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*Novitates neocaledonicae I: An additional new species of *Planchonella* (Sapotaceae) endemic to the Roches de la Ouaième*

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Abstract

A new species of *Planchonella*, endemic to the Roches de la Ouaième in northeastern New Caledonia, is described and illustrated. *Planchonella ulfi* morphologically resembles *P. roseoloba*, while molecular data indicate a closer relation to *P. minutiflora* and *P. koumaciensis*, with all three species belonging to a clade characterized by ridged fruits. The new species brings the total for the genus to 37 species in New Caledonia, 36 of which are endemic to the archipelago. With a single known population comprising 10 individuals, a preliminary risk of extinction assessment using the IUCN Red List criteria indicates that it is Critically Endangered due to risk of fire faced by the shrubby vegetation found on the summit crest of the Roches de la Ouaième. The level of micro-endemism found at this site is discussed.

Key words: Sapotaceae, *Planchonella*, Roches de la Ouaième, New Caledonia, IUCN Red List assessment, new species

Introduction

In November 2010 an expedition using the Rapid Assessment Protocol (RAP) was organized in the Mt. Panié range and the nearby Roches de la Ouaième in northeastern New Caledonia. A series of plots were established to characterize the vegetation and to contribute to the New Caledonian Plant Inventory and Permanent Plot Network (NC-PIPPN) (Ibanez *et al.* 2014). In parallel, general plant collecting was done in order to facilitate the identification of material recorded from inside the plots and to contribute to the overall botanical inventory of the targeted sites. Several taxa were immediately identified as potentially new to science, as indicated in a preliminary report (Munzinger *et al.* 2011), several of which have since been published, including *Meryta rivularis* Lowry (in Callmander & Lowry II 2011: 264; Araliaceae) and *Pandanus taluucensis* Callmander (in Callmander & Lowry II 2011: 268; Pandanaceae), *Podonophelium pachycaule* Munzinger, Lowry, Callmander & Buerki (2013: 1118; Sapindaceae), while another, referred to in the report as '*Tapeinosperma* sp. (JM3527)' was ultimately described as a new variety: *Tapeinosperma tchingouense* var. *longipetiolatum* Schmid (2012: 336; Primulaceae). A full summary of results of the RAP, including data from the plots and list of all the collections made, was recently published (Munzinger 2013).

During inventory work on the summit of the Roches de la Ouaième, fertile material was collected of a plant belonging to the genus *Planchonella* Pierre (1890: 34; Sapotaceae) that had first been observed sterile in 2005 (JM pers. obs.) but could not be identified at the time to a known species. This new material supported the idea that it represented a new entity, and this was confirmed when immature fruits were collected during a subsequent field trip in 2013, making it possible now to provide a detailed description of this new species. Material was also included in a recent molecular phylogenetic study (Swenson *et al.* 2014), which indicated that its closest relatives are *P. minutiflora* Munzinger & Swenson (2009: 182) and *P. koumaciensis* Aubréville (1967: 154), although morphologically it most closely resembles *P. roseoloba* Munzinger & Swenson (in Swenson *et al.* 2007b: 342).

Planchonella has been the subject of intensive study during the last decade as part of a thorough revision of Sapotaceae in New Caledonia. First, the genus was re-circumscribed, merging it with the previously recognized genera *Albertisiella* Pierre ex Aubréville (1964: 42), *Bureavella* Pierre (1890: 16), *Iteiluma* Baillon (1890: 892) and *Pyriluma* (Baill.) Aubréville (1967: 83), and transferring one species from *Planchonella* to *Pichonia* Pierre (1890: 22) (Swenson *et al.* 2007a). A proposal was then made to conserve the name *Planchonella* against *Iteiluma* and *Peuceiluma* Baillon

(1890: 895) (Swenson & Morat 2008). In parallel, eight (Swenson *et al.* 2007b) plus three new species (Munzinger & Swenson 2009), all endemic to New Caledonia, were described and then an identification key was provided for the 36 species recognized in the archipelago (Munzinger & Swenson 2009), only one of which is not endemic, *P. linggensis* (Burck) Pierre (1890: 35) (Morat *et al.* 2012).

Materials and methods

Herbarium specimens of the plant collected on the Roches de la Ouaième were compared with the New Caledonian material of *Planchonella* at P, NOU and MPU (acronyms following Thiers 2014) and with the information presented in publications dealing with the taxonomy of New Caledonian members of *Planchonella* and related genera (Guillaumin 1942, 1944; Herrmann-Erlee & van Royen 1957; van Royen 1957; Vink 1958; Aubréville 1962, 1963, 1967; Swenson *et al.* 2007b; Munzinger & Swenson 2009). For the preparation of the description provided below, material was examined under a Leica S6D binocular microscope, and photos taken in the field with a Nikon D70 camera with optical macro 60 mm were examined. A risk of extinction assessment was conducted using the IUCN Red List criteria (IUCN 2012).

Taxonomy

Planchonella ulfii Munzinger, *sp. nov.* (Figs. 1, 2 & 3)

Haec species Planchonellae roseolobae Munzinger & Svenson *similis, sed longidecurrenti imo, revoluta margine, numerosis intersecondariis nervis reticulo, minoribus crassioribusque foliis, differt.*

Type:—New Caledonia, North Province, sommet des roches de la Ouaième, 900 m, 4.XI.2010, fl., *Munzinger, Hequet, Vandrot, Butin, Birnbaum & Rounds 6150* (P 00641006! -holotype; isotypes: NOU 034143!, S!).

Small branched shrub, reaching 2.5 m tall, with erect branches, young twigs ferruginous with +/- persistent indument, old twigs brown-black. Leaves thick, dark green and shiny above, light green below (in fresh material), clustered toward the summit of twigs, blade obovate, 4–10 × 2–4 cm, with sparse trichomes when young, then quickly glabrous, petiole 15–33 mm long, 1.5 mm in diam., puberulent when young then glabrous, base long decurrent on petiole, margin flat or revolute in fresh material, revolute when dry, apex rounded, venation brochidodromous, extending very close to the margin (less than 1 mm), midvein prominent below, flat to sometime canaliculate above, 6 to 10 pairs of secondary veins, distinct, intersecondary veins numerous, tertiary venation distinct, reticulate. Flowers 5-merous, hermaphroditic or female, borne axillary to the leaves and on the twigs just below the oldest leaves, oriented more or less toward the ground; pedicel curved downward, 2–3(–4) mm, pubescent. Sepals widely elliptic, 3–4 mm, ferruginous, the outer ones completely covered with indument on the adaxial face, the inner ones larger, lacking indument towards the membranous and ciliate margins. Corolla 4–4.5 mm long and wide in hermaphrodite flowers, 3.5 mm long and 2.5 mm wide in female flowers; tube 3 mm long, white or cream, lobes white or slightly pinkish, 1–1.25 mm long, ± oblong. Stamens shorter than the corolla, yellow, filaments ~1 mm long, anthers ~1 mm long, staminodes triangular, as long as filaments. Ovary cylindrical, hairy, 1.5 mm high, 2 mm in diam., slightly lobed, style thick, 2 mm long, slightly shorter than the corolla. Fruit (immature) obovoid, ridged, apex acuminate, up to 33 × 15 mm (acumen ca. 5 mm), glabrous except few hairs at the base. Seeds unknown.

Distribution and Ecology:—*Planchonella ulfii* is only known from a single locality in the north-eastern part of New Caledonia's main island (Grande Terre) situated on the summit crest of the Roches de la Ouaième (Wayem), above 900 m (Fig. 3), where a population of 10 individuals was observed. The second summit of the Roches de la Ouaième, which also reaches to 900 m and is located slightly to the east (see Fig. 3), could not be explored.

Phenology:—Flowers have been observed in November and February, with nearly ripe fruits seen in February.

Etymology:—This new species is dedicated to my friend and colleague Ulf Swenson who has greatly contributed to systematics of New Caledonian Sapotaceae during the last decade with his revisions of *Pichonia* (Swenson & Munzinger 2012) *Pycnandra* Benth (in Benth & Hooker 1876: 658) subg. *Pycnandra* (Swenson & Munzinger 2009), *P.* subg. *Trouettia* (Pierre ex Baillon) Swenson & Munzinger (2010c: 337), *P.* subg. *Achradotypus* (Baillon) Swenson

& Munzinger (2010a: 188) and *P.* subg. *Sebertia* (Pierre ex Engler) Swenson & Munzinger (2010b: 242), in addition to the papers on *Planchonella* cited above and several studies on the phylogenetics of these plants.

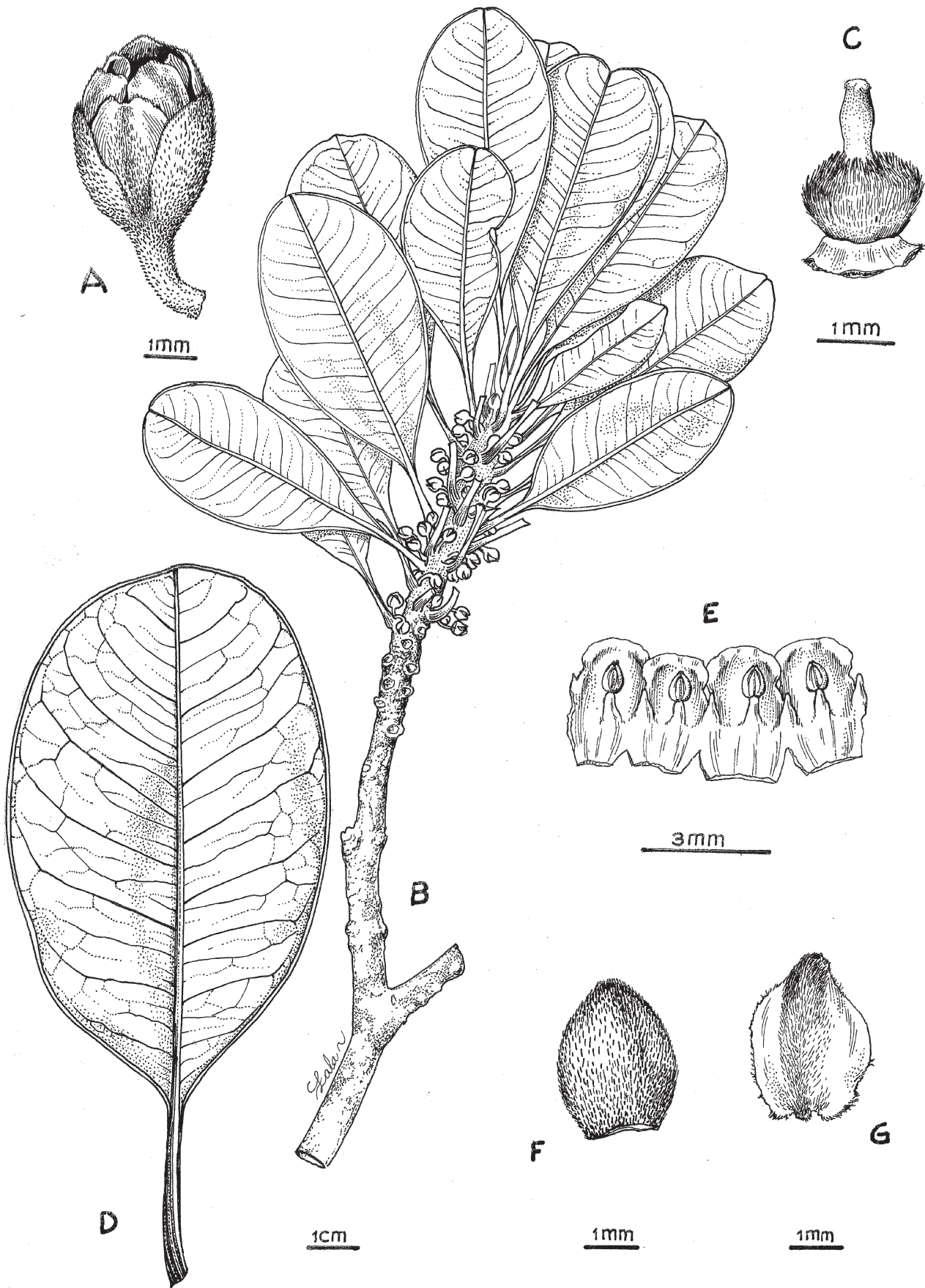


FIGURE 1. A. Floral bud. B. Flowering twig. C. Gynoecium. D. Leaf. E. Inside of the corolla with stamens and staminodes. F. Dorsal face of external sepal. G. Dorsal face of internal sepal. (A–G based on Munzinger & al. 6150).

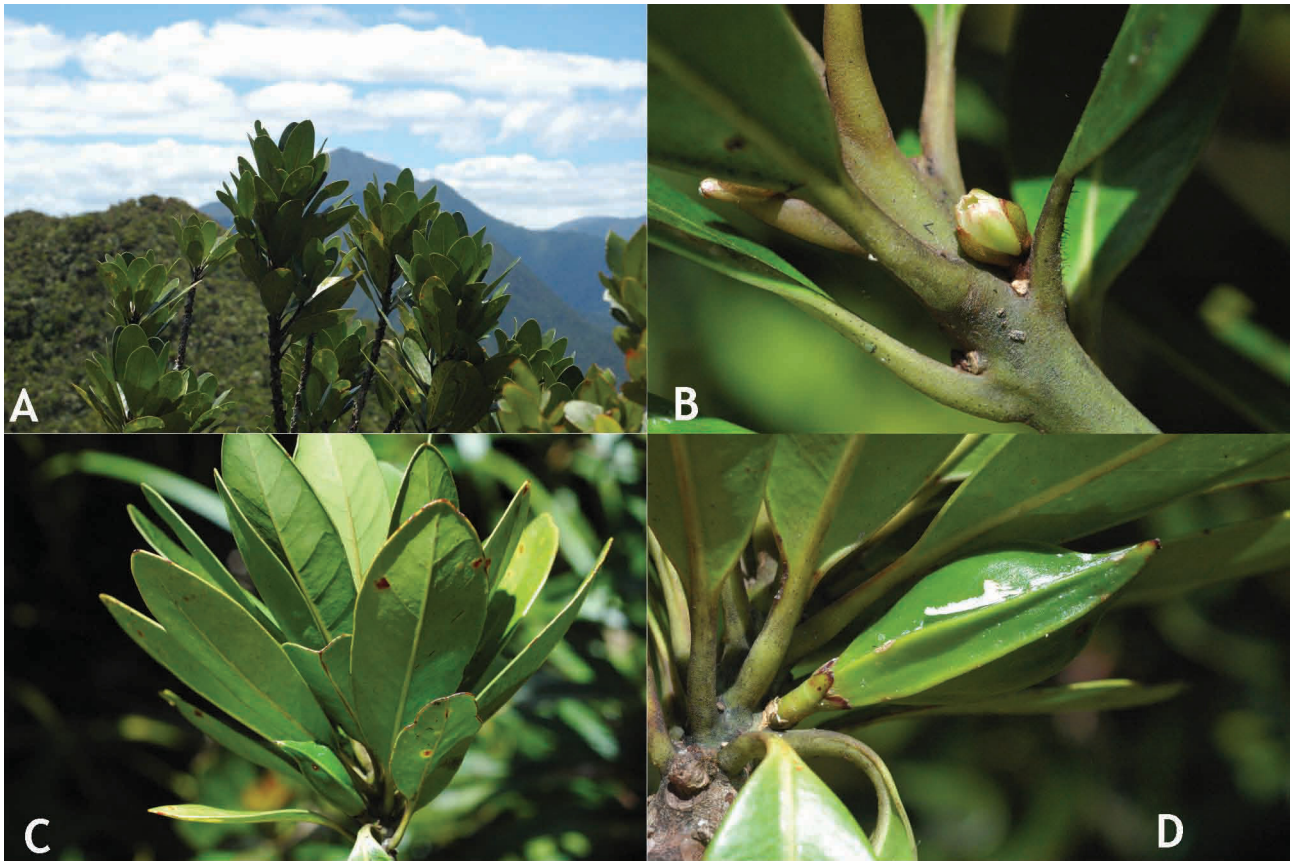


FIGURE 2. Photos of *Planchonella ulfii* taken in the field. **A.** Habit with leaves clustered toward the summit of twigs. **B.** Flower. **C.** Glabrous leaves, intersecondary veins visible, young fruit in the lower left. **D.** Nearly ripe ridged fruit. (A–D from Munzinger & al. 7095, photos J. Munzinger).

Discussion:—*Planchonella ulfii* belongs to clade D1 as defined by Swenson *et al.* (2007b; 2014), a placement that is consistent with its ridged fruit (Fig. 2C, D). The plant resembles *P. roseoloba* Munzinger & Swenson in its morphology, but differs in its smaller and thicker leaves with revolute margin, reticulate venation, numerous intersecondary veins and long-decurrent base (in herb. and see Fig. 2C). These two species also differ in their habit and ecology: *P. ulfii* is a shrub restricted to the summit of the Roches de la Ouaième, above 900 m, in low shrubby vegetation, whereas *P. roseoloba* is a tree occurring in dense humid forest at 300–700 m elevation.

Some flowers of *Planchonella ulfii* appear morphologically to be hermaphrodite whereas others are female (with staminodes rather than fertile stamens), a situation suggesting that the species may be gynomonoeious, as observed in several other new Caledonian members of the genus (Méndez & Munzinger 2010).

Conservation status:—With a single known population of 10 individuals confined to forest situated along a crest that is subject to anthropogenic fires that are regularly set from the base of the cliffs, *Planchonella ulfii* is here assigned a preliminary conservation status of Critically Endangered (CR, D1) using the IUCN Red List criteria (IUCN 2012).

Additional specimens examined (Paratypes):—New Caledonia, North Province, sommet des roches de la Ouaième, 3.II.2013 (fl., fr.), Munzinger, Swenson, Isnard & Butin 7095 (BRI!, MO!, MPU!, NOU!, P!, S!).

Micro-endemism on the Roches de la Ouaième increased?

Bradford & Jaffré (2004) were the first to call attention to the conservation importance of the Roches de la Ouaième, citing no fewer than 12 micro-endemics. A more recent study pointed to a total of 17 very rare species present in this locality, which was classified as a Hotspot of Plant Narrow Endemism (HPNE) by Wulff *et al.* (2013). *Planchonella ulfii* could be regarded as the 18th species on this list were it not for the fact that *Pycnandra ouaiemensis* Swenson & Munzinger (2010a: 210), which was thought to be restricted to the Roches de la Ouaième, was recently recorded farther north in the Mt. Panié range during the RAP, adding a second locality for this species (Munzinger 2013), and suggesting that at least some micro-endemism may be an artifact of inadequate exploration in the surrounding area.

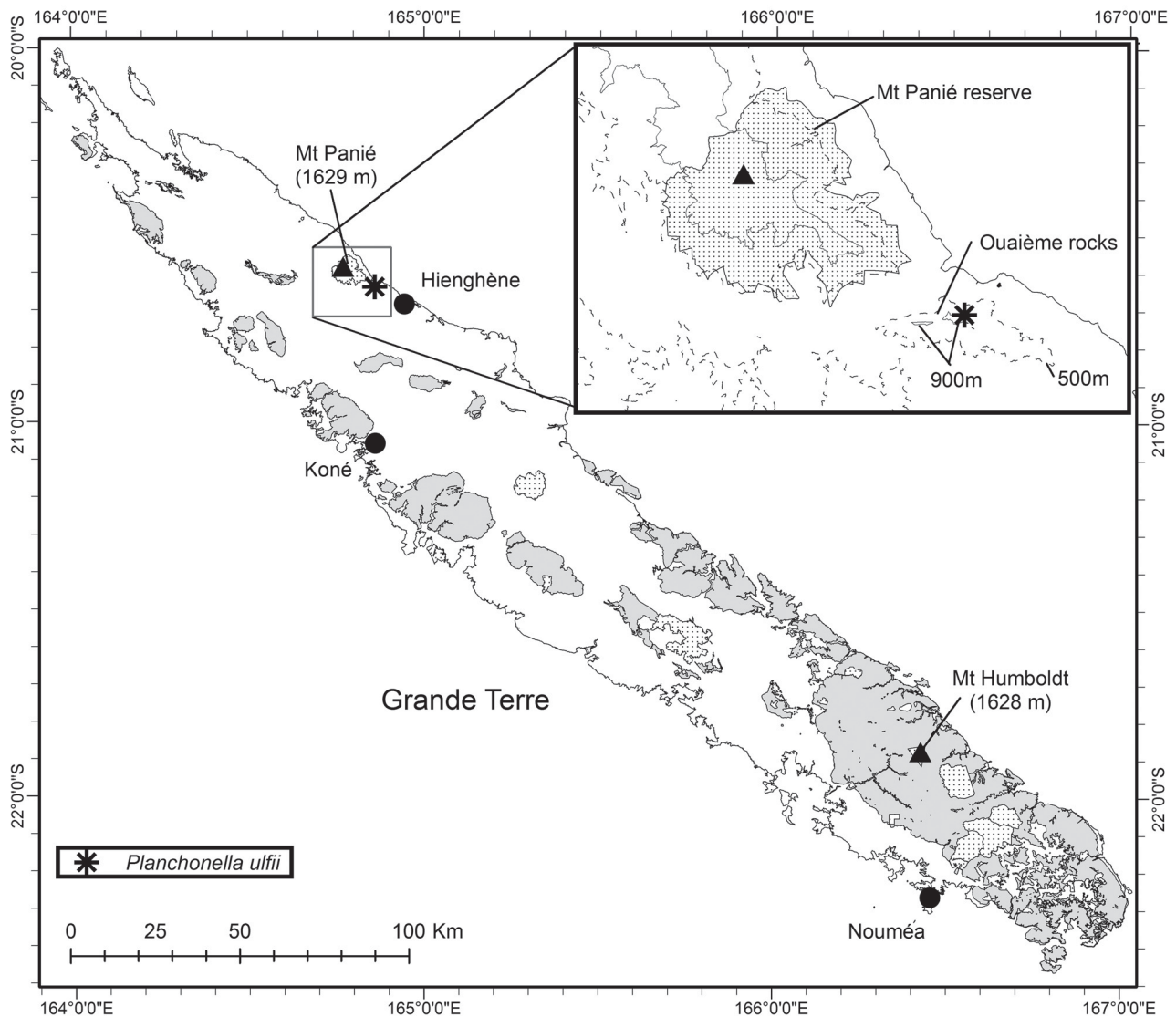


FIGURE 3. Distribution of *Planchonella ulfii*. Grey represents ultramafic substrates, dotted lines delineate protected areas, dashed lines show the 500 m elevational contour, and continuous lines the 900 m contour.

Toward a series of novelties from New Caledonia

Guillaumin's *Flore Analytique et Synoptique de la Nouvelle-Calédonie* (1948) provided identification keys for all of the plants known to occur in the territory at the time, but lacked descriptions and was quickly regarded as inadequate. Indeed, less than twenty years later the first volume of the new *Flore de la Nouvelle-Calédonie & Dépendances* was published (Aubréville *et al.* 1967–), treating individual families and including species descriptions, maps, line drawings and citations of material examined. To date about 52 % of New Caledonia's native flora has been treated (based on Florical (Morat *et al.* 2012)), which might lead one to think that this series is nearing completion. However, this is most definitely not the case, as demonstrated clearly by the situation with Sapotaceae, which were initially treated nearly fifty years ago by Aubréville (1967), who recognized a total of 80 species, but in which about 40 new species have been identified during the last decade, most of which have now been described. Similarly, many novelties or corrections have been published in much more recently treated families, pointing to the fact that many new discoveries are still being made. For example, a new species of *Patersonia* Brown (1807: 1041) (Iridaceae) was recently described (Goldblatt *et al.* 2011), only two decades after the original treatment (Goldblatt 1990) in which only introduced taxa were recorded. Another example results from invaluable information obtained from the cultivation of plants in greenhouses, which revealed the need to resurrect the name *Oxera pancheri* Dubard (1906: 716) (Gâteblé & Munzinger 2012), considered to be a synonym of *O. sulfurea* Dubard (1906: 716) in the treatment of Labiatae in the *Flore* (Mabberley & de Kok 2004). In order to facilitate the publication of the many novelties that will no doubt be forthcoming, a series is being

initiated here. A second contribution will soon follow, describing a new species of *Acropogon* Schlechter (1906: 186) (Malvaceae) (Callmander *et al.*, 2015).

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