

NOTE. — Minor infrageneric variation occurs in pollen grain size and shape (compare Fig. 2E and 2F), size of the apocolpial fields (compare Fig. 2A and 2B), and ornamentation (compare Fig. 2A and 2D). These characters vary, nearly to the same degree, within the species (compare Fig. 2B and 2D).

KEY TO THE SPECIES OF *GONGRODISCUS*

1. Leaves 4-5-jugate; young branches distinctly grooved; inflorescence up to 30 cm long; fruit stipitate, unilocular, densely woolly inside..... **G. sufferrugineus**
- 1'. Leaves 1-3-jugate; young branches not grooved; inflorescence up to 20 cm long; fruit (sub)sessile, two- or three-locular, with tuft of hair below seed and few hairs along carpel margins.
  2. Leaflets up to 6 cm long, subsessile; fruit usually three-locular; young branches smooth..... **G. parvifolius**
  - 2'. Leaflets up to 13 cm long, petioluled; fruit two-locular; young branches rough..... **G. bilocularis**

**Gongrodiscus bilocularis** H. Turner, *sp. nov.* — Fig. 1A, B; 2A; 3A.

*Arbor vel frutex; cortex scaber; foliola 2-6, petiolulata; ovaria et fructus biloculares.*

TYPE. — *McPherson 3210*, New Caledonia, Mandjéla, ca. 600 m, 5 Oct. 1980 (holo-, L!; iso-, MO, NOU!, P).

Tree or shrub. Branchlets rough, puberulous when young; flowering twigs 3-11 mm thick. Leaves 1-3(-4)-jugate; rachis 3-12 cm long, glabrous to puberulous, petiole 1.9-8.5 cm long. Leaflets petioluled, subopposite to alternate; petiolules 5-18 mm long; blade elliptic to obovate, 4-12.9 × 1.9-5.4 cm, length-to-width ratio 1.4-2.5, not punctate; base attenuate to acute, slightly asymmetric, usually basispic side broader; apex slightly acuminate to truncate, tip of apex rounded to retuse, not mucronulate; domatia absent; main nerves 5-26 mm apart, marginally open to apically slightly looped. Inflorescence axillary to ramiflorous, branching in axil and along rachis, 2-17 cm long, puberulous when young; first-order branches up to 7 cm long. Bracts simple, 1.2-4 mm long; bracteoles 0.3-0.8 mm long. Pedicels 1-3.5 mm long, elongating to 5 mm in fruit. Flowers 1-3 mm diameter. Calyx 0.9-1.6 mm long, teeth triangular, apex acute. Petals 0.5-1.2 × 0.5-0.7 mm, claw 0.3-0.7 mm long, apex truncate (to rounded). Disc 5-lobed to 5-partite, lobes episeptal, 0.5-0.7 mm high, (sub)glabrous. Stamens: filament 2-3.1 mm long; anther ca. 0.6-0.7 mm long; pollen rugulate or indistinctly so;  $P = 14(15.7)17 \mu\text{m}$ ,  $E = 23(27.8)33 \mu\text{m}$ ,  $P/E = 0.56$ ,  $A/E = 0.23-0.52$ . Gynoecium: ovary 2-locular; style and stigma elongating to 1.8 mm in fruit, stigmatic lines 0.7-1.2 mm long. Fruit obovate to obcordate in transverse view, with 2 well-developed lobes, 0.9-1.8 cm long by 1.1-1.8 cm broad; stipe 0-2 mm long, broadly cuneate; lobes laterally slightly flattened; outside glabrous, inside (sub)pubescent along margin of carpels and on central axis, with a dense tuft of hair below attachment of embryo. Seed 9-12 × 5.5-7 mm; ariloid covering seed 3/4 to almost completely, opening below apex of seed on dorsal side; hilum lateral, elliptic, 3-3.2 × 1.8-2.2 mm. Embryo: apex of lower cotyledon curled round apex of upper cotyledon; radicle 4.4-5.2 mm long, usually hairy along margins.

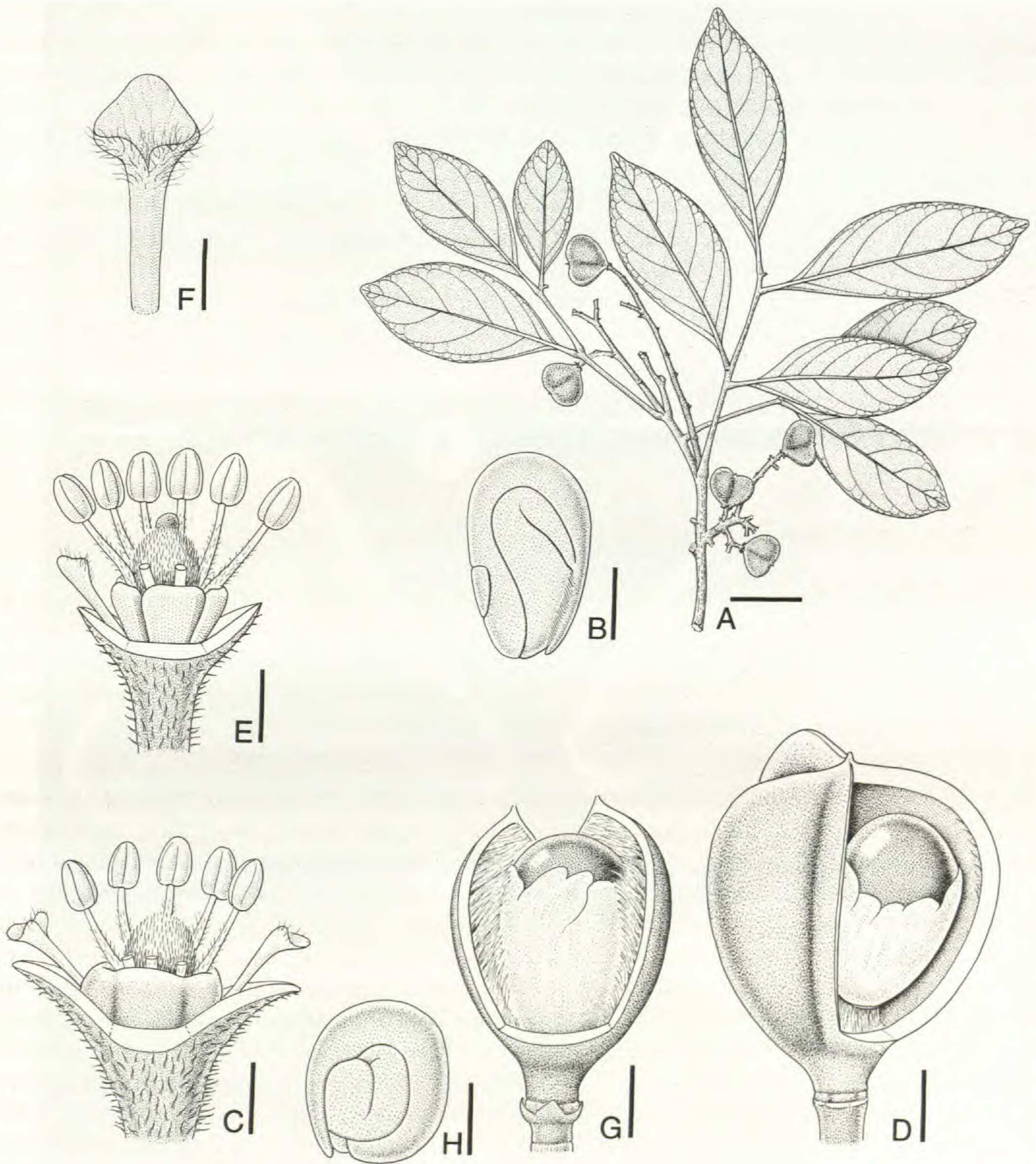


Fig. 1. — *Gongrodiscus bilocularis*: A, habitus, scale bar = 2 cm; B, embryo, note apex of lower cotyledon curled round apex of upper one and hairy margin of radicle, scale bar = 3.3 mm. — *G. parvifolius*: C, partially dissected flower, note entire disc, scale bar = 0.8 mm; D, partially dissected fruit, note tuft of hair below seed and almost glabrous carpels, scale bar = 3.3 mm. — *G. sufferrugineus*: E, partially dissected flower, note distinctly lobed disc, scale bar = 0.8 mm; F, petal, scale bar = 0.4 mm; G, partially dissected fruit, note absence of septa and densely woolly carpels, scale bar = 3.3 mm; H, embryo, note apex of lower cotyledon curled under radicle, scale bar = 3.3 mm. (A, B, McPherson 3210; C, MacKee 29183; D, Hoff 3403; E, F, MacKee 13439; G, H, Guillaumin & Baumann-Bodenheim 10033).

FIELD NOTES. — ECOLOGICAL NOTES: Humid forests, also on serpentinic soils; 150-1000 m. Fl.: March to June; fr.: (April) November to January. — ADDITIONAL DESCRIPTIVE NOTES: Tree or shrub 2-15 m high; bole 30 cm dbh. Bark light brown, (somewhat) rough; branches few, erect. Leaves shiny dark green above, light or pale yellowish green below. Calyx green or pinkish; petals white; filaments white or green; anthers red. Fruit yellow, viscid.

SPECIMENS EXAMINED. — *Blanchon 1018*, Plateau du Col des Rousettes (NOU, P); *Brinon 618*, Thy western extension (P); *Franc 1595A* (P); *Hoff 2667*, sommet de Dogny (NOU); *MacKee 20534*, plateau de Dogny (L, P); *20543*, plateau de Dogny (L, P); *26564*, Canala, sentier Ciu-Coinde (L, P); *38299*, Yate (L, P); *40285*, Haute Yate, Rivière Bleue (L, P); *McPherson 3138*, Plateau de Dogny, 5 km NNE of Sarraméa (L, MO, NOU, P); *3210*, Mandjélia (L, MO, NOU, P), type; *5765*, Upper Ouinné River Valley (P); *Sevenet-Pusset 1902*, Haute Tchamba (NOU); *Suprin 860*, Route de Pembai, Col d'Amieu (NOU, P); *981*, Aérodrome vers "Les Trois Bras" en contournant les lacs (NOU, P).

**Gongrodiscus parvifolius** Radlk. — Fig. 1C, D; 2B; 3B.

Sitzungsber. Math.-Phys. Kl. Königl. Bayer. Akad. Wiss. Münch. 9: 607 (1879); in Engler & Prantl, Nat. Pflanzenfam. III, 5: 351 (1895); Guillaumin, Bull. Mus. Natl. Hist. Nat.: 356 (1911); Bull. Soc. Bot. France 79: 341 (1932); Radlk. in Engler, Pflanzenr. 98f: 1311 (1933); Guillaumin, Fl. Anal. Synopt. Nouv.-Caléd.: 201 (1948). — Type: *Balansa 3010*, New Caledonia, entre Ounia et le Lac Arnaud, 8 Dec. 1870 (holo-, P!).

Small tree or shrub. Branchlets smooth to somewhat rough, not grooved, puberulous when young; flowering twigs 2.5-3 mm thick. Leaves 1-3-jugate; rachis 0.7-5.3 cm long, puberulous, petiole 0.3-2 cm long. Leaflets subsessile, opposite; petiolules 1-4 mm long; blade elliptic to obovate, 1.3-6 × 0.7-3.2 cm, length-to-width ratio 1.3-2.9, not punctate; base acute, symmetric to slightly asymmetric, acroscopic side broader; apex retuse to rounded, not mucronulate; domatia absent to several small pockets opening in front, situated in axils of main nerves; main nerves 2.5-15 mm apart, marginally looped. Inflorescence axillary to pseudoterminal, branching along rachis, 3.8-14(-19) cm long, puberulous when young; first-order branches up to 8.5 cm long. Bracts simple, sometimes pinnatifid to leaf-like, 0.8-5 mm long, leaf-like bracts up to 15 mm; bracteoles 0.3-1.5 mm long. Pedicels 0.5-1.5 mm long. Flowers 2-2.5 mm diameter. Calyx 0.8-1.6 mm long, teeth triangular, apex acute to obtuse. Petals 0.8-1.6 × 0.5-1 mm, claw 0.4-0.9 mm long, apex truncate to obtuse. Disc entire, weakly to distinctly 5-lobed, 0.4-0.6 mm high, sparsely pilose on rim. Stamens: filament 1.8-4 mm long; anther 0.6-0.9 mm long; pollen rugulate or indistinctly so;  $P = 11(15.6)21 \mu\text{m}$ ,  $E = 21(25)29 \mu\text{m}$ ,  $P/E = 0.62$ ,  $A/E = 0.25-0.44$ . Gynoecium: ovary (2-)3-locular, 1.3-1.8 mm long; style and stigma elongating to 0.5-1.2 mm in fruit, stigmatic lines 0.3-0.4 mm long. Fruit obovate to obcordate in transverse view, with 1-3 well-developed lobes, 1.1-1.6 cm long by 1.1-1.3 cm broad; stipe 1-3.5 mm long, broadly cuneate; lobes laterally flattened; outside subglabrous to subpuberulous, inside (sub)pilose along margin of carpels and on central axis, with dense tuft of hair below attachment of embryo. Seed ca.

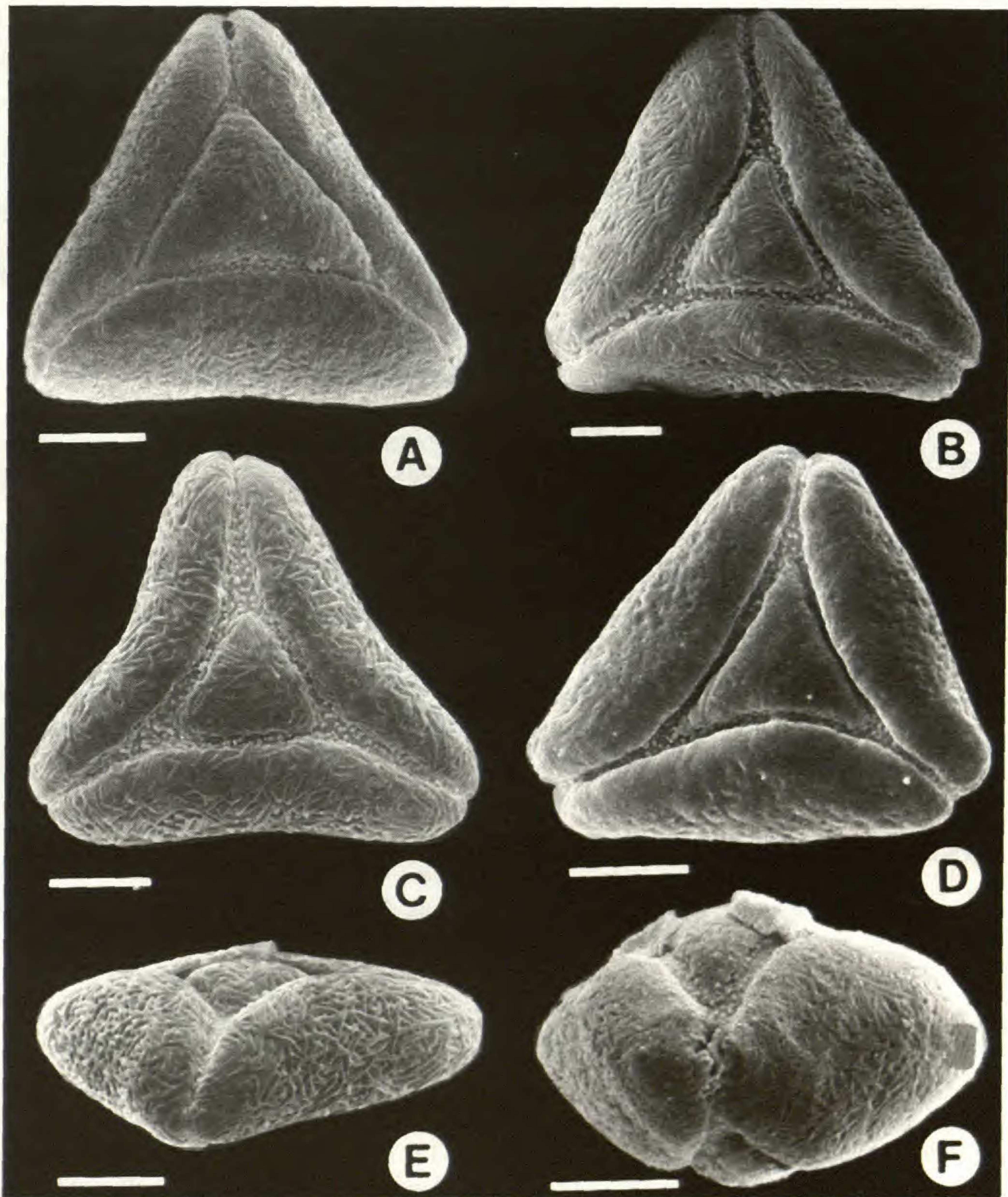


Fig. 2. — SEM photographs of *Gongrodiscus* pollen (scale bar = 5  $\mu$ m throughout). **A**, *G. bilocularis* (MacKee 20534), oblique polar view of grain with rugulate ornamentation and large apocolpial field ( $A/E = 0.52$ ); **B**, *G. parvifolius* (McPherson 4326), polar view of rugulate grain with rather small apocolpial field ( $A/E = 0.31$ ); **C**, **E**, *G. sufferrugineus* (Franc 2395): **C**, polar view of rugulate grain; **E**, oblique equatorial view of grain with relatively low P/E value (ca. 0.40); **D**, **F**, *G. parvifolius* (MacKee 29183): **D**, polar view of grain with indistinctly rugulate ornamentation, showing scattered small pits; **F**, equatorial view of grain with relatively high P/E value (0.64).

9.5 × ca. 5.5 mm; arilloid apically and abaxially open, covering seed 1/2-2/3; hilum subbasal, elliptic, ca. 1.5-2.5 × ca. 1.2-1.5 mm. Embryo: apex of lower cotyledon curled round apex of upper cotyledon; radicle ca. 3 mm long, glabrous.

FIELD NOTES. — ECOLOGICAL NOTES: In dense *Araucaria* and degraded maquis forest, and montane mesoxerophyll forest, on serpentinic terrain; 700-1250 m. Fl.: August to January; fr.: November, December. — ADDITIONAL DESCRIPTIVE NOTES: Small tree or shrub 1-4 m. Bark bright grey. Leaves bright to dark shiny green above, bright yellowish green to bright or pale greyish green below. Branches of inflorescence brown. Flowers white to cream, fragrant; filaments white; anthers (dark) red. Young fruit green.

NOTES. — 1. *Baumann-Bodenheim* 8287, *McPherson* 4326, and *Suprin* 2521 show good examples of inflorescences with leaf-like bracts.

2. According to MORAT et al. (Bull. Mus. natn. Hist. nat. Paris, 4<sup>e</sup> sér., sect. B, Adansonia, 8: 133-182, 1986) this species is restricted to ultrabasic soils.

SPECIMENS EXAMINED. — *Balansa* 3010, collines ferrugineuses situées entre Ounia et le Lac Arnaud (P), type; *Baumann-Bodenheim* 8287, Col de Vulcain (P); 15785, Mt. Bouo (P); *Cayrol* 5, sommet du Mt. Do (NOU); *Compton* 2187, Comboui Mts. (BM); *Franc* 565, Mt. Dzumac (P); *Godefroy s.n.*, Oct. 1910, Mt. Dzumac (L); *Guillaumin & Baumann-Bodenheim* 12621, Mt. Bouo (P); *Hoff* 3403, Sommet du Mt. Do (NOU); *Hürlimann* 1695, Mt. Humboldt, Pic 1165 (P); *Le Rat* 178, Mt. Dzumac (P); 2787 (P); *MacKee* 15978, Mt. Do, crête sommitale (L, P); 17657, Route du Dzumac au-dessus de la Koeala-Goguamba (L, P); 21079, Mt. Do (L, P); 29108, Mt. Do (P); 29183, Tontouta, au NE de La Mine Liliane (P); *McPherson* 4326, Mt. Dzumac road (L, P); *Suprin* 2521, Mt. Do, summit (NOU, P); *Thorne* 28533, central ridge of Mt. Koghi (P); *Veillon* 961, sommet du Mt. Do (NOU).

### ***Gongrodiscus sufferrugineus* Radlk. — Fig. 1E-H; 2C, E; 3C.**

Sitzungsber. Math.-Phys. Kl. Königl. Bayer. Akad. Wiss. Münch. 9: 607 (1879); in Engler & Prantl, Nat. Pflanzenfam. III, 5: 351 (1895); Bot. Jahrb. 39: 177 (1911); Guillaumin, Bull. Soc. Bot. France 79: 341 (1932); Radlk. in Engler, Pflanzenr. 98f: 1311 (1933); Guillaumin, Fl. Anal. Synopt. Nouv.-Caléd.: 201 (1948). — Lectotype (present authors): *Balansa* 3008, New Caledonia, au nord de la Conception, 300 m, 16 Jan. 1871 (P!); paratypes: *Balansa* 557 (P!), 2123 (P!), *Vieillard* 2390 (s.a.), Mt. Dore (P!).

Tree. Branchlets smooth with distinct longitudinal grooves, tomentose; flowering twigs 5-7 mm thick. Leaves (3-)4-5-jugate; rachis 6-19.7 cm long, tomentose, petiole 2.2-10.3 cm long. Leaflets petioluled, opposite to subopposite; petiolules 2-17 mm long; blade elliptic to obovate, 3-15.8 × 1.7-7.3 cm, length-to-width ratio 1.5-3.6, lowest pair somewhat smaller than others, punctate; base attenuate to acute, asymmetric, acroscopic side broader; apex slightly retuse to emarginate to rounded, not or only slightly mucronulate; domatia absent; main nerves 4-25 mm apart, marginally open basally, often looped distally. Inflorescence axillary to pseudoterminal, branching in axil and along rachis, 5.5-30.5 cm long, tomentose; first-order branches up to 14.5 cm long. Bracts simple, rarely leaf-like, 1-3 mm long, leaf-like bracts up to 15 mm long; bracteoles 0.5-0.7 mm long. Pedicels 1-2 mm long. Flowers 1.5-2 mm diameter. Calyx 0.6-1.2 mm long,

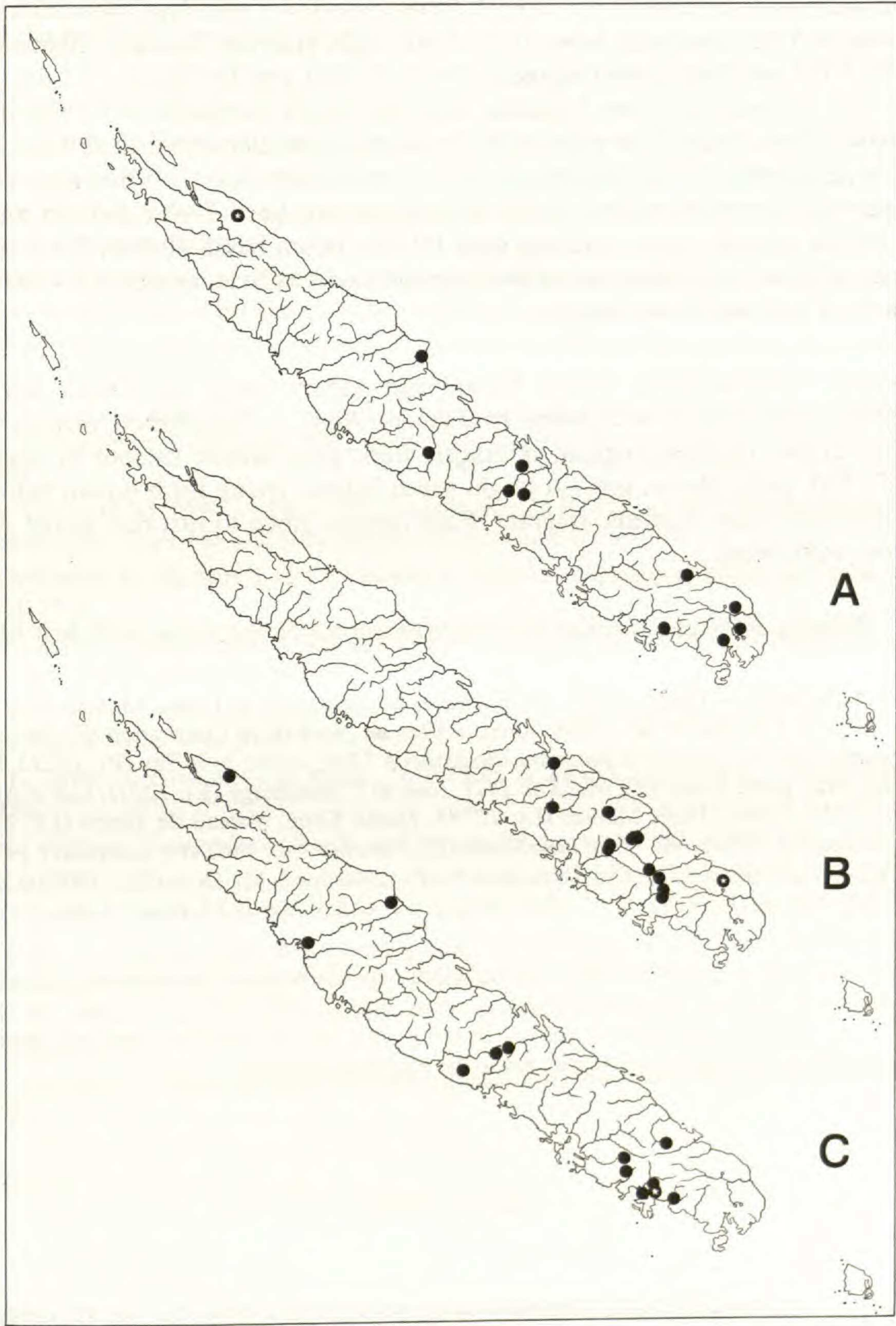


Fig. 3. — Distribution maps. Type localities indicated with a star. A, *Gongrodiscus bilocularis*; B, *G. parvifolius*; C, *G. sufferrugineus*.

teeth elliptic, apex acute. Petals 0.7-1.7 × 0.3-1.2 mm, claw 0.4-1 mm long, apex truncate to acute. Disc consisting of 5 free episeptal lobes, 0.4-0.8 mm high, glabrous. Stamens: filament 2.2-4 mm long; anther 0.8-0.9 mm long; pollen rugulate;  $P = 11(15.5)21 \mu\text{m}$ ,  $E = 26(29.9)35 \mu\text{m}$ ,  $P/E = 0.51$ ,  $A/E = 0.30-0.36$ . Gynoecium: ovary 3-locular, style and stigma elongating to 1.3 mm in fruit, stigmatic lines 0.4-0.5 mm long. Fruit ellipsoidal, 3-valved, unilocular above attachment of seeds, 1, rarely 2 seeds developing, 0.9-1.8 cm long by 0.7-1.1 cm broad; stipe 1.7-5 mm long, slender; outside subtomentose to subpuberulous, inside densely woolly. Seed 7-10 × 5.5-7.5 mm, blackish when dry; arilloid apically open, covering seed 1/2-3/4; hilum basal, elliptic, 2.4-3 × 1.9-2 mm. Embryo: apex of lower cotyledon curved back upward under radicle; radicle 3.5-4 mm long, densely hairy around base and along margin.

FIELD NOTES. — ECOLOGICAL NOTES: Humid and gallery forest, on schists and limestone; 100-400 (1200) m. Fl.: August to October; fr.: January, April. — ADDITIONAL DESCRIPTIVE NOTES: Tree 5-25 m. Crown rounded, regular, in stages. Bark grey, almost smooth to slightly rough. Leaves shiny dark green above, greyish bright green below; young flush brown below. Flowers green to white with white stamens, fragrant. Fruit outside green to rust-red, inside white hairy; arilloid green; seeds black.

NOTE. — *Balansa 3008* and *MacKee 22518* are examples of specimens with leaf-like bracts.

SPECIMENS EXAMINED. — *Balansa 557*, forêts situées au-dessus de la Ferme-Modèle (P); *2123*, forêts situées au Nord de la Conception (P); *3008*, forêts situées au Nord de la Conception (P), lectotype; *Franc 2395*, L'Hermitage (P); *Guillaumin & Baumann-Bodenheim 7205*, vallée de la Thy (P); *10033*, Mt. Mou (L, P); *10038*, Mt. Mou, pente Ouest (P); *MacKee 2411*, road to L'Hermitage (L); *12011*, Col d'Amieu, vallée de Toili (L); *13439*, Farino, Forêt Monier (L); *17745*, Haute Kone, plateau de Tango (L); *22518*, Haute Boghen, Col Toma (L); *38696*, Mt. Mou, base Ouest (L); *Pancher s.n.*, 1862 (P); *Schlechter 14916*, auf den Bergen bei Paita (L); *Vieillard 357*, 1855-1860, Balade (P); *2390* (s.a.), Mt. Dore (P); *2390* (s.a.), Wagap (P); *2390*, 1855-1860, Wagap (P); *2390*, 1861-1867, Wagap (P); *C.T. White 2174*, Paita (A, P).

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## ***Barthlottia*, a new monotypic genus of Scrophulariaceae-Manuleae from Madagascar**

E. FISCHER

**Summary:** The new monotypic genus *Barthlottia* from Madagascar is described. It is related to the Southern African *Manuleopsis* in the tribe Manuleae, but differs in the size and colour of the corolla, the insertion of the stamens and the capitate stigma. This is the first record of a member of the Manuleae for Madagascar.

**Résumé :** Le nouveau genre monotypique *Barthlottia*, de Madagascar, est décrit. Il est proche du genre sud-africain *Manuleopsis* de la tribu des Manuleae, dont il diffère par les dimensions et la couleur de la corolle, l'insertion des étamines et le stigmaté capité. C'est la première mention de cette tribu pour Madagascar.

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Madagascar is famous for its endemic species and harbours a flora which is quite different from the adjacent continental Africa. Seven families of flowering plants are restricted to the island: Didymelaceae, Didiereaceae, Diegodendraceae, Sarcolaenaceae, Sphaerosepalaceae, Geosiridaceae, Humbertiaceae (RAUH 1973), the two latter families now included into the Iridaceae and the Convolvulaceae. The percentage of endemic genera is much higher and has been estimated to be near 20% (RAUH 1973). The Scrophulariaceae have been neglected and only 3 genera (*Allocalyx*, now a synonym of *Bacopa*, *Bryodes* and *Hydrotriche*) are listed as endemics in recent treatments (LEROY 1978; TAKHTAJAN 1986). New studies on the family have changed this picture and show that the Scrophulariaceae of Madagascar are much more diverse. They consist of 28 indigenous genera with 72 species (FISCHER 1995). Among them, 7 genera are endemic: *Ranopisoa* Leroy (1 sp.), *Hydrotriche* Zucc. (4 spp.), *Pseudomelasma* E. Fischer (1 sp.), *Tetraspidium* Baker (1 sp.), *Rhaphispermum* Benth. (1 sp.), *Radamaea* Benth. (5 spp.) and *Leucosalpa* Scott-Elliot (3 spp.). At the species level 40 taxa are endemic to Madagascar and 1 to the Comoro Islands. Eight genera with 9 species are introduced and thus a total number of 36 genera and 81 species is recorded for Madagascar and the Comores. However, new discoveries are still being made and we may expect that there are many more endemics to be found in remote areas.

During the preparation of the account of Scrophulariaceae for the "Flore de Madagascar et des Comores", I came across some sheets of a remarkable shrub with large red flowers, which did not

fit into any known genus. The synthecous anthers clearly placed it into the subfamily Scrophularioideae. In the Muséum national d'Histoire naturelle in Paris, some notes of H. HUMBERT were found, where he considered the plant to be a new genus near *Phygelius*. Unfortunately, he did not propose a name nor published a description. Close examination by the present author revealed that the affinities to *Phygelius* are only superficial and that there is a strong relation to the tribe Manuleae, especially the monotypic Southern African genus *Manuleopsis* (HILLIARD 1994). Our plant differs from it, however, in many respects, and therefore, I have chosen to describe it as a new genus.

**BARTHLOTTIA** E. Fischer, **gen. nov.**

*Affinis e tribu Manulearum Manuleopsis, sed corolla campanulata intus glabra, staminibus basi tubus corollae insertis, stigmatibus capitato et pedicellis in fructu reflexis, valde differt. Ab omnibus generibus ceteris ex affinitate Manulearum magnitudine et colore corollae distinctum.*

TYPE. — *Barthlottia madagascariensis* E. Fischer

This new genus is monotypic at present.

**Barthlottia madagascariensis** E. Fischer, **sp. nov.** — Fig. 1, 2.

*Frutex sarmentosus parum ramosus (ca. 2 m altus), radicibus valde tuberosis, ramis quadrangularibus angulis costulatis valde prominentibus, praeter ramulos inflorescentiae glabris. Folia opposita, decussata, internodiis 2-5 cm segregata, petiolata, petiolo 2-5 cm longo decurrentio limbo anguste alato, ad basim valde dilatato et latius alato, limbo elliptico-lanceolato e media longitudine ad basim cuneatum et ad apicem anguste acutum, aequaliter attenuato, 7-18 cm longo, 3-6 cm lato, nervis supra impressis, subtus prominentibus, secundariis ca. 8 utroque latere, obliquis, reticulo tertiaro laxo, parum distincto, anastomosantibus inter se, glandulis impressis punctato. Inflorescentiae cymulis saepius unifloribus in thyrsos terminales dispositis compositae, pedunculi et pedicelli pilis glanduliferis minutissimis hirti. Calyx ut pedicellus minute hirto-glandulosus, late campanulatus, ca. 8 mm longus, sepala 3.5 mm lata, parte indivisa brevi, 2-3 mm longa, post anthesim leviter accrescens, lobis paulum inaequalibus, obovatis, apice breviter acuminato, haud carinatis, nervo medio vix distincto, nervulis reticulatis. Corolla longe tubulosa, campanulata, tubo 38-45 mm longo, in quarto inferiore ca. 6 mm in diam., superius dilatato, 12 mm diam. attingente, lobis late ovatis, 10-12 × 12 mm, crassa, extus purpurea, tubo intus pallide carneo, lineolis purpureis striato. Stamina ad basim corollae inserta, filamentis 35-38 mm longis, antheris synthecibus, 4.5 mm longis. Ovarium obconicum, apice acuminato, stylus filiformis, 23 mm longus, stigma capitatum.*

TYPE. — *Humbert 20513*, Madagascar, vallée du Mandrare, affluent de la Manampanihy (Sud-Est), montagne au S de Tanandava, forêt ombrophile sur argile latéritique et granite, rochers, 550 m, 11-16 mars 1947 (holo-, P).

MATERIAL STUDIED. — MADAGASCAR: *Guillaumet 3861*, bord oriental des chaînes W Manantenina, sur un rocher au bord de l'eau, 100 m, juil. 1971 (P); *Humbert 20513*, type (P); *Réserves Naturelles: RN 6602 Rakotoson*, RN XI, Naniliha, Distr. Fort Dauphin, 28 juil. 1954 (P).