Revision of *Pycnandra* subgenus *Sebertia* (Sapotaceae) and a generic key to the family in New Caledonia

Ulf SWENSON
Department of Phanerogamic Botany, Swedish Museum of Natural History,
P.O. Box 50007, SE-104 05 Stockholm (Sweden)
ulf.swenson@nrm.se

Jérôme MUNZINGER
Institut de Recherche pour le Développement, UMR AMAP,
Laboratoire de Botanique et d'Écologie végétale appliquées,
Herbarium NOU, BPA5, 98848 (New Caledonia)
and Institut de Recherche pour le Développement, UMR AMAP,
TA A-51/PS2, F-34398 Montpellier cedex 5 (France)
jerome.munzinger@ird.fr

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ABSTRACT
The satellite genus *Sebertia* (Sapotaceae, Chrysophylloideae) in New Caledonia is here recognized as *Pycnandra* subgenus *Sebertia*, a group comprising only two species. *Pycnandra canaliculata* is described and illustrated as new from the south part of Grande Terre where it occurs in maquis vegetation and humid forest on ultramafic soils, often along watercourses. This species is well known among many biologists but misidentified until now as *Sebertia gatopensis*, a synonym of *P. blanchonii* that resides in northwest Grande Terre. In New Caledonia, *Pycnandra* is the only sapotaceous genus with flowers that lack staminodes and *Pycnandra* subgenus *Sebertia* is characterized by small white flowers and fruits lacking stylar remnants. The fruits are characteristic with a scale-like epidermis that is translucent and peels off in *P. acuminata* versus brown and persistent in *P. canaliculata*. Using field data and applying IUCN criteria, we assess the preliminary threat as Least Concern (LC) for *P. acuminata* and Vulnerable (VU) for *P. canaliculata*.

KEY WORDS
Sapotaceae,
Pycnandra,
Sebertia,
New Caledonia,
conservation status,
new species.

RÉSUMÉ
Révision de Pycnandra *sous-genre* Sebertia *(Sapotaceae) avec une clé générique pour la famille en Nouvelle-Calédonie.*
Le genre satellite *Sebertia* (Sapotaceae, Chrysophylloideae) de Nouvelle-Calédonie est reconnu ici comme *Pycnandra* sous-genre *Sebertia*, un groupe ne contenant que deux espèces. *Pycnandra canaliculata* est décrite et illustrée comme nouveauté de la partie sud de la Grande-Terre où elle croît en maquis et en forêt humide sur terrain ultramafique, souvent le long des cours d'eau. Cette espèce était bien connue des biologistes, mais était mal identifiée jusqu'à présent sous *Sebertia gatopensis*, un synonyme de *P. blanchonii* qui existe dans le nord-ouest de la Grande-Terre. En Nouvelle-Calédonie, *Pycnandra* est le seul genre de Sapotaceae à fleur sans staminodes, et *Pycnandra* sous-genre *Sebertia* est caractérisé par des petites fleurs blanches et des fruits sans style persistant. Les fruits sont caractéristiques avec un épiderme écailleux et translucide, qui se détache chez *P. acuminata*, alors qu'il est brun et persistant chez *P. canaliculata*. En utilisant les données de terrain et en appliquant les critères de l'UICN, nous proposons le statut préliminaire de Préoccupation mineure (LC) pour *P. acuminata* et de Vulnérable (VU) pour *P. canaliculata*.

MOTS CLÉS
Sapotaceae,
Pycnandra,
Sebertia,
Nouvelle-Calédonie,
statuts de conservation,
espèce nouvelle.

INTRODUCTION

Sapotaceae is known as a species-rich flowering plant family in New Caledonia with approximately 80 species (Aubréville 1967; Jaffré *et al*. 2001). Ecological studies and inventories of the forests during the 1990s have resulted in many collections impossible to determine to species and several new taxa were believed to have been discovered (Jaffré & Veillon 1990, 1995). Revision of the family in New Caledonia, especially with IUCN Red List threat assessments (see Munzinger *et al*. 2008), was therefore urgently needed and we seriously embarked on a systematic survey of the family in 2002. Since then, we have described 11 species of *Planchonella* (Swenson *et al*. 2007a; Munzinger & Swenson 2009), seven of *Pycnandra* subgenus *Pycnandra* (Swenson & Munzinger 2009), five of *P.* subgenus *Achradotypus* (Swenson & Munzinger 2010), but approximately 125 taxa are known to us and many remain to be described. Here, we revise *Pycnandra* subgenus *Sebertia*, propose Red List categories to the members, and provide users with a generic key to the family in the territory.

The family was treated for the territory by Aubréville (1967) in his first volume of *Flore de la Nouvelle-Calédonie et Dépendances.* He recognized 16 genera of which *Corbassona*, *Leptostylis*, *Ochrothallus*, *Pycnandra*, *Sebertia* and *Trouettia* have flowers without staminodes. Pennington (1991), in his *Genera of Sapotaceae*, had doubts as to the generic limits, not the least for the taxa in New Caledonia. He proposed a new classification of the family and for those genera mentioned above, he accepted *Leptostylis* and *Pycnandra*. *Leptostylis* is characterized by opposite leaves, four sepals, and one stamen inserted opposite each corolla lobe whereas *Pycnandra* is characterized by alternate leaves, five sepals, and two (or one) stamens inserted opposite each corolla lobe. However, several species were transferred to *Niemeyera*, a genus found in Australia, or left as insufficiently known or doubtful taxa (Pennington 1991; Govaerts *et al.* 2001). Based on a series of cladistic studies using both morphology and DNA sequence data, it is clear that all these taxa are members of the subfamily Chrysophylloideae (Anderberg & Swenson 2003; Swenson & Anderberg 2005) and forms a monophyletic group with notoriously problematic generic delimitations

(Bartish *et al.* 2005; Swenson *et al.* 2007b). In a subsequent study, Swenson *et al*. (2008) demonstrated that the number of stamens opposite each corolla lobe and the anisomerous flower, in which the number of petals differs from the number of sepals, are of limited diagnostic value. They proposed alternative generic classifications, provided available names for clades, but refrained from making any firm recommendation. However, it is now clear from additionally new species and cladistic analyses (unpubl. data) that the classification that offers nomenclatural stability is the one that relegates these genera (or clades) to an infrageneric level of *Pycnandra* (Swenson & Munzinger 2009).

The name *Sebertia* (*S. acuminata*) was first proposed by J. B. L. Pierre in an unpublished manuscript, a name deliberately published in synonymy by Baillon (1891) when he established his species *Sersalisia acuminata*. *Sebertia* was later validly published by Engler (1897), the genus was dedicated to the French marine officer and wood technologist Hippolyte Sebert (1839-1930) (Stafleu & Cowan 1985). Despite that flowers have been poorly known for a long time, *Sebertia* has been accepted in some classification systems (Lam 1939; Aubréville 1964, 1967) or united with *Pouteria* (Baehni 1942; Herrmann-Erlee & van Royen 1957) or *Niemeyera* (Pennington 1991). *Pycnandra acuminata* and *P. canaliculata* form a strongly supported group with weak affinities to *Pycnandra* subgenus *Leptostylis* (under revision; Bartish *et al.* 2005; Swenson *et al.* 2007b, 2008).

MATERIAL AND METHODS

Morphological data, as reported by Swenson & Munzinger (2009), were gathered from herbarium specimens and fresh material collected from 2002 onwards. New material has primarily been deposited at MO, NOU, P and S. Flowers and fruits from herbarium specimens were boiled in Copenhagen mixture (70 ml ethanol, 29 ml distilled water, 1 ml glycerol) in a microwave oven until the parts are soft and then examined under a stereo microscope. Flower and seed characters were also studied in the field, and when appropriate, fruits were dissected and seeds cleared from pulp. The terminology used follows Harris & Harris (1997). Illustrations were prepared using both herbarium specimens and photos taken in the field. Lists of examined specimens are organized alphabetically by locality and then in chronological order.

We applied the IUCN criteria (IUCN 2001) and guidelines (IUCN 2008) in order to assess Red List categories to the two species of *Pycnandra* subgenus *Sebertia*. We have used available herbarium specimens (listed below) as well as data derived from botanical inventories in New Caledonia made by the botanical laboratory in Noumea (NOU). Despite being a hot spot of biodiversity (Myers 1988; Myers *et al.* 2000), New Caledonia is partly poorly explored and following IUCN's guidelines can lead to the miscalculation of the threat status (Callmander *et al.* 2007). To avoid this situation, we used a slightly modified protocol following Swenson & Munzinger (2009).

Key to the genera of the family Sapotaceae Juss. in New Caledonia

1. Calyx of 1 whorl; stipules absent (Chrysophylloideae) 2
— Calyx of 2 whorls; small caducous stipules usually present (Sapotoideae) 5

2. Staminodes present; flowers generally axillary 3
— Staminodes absent; flowers generally along branches (or fallen leaves) ..... *Pycnandra*

3. Tertiary leaf venation well developed, reticulate or oblique, higher venation not areolate ..... *Planchonella*
— Tertiary leaf venation often poorly developed, higher venation areolate 4

4. Stamens inserted in the middle of the corolla tube; cotyledons foliaceous; endosperm present ..... *Beccariella*
— Stamens inserted in the corolla tube orifice; cotyledons plano-convex; endosperm absent ..... *Pichonia*

5. Calyx of 2 whorls, 3 sepals in each ..... *Manilkara*
— Calyx of 2 whorls, 4 sepals in each ..... *Mimusops*

KEY TO THE SUBGENERA OF THE GENUS *PYCNANDRA* BENTH.

1. Leaves opposite; sepals 4; ovaries with 4 locules ..... subgen. *Leptostylis*
— Leaves alternate or ± verticillate; sepals 5 or more; ovaries with 3, 5, or more locules 2

2. Leaves ± verticillate; leafy shoots borne beneath clusters of leaves; ovaries with 3 locules ..... subgen. *Wagapensia*
— Leaves alternate; leafy shoots (as described above) absent; ovaries with 5 or more locules 3

3. Ovaries glabrous (except in *P. viridiflora*); corolla lobes often recurved; fruits ± cylindrical ..... subgen. *Pycnandra*
— Ovaries pubescent, at least around the base; corolla lobes often spreading; fruits not cylindric 4

4. Leaves glabrous beneath (except in *P. belepensis*, *P. decandra*); bract(s) present along pedicel ..... subgen. *Achradotypus*
— Leaves pubescent beneath; bract(s) absent along pedicel (except in *P. pubiflora* and *P. schmidii*), or flowers sessile 5

5. Flowers ≥ 3 mm wide, often pubescent; fruit glabrous or pubescent, with a stylar remnant ..... subgen. *Trouettia*
— Flowers 2-3 mm wide, glabrous; fruit with scale-like epidermis, without a stylar remnant ..... subgen. *Sebertia*

SYSTEMATICS

Family SAPOTACEAE Juss.
Genus *Pycnandra* Benth

Subgenus *Sebertia* (Pierre ex Engl.)
Swenson & Munzinger, comb. et stat. nov.

Sebertia Pierre ex Engl. *in* Engl. & Prantl., *Natürlichen Pflanzenfamilien, Nachträge* 4 (1): 280 (1897). — Type: *Sebertia acuminata* (Baill.) Engl.

DESCRIPTION

Trees up to 20 m tall. Leaves simple, entire, alternate, clustered at tips of branches, bicoloured, dark green above, golden brown (later grey) below of indument; trichomes malpighiaceous with short and straight arms, cell walls thick or ventral side thick and dorsal side thin; leaf base cuneate; leaf apex round to acute; stipules absent; secondary venation brochidodromous, faint above, weakly visible below, covered by indument; intersecondaries absent; tertiary veins reticulate, weakly visible, never areolate. Flowers anisomerous, borne in fascicles that are axillary and/or along branches, not on burls, bisexual, pedicellate or sessile. Sepals 5 in a single whorl, free, quincuncial, tomentulose outside, inner with a glabrous margin, glabrous inside, persistent in fruit. Corolla small, 2-3 mm wide, cup-shaped, glabrous, white, lobes and tube of equal length; corolla lobes 5-7, oblong to orbicular, recurved. Stamens opposite the corolla lobes, as many as them, inserted in the tube orifice, as long as the corolla, glabrous; anthers small, 0.5-1.0 mm, ± ovate, basifixed, versatile, calcarate for 10% of their length; anther appendage absent or minute. Staminodes absent. Ovary with 5 locules, pubescent; style minute, slender, without visible stigmatic areas. Fruit a berry, ovoid, one-seeded, with a scale-like epidermis, peels off or persistent; style remnant indistin-

guishable; seeds not laterally compressed, of the same form as the fruit; seed scar oblong, ± 50% of seed circumference and 100% of seed length; testa dull, grey, hard (0.7-1.3 mm); cotyledons plano-convex, smooth, red; radicle included in cotyledons; endosperm absent.

KEY TO THE SPECIES OF SUBGENUS *SEBERTIA*

1. Petiole 15-25 mm long; flowers sessile; fruit green, ellipsoid, 25-40 × 15-20 mm, epidermis scaly and peeling off; latex greenish or bluish ..... *P. acuminata*
— Petiole 20-40 mm long; flowers pedicellate; fruit brown, ovoid, 40-70 × 20-35 mm, epidermis scaly and persistent; latex white ..... *P. canaliculata*

Pycnandra acuminata (Baill.) Swenson & Munzinger, comb. nov. (Fig. 1)

Sersalisia acuminata Baill., *Bulletin mensuel de la Société linnéenne de Paris* 2: 945 (1891). — *Sebertia acuminata* Pierre ex Baill., *Bulletin mensuel de la Société linnéenne de Paris* 2: 945 (1891), nom. inval., pro. syn. — *Sebertia acuminata* (Baill.) Engl., *Natürlichen Pflanzenfamilien, Nachträge* 4 (1): 280 (1897). — *Pouteria acuminata* (Baill.) Baehni, *Candollea* 9: 406 (1942). — *Niemeyera acuminata* (Baill.) T.D.Penn., *Genera of Sapotaceae* 235 (1991). — Typus: Nouvelle-Calédonie, bords des ruisseaux au-dessus d'Ouroué près de l'embouchure du Dotio, XII.1871, *Balansa 3468* (holo-, P 00292324; iso-, K, L, P 00292323, P 00292325, P 00647510).

Chrysophyllum sarlinii Guillaumin, *Bulletin du Muséum national d'Histoire naturelle*, 2e sér., 22: 117 (1950). — *Trouettia sarlinii* (Guillaumin) Aubrév., *Adansonia, n.s.*, 2: 177 (1962). — Typus: Nouvelle-Calédonie, route de Yaté, VIII.1949, *Sarlin 167* (holo-, P 00279889).

MATERIAL EXAMINED. — **New Caledonia**. Province Nord, Baie (Hô) Ugué, 27.VII.1968, *MacKee 19268* (NOU). — Canala, Mondi, 24.IX.1970, *MacKee 22569* (NOU, P). — Houaïlou, Col de Hô, 20.III.1968, *MacKee 18494* (NOU, P). — *Loc. cit.*, 14.XI.1969, *MacKee 21181* (NOU, P). — *Loc. cit.*, 130 m, 15.XI.1981, *Pennington & McPherson 10317* (MO, NOU). — Dome de Tiébaghi, pente sud-ouest, 300-500 m, 9.IV.1966, *MacKee 14941*, (L, P, S); *MacKee 14942* (L, P). — *Loc. cit.*, côté Chagrin, 14.II.1969, *Schmid 2730* (NOU). — *Loc. cit.*, western slope at Virage Grenaillie, 20°27'33"S, 164°11'33"E, 354 m, 28.VIII.2009, *Swenson, Munzinger & Barrabé 924* (NOU, P, S). — Mé Maoya, Basse vallée Petite Yaté, 21.II.1970, *MacKee 21614* (NOU, P, S). Province Sud, Base du Pic du Pin, près de la mine Anna-Madeleine, 1.IV.1942, *Virot 595* (P). — Bassin de la Tontouta, 17.XI.1975, *Jaffré 1511* (NOU). — Forêt Cachée, 8.V.1967, *Veillon 1210* (NOU, P). — *Loc. cit.*, 4.VIII.1980, *Jaffré 380* (NOU). — Plaine des Lacs, Crête au sud du Grand Lac, 300 m, 23.I.1969, *MacKee 20182* (NOU, P, S). — Port Bouquet, Rivière Koum, près de la confluence entre la Rivière Koum et la Néma, 20 m, 24.XI.2001, *Munzinger 1006* (MO, NOU, P). — Rivière Bleue, 10.II.1974, *Schmid 4937* (NOU, P). — *Loc. cit.*, 21.XII.1989, *Veillon 7241* (NOU, P). — Vallée de Creek Pernod, 19.III.1967, *MacKee 16544* (NOU, P). — Yaté, 5.I.1993, *MacKee 46089* (NOU, P). — *Loc. cit.*, Près du campement du "22 km", 150 m, 8.VIII.1958, *Hürlimann 3276* (G, P).

DESCRIPTION

Tree up to 15 m tall and 70 cm in DBH. Leaves elliptic-obovate, 6-8 × 2-4 cm; secondaries of 10-12 pairs; petiole 15-25 mm long, tomentulose, brown. Flowers 5-6 per fascicle, sessile. Sepals 1.5 mm long, orbicular to elliptic. Corolla, stamens, and ovary as described above. Fruit 25-40 × 15-20 mm, green; epidermis scale-like, translucent, peeling off; latex greenish or bluish.

DISTRIBUTION AND CHARACTERISTICS

Pycnandra acuminata is strictly confined to lowland humid forest on rocky serpentine soils (Fig. 2). It is a naturally uncommon species, mainly found in the Grand Massif du Sud, extending along the east coast, across the island, to one locality in the northwest of New Caledonia (Dôme de Tiébaghi). The most remarkable trait is the ability to accumulate nickel, especially in the latex, which is bluish in colour and may contain more than 25% (dry weight) nickel (Jaffré *et al.* 1976; Sagner *et al.* 1998; Boyd & Jaffré 2001; Perrier *et al.* 2004; Boyd *et al.* 2006). Both flowering and fruiting seasons seem to be sporadic and fertile material has been recorded in December, January, May and August. *Pycnandra acuminata* has strongly discoloured leaves with a dark green

upper side, contrasting to the almost golden indument of the lower side. Fertile specimens are recognized by tiny, white and sessile flowers, and cannot be confused with its close relative *P. canaliculata*. Sterile specimens could pose identification problems, possibly with *P. sessiliflora* Swenson & Munzinger, but the coloured latex is diagnostic. The fruit of *P. acuminata* can reach a diameter of 2 cm, and the taxon should belong to the 16% of the forest trees on ultramafic soils whose seeds are exclusively dispersed by the notou or giant pigeon, *Ducula goliath* (Carpenter *et al.* 2003).

Taxonomic note

Baillon (1891) described *Sersalisia acuminata* and in the same sentence he published in synonym (pro. syn.) *Sebertia acuminata*, a name that Pierre had proposed in an unpublished manuscript. Since Baillon did not except the genus *Sebertia*, that name was not validly published under Article 34.1 of the *International Code of Botanical Nomenclature* (McNeill *et al.* 2006). However, the name *Sebertia* was validly published by Engler (1897) who accepted one species and referred to Pierre's name *Sebertia acuminata*. Hence, the basionym is *Sersalisia acuminata* Baill., on which the present specific name is combined.

Conservation status

Thirteen subpopulations are known of *Pycnandra acuminata*, giving an EOO of 6550 km² of which 2800 km² is located on ultramafic rocks, but the AOO is only 96 km². Yet, seven populations are within the protected areas Fausse Yaté, Forêt Cachée, Forêt Nord, Pic du Grand Kaori, Pic du Pin, Rivière Bleue, Yaté Barrage, and an additional population is found in the natural area Forêt Demazures. The remaining five populations are growing in different areas upon mining concessions. Expanding mining operations threaten the most isolated population, on Dome de Tiébaghi. The population in the south of Grande Terre should gain legal protection in the future, because the ecosystem of humid forest was recently proposed to become protected (Anonymous 2009). *Pycnandra acuminata* is assigned a preliminary status of Least Concern (LC).

Pycnandra canaliculata
Swenson & Munzinger, sp. nov.
(Fig. 3)

Species haec Pycnandrae acuminatae *similis sed differt petiolis 20-40 mm longis, floribus pedicellatis et fructibus ferrugineis et squamilosis.*

Typus. — **New Caledonia**. Province Sud, Goro, 22°17'47"S, 166°59'48"E, 26.IV.2004, *Munzinger, Dagostini & McCoy 2108* (holo-, P 00612599; iso-, NOU 006423, S 08-14412).

Material examined. — **New Caledonia**. Province Sud, Berge de la Madeleine, 20.I.1978, *Jaffré 2236* (NOU, P). — Goro-nickel, Haute Kwé, 18.V.2002, *Dagostini & Rigault 628* (NOU). — Haute Yaté, Rivière Bleue, 18.III.1982, *MacKee 40280* (NOU). — Les Électriques, 22°11'38"S, 166°39'55"E, 560 m, 16.IV.2004, *Munzinger, D. I., B. & S. Létocart 2067* (MO, NOU, P, S). — Plaine des Lacs, near new bridge over Madeleine River, 5.XI.1959, *Thorne 28560* (L, P, Z). — *Loc. cit.*, ad rivum Madeleine, 250 m, 3.VII.1965, *Bernardi 9385* (L, G, P, S, Z). — *Loc. cit.*, east of Grand Lac, 20.II.1983, *McPherson 5518* (MO, P). — Réserve du Pic du Pin, Patch forestier Sud-Ouest, zone de la Rivière Bleue de Prony, 22°16'07"S, 166°45'45"E, 260 m, 2.IV.2008, *Barrabé, Rigault & Nigote 650* (NOU, S). — Rive gauche de Creek Pernod, 14.I.1966, *Veillon 600* (P). — *Loc. cit.*, 19.I.1978, *Cabalion 357* (NOU). — Rivière Bleue, 150-170 m, 4.VII.1965, *Bernardi 9407* (G). — *Loc. cit.*, 1.IV.1981, *MacKee 38889* (NOU, P). — Rivière des Lacs, 7.X.1950, *Guillaumin & Baumann-Bodenheim 6748* (G, P, Z). — *Loc. cit.*, 200 m, 15.IX.1970, *MacKee 22494* (NOU, P, S). — *Loc. cit.*, 200 m, 2.II.1973, *MacKee 26209* (P, S). — *Loc. cit.*, 150 m, 10.III.1978, *MacKee 34825* (NOU, P, S). — *Loc. cit.*, 150 m, 24.XII.1980, *MacKee 38442* (L, NOU, P, S). — *Loc. cit.*, along banks of La Madeleine, south of Nouméa-Yaté road, 23.XI.1980, *McPherson 2136* (MO, NOU, P). — *Loc. cit.*, 27.XI.1980, *McPherson 2483* (K, MO, NOU, P). — *Loc. cit.*, 1.XI.1981, *Pennington & McPherson 10268* (MO, NOU). — *Loc. cit.*, 5 km en aval de la Chute, 200 m, 28.III.1986, *MacKee 43051* (NOU, P, S). — *Loc. cit.*, 220 m, 24.XI.1992, *MacKee (leg. Suprin) 46022* (NOU, P, S). — *Loc. cit.*, rive droite, en aval de la chute, 29.XII.2005, *Suprin 2659* (NOU). — Rivière Madeleine, 22.X.1989, *Veillon 7217* (NOU). — Route de Yaté, près de la Rivière des Lacs, 25.I.1966, *MacKee 14280* (P). — *Loc. cit.*, près de la Rivière des Lacs, 31.I.1969, *MacKee 20227* (NOU). — *Loc. cit.*, près du pont de la Rivière des Lacs, 150 m, 31.VII.1966, *MacKee 15402* (L, P). — *Loc. cit.*, entre la Rivière des Lacs et le barrage, 200 m, 16.IV.1967, *MacKee 16579* (NOU, P, S). — Sud-Ouest du Mamié, 550 m, 15.III.2000, *Dagostini & Rigault 257* (NOU, P). — Yaté, 27.VII.1965, *Aubréville & Heine 287* (P). — *Loc. cit.*, Barrage, 19.II.1986, *MacKee 43020* (NOU).

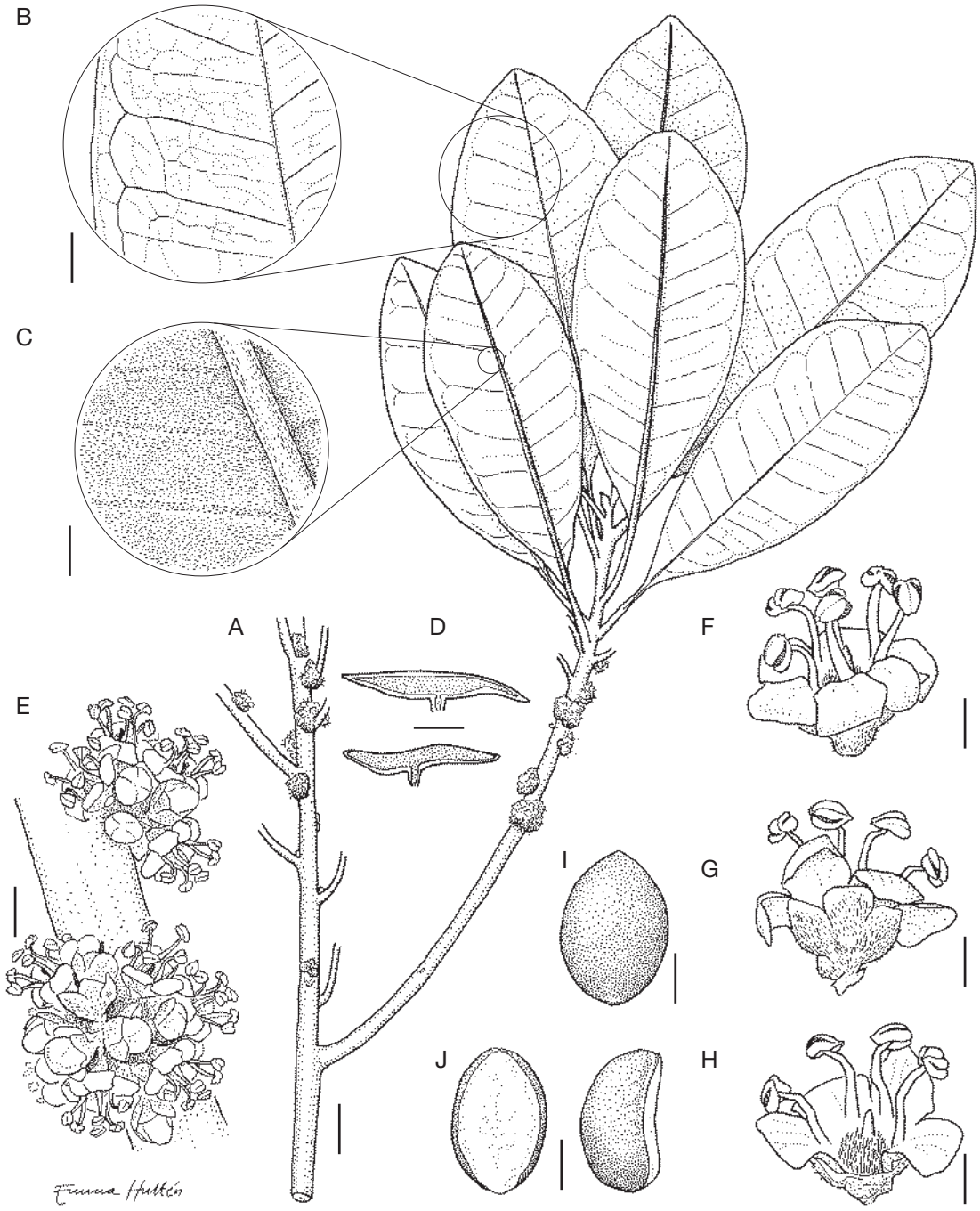

FIG. 1. — *Pycnandra acuminata* (Baill.) Swenson & Munzinger: **A**, habit with fascicles of flowers; **B**, leaf venation (upper surface); **C**, indument of lower leaf surface; **D**, leaf trichomes; **E**, inflorescence; **F**, flower (corolla view); **G**, flower (sepal view); **H**, section of flower showing pubescent ovary; **I**, fruit; **J**, seed, view of testa (left) and side view (right). A-H, *MacKee 21614*; I, J, *Munzinger 1006*. Scale bars: A, I, J, 10 mm; B, 5 mm; C, F-H, 1 mm; D, 0.1 mm; E, 2.5 mm. Drawn by Emma Hultén.

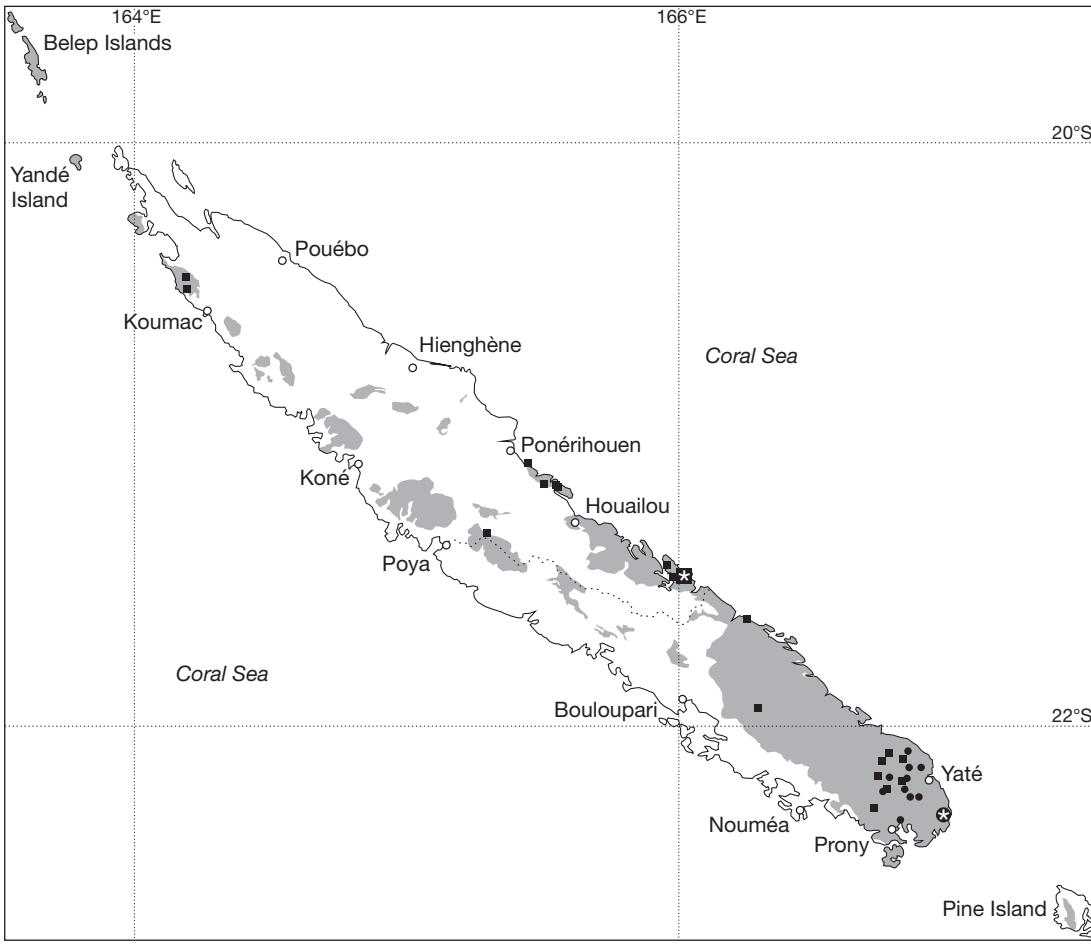

FIG. 2. — Map of New Caledonia with the distribution of *Pycnandra acuminata* (■) and *P. canaliculata* (●). Type localities are indicated with ⋆ and the shaded areas are land/mountain ranges dominated by ultramafic soil.

DESCRIPTION

Shrub or small tree up to 4 m, but can reach 20 m tall. Leaves elliptic-oblong, 6-20 × 3-7 cm; midvein near petiole canaliculate; secondaries of 9-13(-17) pairs, loops at the margin often poorly developed; petiole 20-40 mm long, tomentulose, brown, soon turning greyish. Flowers 1-6 per fascicle, pedicellate; pedicel 1-3 mm long, tomentulose. Sepals 1.3-1.7 mm long, orbicular to oblong. Corolla, stamens, and ovary as described above. Fruit 40-70 × 20-35 mm; epidermis scale-like, brown, persistent; latex white.

DISTRIBUTION AND CHARACTERISTICS

Pycnandra canaliculata occurs only on ultramafic soils in the south part of Grande Terre where it is quite common along Rivière des Lacs, Rivière Bleue, and the Grand Lac area (Fig. 2). The species often grows along watercourses in maquis vegetation where it develops to a four or five meter tall branching tree, but it can be found in old growth of humid forest where it may form larger trees. The tallest tree so far recorded was about 20 m tall. The foliage is bicoloured; dark green above and golden brown of indument be-

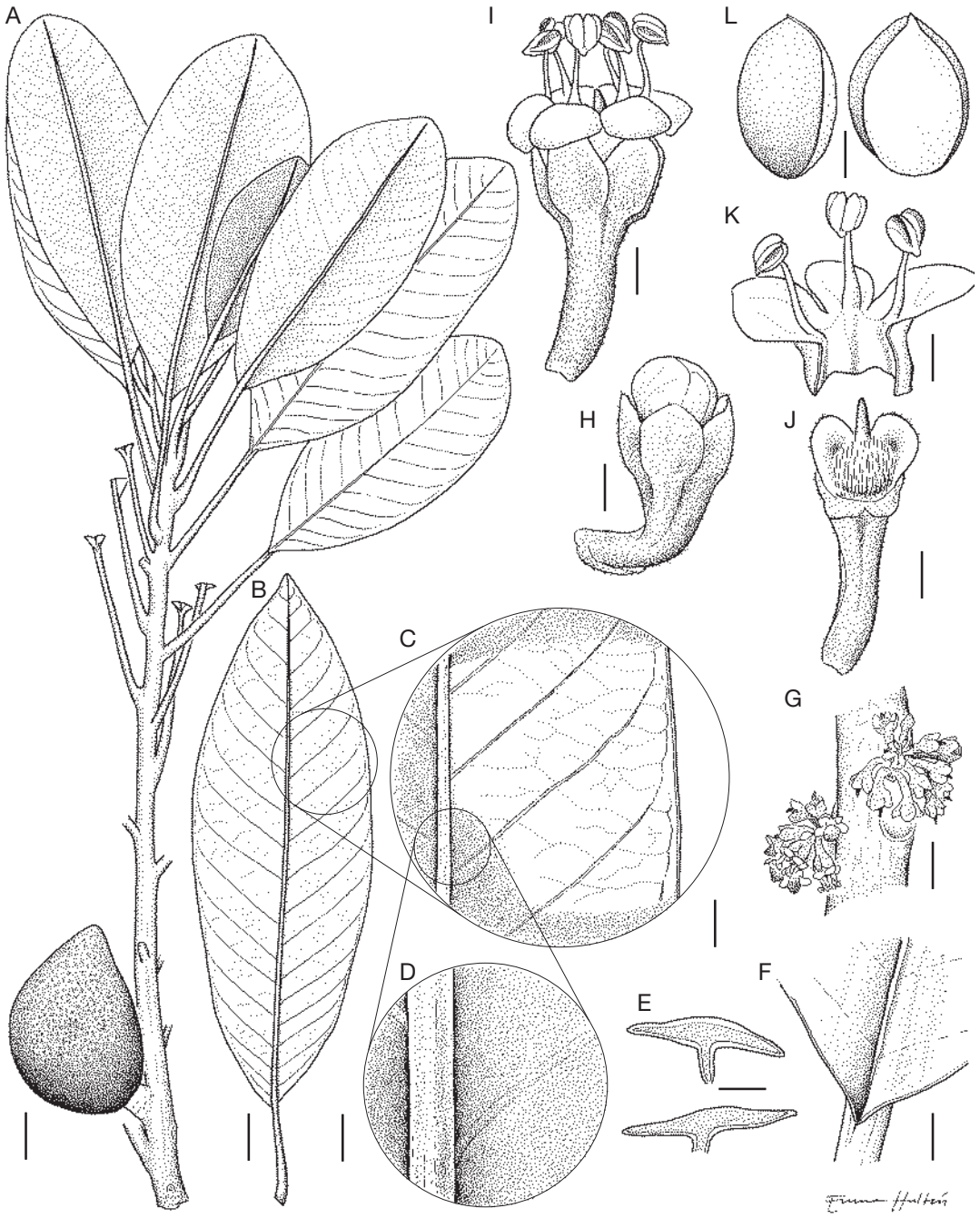

FIG. 3 — *Pycnandra canaliculata* Swenson & Munzinger: **A**, habit with fruit; **B**, large leaf; **C**, leaf venation (lower surface), part of indument removed; **D**, indument of the lower leaf surface; **E**, leaf trichomes; **F**, canaliculate leaf base (upper surface); **G**, inflorescence; **H**, bud; **I**, flower; **J**, transection of flower showing pubescent ovary; **K**, part of a corolla; **L**, seed, side view (left) and view of testa (right). A, F-L, *Munzinger et al. 2108*; B-E, *MacKee 22494*. Scale bars: A, 7 mm; B, 15 mm; C, G, 5 mm; D, F, 2 mm; E, 0.1 mm; H-K, 1 mm; L, 10 mm. Drawn by Emma Hultén.

low that quickly vanishes and becomes grey. One useful field character is the canaliculate midvein, which is conspicuous near the petiole (Fig. 3F). In contrast to *P. acuminata*, the flowers have short pedicels (not sessile) and the fruits are quite large, brown, and with a scale-like, persistent epidermis. The fruits are bigger than those of *P. acuminata*, most probably too large to be swallowed and dispersed by the notou. Flying foxes may be the only native dispersal agent.

Nomenclatural remark

Among biologists in New Caledonia, this is a well-known species, frequently collected and determined as *Sebertia gatopensis* (Aubréville 1967). However, the nomenclatural type of that name is conspecific with *Ochrothallus blanchonii* Aubrév. (= *Pycnandra blanchonii* (Aubrév.) Swenson & Munzinger), but all other collections belong to *P. canaliculata*.

Etymology

This species is named after the groove (*canaliculata*) that runs along the midvein on the upper part of the blade, clearly visible near the petiole.

Conservation status

Nine subpopulations of *Pycnandra canaliculata* are known, resulting in an EOO of 128 km² and an AOO of 64 km². Five of these are inside protected areas: Chutes de la Madeleine, Forêt Nord, Pic du Pin, Rivière Bleue, and Yaté Barrage. The four remaining ones are within mining concessions and their future is uncertain. Several localities are isolated stands in maquis vegetation, an ecosystem that is not concerned by the recent treaty to protect the humid forest (Anonymous 2009). *Pycnandra canaliculata* is therefore assigned a preliminary status of Vulnerable (VU: B1ab(i,iii), B2ab(i,iii)).

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