegetative characters *A. macrocalyx* shows the closest relationship with *Rhinopteryx* in the hairiness of the leaves and the branches, while the absence of a full indumentum in *A. natalitius* is the most pronounced difference with *Rhinopteryx*. Nevertheless, the present author prefers to consider of all *Acridocarpus* species *A. natalitius* as the closest relative to *Rhinopteryx*, because of the similarity in flower parts, in the general appearance, and the sizes of the plants of the two taxa. Moreover it appears that the absence of an indumentum depends on age, which means that young parts of both *A. natalitius* and *Rhinopteryx* have a full indumentum which disappears when the plant grows older, but this more rapidly in *A. natalitius*.

Acridocarpus (G. Don) Guill. et Perr., Tent. Fl. Seneg. 1: 123, t. 29. 1832. Type species: *A. plagiopterus* Guill. et Perr.

Heterotypic synonym: *Rhinopteryx* Ndz., Engler & Prantl, Nat. Pflanzenfam. 3(4): 352–353. 1896. Type species: *Rh. spectabilis* Ndz.

Tree, or often sarmentose shrub or liana, sometimes twining, rarely rooting near leaf insertions, often appearing as a rhizomatous herb, when yearly burnt by bush fires. Branches more or less lenticellate, glabrous or occasionally glabrescent; branchlets sometimes lenticellate, from tomentose to glabrescent, hairs T-shaped and/or dichotomously branched with suberect branches. Leaves alternate or rarely opposite (Madagascan species, ARÈNES 1950), very variable in shape and size, from linear to obovate, from retuse to long acuminate at the apex, attenuate to cordate, or occasionally sagittate at the base, entire and revolute at the margin, which is sometimes undulate; petiole tomentose to glabrous, often more densely hairy above or beneath, hairs T-shaped and/or dichotomously branched, sometimes 1 or 2 glands on the petiole; up to three pairs of glands at the base of the blade beneath, while other glands are absent, or many to few are irregularly spread on the blade beneath, or spread along the midrib or along the margin beneath; glands orbicular and rugose; midrib mostly prominent beneath, as are sometimes the secondary and tertiary veins; young leaves with both sides tomentose to villose, mature leaves glabrous or less often pilose at both sides; hairs T-shaped and/or dichotomously branched; stipules none. Inflorescence terminal and/or axillary, mostly a raceme, rarely corymbiform or umbellate, sometimes a large panicle. Rhachis tomentose to glabrescent with T-shaped hairs and/or dichotomously branched hairs, sometimes with ribs connecting the pedicels, rarely lenticellate. Bracts inserted below the insertion of the pedicels, mostly triangular, less often subulate, or sometimes ovate, obtuse or acute at the apex, glabrous above or hairy on both sides, with T-shaped hairs, but also with some dichotomously branched hairs, occasionally with two glands at the base beneath, blade of the bracts often erect or rarely recurved. Two opposite bracteoles at the very base of the pedicels, which may appear as stipules of the bracts, mostly shaped like the bracts, but smaller, more often with one or two glands beneath at the base. Pedicels slender, twisted or not, tomentose to pilose with T-shaped and/or dichotomously branched hairs. Flower bud globose, ovoid or ellipsoid. Calyx 5-merous, with almost free sepals, slightly spurred, outside villose to pilose, often ciliate at the margin, inside mostly glabrous, but sometimes pilose in the middle, obtuse or acute at the apex; dorsal sepal mostly elliptic, sometimes ovate to elliptic or orbicular, rarely with one or two lateral basal glands outside; lateral sepals mostly ovate, sometimes elliptic, rarely one to two glands on one of them; ventral ones ovate to elliptic, both of them with 0–2 glands, often one additional gland, which is connecting the two sepals; glands orbicular, glabrous, smooth, impressed or slightly prominent. Petals 5, bright or orange yellow, alternating with the sepals, glabrous on both sides (or occasionally (once observed) with some T-shaped hairs on the base outside of the dorsal petals), obtuse at the apex; dorsal petals mostly

obovate, sometimes obovate-orbicular, cuneate at the base, fimbriate or laciniate at the margin; lateral petals sometimes galeate, orbicular, attenuate at the base, crenate or crenate-laciniate at the margin; ventral one galeate, orbicular, attenuate at the base, crenate or crenate-laciniate at the margin. Stamens 10, irregularly obdiplostemon (sometimes the three ventrals diplostemon, both types occurring within a single species); filaments opposite the sepals mostly longer than those opposite the petals, sometimes irregularly unequal, or rarely equal, glabrous, thickened at the base; anthers basifix, ovate or oblong, or narrowly so, from acuminate to subtruncate at the apex, or with two similar apices side by side, cordate to sometimes truncate at the base, glabrous or occasionally with some dorsal T-shaped hairs, with three ventral longitudinal grooves, dehiscent with two pores one in each of the lateral grooves, dorsally connective more or less prominent. Pistil: ovary globose, subglobose, or bi- or trilobed, tomentose with T-shaped and/or fewer dichotomously branched hairs, with mostly three carpels and an equal number of cells, mostly the dorsal carpel is poorly developed, and bears a style, which is reduced to an acute apex; mostly two long, terete, filiform, and glabrous styles, curved inwards or sometimes sigmoidally, persistent on the fruit; stigma at the apex of the style, inconspicuous. Fruit composed of 1–3 samaras, subtended by the calyx and the dry filaments; wing of a samara dorsal, surrounding the nutlet, or nearly so, or only the uppermost part of it, from narrowly semi-obovate to semi-ovate or semi-orbicular, distal margin straight or slightly curved towards the apex; proximal margin mostly rounded or curved sigmoidally, both of them entire; outer margin rounded, entire or often erodate, often undulate; wing with flabellate venation, glabrous to pilose with T-shaped and less often also dichotomously branched hairs; nutlet semi-globose or semi-ovoid, tomentose to pilose with T-shaped and sometimes also dichotomously branched hairs.

Distribution: Africa, mainly tropical, also known from New Caledonia.

Ecology: Mainly rain forest, less often savanna or beach. Altitude 0–4800 m.

Material examined:

A. alternifolius Ndz.

Ivory Coast: Sassandra (fl. Aug.) J. J. F. E. de Wilde 352 (WAG); Road Abidjan – Gr. Bassam, Abouabou Reserve (fl., fr. Sept.) J. J. F. E. de Wilde 504 (WAG); Ghana: Krobo (fr. Oct.) J. K. Morton 59/2 (WAG); Aburi Escarpment (fl., fr. imm. Oct.) Morton 7862 (WAG);

A. alopecurus Sprague

Kenya: Shimba Hills, Kwale (fr. Jan.) Verdcourt 3920A (K); Pemba: sin. loc. (fr.) Barand s.n. (holo.; K); Tanzania: Pangani District, Bushiri Estate (fl. Dec.) Faulkner 744 (K);

A. chevalieri Sprague

Ivory Coast: Brafouedi (fl., fr. imm. Dec.) H. C. D. de Wit 8209 (WAG);

A. chloropterus Oliv.

Tanzania: Mahenge-Kilwa District, near the beginning of the Rufiji R. (fl. June) Schlieben 2427 (K); Lupembe, N. of Ruhudje R. (fr. Oct.) Schlieben 1335 (BM); Lindi District, Rowuma aerea, Nevala-Kuegebrug (fl. April) Schlieben 6509 (BM); South Africa: sin. loc. (fl., fr. June) Kirk s.n. (type; K);

A. congolensis Sprague

Zaire: Madimba Terr., Kinkoko valley (fr. July) C. Donis 1881 (WAG); Angola: Sumba, Peco (fl.) Gossweiler 9193 (BM); Sumba, Peco (fl., fr. imm. Aug.) Gossweiler 9114 (BM);

A. glaucescens Engl.

Somalia: between Balad and Mahaddei Uen (fl., fr. Jan.) *Bally* B3749 (K);

A. katangensis de Wildem.

Zambia: Abercorn District (fl. Sept.) *Gamwell* 242 (BM);

A. longifolius Hook.

Sierra Leone: sin. loc. (fl.) *G. Don* s.n. (iso.; BM); Cameroun: Douala, right b. of Dibamba R. (fl. Aug.) *Leeuwenberg* 6459 (WAG); Kribi, Bipindi road (fl. March) *J. J. Bos* 4169 (WAG); Kribi (fl., fr. Nov.) *J. J. Bos* 5596 (WAG); Kribi, Great Batanga road (fl., fr. Oct.) *J. J. Bos* 3130 (WAG); Kribi, Great Batanga road (fr. Febr.) *J. J. Bos* 3891 (WAG); Kribi (fl. Aug.) *W. de Wilde* c.s. 2885 (WAG); Kribi, Campo road (fl., fr. July) *J. J. Bos* 7151 (WAG);

A. macrocalyx Engl.

Nigeria: sin. loc. (fr.) *J. D. Kennedy* 1963 (BM); Cameroun: Bipindi (fr.) *G. Zenker* 2472 (type; K); Yaunde (fl.) *Zenker* 1403 (K); Bitya, near the Ja R. (fl. March) *Nsóló* in coll. *Bates* 1816 (K); Zaire: Dungu Terr., Doruma (fr. June) *De Graer* 590 (WAG);

A. natalitius Juss.

Mozambique: between Chibuto and Gomes da Costa (fl., fr. Nov.) *Grandvaux Barbosa & de Lemos* 8113 (K); between Magude and Panjane (fl. Jan.) *Torre* 7225 (WAG); Namaacha (fl., fr. Febr.) *Gomes de Sousa* 404 (K); Namaacha (fl., fr. Dec.) *Torre* 6897 (WAG); Lourenço Marques, Goba (fl., fr. Febr.) *Exell & Mendonça & Wild* 561 (BM); Lourenço Marques, Bella Vista, Tinonganine (fl. Dec.) *de Lemos & Balsinhas* 242 (BM); Lourenço Marques, road from Bella Vista to Catuane (fl. Oct.) *Gomes de Sousa* 3633 (K); Lourenço Marques, Goba, near Maiuana R. (fl., fr. Nov.) *Balsinhas* 213 (K); Maueele (fl. Dec.) *Gomes de Sousa* 1923 (K); South Africa: St. Johns District (fl.) *Pegler* 1535 (BM); Prov. Natal, Ntunzini District (fl. Febr.) *Wells & Edwards* 133 (BM);

A. plagiopterus Guill. et Perr.

Guinea (Bissau): Bijimita (fl., fr. Febr.) *Espirito Santo* 1758 (WAG); Canchungo (fl. April) *Espirito Santo* 1236 (WAG); Guinea (Conakry): sin. loc. (fl., fr.) *Farmar* 315 (BM); Sierra Leone: by main road to Kent from junction on Peninsula road (fl., fr. imm. Dec.) *Morton* 199 (SL, K, GC, WAG, FHI, IFAN); Liberia: Voinjama, on road to Zorzor (fl. Dec.) *J. J. Bos* 2598 (WAG); Tapeta, Liberia Baptist Mission airstrip (fl. Jan.) *J. J. Bos* 2729 (WAG); Cameroun: Pangar R., Deng-Deng (fr. Febr.) *Letouzey* 3466 (WAG);

A. smeathmanni Guill. et Perr.

Guinea (Bissau): between Susana and Domingos (fl., fr. March) *Espirito Santo* 2246 (WAG); Ivory Coast: Abidjan (fl., fr. Sept.) *W. de Wilde* c.s. 869 (WAG); Port Bouet (fl., fr. Sept.) *W. de Wilde* c.s. 908 (WAG); Zaire: Orientale, Stanleyville (fl., fr. Jan.) *Robijns* 1389 (WAG); Equateur, Banzyville (Lebangi) (fr. Jan.) *Lebrun* 2106 (WAG);

A. socotranus Oliv.

Socotra: Jebel Rughid, above Ras Hebak (fl., fr. imm. April) *Smith & Lavranos* 352 (WAG, K); Jebel Rughid, Wadi Aiyest (fr. May) *Smith & Lavranos* 609 (K); Jebel Rughid (fl. March) *Smith & Lavranos* 204 (WAG); Hagghiher Mts., Has Hus, S. of Adno Dhemalu (fl., fr. imm. May) *Smith & Lavranos* 736 (K); Kereguiyit (fl., fr.) *Schweinfurth* 454 (K); Reiged (fl. April) *Popov* SO/367 (BM); sin. loc. (fl. Dec.) *Bayley Balfour* 272 (type; K);

A. spectabilis (Ndz.) v. Doorn, *comb. nov.*: see below.

A. zanzibaricus Juss.

Kenya: Kurawa, S. of Garsen; Tana R. District (fl., fr. Oct.) *Polhill & Paulo* 637 (K); Bamba, W. of Kilifi (fl. Oct.) *Tweedie* 1258 (K); Mida, coast (fl., fr. July) *Battiscombe* 801 (K); Zanzibar: Cum Bensih (fl., fr.) *J. M. Hildebrandt* 1151 (BM).

Acridocarpus spectabilis (Ndz.) v. Doorn, *comb. nov.*

Basionym: *Rhinopteryx spectabilis* Ndz., Engler & Prantl, Nat. Pflanzenfam. 3 (4): 352–353. 1896. Type: Gambia: S. bank of Gambie R., Brown & Les-

ter 50 (K; lectotype, was isotype, see remarks). Homotypic synonym: *Acridocarpus hemicyclopterus* Sprague, Journ. Bot. 44: 205. 1906. The lectotype of this name selected among syntypes is the lectotype of the preceding name.

Heterotypic synonyms: *A. kerstingii* Engler, Engler's Bot. Jahrb. 43: 382. 1909. Type: Togo: near Bandjebi, Kersting 507 (holotype not seen, destroyed in Berlin; lectotype was isotype, E). Homotypic synonym: *Rh. kerstingii* (Engl.) Ndz., Arb. Bot. Inst. Braunsberg 7: 20. 1921; Hutchinson & Dalziel, Fl. W. T. A. 1 (1 and 2): 273. 1928 (superfluous combination). *Rhinopteryx angustifolia* Sprague, Kew Bull. 1922: 194. 1922. Type: Ghana: between Sambu and Pabia Lorha, Macleod 815 (K; holo.). Homotypic synonym: *Rh. spectabilis* Ndz. subsp. *angustifolia* (Sprague) Ndz., Engler's Pflanzenreich 4 (141): 281. 1928.

Small tree or shrub, and then erect or straggling, 60–80 cm high, when yearly burnt by bush fires appearing as a rhizomatous herb (see remarks). *Roots* wanting. *Branches* more or less lenticellate, with longitudinal ribs connecting the petioles, and sometimes also with narrower ribs in between; branchlets tomentose with once dichotomously branched hairs, glabrescent. *Leaves* alternate, shortly petiolate or sessile; petiole, if present, up to 5 mm long, tomentose with branched hairs; blade variable in shape, ovate or obovate to narrowly so, 1.5–9 times as long as broad, 3–19.5 × 0.5–8 cm, cuspidate to retuse at the apex, attenuate to rounded at the base, entire or near the base and the apex undulate, revolute at the margin, villose to pilose at both sides, sometimes more densely so on the veins, especially on the midrib; veins sometimes impressed above, prominent beneath; secondary veins 10–20 on each side; 0–2 glands at the base beneath or on the petiole, many to few others often concentrated along the midrib, otherwise irregularly spread; glands orbicular, 0.5–1.5 mm in diameter, with a slightly prominent margin. *Inflorescence* a terminal raceme, rarely with the rhachis branched near the base, laxly to densely flowered. *Rhachis* and pedicels tomentose with branched and T-shaped hairs or glabrous between the ribs connecting the pedicels. *Bracts* at the base of the rhachis mostly leafy, other bracts small, scale-like, triangular or subulate, 4–6 mm long, without glands, above glabrous, beneath tomentose with T-shaped and dichotomously branched hairs. *Bracteoles* appearing as stipules of the bracts, shaped like them, but smaller, and 1–3 mm long. *Pedicels* slender, slightly twisted, (4–)10–25 mm long, slightly thickened at the base. *Flower bud* globose or ovoid, 5–6 mm high, when corolla reaches twice the length of the calyx. *Calyx* 5-merous, sepals nearly free, slightly spurred at the base, inside glabrous, outside villose with short T-shaped and dichotomously branched hairs, acute or obtuse at the apex, entire at the margin; dorsal sepal ovate to elliptic or sometimes obovate, 3–6.5 mm long, occasionally with two glands; two lateral sepals broadly ovate to elliptic, as long as the dorsal one, rarely with one or two glands; ventral sepals equal or subequal, ovate, narrowly ovate, or sometimes elliptic, 3–6 mm long, mostly one with one gland and the other with two glands, sometimes both with two glands; glands orbicular, 0.5–2 mm in diameter, slightly prominent. *Petals* bright yellow, 5, sometimes slightly undulate, glabrous on both sides; two dorsal petals obovate, 9–

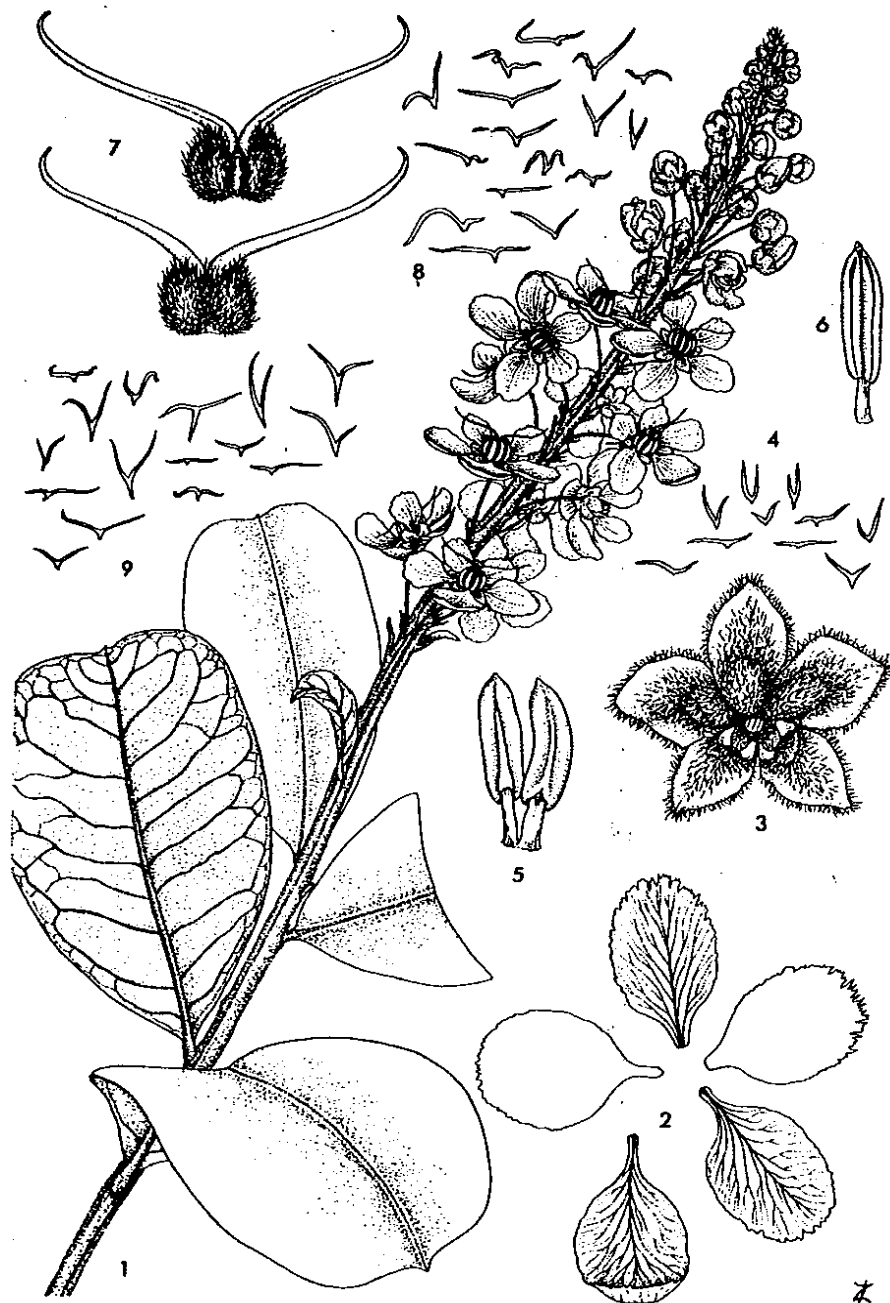


Fig. 1. 1. *Acridocarpus spectabilis*; flowering branch, $\times 0.67$. 2. *A. spectabilis*; petals $\times 2$. 3. *A. spectabilis*; calyx, outside (dorsal sepal above), $\times 4$. 4. *A. spectabilis*; hair types of the outside of the calyx, $\times 14$. 5. *A. spectabilis*; outside of two stamens (left one situated opposite a sepal, right one opposite a petal), $\times 4$. 6. *A. spectabilis*; stamen, inner surface, $\times 4$. 7. *A. spectabilis*; pistil (dorsal side above, beneath is drawn the ventral side), $\times 4$. 8. *A. spectabilis*; hair types of the pistil, $\times 14$. 9. *A. spectabilis*; hair types of the blade of the leaves beneath, $\times 14$.

(1. - Brown & Lester 47; 2-8. - J. G. Adam 2915; 9. - Brown & Lester 47)

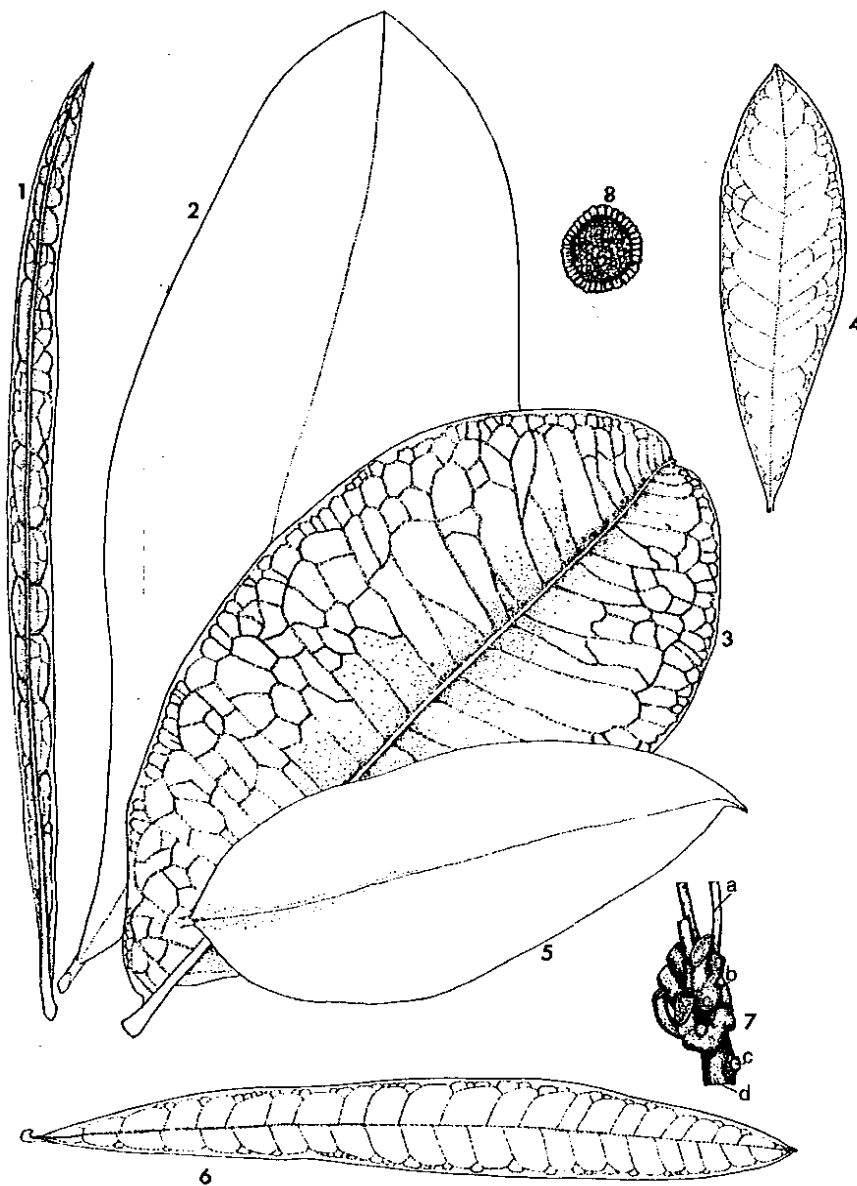


Fig.

Fig. 2. 1. *Acridocarpus spectabilis*; leaf linear, $\times 0.67$. 2. *A. spectabilis*; leaf elliptic, base unequal, apiculate at the apex, $\times 0.67$. 3. *A. spectabilis*; leaf obovate-narrowly obovate, $\times 0.67$. 4. *A. spectabilis*; leaf narrowly elliptic, $\times 0.67$. 5. *A. spectabilis*; leaf ovate, acuminate at the apex, $\times 0.67$. 6. *A. spectabilis*; leaf narrowly elliptic, $\times 0.67$. 7. *A. spectabilis*; base of stem appearing rhizomatous; a. branchlet, b. leaf bud, c. leaf scar, d. stem, $\times 0.67$. 8. *A. spectabilis*; gland of leaves, $\times 60$.

(1. - Macclaud 344; 2. and 3. - Berhaut 4385; 4. - Trochain 1212; 5. - Akpabla 1882; 6. - Macclaud 03.9-S; 7. - Espirito Santo 3181; 8. - Berhaut 4385)

12–13 mm long; two lateral petals sometimes galeate, orbicular to obovate, 10–14 mm long; ventral one mostly galeate, orbicular, 9.5–14 mm long. *Stamens*: filaments opposite the sepals 1 mm long, longer and slightly thinner than those opposite the petals, which are about 0.5 mm long; anthers narrowly oblong, 3–5 mm long, with a single apiculate, acuminate or acute apex, or with two similar apices side by side, cordate or subcordate at the base; connective prominent outside. *Pistil*: ovary globose to slightly bilobed, and then the dorsal lobe aborted, rarely with three or occasionally four fertile lobes, tomentose with T-shaped and some dichotomously branched hairs; each normal carpel with a terete, incurved style, which is 6–10 mm long and enrolled in the bud; stigma situated at the apex of the style, inconspicuous. *Fruit* composed of 1–2 samaras, subtended by the calyx and the dry filaments; wing of the samara surrounding the nutlet, semi-ovate to semi-orbicular, $3.5\text{--}9 \times 3\text{--}4\text{--}(5)$ cm, proximal and distal sides with an entire and mostly straight revolute margin, proximal side 1–3.5 cm long, distal one 2.5–6 cm long, other side rounded, entire, undulate, and revolute; wing pilose with short T-shaped, and sometimes also with dichotomously branched hairs, and with flabellate venation, radiating $120^{\circ}\text{--}270^{\circ}$; persistent style S-shaped and appressed to the distal side of the wing; nutlet semi-ovoid to hemispherical, 7–12 mm high, 5–7 mm thick, tomentose with T-shaped and some dichotomously branched hairs; areola ovate to elliptic, concave, glabrous, creamy. *Seed* with *embryo* straight, about 5.5×3 mm.

Distribution: West Tropical Africa (known from Senegal, Gambia, Mali, Guinea (Bissau), Guinea (Conakry), Ghana, Togo).

Ecology: Woodland or grass savanna, on moist places, and resistant to bush fires.

Vernacular name: 'Krufano' (teste Fox 41, language not mentioned by the collector cited).

Use: Rhizomes are eaten, when no Cola nuts are available (bitter tasting, teste Fox 41).

Material examined:

Senegal: Gouloumbo (fl. April) *Nongonierma* 426 (BR); Ouassadou, Gambia River basin (sterile) *Berhaut* 4385 (P); near Tambacounda (fl.) *J. G. Adam* 8252 (P); Niokolo-Koba (fl., fr. imm. March) *Berhaut* 1531 (BR, P); Niokolo-Koba (fr. March) *J. G. Adam* 17933 (P); Kanéméré (fl. April) *Fotius* 13647 (P); sin. loc. *Trochain* 1212, 3800 (P).

Gambia: N. bank of Gambia R. (fr. Sept.) *Ozanne* 5 (K; paratype of *A. hemicyclopterus* Sprague); S. bank of Gambia R. (fl. April) *Brown & Lester* 47 (E, K; paratype of *A. hemicyclopterus* Sprague); S. bank of Gambia R. (fl., fr. April) *Brown & Lester* 50 (K; lectotype of *Rh. spectabilis* Ndz., was isotype); Genieri WC5 (fl. Febr.) *Fox* 41 (K).

Mali: surroundings of Dinguiray (fl. March) *Vuillet* 81 (P); sin. loc. *Bellamy* 433 (P).

Guinea (Bissau): Gabu, Caujadudi (fr. June) *Espirito Santo* 2929 (LISC); Gabu, Caujadudi, Chanha (fl. Febr.) *Espirito Santo* 2886 (LISC); Contubo-El, Geba R. bank (fl., fr. imm. March) *Espirito Santo* 3181 (LISC); between Mansoa and Nhaera (fl., fr. Aug.) *Espirito Santo* 4078 (COI).

Guinea (Conakry): Badiar (fl. June) *Macclaud* 328, and 344 (P); Conioguiss, surroundings of Kadé (fl. July) *Pobéguin* 2143 (P); surroundings of Dinguiray, Ms. Niara (fl. Dec.) *J. G. Adam* 2915 (P); sin. loc. *Jacques-Félix* 1423 (P); *Macclaud* 03.9-S (P).

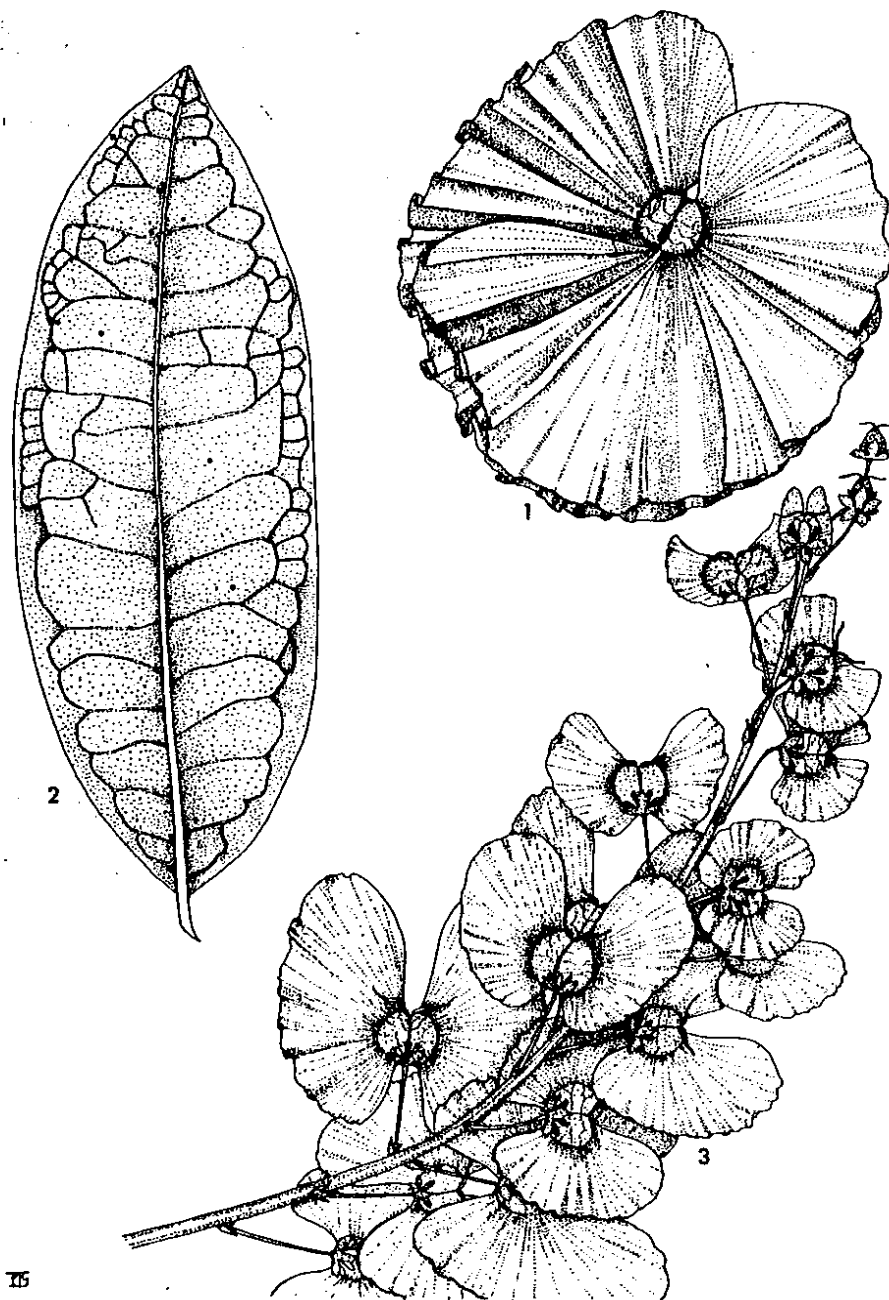


Fig. 3. 1. *Acridocarpus spectabilis*; mature fruit, $\times 0.67$. 2. *A. spectabilis*; leaf elliptic, slightly acuminate-acute at the apex, glands beneath, $\times 0.67$. 3. *A. spectabilis*; fruiting raceme, $\times 0.67$. (1. and 2. — *Entl & Hall* 36732; 3. — *Macleod* 815)

Ghana: N. Terr., Mamprusi District, Nakpanduri (fl., fr. March) *Hepper & Morton* A3133 (K); Gambaga (fl., fr. imm. Jan.) *Akpabla* 1882 (K, WAG); Gambaga (fr. June) *Akpabla* 680 (K); Gambaga Hills (fr. April) *Morton* 8964 (K); between Yamale and Yendi, near Zan (fr. March) *C. D. Adams* 3875 (K); between Sambu and Pabia Lorha (fr. Febr.) *Macleod* 815 (K; holotype of *Rh. angustifolia* Sprague); Mole Game Reserve, Lovi Camp (fr. March) *Enti & Hall* 36732 (K).

Togo: near Bandjebe (fr.) *Kersting* 507 (E; lectotype of *Rh. kerstingii* (Engl.) Ndz., was isotype).

After comparison of the types of *A. spectabilis* and of the names here listed as synonyms of this species, the present author concluded, that all belong to a single species.

Niedenau considered *A. kerstingii* (which he combined with *Rhinopteryx*, 1921) different from *Rh. spectabilis*, and used the characters mentioned below for this distinction. Some of them he used only in 1921, and some others he used only in his monograph of 1928. To obtain a complete survey of Niedenau's argument, all characters ever mentioned by him are considered here:

Leaves oblong, inequally obtuse or rounded at the base, acute or acute-acuminate at the apex, instead of leaves ovate, obtuse or acute at the base, and retuse at the apex in *Rh. spectabilis*. The leaves vary far more than Niedenau supposed. Transitions have been observed:

ovate and elliptic leaves have been observed in *Nongonierma* 426, *Kersting* 507, *Ozanne* 5, and *Morton* 8964; elliptic and narrowly elliptic leaves are available in *Jacques-Félix* 1423; elliptic and narrowly obovate leaves have all of the following specimens: *Vuillet* 81, *Espirito Santo* 3181, *Maclaud* 03.9-S, *J. G. Adam* 17933; narrowly obovate and obovate leaves have been observed in *Fotius* 13647; ovate and narrowly elliptic leaves are available in both *Akpabla* 680, and 1882; narrowly elliptic and oblong leaves are available in the specimens enumerated here: *Hepper & Morton* A3133, and *C. D. Adams* 3875.

All specimens cited below, among which the types of *Rh. spectabilis*, *Rh. angustifolia*, and *A. kerstingii*, have both leaves with equal and unequal bases: *Brown & Lester* 50, and 47, *Kersting* 507, *Macleod* 815, *Ozanne* 5, *Fox* 41, *Pobéguin* 2143, *Bellamy* 433, *J. G. Adam* 2915, *Trochain* 1212, *Jacques-Félix* 1423.

The leaf bases show a gradual variation between acute and rounded. Acute bases have been observed in: *Berhaut* 1531, *Vuillet* 81, *J. G. Adam* 17933, *Maclaud* 344, *Fotius* 13647; acutish in *Macleod* 815, *J. G. Adam* 8252, *Jacques-Félix* 1423, *Trochain* 3800; obtuse in: *Akpabla* 1882, *Nongonierma* 426, *Brown & Lester* 47, and 50, *Ozanne* 5, *Fox* 41, *Hepper & Morton* A3133; nearly rounded in *Akpabla* 680; and rounded in *Kersting* 507.

Niedenau distinguished *Rh. kerstingii* also because of the leaf apex, described as acute or acute-acuminate instead of retuse. This distinction cannot be supported by the present author; e.g. she saw retuse and acute, and slightly acuminate apices in leaves of *Trochain* 1212.

Another distinction made by Niedenau concerned the feet of the hairs, of which was said that they were 60–120 μ m long in *Rh. kerstingii*, instead of very short or (almost) wanting as in *Rh. spectabilis*. However, the hairs of all three

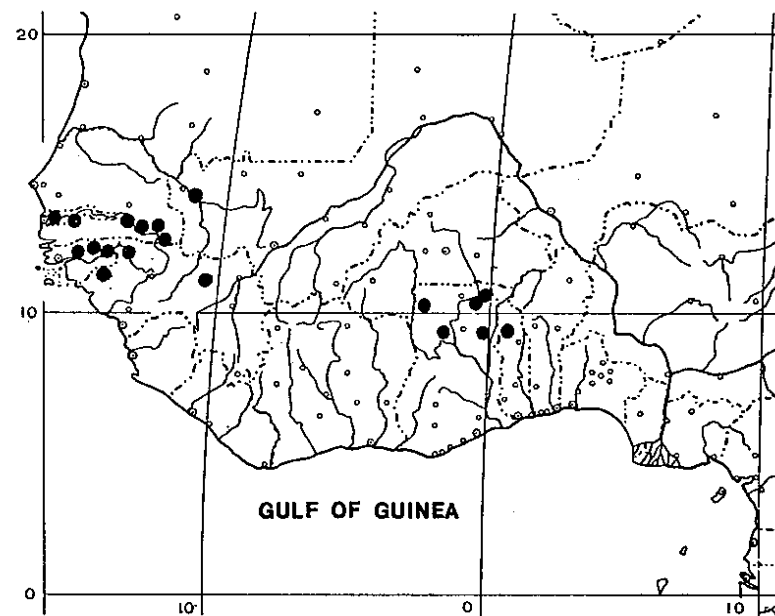


Fig. 4. Distribution map of *Acridocarpus spectabilis*

type specimens: *Brown & Lester* 50, *Macleod* 815, and *Kersting* 507, show exactly the same variation in size of the hairs and their feet.

The last character of *Rh. kerstingii*, that it has ovate instead of obovate or narrowly obovate-ovate sepals, also turns out to be of no use. *Kersting* 507, the type of the latter name, has both ovate and obovate sepals.

Sprague distinguished *Rh. angustifolia* from *Rh. spectabilis* at hand of the two following characters; anthers shortly bi-apiculate instead of strongly apiculate; wing of the samara larger than in *Rh. spectabilis*.

Unfortunately the anthers of *Macleod* 815 are lost after they were described by Sprague. The present author observed transitions between strongly apiculate and biapiculate anthers; e.g. *Akpabla* 1882 (strongly bi-apiculate), *Espirito Santo* 3181 (strongly apiculate), *Nongonierma* 426, and *Maclaud* 328 (bi-apiculate), *Fox* 41 (apiculate), *Berhaut* 1531, and *Ozanne* 5 (bi-acute), *Enti & Hall* 36732 (acute).

The size of the wing varies more than was supposed by Sprague, as appears from the following list of specimens with their sizes:

<i>Kersting</i> 507	3.5–6.4 $\times$ 2–4 cm
<i>Brown & Lester</i> 50	5–5.3 $\times$ 3.2–3.5 cm
<i>Ozanne</i> 5	4.5–5.5 $\times$ 2.7–3.5 cm
<i>Hepper & Morton</i> A3133	4.5–6 $\times$ 3–3.5 cm
<i>Espirito Santo</i> 2929	3.5–5 $\times$ 2.5–3.75 cm
<i>C. D. Adams</i> 3875	7 $\times$ 4.5 and 4.5 $\times$ 4 cm

It is concluded, that *Rh. angustifolia* and *Rh. spectabilis* cannot be segregated on account of the anthers being (strongly) apiculate or bi-apiculate.

Remarks

The K-sheet of *Brown & Lester 50* is considered here as a duplicate of the specimen cited by Niedenzu; it has not been annotated by Niedenzu. Probably the specimen studied by him has been destroyed in B.

Some of the specimens examined have at the base of the stem a branched portion, that appears rhizomatous. This consists of one or two leaf-bearing and flowering or fruiting unbranched branchlets and some partially carbonized stumps: *Berhaut 1531*, *Trochain 1212*, *Espirito Santo 2929*, and *3181* and *Jacques-Félix 1423*.

(The latter phenomenon has been observed in various genera, e.g. *Combretum*, *Sapium*, *Strychnos*, *Syzygium*).

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REFERENCES

- ARÈNES, J. (1950): *Malp., Fl. Madag.* (108e fam.): 10–15.
 — (1954): *Not. Syst.* 15: 4.
 — & P. JEAGER, (1964): *l.c. Pl. Afr.* 6: 127.
 BADRÉ, F. (1972): *Malp., Fl. Cam.* 14: 12.
 — (1973): *Malp., Fl. Gabon* 21: 5.
 BAILLON, H. (1843): *Adansonia* 11: 248.
 ENGLER, A. (1905): *Engler's Bot. Jahrb.* 36: 251.
 — (1909): *Engler's Bot. Jahrb.* 43: 382.
 JUSSIEU, A. DE (1843): *Arch. Mus. Paris* 3: 487, 489–490.
 LAUNERT, E. (1968): *Malp., Fl. T. E. A.*: 9, 11–12.
 NIEDENZU, F. (1896): *Engler & Prantl. Nat. Pflanzenfam.* 3 (4): 352–353.
 — (1921): *Arb. Bot. Inst. Braunsberg* 7: 20.
 — (1924): *Verz. Vorles. Ak. Braunsberg S.-S.*: 19.
 — (1928): Monogr. *Malp.*, in *Engler's Pflanzenreich* 4 (141): 262, 270, 277, 279–281.
 SPRAGUE, T. A. (1906): A revision of *Acridocarpus*. *Journ. Bot.* 44: 204–206.
 — (1922): *Kew Bull.* 1922: 194.
 WILCZEK, R. (1955): *Novitates Africanæ I. Bull. Jard. Bot. Brux.* 25: 306–307.
 — (1958): *Malp., F. C. B.* 7: 232.