

On the distinction of *Atractocarpus heterophyllus* (Montrouz.) Guillaumin & Beauvis. and *A. bracteatus* Schltr. & K.Krause (Rubiaceae): in search of the correct name for the type species of *Atractocarpus* Schltr. & K.Krause

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ABSTRACT

Atractocarpus Schltr. & K.Krause is an Australian and Pacific genus of Gardenieae (Rubiaceae) which includes *c.* 40 species. The genus was initially described for a species bearing fusiform fruits, and occurring in the southern part of New Caledonia, viz. *A. bracteatus* Schltr. & K.Krause. Another species, *A. heterophyllus* (Montrouz.) Guillaumin & Beauvis. with oblong leaves and oblong ovoid fruits was described for New Caledonia, but initially under *Gardenia* Ellis and this for the North of the archipelago. During later revisions and supplementary descriptions of species in the genus, both species carrying heteromorphic leaves were reconsidered. The name *A. bracteatus* was placed in synonymy of *A. heterophyllus*; while keeping a delimitation of the species restricted to the southeastern populations. This situation ended in the re-description of the northern species, named *A. balansaeanus* Guillaumin. The results of the present work, based on the examination of herbarium specimens and literature, disentangles the collusion for *A. heterophyllus* vs *A. bracteatus*. Hence, the correct name typifying *Atractocarpus* is *A. bracteatus*. In regard to the destruction of the holotype for *A. bracteatus* in Berlin (B) and of two of the syntypes for *A. heterophyllus* in Lyon (LYJB), typifications for these species names are proposed. To clarify their taxonomy, complete descriptions, lists of specimens and illustrations are provided for both species.

KEY WORDS

Gardenieae,
nomenclature,
New Caledonia,
taxonomy,
typification.

RÉSUMÉ

De la distinction entre Atractocarpus heterophyllus (Montrouz.) Guillaumin & Beauvis. et A. bracteatus Schltr. & K.Krause (Rubiaceae): vers un nom approprié pour l'espèce type d'Atractocarpus Schltr. & K.Krause.

Atractocarpus Schltr. & K.Krause est un genre océanien de Gardenieae (Rubiaceae) qui comprend environ 40 espèces. Le genre a été décrit pour une espèce portant des fruits fusiformes au sud de la Nouvelle-Calédonie, à savoir *A. bracteatus* Schltr. & K.Krause. Une autre espèce, *A. heterophyllus* (Montrouz.) Guillaumin & Beauvis., à feuilles oblongues et fruits oblongs-ovoïdes a été décrite pour la Nouvelle-Calédonie, mais initialement sous *Gardenia* Ellis et ce pour le nord de l'archipel. Au cours de révisions ultérieures incluant des descriptions d'espèces supplémentaires dans le genre, les deux espèces portant des feuilles hétéromorphes ont été reconsidérées. Le nom *A. bracteatus* a été placé en synonymie d'*A. heterophyllus*, tout en conservant une vision restrictive de la délimitation de l'espèce à des populations du sud. Ceci a alors abouti à la description d'un nouveau nom pour l'espèce du nord, *A. balansaeanus* Guillaumin. Les résultats du présent travail, fondé sur l'examen de spécimens d'herbiers et de la littérature, mettent en lumière la confusion entre *A. heterophyllus* et *A. bracteatus*. Ainsi, le nom correct à utiliser pour le type d'*Atractocarpus* est *A. bracteatus*. En regard de la destruction de l'holotype d'*A. bracteatus* à Berlin (B) et de deux des syntypes d'*A. heterophyllus* à Lyon (LYJB), de nouvelles typifications sont proposées pour ces deux noms. Afin de clarifier leur taxonomie, des descriptions complètes, des listes de spécimens et des illustrations sont présentées pour chaque espèce.

MOTS CLÉS

Gardenieae,
nomenclature,
Nouvelle Calédonie,
taxonomie,
typification.

INTRODUCTION

Atractocarpus Schltr. & K.Krause (Rubiaceae) is currently the most species-rich Australian and Pacific genus of Gardenieae (Rubiaceae), comprising c. 40 species. Consequent to phylogenetic investigations by Puttock & Quinn (1999) in a study of the tribe Gardenieae, Puttock (1999) enlarged the generic concept of *Atractocarpus* to *Neofranciella* Guillaumin, *Sukunia* A.C.Sm., *Sulitia* Merr. and *Trukia* Kaneh. This broad circumscription of *Atractocarpus* has been recently criticized (Wong 2004; Robbrecht & Manen 2006), based on other phylogenetic data. Independently, Gustafsson & Persson (2002) restricted the pantropical genus *Randia* L. to a narrow group of Central American spiny taxa. Amongst the Pacific "*Randia*" species awaiting a new generic placement, several ones belong to *Atractocarpus sensu* Puttock (1999). The Pacific Gardenieae consequently require deep systematic studies to circumscribe genera, among which *Atractocarpus*, and to allocate species to valid genera.

Initially, *Atractocarpus* was described to accommodate a single southeastern New Caledonian species, *A. bracteatus* Schltr. & K.Krause, with heteromorphic leaves (Schlechter & Krause 1908). The genus took its name ("atraktos": a spindle, "carpos": a fruit) from this species characteristic fusiform berries. Later, seven New Caledonian species were described in *Atractocarpus* and one was transferred to it (Guillaumin & Beauvisage 1913; Moore 1921; Guillaumin 1930), of which several ones do not share the "typical" fusiform fruits. In their taxonomic treatment, Guillaumin & Beauvisage (1913) placed *A. bracteatus* to the synonymy of *A. heterophyllus* (Montrouz.) Guillaumin & Beauvis., a species originally described in *Gardenia* Ellis (Montrouz. 1860). Montrouz. (1860) protologue for *A. heterophyllus* (as *Gardenia*) was based on specimens collected in the northern islands of the archipelago. The distribution information for *A. heterophyllus* consequently swapped from the north to the south between Montrouz. (1860: northern New Caledonia) and Guillaumin &

TABLE 1. — Useful morphological, ecological and distributional features for *Atractocarpus* Schltr. & K.Krause species *A. bracteatus* Schltr. & K.Krause (Rubiaceae) and *A. heterophyllus* (Montrouz.) Guillaumin & Beauvis. recognition.

Features	<i>A. heterophyllus</i> (<i>A. heterophyllus</i> sensu typo) (<i>A. balanseanus</i> Guillaumin)	<i>A. bracteatus</i> (<i>A. heterophyllus</i> sensu Guillaumin & Beauvisage 1913)
Morphological traits		
Lamina base	Rounded	Attenuated
Petiole	25-46 mm long	16-22 mm long
Female inflorescence	Uniflorous	Uniflorous to Triflorous
Male inflorescence	Triflorous	Tri-Pentaflorous
Fruit	Oblong-ovoid	Fusiform
Ecology		
Environment	Opened and forested areas	Forested areas
Preferences	Riparian	Non obligatory riparian
Soil	Limestones and serpentine	Ultramafic and calcareous
Distribution		
New Caledonia	North of the archipelago	South of the archipelago

Beauvisage (1913: southeastern New Caledonia), simultaneously with the placement of *A. bracteatus* under *A. heterophyllus*. Since the latter treatment, *A. heterophyllus* has always been considered as depicted by Puttock (1999): “*Atractocarpus heterophyllus* is endemic to southeastern New Caledonia and Isle of Pines and restricted to ultramafic soils.” The present contribution intends to disentangle the collusion for *A. heterophyllus* vs *A. bracteatus*, prior to further systematic investigations of the genus.

METHODS AND RESULTS

The herbarium material of the New Caledonian *Atractocarpus* was identified (mainly from NOU and P; see the systematic section) and the species delimited according to the types and/or protologues of names. The original material was destroyed in Berlin (B) for *A. bracteatus* and part of it in Lyon (LYJB) for *A. heterophyllus* (number of Montrouzier's collections were burned at the University of Lyon, France; comm. from LYJB). According to this, typifications of names are proposed and lectotypes chosen among syntypes when possible (note: numbers indicated for Montrouzier's collections are those used and added on sheets by Beauvisage and not initially given by the collector himself). The taxa treated in the present study were well gathered and

documented in herbaria. Based on examined specimens, the diagnostic characters to species were listed (Table 1) and the plants were illustrated (Figs 1-3). Two morphologically distinct groups corresponding to species were identified. These two groups were geographically vicariant (Fig. 4), one restricted to the northern archipelago and the other to the southern area of New Caledonia.

DISCUSSION

Guillaumin (1930) recognized nine species of *Atractocarpus*. Amongst these species, two are very distinctly heterophyllous: one called *A. heterophyllus* (syn. *A. bracteatus* following Guillaumin & Beauvisage 1913; with fusiform fruits and vegetative leaves with a basally attenuate lamina) and another one described as *A. balansaeanus* Guillaumin (with ovoid fruits and vegetative leaves with basally rounded lamina).

Atractocarpus heterophyllus sensu typo (Montrouzier 1860: as *Gardenia heterophylla*), occurs in the northern part of the archipelago. Morphological aspects of the original description of *A. heterophyllus* suggest that the species have oblong-ovoid fruits and two different kinds of leaves: large oblong vegetative ones with a rounded base of the lamina and small subcircular cordate inflorescences. Montrouzier (1860)

placed it in his section *Oxyphyllodium*, together with *Gardenia artensis* Montrouz. bearing rounded fruits. After a careful examination, the gathering *Montrouzier 179*, syntype of *Atractocarpus heterophyllus*, corresponds morphologically to the species concept given by Guillaumin (1930) for *A. balansaeanus*. Consequently, the species currently called *A. balansaeanus* has to be named *A. heterophyllus* (Table 1; Figs 3, 4).

Montrouzier was aware of New Caledonian Gardenieae with fusiform fruits as he described a *Gardenia* section *Septocarpus* Montrouz. diagnosed by “fructus fusiformis”, for *G. edulis* Montrouz., a species related to southeastern species of *Atractocarpus* discussed here. The species hitherto considered as *A. heterophyllus* since Guillaumin & Beauvisage’s (1913) treatment, with attenuated lamina base and fusiform fruit, should consequently recover the name *A. bracteatus* (Table 1; Figs 1, 2, 4).

The confusion between *A. heterophyllus sensu* Montrouzier (1860) and *A. heterophyllus sensu* Guillaumin & Beauvisage (1913), originates from the wrong assignation by the latter authors of the type specimens of *A. heterophyllus* to the southeastern species. One may suggest that Guillaumin & Beauvisage (1913) recognized a sole broad species including specimens of both taxa. However, Guillaumin’s (1930) description of *A. balansaeanus*, using a sensibly proximate combination of characters than the one given for the *Gardenia heterophylla* protologue, shows that Guillaumin correctly evaluated the differences between the two New Caledonian species bearing highly heteromorphic leaves.

After all, the correct name typifying *Atractocarpus* is *A. bracteatus* instead of *A. heterophyllus*.

SYSTEMATIC TREATMENT

The following taxonomic treatment provides synonymy, full description, illustrations, and distribution map for *Atractocarpus bracteatus* and *A. heterophyllus*. Diagnostic features to species are listed in Table 1, pending an identification key in the complete revision of New Caledonian Gardenieae. To stabilise the use of these names, a nomenclatural treatment is proposed here for both species. Specimens examined are listed under species names.

Genus *Atractocarpus* Schltr. & K.Krause

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 40 (92): 43 (1908). — Type: *A. bracteatus* Schltr. & K.Krause.

DESCRIPTION

Atractocarpus is currently a genus of c. 40 species that occur in Australia, the Federated States of Micronesia, Fiji, Indonesia, New Caledonia, Papua New Guinea, Philippines, Solomon Islands, Society Islands, Tonga and Vanuatu, with the highest diversity in New Caledonia. The New Caledonian species are mostly riparian, living in mesic to humid forests, or more rarely in bushes. The Australian and other Pacific islands representatives occupy various mesic forests, swamp forests and maritime semi-deciduous thickets.

The diagnostic combination of characters for the genus, *sensu* Puttock (1999) is: flowers with subsessile anthers; styles completely included in the tube; patent corolla lobes; porate pollen grains in monads; ovary bilocular, placentation axile; berries moderate to large, spherical to fusiform, many-seeded; and seeds large with an extensive peripheral hilum.

An interesting characteristic feature also noted by Puttock (1999) consists of the placental mass degenerating into a watery pulp, enclosing seeds. At the fruit stage, the locule limits and the placentation type become consequently not obvious in fruit-section (see Figs 2; 3).

Atractocarpus bracteatus Schltr. & K.Krause (Figs 1; 2)

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 40 (92): 43 (1908). — Type: **New Caledonia**. Couvelée, fl., 1900-1906, *Le Rat* 537 (neo-, P, *hic designatus*). — Previous type: **New Caledonia**. Süd-Bezirk, Couvelée, 1900-1906, *Le Rat* 90 (holo-, B†).

Gardenia fusiformis Baill. ex Heckel, *Annales de l'Institut de Botanique-Géologique Colonial de Marseille*, II, 10: 256 (1912). — Type: **New Caledonia**, Baie de Prony, fr., 1862, *Pancher s.n.* (holo-, P).

OTHER SPECIMENS EXAMINATED. — **New Caledonia**. Baie de Prony, fl., 1910, *d'Alleizette* (leg. Godefroy)

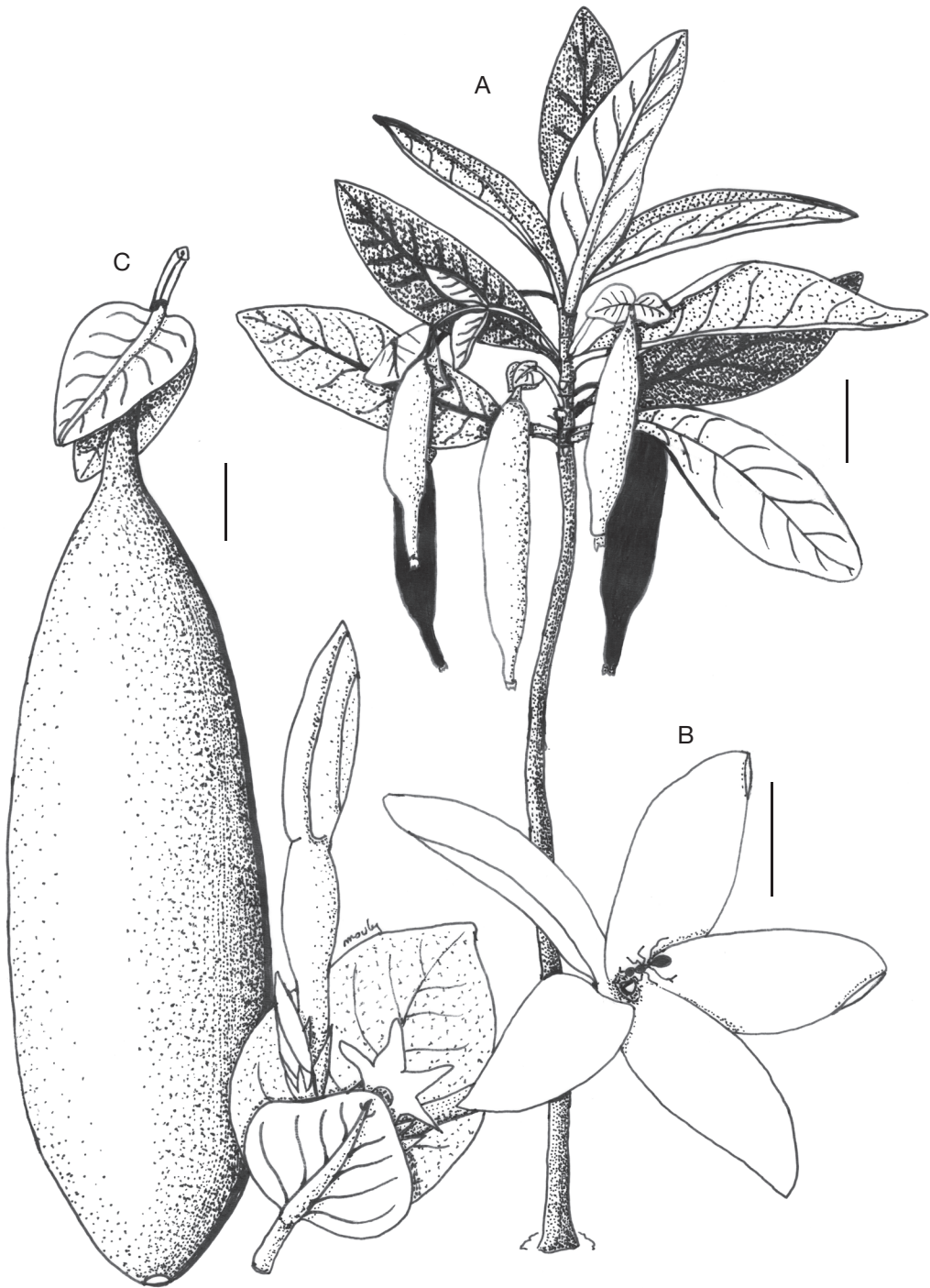


FIG. 1. — *Atractocarpus bracteatus* Schltr. & K.Krause: **A**, view of a female individual in fruit; **B**, male inflorescence, and detail of a flower with ant; **C**, mature fruit. Scale bars: A, 10 cm; B, C, 1 cm. Based on pictures by Daniel & Irène Létocart (www.endemia.nc).

- 354 (P). — Forêts de la baie de Prony, fl. fr., IX.1868, *Balansa* 353 (P). — Île Casy, dans la baie de Prony, fr., 24.VI.1869, *Balansa* 2014 (P). — Collines éruptives situées vers le cours supérieur de la Tamoa, fl. fr., 11.IV.1870, *Balansa* 2896 (P). — Vallée du Dothio, fl., XII.1871, *Balansa* 3419 (P, P). — Environs de Mamarie, dans la partie supérieure du bassin du Tio, fl., I.1872, *Balansa* 3650 (P). — Thio-Canala, Dothio, 21°35'S, 166°6'E, 170 m, fl. fr., 29.XII.1977, *Bamps* 6103 (BR, NOU, P). — Col d'Amieu, réserve forestière, 21°37'S, 165°49'E, 390 m, fl., 30.XII.1977, *Bamps* 6116 (BR, P). — Mt Mou, 300 m, 10.IX.1950, *Baumann-Bodenheim* 5859 (P). — Île des Pins, E. Baie d'Upi, 25.V.1951, *Baumann-Bodenheim* 13412 (P). — Île des Pins, Kuto, 26.V.1951, *Baumann-Bodenheim* 13459 (P). — Île des Pins, Kuto, fr., 27.V.1951, *Baumann-Bodenheim* 13591 (P). — Île des Pins, île dans l'anse de Kanuméra, fr., 27.V.1951, *Baumann-Bodenheim* 13616 (P). — Baie des Pirogues, plage, fr., 2.XII.1951, *Baumann-Bodenheim* 15818 (P). — Creek Tao, fl., 26.XII.1951, *Baumann-Bodenheim* 15958 (P). — Île des Pins (Kunié), fr., 17.VII.1965, *Bernardi* 9698 (G, P). — *S. loc.*, fr., I.1980, *Bourret* 2210 (NOU). — Rivière des Pirogues, fr., 4.I.1978, *Cabalion NC352* (P). — Bonne Anse, Baie du Sud, 1903, *Cribb* 1363 (NOU, P). — Plum, creek Lucky, fr., 21.II.2001, *Dagostini & Rigault* 289 (NOU). — Forêt Nord, fr., 7.IX.2006, *Dagostini* 1201 (NOU, P). — Wenig verzweigtes Stammschen im Unterwuchs des Waldes im Malgrunde des Kalouéholatales, fr., II.1924, *Däniker* 3137 (P, Z). — Mont Dore, fl., 26.III.1974, *Debray* 2202 (P). — Île des Pins, fl., 24.I.1978, *Debray* 2707 (P). — Île des Pins, bord de chemin, fl., 26.I.1978, *Debray* 2744 (P). — Port Boisé, bord de rivière, fl., 1861, *Deplanche* 245 (P). — *S. loc.*, fl., 1861, *Deplanche* 245 bis (P). — Nouméa, littoral entre la Baie Nord et le Cap N'Dua, fl., II.1909, *Franc* 759 (P). — Prony, lieux ombragés et frais, fl., I.1914, *Franc* 1639a (P). — Prony, littoral, fl., I.1914, *Franc* 1766 (P). — Port Boisé, littoral, fl., I.1914, *Franc* 1766a (P). — Île des Pins, fl. fr., 1874-1876, *Germain s.n.* (P). — Base du Mt Mou, 15.X.1950, *Guillaumin & Baumann-Bodenheim* 6889 (P). — Base du Mt Dore, 8.II.1950, *Guillaumin & Baumann-Bodenheim* 7947 (P). — Base du Mt Dore, 8.II.1951, *Guillaumin & Baumann-Bodenheim* 7956 (P). — Vallée des Pirogues, fl., 29.III.1951, *Guillaumin & Baumann-Bodenheim* 11528 (P). — Port Boisé, fr., 10.V.1979, *Hoff* 844 (NOU). — Port Boisé, fr., 10.VI.1980, *Hoff* 2209 (NOU). — Port Boisé, fr., 10.VI.1980, *Hoff* 2247 (NOU). — Baie des Pirogues, 120 m, 16.XII.1950, *Hürlimann* 371 (P). — Tonaouron-Goro, 10 m, fl., 9.I.1951, *Hürlimann* 567 (P). — "Sill" serpentineux de St André Yallein, fl., 24.VII.1968, *Jaffré* 64 (NOU). — Route de Prony, fr., 31.X.1972, *Jaffré* 998 (NOU, P). — Route de Prony, fl., 4.I.1978, *Jaffré* 2164 (NOU, P). — Route de Prony, baie N'go, sur éboulis péridotiques et colluvions ferralitiques, lisière de forêt dense, fr., 27.VIII.2000, *Jaffré* 3445 (P). — Prony, 300 m, fl., 1900-1910, *Le Rat* 1731 (P). — Plum, just above beach, fr., 14.I.1956, *MacKee* 3778 (P). — Île des Pins, Kuto, raised coral rock on sandy beach, 5-10 m, fr., 4.VIII.1956, *MacKee* 5021 (P). — Mokoué, région de Canala, fl., 17.I.1961, *MacKee* 8156 (P). — Crête à l'Ouest du Col de Petchicara, versant de Dothio, 500 m, fl., 7.V.1965, *MacKee* 12531 (P). — Nakéty, 30 m, fl. fr., 8.V.1965, *MacKee* 12548 (NOU, P). — Île des Pins, presqu'île d'Oro, forêt à l'intérieur de la presqu'île, 5 m, fr., 19.XII.1965, *MacKee* 14096 (P). — Prony, Baie Nord, terrain serpentineux, 0-30 m, fr., 10.IV.1966, *MacKee (leg. Corbasson)* 14708 (P). — Baie des Pirogues, maquis près de la plage, fl., 15.IV.1967, *MacKee* 16574 (P). — Plum, Baie Ngo, maquis sur terrain rocheux serpentineux, 50 m, 28.I.1970, *MacKee (leg. Corbasson)* 21487 (P). — Base S.E. du Mt Dore, fl., V.1970, *MacKee* 21874 (NOU). — Kuebini, Île Nou, fl., 29.X.1970, *MacKee* 22785 (NOU). — Île des Pins, plateau central, bandes de forêt en terrain rocheux serpentineux, 100 m, fl. fr., 1.IV.1971, *MacKee* 23571 (P). — Nakéty, Mokoué, forêt-galerie, 20 m, fl. fr., 13.XI.1971, *MacKee* 24686 (P). — Port Boisé, littoral Est, forêt sur le terrain rocheux serpentineux, 0-10 m, fl., 13.VII.1973, *MacKee* 26940 (P). — Port Boisé, littoral rocheux serpentineux, fr., 27.X.1973, *MacKee (leg. Aymard)* 27613 (P). — Prony, Île Casy, terrain serpentineux, 0-40 m, fl. fr., 15.IV.1974, *MacKee* 28504 (P). — Île des Pins, Baie des Crabes, fl. fr., 8.IX.1977, *MacKee* 33821 (NOU, P). — Cap Reine Charlotte, forêt basse côtière, terrain rocheux serpentineux, 2 m, fl., 29.XI.1978, *MacKee* 36143 (P). — Dothio, Haute Ouen Koura, fl., II.1979, *MacKee* 36583 (NOU, P). — Doti, terrain serpentineux, 50 m, fr., 17.VIII.1984, *MacKee (leg. Nasi)* 42122 (P). — Yaté, 15 m, fl. fr., 22.IV.1993, *MacKee* 46196 (NOU, P). — Port Boisé, c. 20 air-km S of Yaté, coastal forest of Port Boisé, fr., 12.VI.1980, *McPherson* 2795 (NOU, P). — Dothio River valley, near Thio, along road and trails by river, leaving highway just short of one-way portion, forest, c. 50 m, fr., 27.I.1983, *McPherson* 5431 (MO, P). — Province Sud, Port Boisé, 20-50 m, fl. fr. 21.XI.2003, *Mouly* 149 (P). — Province Sud, Île des Pins, sentier forestier entre la baie d'Oro et la baie d'Upi, 0-10 m, fl. 4.I.2004, *Mouly & Innocente* 269 (P). — Col de Pé-tchécara, 100 m à gauche en suivant le début de la piste, forêt en face de la piste, fr., 14.IV.1999, *Munzinger & Cabalion* 479 (P). — Forêt Anaïs, Prony, 22°18'06"S, 166°42'56"E, fr., 16.VI.2004, *Munzinger* 2130 (NOU, P, UPS). — Île des Pins, îlot Moro à l'Ouest de l'Île des Pins, 22°39'6"S, 167°23'39"E, fr., 27.VII.2004, *Munzinger (leg. Cunkelman)* 2278 (P). — Tontouta, 21°58'20"S, 166°14'56"E, fr., 26.II.2006, *Munzinger* 3348 (NOU, P). — Col de Mouirange, versant NO, fl.

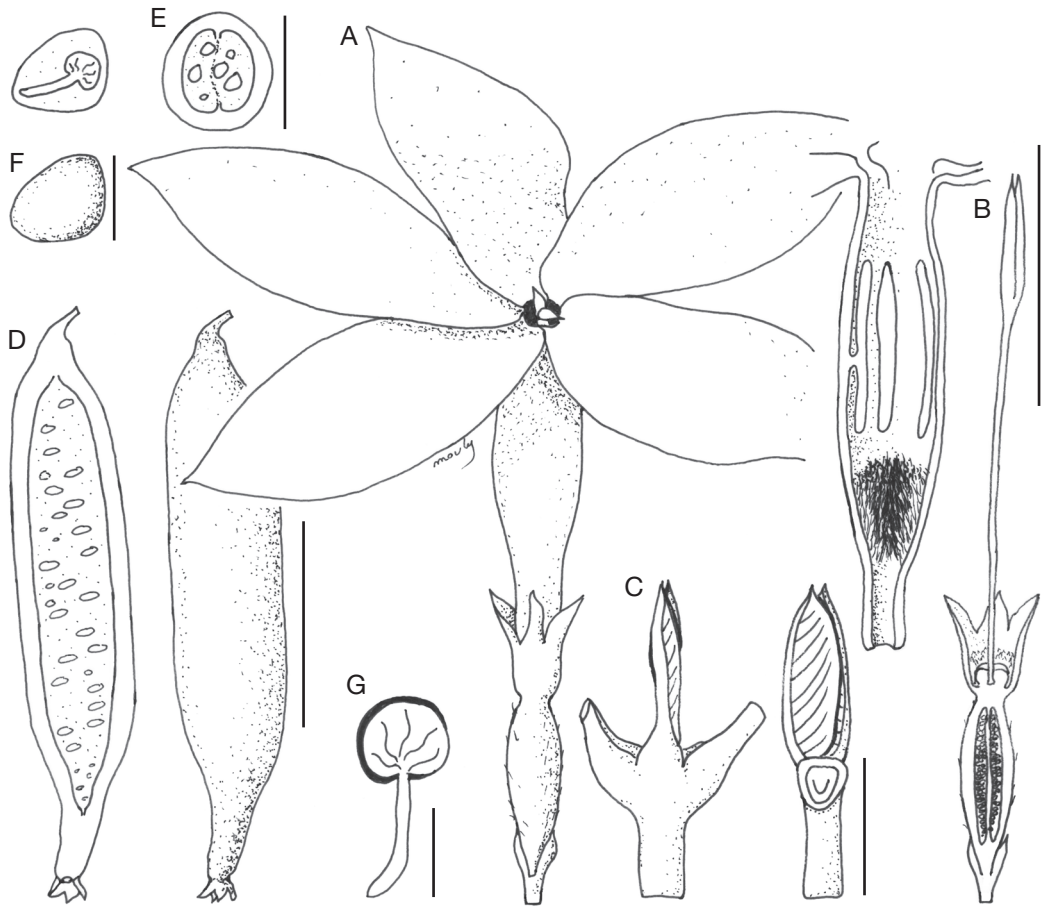


FIG. 2. — *Atractocarpus bracteatus* Schltr. & K.Krause: **A**, female flower; **B**, longitudinal section of a female flower (corolla and stamens detached from hypanthium); **C**, detail of stipules at branch apex; **D**, entire fruit and longitudinal section of a fruit; **E**, transversal section of a fruit; **F**, entire seed and its longitudinal section; **G**, embryo. Scale bars: A-C, 1.5 cm; D, 6 cm; E, 1.5 cm; F, 5 mm; G, 2 mm. Based on Mouly 149 (P).

(fr. doubtful), 4.II.1966, *Nothis* 8 (NOU, P). — Lisières des massifs dans le voisinage de la mer, 1862, *Pancher s.n.* (P). — Baie de Prony, fr., *Pancher s.n.* (P). — Passe entre Thio-Nakéty, c. 400 m, fl., 2.I.1912, *Sarasin* 371 (P). — Creek Pernod, rive droite, 250 m, fl., 15.VI.1965, *Schmid* 330 (NOU, P). — Kouakoué, bord de ruisseau, fr., 18.XI.1965, *Schmid* 772 (NOU). — Île des Pins, vers la Baie de la Corbeille, fr., 10.VI.1967, *Schmid* 2138 (NOU). — Île des Pins, forêt sur épandage au pied du Pic N'Ga, fl., 9.VI.1967, *Schmid* 2138 bis (NOU). — Île des Pins, Est, fr., 3.V.1974, *Schmid* 4969 (NOU). — Îlot Casy, Baie de Prony, fr., 15.IV.1974, *Sévenet* 637 (NOU). — Vers la Baie d'Oupi, Île des Pins, fr., 2.V.1974, *Sévenet* 652 (NOU). — N.E. Baie Ngo, N. Pt. 16, fl., 7.III.1964, *Stauffer* 5768 (NOU,

P). — Petite forêt sèche, Mont-Dore, fr., 11.V.1978, *Suprin* 403 (NOU). — Secteur de Ngo, Rivière des Pirogues, forêt de thalweg, fr., 17.VII.1980, *Suprin* 582 (P). — Baie de Ngo, forêt sur éboulis et sol brun, c. 200 m, fr., 18.VIII.1978, *Tirel* 1202 (P). — Bord du Dothio, route des Colons, fl. fr., 4.I.1965, *Veillon* 5 (NOU, P). — Au-dessus de Baie N'Go, c. 200 m, fl., 4.II.1982, *Veillon* 4814 (NOU, P). — Base du Pic du Pin, près de la mine Anna Madeleine, exploitation forestière Lafleur, clairière de la zone marginale forestière, terrain serpentineux, fl., 1.IV.1942, *Virost* 604 (P). — Littoral près de Goro, au sud-est du village, c. 5 m, fl., 28.III.1942, *Virost* 644 (P). — Presqu'île de Kuto, Île des Pins, bois littoraux humides, plateaux madréporiques émergés, c. 5 m, fr., 5.II.1943, *Virost* 985 (P).

DESCRIPTION

Dioecious, slender tree 1–3 m high, monocaul or few stemmed. Stipules paired, imbricate, lanceolate, 12–21 × 3–5 mm. Leaves of non-flowering shoots elliptic to oblanceolate, glabrous; petioles 16–22 mm long; lamina 160–320 × 50–160 mm, apex acuminate, base attenuated, glossy dark green, dull grey-green below, coriaceous; secondary veins 12–14 pairs at 50–60° to the midvein. Inflorescences axillary, branch-like to 250 mm long, perennial in male individuals, flowers arranged in cymes, up to 5-florous in male, and solitary to 3-florous in female individuals, flowers subtended by modified leaves, cordate, 30–40 mm long; flowers ± sessile, 5-merous, with a slightly sexual differentiation. Hypanthium 9–12 mm long and linear in male, ovules aborted; 12–16 × 3–5 × 3–5 mm, centrally inflated in female individuals. Calyx tube obconical, 3–4 mm long; lobes triangular, 1.5–2 mm long. Corolla tube 18–28 mm long, urceolate, *c.* 5 mm diameter at the widest point, glabrescent outside, glabrous inside except where it is bearded below the anthers. Corolla lobes lanceolate, *c.* 18 × 7–10 mm, glabrous. Anthers bilocular, 7–10 mm long, dorsifixed, supramedifixed, attached 4–5 mm from their apices, subsessile, inserted 5–6 mm below the sinuses of the corolla lobes. Style included, *c.* 25 mm long; stigmatic lobes 2, *c.* 9 mm long. Ovary bilocular, elongate, *c.* 9 × 2 × 2 mm, placentation axile, each bearing many ovules in a longitudinal row. Fruit berry, solitary, fusiform, 120–310 × 30–35 mm, smooth narrowing towards the calyx tube; exocarp smooth, green when mature; placentas extending in a whitish pulp. Seeds *c.* 5 × 5 × 0.6 mm; hilum occupying *c.* 0.6 of the perimeter of seed; exotesta cells with a thickened ring around the inner tangential wall and occasional interstitial thickenings.

NOTE ON TYPIFICATION

Herbaria where *A. Le Rat* collections are deposited (according to HUH Index of Botanists: http://kiki.huh.harvard.edu/databases/botanist_index.html) were consulted, as well as institutions where F. R. R. Schlechter usually sent herbarium material. The holotype *Le Rat* 90 has been destroyed in B (B herbarium communication), and any duplicate has been found nor in P where most of *Le Rat* collection

is, neither in other herbaria (A, BM, BR, E, G, H, K, L, S, U, W, WRS�). The gathering *Le Rat* 537, collected in the type locality by the same botanist and deposited at P, is designated as a neotype.

DISTRIBUTION, ECOLOGY, AND HABITAT

Atractocarpus bracteatus is endemic to southeastern New Caledonia and the Isle of Pines (Fig. 4). The species is a non obligatory riparian, and it grows mainly on ultramafic soils, calcareous rocks and occasionally on eroded elevated corals. The ant indicated in Figure 1, as observed in the field, is not an evidence of ant-pollination, but an indication that *A. bracteatus* nectar secretions attract ants, forming temporary colonies on plant individuals. Fruiting takes long time in the species, as observed on cultivated specimens in New Caledonia, necessitating more than two years to reach maturity.

NOTE

Two unpublished names, *Genipa semperflorens* and *Genipa xylopioides*, are present in annotations by Baillon on herbarium sheets in P. *Genipa* was at that time one of the few considered genera in Gardenieae, together with *Gardenia* and *Randia*. Both *Randia* and *Genipa* are now restricted to the Neotropics (Persson 2002; Gustafsson & Persson 2002), and New Caledonian Gardenieae species were never considered as potential *Genipa* species since then.

Atractocarpus heterophyllus

(Montrouz.) Guillaumin & Beauvis.
(Fig. 3)

Annales de la Société botanique de Lyon 38: 96 (1913 publ. 1914). — Basionym: *Gardenia heterophylla* Montrouz., *Mémoires de l'Académie Royale des Sciences de Lyon, Secteur Sciences* 10: 216 (1860). — Type: **New Caledonia**. Île Art, 1859, *Montrouzier* 179 (lecto-, MPU, *hic designatus*). — Previous syntypes: **New Caledonia**. Île Art, 1859, *Montrouzier* 94 (LYJB†). — Île Art, 1859, *Montrouzier* 95 (LYJB†).

Atractocarpus balansaeanus Baill. ex Guillaumin, *Archives de Botanique*, *Mémoire* 3 (5): 12 (1930). — Type: **New Caledonia**. Île Yandé, fr., 23.VI.1871, *Balansa* 3212 (lecto-, P, *hic designatus*; isolecto-, P). — Previous syntype: **New Caledonia**. “Rade de Canala, sur les rochers maritimes” (doubtful locality, see note below), fr., 29.VI.1869, *Balansa* 2012 (P).



FIG. 3. — *Attractocarpus heterophyllus* (Montrouz.) Guillaumin & Beauvis.: **A**, view of the apex of a female individual in fruit; **B**, detail of stipules at branch apex; **C**, transversal section of a fruit; **D**, longitudinal section of a fruit; **E**, developed placenta at fruit stage, in dorsal and ventral views; **F**, longitudinal section of a seed; **G**, embryo. Scale bars: A-E, 3 cm ; F, G, 2 mm. Based on MacKee 26464 (P) and unpublished N. Hallé's drawings of New Caledonian Rubiaceae *in sched* (P).

OTHER SPECIMENS EXAMINATED. — **New Caledonia.** Mt Yandé, fr., 23.VIII.1978, *Cabalion* 644 (P). — Insel Yandé, fl., 7.IV.1925, *Däniker* 1574 (P). — Vallée de Voh sup., 250 m, 12.IV.1951, *Guillaumin & Baumann-Bodenheim* 12122 (P). — Boulinda 200 m, fr., 1.VII.1972, *Jaffré* 844 (NOU, P). — Base du Massif du Boulinda, fr., 8.VII.1975, *Jaffré* 1346 (NOU); *idem*, *Jaffré* 1352 (NOU). — Île Pott, Panan, 10-60 m, fr., 29 Jul 1968, *MacKee* 19355 (NOU, P). — Île Yandé, fl. fr., 6.X.1970, *MacKee* 22621 (NOU). — Népoui, presque île de Muéo, fl., 10.XII.1970, *MacKee* 22997 (NOU, P). — Baaba, secteur S.O., fr., 6.I.1971, *MacKee* 23194 (NOU). — Plateau de Tiéa, pente Nord, maquis sur terrain rocheux serpentineux, 200-300 m, fr., 2.XI.1971, *MacKee* 24536 (P). — Amos, fl., 4.XII.1972, *MacKee* 26041 (NOU). — Gomen, Ouéholle, maquis sur pente serpentineuse, 300 m, fl., 28.XII.1972, *MacKee* 26124 (P). — Col d'Arama, versant Ouest, maquis ouvert sur terrain serpentineux, 80 m, fr., 23.III.1973, *MacKee* 26464 (P). — Kopéto, crête est du Mt Vert, maquis haut sur pente raide rocheuse serpentineuse, 700 m, fr., 24.VI.1973, *MacKee* 26888 (P). — Vallée de Poya, Ndokoa, maquis sur terrain rocheux serpentineux, 100 m, fr., 31.X.1973, *MacKee* 27703 (P). — Poya, Avangui, 300 m, fl., 2.I.1976, *MacKee* 30611 (NOU, P). — Poindimié, Povila, forêt dense basse, terrain serpentineux rocheux, 200 m, fr., 13.IX.1976, *MacKee* 31522 (P). — Poya, Nékoro, 200 m, fr., 21.V.1977, *MacKee* 33208 (NOU, P). — Paagoumène, maquis haut sur terrain serpentineux, 10 m, fl., 6.II.1980, *MacKee* 37809 (P). — Poya, Ndokoa, fr., 11.VII.1981, *MacKee* 39214 (NOU, P). — Dent de Poya, 500 m, fr., 17.X.1981, *MacKee* 39569 (NOU, P). — Poya, restes de forêt sur alluvions, 40 m, fl., 1.XII.1990, *MacKee* (leg. Cherrier) 45197 (P). — Poya, restes de forêt sur alluvions, 40 m, fr., 1.XII.1990, *MacKee* (leg. Cherrier) 45202 (P). — Île Yandé, fr., 23.VIII.1978, *Morat* 6131 (NOU). — Province Nord, Poya, Nétéa, le long du creek, 50-150 m, fr., 8.VI.2007, *Mouly & Barrabé* 850 (BR, K, NOU, P). — Île Yandé, face Est, 200 m, fr., 5.X.2005, *Munzinger & Swenson* 3037 (NOU, P). — Poya, Nétéa, 21°15'6"S., 165°11'27"E., fr., 3.III.2007, *Munzinger* 4190 (NOU). — Gorges de N'Dokoa, Poya, fr., 20.X.1974, *Sévenet* 731 (P). — Île Yandé, N.O., fr., 23.VIII.1978, *Veillon* 3657 (NOU, P). — Montagnes de Balade, fl., 1855-1860, *Vieillard* 649 (P). — Wagap, 1861-1867, *Vieillard* 2752 (P).

DESCRIPTION

Dioecious, small slender tree 1-2.5 m high, mono-caul, or few stemmed. Stipules paired, imbricate, lanceolate, 12-15 × 3-4 mm. Leaves opposite, of non-flowering shoots oblong-elliptic, glabrous; petioles 26-42 mm long; lamina 140-220 × 50-100 mm, apex acuminate, base rounded, glossy dark green,

dull grey-green below, coriaceous; secondary veins 5-10 pairs at 55-65° to the midvein. Inflorescences axillary, branch-like to 140 mm long, consisting of 2 internodes, flowers arranged in cymes, 3-florous in male, and solitary in female individuals; flowers ± sessile, 5-merous, with a slight sexual differentiation, flowers subtended by modified leaves, cordate, 20-45 mm long. Hypanthium 9-10 mm long and linear in male, 11-14 × 3-5 × 3-5 mm, centrally inflated in female individuals. Calyx tube obconical, 2-3 mm long; lobes triangular, 1.5-2 mm long. Corolla tube c. 20 mm long, urceolate, c. 4 mm diameter at the widest point, glabrescent outside, glabrous inside, except where it is bearded below the anthers. Corolla lobes lanceolate, c. 15 × 7-10 mm, glabrous. Anthers bilocular, 7-10 mm long, dorsifixed, suprasedifixed, attached 4-5 mm from their apices, subsessile, inserted 5-6 mm below the sinuses of the corolla lobes. Style included, c. 19 mm long; stigmatic lobes 2, c. 7 mm long. Ovary bilocular, elongate, c. 8 × 2 × 2 mm, placentation axile, each bearing many ovules. Fruit solitary, oblong-ovoid, 30-60 × 25-50 mm, smooth narrowing towards the calyx tube; exocarp smooth, green when mature; placentas extending in a whitish pulp. Seeds c. 4 × 4 × 0.5 mm; hilum occupying c. 0.5 mm of the perimeter of seed; exotesta cells with a thickened ring around the inner tangential wall and occasional interstitial thickenings.

NOTE ON TYPIFICATIONS

Since Montrouzier never cited the original material in his Flora, possible syntypes are accepted from citations in Guillaumin & Beauvisage (1913). As two of the three syntypes of *A. heterophyllus* (*Montrouzier* 94, 95) have been destroyed in LYJB, only one Montrouzier's gathering (*Montrouzier* 179) remains available at MPU. Though without any annotation from Montrouzier as an author, the MPU gathering cannot be rejected as original material, being in agreement with the protologue and collected before the publication of the protologue. The collection *Montrouzier* 179 is thus designated here as lectotype for *A. heterophyllus*.

The lectotype of *Attractocarpus balansaeanus* was chosen from two original gatherings cited by Guillaumin (1930). The collection *Balansa* 3212, designated as lectotype, is well preserved and representative

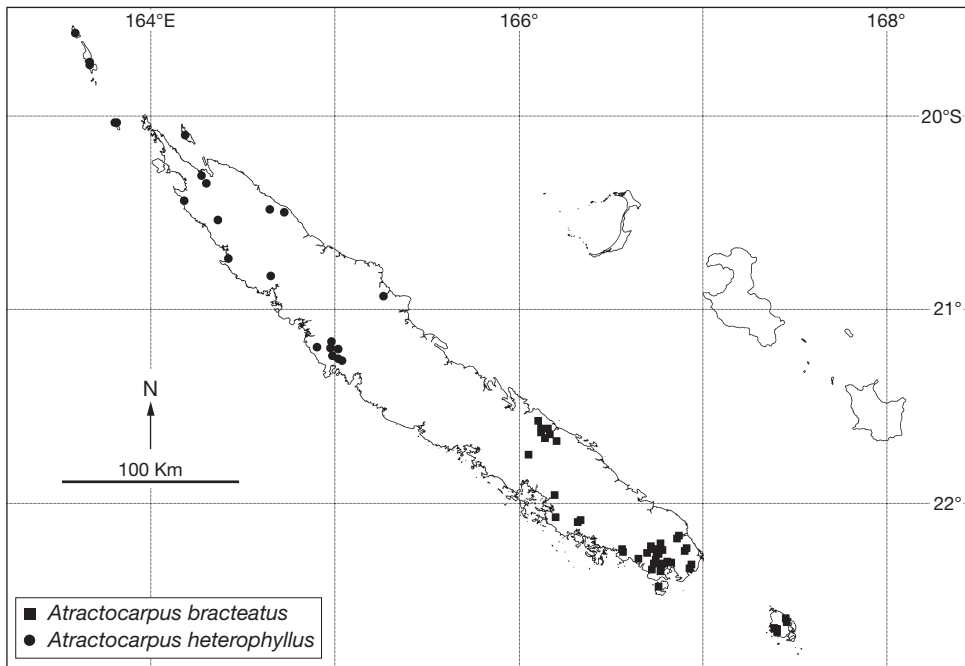


FIG. 4. — Distribution map of *Atractocarpus bracteatus* Schltr. & K.Krause (■) and *A. heterophyllus* (Montrouz.) Guillaumin & Beauvis. (●) in New Caledonia.

of the protologue. The other syntype collection *Balansa 2012* consists of only one sheet in worse condition than the lectotype.

DISTRIBUTION, ECOLOGY, AND HABITAT

Atractocarpus heterophyllus is endemic to northern New Caledonia and Belep Islands (Fig. 4). This species is exclusively riparian, restricted to limestone and serpentine soils, on rocks and rock slides. On the main island, most of specimens collected belong to the western coast populations. The gathering *Balansa 2012* bears the label information “Canala” (southeastern coast), a locality poorly reliable for the species. Besides the gathering *Balansa 2012*, the two old collections made by Vieillard from the east are unclearly localized. Indeed, Vieillard indicated on labels the locality where he was based instead of the locality of the collection. The eastern coast is now well explored, and only one recent collection can be attributed to *A. heterophyllus*, in the Poindimié area. The few eastern populations are probably smaller and more threatened than the western ones.

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