

A review of *Grevillea* (Proteaceae) from New Caledonia with the description of two new species

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Abstract

The taxonomy of *Grevillea* (Proteaceae) in New Caledonia is reviewed. The names *G. deplanchei*, *G. macmillanii*, *G. rubiginosa*, and *G. sinuata* are re-instated at the species rank. A new name, *G. mondorensis*, is provided for the plants previously identified as *G. gillivrayi* var. *glabriflora*, and two new species are described, *G. nepwiensis* and *G. vuniana*. Second-step lectotypifications are provided for *G. heterochroma*, *G. rubiginosa*, and *G. vieillardii*. This study raises the number of endemic species of *Grevillea* recognized in New Caledonia from three to ten. An identification key to all species of *Grevillea* in New Caledonia is provided.

Keywords: conservation, *Hakea*, island, micro-endemic, ultramafic

Introduction

Proteaceae are represented in New Caledonia by a rich and unique assemblage of 9 genera and 43 species that are all endemic to the archipelago (Jaffré *et al.* 2001; Morat *et al.* 2012). Viot (1968) recognized three endemic species of *Grevillea* R. Brown ex Knight (1809: 120) in New Caledonia with numerous intraspecific taxa, and this taxonomy has been left unchanged (McGillivray & Makinson 1993; Morat *et al.* 2012). The genus belongs to the subtribe Hakeinae, a strongly supported monophyletic clade (Sauquet *et al.* 2009) containing five genera (Weston 2007): *Buckinghamia* Mueller (1867: 247), *Finschia* Warburg (1891: 297), *Grevillea*, *Hakea* Schrader & Wendland (1797: 27), and *Opisthiolepis* Smith (1952: 79). Molecular phylogenetic analyses (Mast *et al.* 2015) have shown that the largest genus *Grevillea* (362 species) was paraphyletic with respect to *Hakea* (149 spp.) and *Finschia* (4 spp.). Christenhusz *et al.* (2018) proposed to transfer all the species of *Grevillea* and *Finschia* into *Hakea*, the oldest name, and provided the necessary combinations. However, ongoing phylogenomic studies suggest that there may be a less disruptive way to recircumscribe the genera of Hakeinae (P. Weston, pers. comm.), and the New Caledonia species of Hakeinae are here treated as *Grevillea*.

Several recent collections of *Grevillea* did not fit well in the taxonomic scheme by Viot (1968). Some collections from the vicinity of Pouembout in the north west of Grande Terre resemble *G. gillivrayi* Hooker (1854: 358), a species restricted to the south and the east coast. A few recent collections near Yaté, in the southeast, resemble *G. meisneri* Montrouzier (1860: 248), a species restricted to the north west. In addition, the collections available today provide a better understanding of the morphological variability within *G. exul* Lindley (1851: 273) and *G. gillivrayi*. Because these variations are linked with geography and ecology, the re-instatement of several species names treated as synonyms or infra-specific taxa by Viot (1968) seems necessary. A reappraisal of the entire genus *Grevillea* from New Caledonia is therefore provided.

Material and methods

Measurements, shapes and colours of the different organs are based on the examination of herbarium material, field observations and material collected in spirit. All herbarium specimens of *Grevillea* present at NOU and P were examined (Herbarium acronyms follow Thiers 2020). Additional type material were viewed online. Floral terminology follows McGillivray & Makinson (1993). Small morphological organs were observed using a Nikon AZ100 binocular microscope. The risk of extinction assessment was conducted using the IUCN Red List Criteria (IUCN 2012); Area Of Occupancy (AOO, using a 2×2 km grid) and Extent Of Occurrence (EOO) values were calculated using the online “geocat” software (Bachman *et al.* 2011).

Results

The plants from Kopeto, Boulinda, Paéoua and Tia that had previously been identified as *G. gillivrayi* differ from other specimens of this species from the south and eastern coast by their architecture (lack of vertical flowering axes) and the red indumentum covering the inflorescence axis, pedicels and perianth. The novel collections of *G. meisneri* from the vicinity of Lake Chakeke (Yaté, southeast of the main island) differ from the collections from the north west by their leaves that are consistently glabrous (versus usually hairy underneath) and larger (13–20 cm long on sterile shoot, 8–12 cm long on fertile shoot, versus 5–12 and 3–10 cm). Their flowers are consistently glabrous and larger (distance from rachis to style end 5.8–6 cm, versus 5 cm).

Discussion

One collection from Kopeto (MacKee 17093) and one from Boulinda (MacKee 17158) had previously been identified as *G. gillivrayi* var. *gillivrayi* form *gillivrayi*. Virot (1968) considered they were isolated localities without mentioning any morphological differences. With more collections from Boulinda, Kopeto, Paéoua and Tia, it became clear that these plants can be easily distinguished morphologically from *G. gillivrayi* s.s., which is restricted to isle of Pines, the South and the eastern coast of the main island. Population genetic studies confirm that the plants from the two regions are genetically isolated (Majourau & Pillon, unpublished). The recent collections (since 2013) near Yaté identified as *G. meisneri* differs from the northern populations of the latter and these populations are separated by more than 200 km, a large distance at the scale of New Caledonia. Their ecology is also quite different with the plants in Yaté found in forest and forest edge over peridotite rocks whereas the northern plants are mostly found in exposed conditions (maquis) on serpentinite. The habitat in Yaté is also likely to be relatively wet (possibly over 3000 mm/y precipitation) while that in the North is dry (mostly less 1500 mm/y).

Grevillea nepwiensis Majourau & Pillon sp. nov (Figure 1)

Type:—NEW CALEDONIA. Northern Province : Kopeto, crête est du Mont Vert, 800 m, 8 July 1970, MacKee 22218 (holo-: P02363429! ; iso-: P02363428!, NOU035905!).

Diagnosis:—This species resembles *Grevillea gillivrayi* from which it differs by its consistently bright red flowers (versus pale pink, pale yellow, orange, pink or red) and the inflorescence axis, pedicels and perianth covered externally with a red indumentum (red felty hair versus white sericeous hair). Its inflorescences are terminal or ramiflorous, but not axillary along leafy stem portion on long vertical axes.

Shrub or small *tree*, (0.5–)1.5–3(–6) m high; branchlets angular to rounded, subsericeous to pubescent. Alternate arrangement of leaves on branchlets. *Leaves* horizontal or ascending, petiolate, simple, broadly to narrowly elliptical, obovate, (2.5–)5–8.5(–13) cm long, (1.1–)1.8–3.9(–6.7) cm wide; base cuneate, petioles (0.3–)0.7–1.2(–1.7) cm long, indumentum reddish-brown to silver; apex rounded, or obtuse-mucronate, occasionally emarginate; margin recurved; upper surface glabrous or with scattered silver hairs, lower surface densely pubescent or tomentose with a reddish-brown to silver indumentum depending on leaf age, venation penninerved slightly protruding on both sides; coriaceous; persistent axillary bud in leaf axils. *Inflorescences* terminal or occasionally axillary (but not on specialized axis),

erect or spreading but never pendant, simple, pedunculate, 7.5–8.5(–11) cm long, simple inflorescences cylindrical, centripetal; primary peduncles 1.25–1.5 cm long, brown, tomentose; inflorescence dense with (120–)140–175(–190) flowers per inflorescence; bracts reddish/brown pubescent and deciduous. Pedicels 0.1–0.2–0.3 cm long, reddish/brown, pilose; torus oblique at 15°, 1.45 mm across; perianth oblong-ovoid, outer surface narrowly subsericeous (brown/reddish hairs), inner surface tomentose (colorless hairs); tepals separating to the base at anthesis; tepals 10 mm long, 1.4 mm wide; anther fused to the inner side of tepals, stamen longitudinally positioned at the end of the inner face of tepal, stamen 0.5 mm long, 0.2 mm wide; nectary inconspicuous, partly enclosed within the torus, wide linguiform, margin shortly tridentate, glabrous, extending 0.05–0.1 mm above the rim, 0.13 mm along the rim and 0.03 mm thick at the level of the rim; pistil 27 mm long, glabrous; stipe 22–25 mm long; ovary superior, hypogynous insertion, ovary obliquely ovoid, a little darker than the stipe, 10 mm long; ovules attached at c. the midpoint between basal and medial position; pollen-presenter oblique at 20°, broadly oblong-elliptical, 1.5 mm long, 1 mm wide, stigma central. *Fruits* posteriorly oblique on the pedicels, obliquely elliptical, compressed laterally, 23–26 mm long, 8–11 mm wide, 4–5 mm thick; style persistent but fragile; surface rugulose; pericarp c. 0.5 mm across at the suture, texture crustaceous. Seed peripterous, elliptical, 19 mm long, 7–8 mm wide, outer surface slightly convex, texture brittle and chartaceous, wing 1–4 mm wide.



FIGURE 1. *Grevillea nepwiensis*. A. Inflorescence and young vegetative shoot; B. Fruits; C. Inflorescences and lower side of leaves revealing dense red hair; D. habit. Pictures by Y. Pillon (A, B, D) and G. Gâteblé (C).

Distribution and habitat:—This species is only known in the Pouembout region on Plateau de Tia, Kopeto, Paéoua and Boulinda (Figure 2). It is found in pristine to degraded shrubland on ultramafic substrates between 400 and 1000 m elevation.

Etymology:— This species is named after the village of Nepoui (Nepwi in the local Paicî language) located at the center of the distribution of this species.

Conservation status:—Within an Extant of Occurrence (EOO) of 190 km², and an Area of Occupancy (AOO) of 40 km², all four locations occur outside of protected areas and with strong mining (particularly Mount Kopeto) and fire pressures. *Grevillea nepwiensis* will be evaluated by the New Caledonia Plant Red List Authority and could be assigned a preliminary status of Endangered based on the IUCN Red List Categories and Criteria: EN B1ab(i,ii,iii,v)+2ab(i,ii,iii,v).

Paratypes:—NEW CALEDONIA, NORTHERN PROVINCE, Haute Népoui – Oua Péoué: Contrefort Sud de Kopeto, 600 m, 25 March 1969, *MacKee* 20394 (P02363436!, P02363434!); est du Kopeto : aiguilles du Mont Muéo, 900 m, 28 November 1980, *Morat* 6634 (P02363004!, NOU035940!); Mont Kopeto : pente Nord, 400–800 m, 6 July 1967, *MacKee* 17093 (P02363384 !, P02363385 !, NOU035903!); Haute Népoui: crête au Sud de Ouaté, 500–800 m, 28 July 1967, *MacKee* 17394 (P023633380! P02363379!); Mont Boulinda, 800m, 12 April 1968, *Bernardi* 12762 (P02363307!); Mont Boulinda: pente au-dessus de la Oua Nepoua, 950m, 25 July 1967, *MacKee* 17158 (P02363381!); Mont Boulinda vers 800–900 m, 26 July 1967, *Schmid* 2281 (NOU035904!); Boulinda– Pic Poya, 26 April 1965, *Veillon* 97 (P02304495!, NOU035907!); Massif du Boulinda – crête vers 950 m, 26 July 1967, *Veillon* 1291 (NOU035906!); Plateau de Tia, 164°53'24.46", 21°10'50.5"S, 394 m, 29 January 2017, *Bruy* 602 (NOU084983!); Plateau de Tia,

164°53'24.942"E 21°10'52.058"S, 400m, 12 May 2019, *Fleurot* 565 (NOU090362!, P00936735!); Plateau de Tia, 400m, 04 April 1968, *MacKee* 18608 (P02363382!, P02363383!); Plateau de Tia, 164°53'22.5"E, 21°10'44.3"S, 400m, 23 October 2018, *Pillon, Poullain & Fleurot* 1464 (NOU,P); Mont Paéoua, 165°04'38.1"E 21°09'44"S, 650m, 18 September 2019, *Pillon, Bruy & Oedin* 1499 (NOU,P).

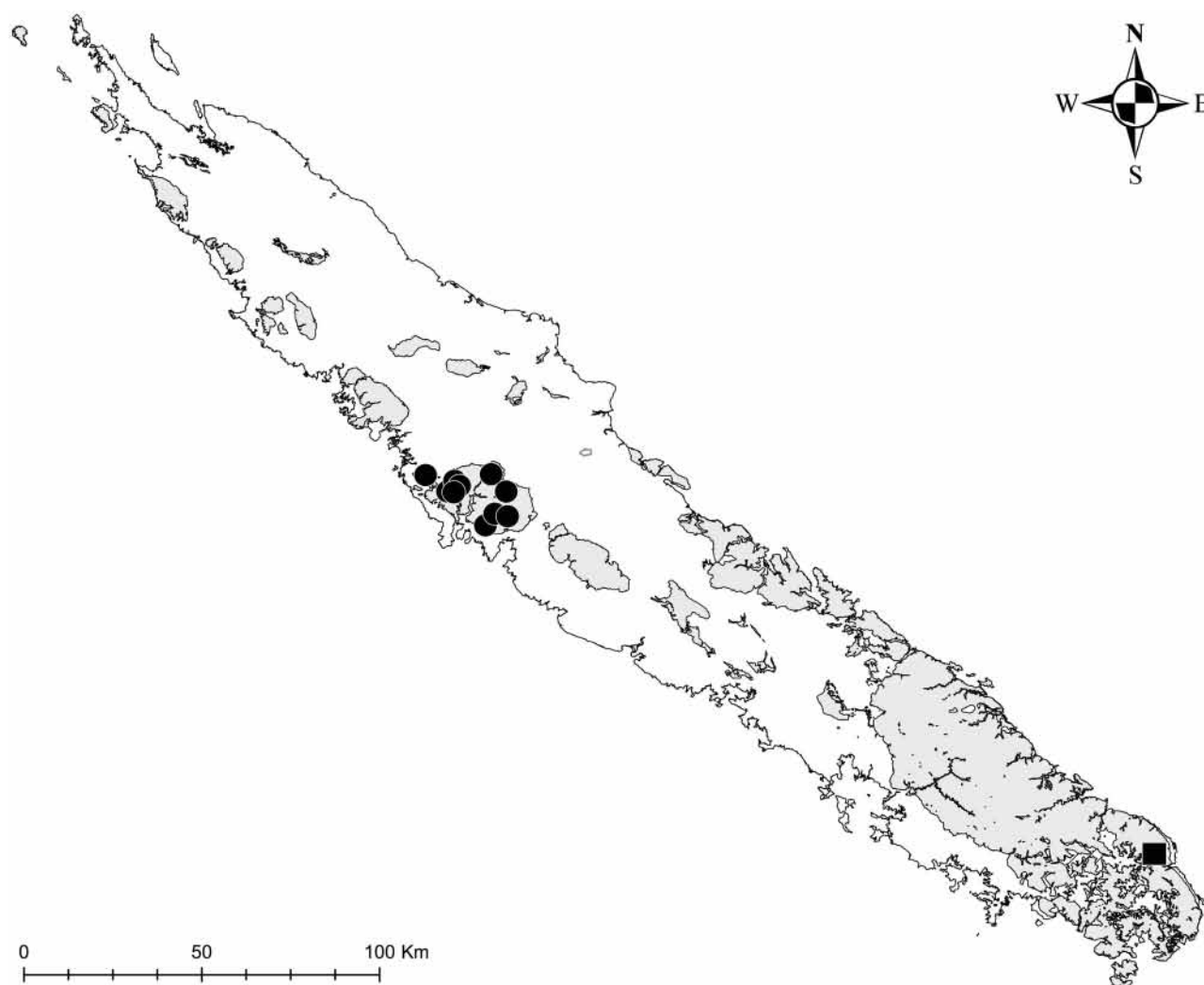


FIGURE 2. Distribution of *Grevillea nepwiensis* (•) and *G. vuniana* (■). Grey areas indicate ultramafic substrates.

***Grevillea vuniana* Pillon sp. nov** (Figure 3)

Type:—NEW CALEDONIA. Southern Province: Yaté, au-dessus d'Unia, bord du lac Chakeke, 22°06'17.9"S, 166°54'45.8"E, 410 m, 4 October 2019, *Pillon, Amice, Bruy, Butin, Lannuzel, Laudereau & Lauderau, Thouvenot* 1511 (holo-: P; iso-: P, NOU).

Diagnosis:—This species resembles *Grevillea meisneri* from which it differs by its leaves that are consistently glabrous (versus generally hairy underneath) and larger (13–20 cm long on sterile shoot, 8–12 long on fertile shoot, versus maximum 12 and 10 cm, in *G. meisneri*), and its flowers that are consistently glabrous and larger (distance from rachis to style end 5.8–6 cm, versus 5 cm in *G. meisneri*).

Small *tree*, up to 6 m high; single-stemmed, branchlets rounded to angular, glabrous or occasionally sericeous on very young parts. Bark black and smooth to grey and rough. Alternate arrangement of leaves on branchlets. *Leaves* horizontal or ascending, often restricted to the ends of the branchlets, petiolate, simple, obovate, elliptical, or occasionally spatulate or broadly cuneiform-emarginate; 13–20 cm long, (3.5)–4–6.2–(8) cm wide on sterile shoot; (7)–8–12 cm long, 1.7–2.5–(3.2) cm wide on fertile shoot; base cuneate to narrowly attenuate, petiole 7–12–(15) mm long. Apex obtuse, emarginate, sometimes mucronate, margin entire, shortly and slightly recurved, glabrous on both side. Venation evident on both sides particularly adaxially, many lateral veins of varying thickness at c. 20–30° to the midvein, reticulum evident on lower surface, subcoriaceous. *Inflorescences* terminal, simple, decurved

to reflexed, shortly and loosely subcylindrical, centripetal, (2)–3.5–5.5–(7.5) long, distance from rachis to style end 5.8–6 cm, primary peduncle (1)–1.8–2.5 cm, glabrous, reddish. 20–40 flowers usually inserted in pairs, entirely red except the yellowish ovary and limb. Bract not seen, floral orientation with the suture adaxial; pedicels spreading to slightly retrorse, 7–10 mm, glabrous. Torus transverse to slightly oblique at 10°, 2 mm across. Perianth oblong-ovoid in section, 1.8–2 mm across, outer surface glabrous, inner surface finely papillose-granulose, tepal coherent in the lower half except at the dorsal side. Limb broadly ovoid to subglobose, 3–3.5 mm long yellowish, dorsal tepals c. 20 mm long, 0.7 mm wide. Nectary prominent, partly enclosed within the torus, U-shaped, broadly tridentate, extended 0.3 mm above the rim. Pistil 52–55 mm long, glabrous, stipe 2.5 mm long, ovary obliquely ovoid 1.5–1.8 mm long. Style dilating gradually in the apical 3 mm to the style end. Pollen presenter very oblique at c. 80°, oblong-elliptical or slightly-ovoid, convex, 1.6–1.8 mm long, 2 mm wide, 0.5 mm high, stigma central. Fruits laterally compressed and ridged along the dorsal side, glabrous, style persistent. Mature fruit and seed unknown.

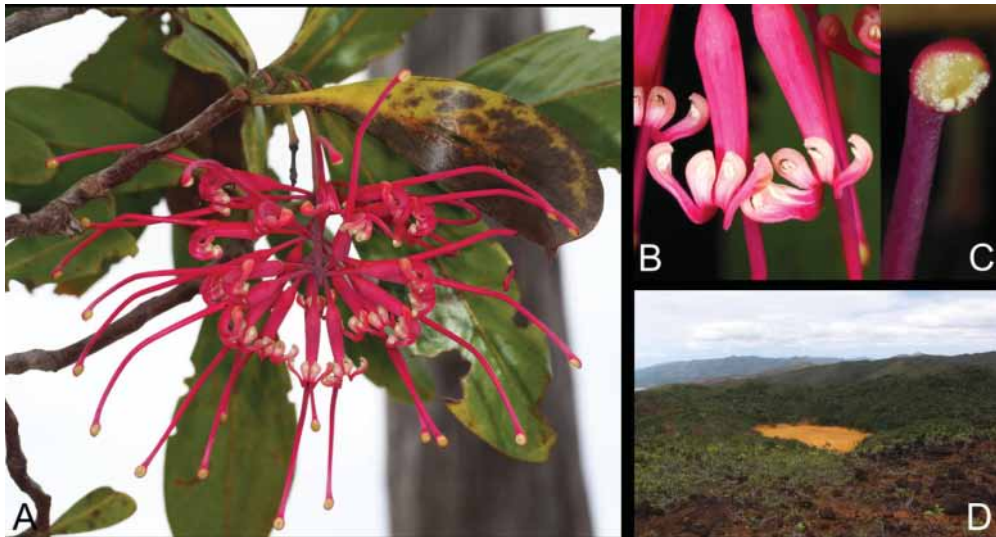


FIGURE 3. *Grevillea vuniana*. A. Inflorescences; B. perianth; C. pollen presenter; D. lake Chakeke, the population is located in the forest on the right side of the lake. Pictures by C. Laudereau (A, B, C) and Y. Pillon (D).

Distribution and habitat:—This species is only known in the vicinity of lake Chakeke above the tribe of Unia in Yaté, in the south-east of New Caledonia (Figure 2). It is found in low forest and forest edge near temporary lake and temporary river on lateritic alluvium.

Etymology:—This species is named after the nearby tribe of Unia (Vunia in the local djubea language) where the plant has been found.

Conservation status:—This species is known from a single location, where the vegetation is well-preserved. The most likely threat might be fire, although the population is quite distant from any habitation or any site of human activities. The population size is likely to be small, at least 20 individuals have been seen with recruitment, although the area has been little explored. *Grevillea vuniana* will be evaluated by the New Caledonia Plant Red List Authority and could be assigned a preliminary status of Endangered based on the IUCN Red List Categories and Criteria: VU D2.

Paratypes:—NEW CALEDONIA, southern Province, Monts d’Unia, 166°54’38.89’’E 22°6’19.6’’, 18 October 2013, *Butin* 99 (NOU083711!); Monts d’Unia, 166°54’38.89’’E 22°6’19.6’’, 18 November 2013 *Butin* 98 (NOU083710!)

Taxonomy

Virot (1968) recognized only three native species in New Caledonia: *G. exul*, *G. gillivrayi* and *G. meisneri*. In addition to the two species described above, several species that he treated as synonym, subspecies, variety or form are here re-instated. Following the definition of holotypes according to McNeill (2014), lectotypification for some of these names was needed. When they described new species of *Grevillea*, Brongniart & Gris (1865) often cited several collections without explicitly designating a type. Virot (1968) did a first-step lectotypification by designating one of

the collections as “type”. Gillivray visited or got some specimens on loan from P in 1983 and annotated one duplicate of some of these collections as “holotype” or “lectotype”, doing therefore a second-step lectotypification (McGillivray & Makinson 1993). A few more names still require lectotypification and are dealt with below.

Grevillea deplanchei Brongniart & Gris (1865: 39). *Grevillea gillivrayi* var. *gillivrayi* form *angustifolia* Viot (1968: 163). Lectotype (designated by McGillivray & Makinson 1993):—NEW CALEDONIA, Kanala, 1861–1867, *Vieillard 1113* (P00645079! [upper right fragment]; iso-: P00645080!, P00645081!) Remaining syntypes:—Kanala, 1864, *Deplanche 99* (P00645076!, P00645077!, P00645078!)

Grevillea comptonii S. Moore (in Rendle *et al.* 1921: 388). Type:—NEW CALEDONIA, river Dumbéa, 28 November 1914, *Compton 416* (holo-: BM000915637!).

This taxon was treated by Viot (1968) as *Grevillea gillivrayi* var. *gillivrayi* form *angustifolia* but is here re-instated at the specific rank. It is easily distinguished from *G. gillivrayi* s.s. by its stenophyllous leaves (long and narrow) associated with its riparian habitat. Its flowers seem consistently pink-red (not pale yellow, pale pink, orange) and its twigs relatively long and erect. It has not been seen in the vicinity of *G. gillivrayi*, although sympatry is not excluded. Several studies have indicated that genetic differentiation can be rapid between riparian forms with stenophyllous leaves and their ancestors (Mitsui & Setoguchi 2012; Stacy *et al.* 2014), but available genetic data in *Grevillea* are not yet conclusive (Majourau & Pillon, unpublished). Brongniart & Gris (1865) cited three collections as syntypes of *Grevillea deplanchei*: *Deplanche 99*, and *Deplanche 212*, and *Vieillard 1113*. Viot (1968) chose the collection *Vieillard 1112* as a lectotype and McGillivray (1993) selected the upper right fragment of the sheet P00645079 as the lectotype. *Deplanche 212* is excluded here as a syntype and identified as *G. gillivrayi* s.s.

Grevillea exul Lindley (1851: 273). *Hakea exul* (Lindley) Christenhusz & Byng (in Christenhusz *et al.* 2018: 81). Type:—NEW CALEDONIA, East coast of New Caledonia, in exposed situation, 1850, *C. Moore s.n.* (holo-: CGE[not seen], iso-: NSW135256, NSW928814)

Grevillea heterochroma Brongniart & Gris (1865: 40). Lectotype (designated here):—NEW CALEDONIA, Kanala, 1855–1860, *Vieillard 1117* (P00645065!; iso-: P00645063!, P00645064!). Remaining syntypes:—Kanala, s. dat., *Deplanche 98* (P00645053!, P00645054!, P00645055!, P00645056!).

Grevillea macrostachya Brongniart & Gris (1865: 38). Lectotype (designated by McGillivray & Makinson 1993):—NEW CALEDONIA, Kanala, *Vieillard 1116* (P00645058!; iso-: P00645059!, P00645060!, P00645061!, P00645062!). Remaining syntypes:—Port boisé, s. dat., *Deplanche 97* (P00645050!, P00645051!, P00645052!).

Brongniart & Gris (1865) cited two collections as syntypes of *Grevillea heterochroma*: *Deplanche 98* and *Vieillard 1117*. Viot (1968) chose the collection *Vieillard 1117* and the sheet P00645065 with Brongniart & Gris’ handwriting is here chosen as the lectotype. Brongniart & Gris (1865) cited two collections as syntypes of *Grevillea macrostachya*: *Vieillard 1116* and *Deplanche 97*. Viot (1968) chose the collection *Vieillard 1117* as a lectotype and McGillivray (1993) annotated the specimen P00645058 as type, and is therefore treated here as the lectotype.

Grevillea gillivrayi Hooker (1854: 358). *Hakea gillivrayi* (Hooker) Christenhusz & Byng (in Christenhusz *et al.* 2018: 82). Holotype:—NEW CALEDONIA, Peak of Isle of Pines, near summit, October 1853, *MacGillivray 854* (K000799695!)

Grevillea acervata S. Moore (in Rendle *et al.* 1921: 388). Type:—NEW CALEDONIA, Cap Bocage, 10 July 1914, *Compton 1398* (Holotype: BM000915636!, iso-: NSW928810).

Grevillea oleifolia Brongniart & Gris ex Guillaumin (1911: 216) nom. nud.

Grevillea tontoutensis Guillaumin (1959: 176). Type:—NEW CALEDONIA, North bank of Tontouta river near junction of Kalouéholá, 200 m, 23 October 1955, *MacKee 3305* (holotype: P00645088!, isotype: US).

Grevillea vieillardii Brongniart & Gris (1865: 41). Lectotype (designated here):—NEW CALEDONIA, Kanala, 1855–1860, *Vieillard 1112* (P00645325!; iso-: P00645327!) ; possible iso-: P00645085!, P00645326!, K000799686!, K000799687!). Remaining syntypes:—*Deplanche 96* (P00645083!, P00645084!).

Grevillea vieillardii var. *emarginata* Brongniart & Gris (1865: 41). Lectotype (designated by McGillivray & Makinson 1993):—NEW CALEDONIA, Kanala, 1855–1860, *Vieillard 1111* (P00645089!; iso-: P00645090!, P00645091!, P00645092!).

Some plants from Tontouta valley, where the type of *G. tontoutensis* was collected, differ from other specimen of *G. gillivrayi* by their larger stature (larger tree, larger leaves); their flower are also consistently bright red. However, we have been unable to find a discontinuous character that could distinguish what may be simply a geographical variant in the Tontouta valley, an area known for its high micro-endemism (Wulff *et al.* 2013). Brongniart & Gris (1865) cited two collections as syntypes of *Grevillea vieillardii*: *Deplanche* 96 and *Vieillard* 1112. Viot (1968) chose the collection *Vieillard* 1112 as a lectotype. McGillivray (1993) overlooked this choice and selected one sheet of *Deplanche* 96 as the lectotype. The sheet P00645325 of *Vieillard* 1112 with Brongniart & Gris' handwriting is here chosen as the lectotype.

Grevillea macmillanii Guillaumin (1958: 399). Type:—NEW CALEDONIA. Road from Boulouparis to Thio, 1 mile southwest of Thio, 25 July 1952, *MacMillan* 5121 (holo-: P00645057!, iso-: K000799685!)

This taxon was treated by Viot (1968) as a synonym of *G. exul* subsp. *exul*. It differs from *G. exul* s.s. by its narrow, needle-like leaves, and is restricted to the region of Thio and Mont Do.

Grevillea meisneri Montrouzier var. *meisneri* (1860: 248). *Hakea meisneri* (Montrouzier) Christenhusz & Byng (in Christenhusz *et al.* 2018: 86). Lectotype (designated by McGillivray & Makinson 1993):—NEW CALEDONIA, île Art, s. dat., *Montrouzier* 196 (P00645096!, iso-: P00645097!)

Grevillea producta S. Moore (in Rendle *et al.* 1921: 389). Type:—NEW CALEDONIA, Taom, 300 ft, 3 December 1914, *Compton* 2318 (holo-: BM000915639!, iso-: P00645094!, P00645095!).

Grevillea meisneri var. *rhododesmia* (Schlechter) Viot (1968: 145). *Grevillea rhododesmia* Schlechter (1908: 22). Type:—NEW CALEDONIA, Tahafé, October 1902, *Cribs* 1251 (holo-: B10027958!)

Grevillea meisneri var. *argyrophylla* Guillaumin (1959: 175). Type:—NEW CALEDONIA, dôme de la Tiébaghi, 300–600 m, 14 June 1956, *McKee* 4824 (holo-: P00645093!).

Grevillea mondorensis Majourau & Pillon *nom. nov.* Replaced synonym: *Grevillea gillivrayi* var. *glabriflora* Viot (1968: 163). Type:—NEW CALEDONIA. Mont Dore, 400 m, 1 May 1955, *MacKee* 2456 (holo-: P0045082!)

Viot (1968) created the variety *glabriflora* within *G. gillivrayi* to accommodate individuals with glabrous tepals and inflorescence axes. They further differ from *G. gillivrayi* sensu stricto by their inflorescences that can be terminal instead of exclusively axillary; and ramiflorous to cauliflorous on large woody branches and trunk, instead of developing on long vertical and slender axis or laterals branches. Genetic studies (Majourau & Pillon, unpublished) further support the distinctiveness of this taxon that is here raised to the specific rank. To avoid confusion with *Hakea glabriflora* Gandoger (1919: 229), *Hakea glabra* Shrader & Wendland (1797: 27) or *Grevillea glabrata* (Lindley) Meisner (1845: 549), the new name *G. mondorensis* is here created in reference to Mont Dore, the only locality from which the taxon is known.

Grevillea rubiginosa Brongniart & Gris (1865: 40). *Hakea rubiginosa* (Brongniart & Gris) Christenhusz & Byng (in Christenhusz *et al.* 2018: 89). *Grevillea exul* subsp. *rubiginosa* (Brongniart & Gris) Viot (1968: 153). Lectotype (designated here):—NEW CALEDONIA, 1861, *Deplanche* 213 (P00645074!; iso-: P00645075!). Remaining syntype:—*Vieillard* 1114 (not found)

Grevillea exul subsp. *rubiginosa* form *bicolor* Viot (1968: 153). Type:—NEW CALEDONIA, auf dem Bergen am Ngoye, 700 m, 4 November 1902, *Schlechter* 15219 (holo-: P00645070!, iso-: Z000043915!, NSW928812).

Grevillea rubiginosa var. *angustifolia* Guillaumin (1935: 283). Lectotype (designated by McGillivray & Makinson 1993):—NEW CALEDONIA, Mont Penari, 800 m, February 1872, *Balansa* 176 (P00645071!, isoelectotypes: P00645072!, P00645073!, L0039471, MEL75286).

This taxon was treated by Viot (1968) as *G. exul* subsp. *rubiginosa*, but is re-instated here to the specific rank. It differs from *G. exul* s.s. by its inflorescences axis with a red indumentum, its tepals consistently pubescent (red hairs), and often much-branched inflorescences. The leaves also tend to be broader and more coriaceous with a red

indumentum below. The two taxa are mostly allopatric (except in Dumbea valley), *G. rubiginosa* being confined to the South and the Isles of Pines while *G. exul* occurs in the center and north-West of Grande Terre. Brongniart & Gris (1865) cited two collections as syntypes of *Grevillea rubiginosa*: *Deplanche 213* and *Vieillard 1114*. Viot (1968) chose the collection *Deplanche 212* as the lectotype, and the sheet P00645074 with an original label and Brongniart & Gris' handwriting is here chosen as the lectotype.

Grevillea sinuata Brongniart & Gris (1865: 40). *Grevillea exul* subsp. *exul* var. *nudiflora* Viot (1968: 153). Lectotype (designated by McGillivray & Makinson 1993):—Kanala, 1855–1860, *Vieillard 1115* (P00645066!). Remaining syntypes: Kanala, 1855–1860, *Vieillard 1115* (P00645067!, P00645068!, P00645069!)

This taxon was treated by Viot (1968) as *G. exul* subsp. *exul* var. *nudiflora* and is here re-instated to the specific rank. It can easily be distinguished from *G. exul* s.s. by its glabrous tepals and inflorescence axes. The two taxa are not sympatric, *G. sinuata* is restricted to the area of Kouaoua, Poro and La Foa, while *G. exul* is more widespread, but apparently absent from this area. Brongniart & Gris (1865) cited a single collection for *Grevillea sinuata* viz. *Vieillard 1115*.

Key to the species of *Grevillea* from New Caledonia:

1. Inflorescences unilateral (“toothbrush”), flowers white (rarely pink), fruit valve rounded..... 2 (*G. exul* group)
- Inflorescences cylindrical (“bottlebrush”), flowers usually red, sometimes yellow, orange pink or very pale but not white, fruit valve laterally flattened 5 (*G. gillivrayi* group)

G. exul group

2. Inflorescences axis and outside surface of tepals covered with a red pubescence, leaves usually with a red pubescence on the lower surface, South of New Caledonia *G. rubiginosa*
- Inflorescence axis and outside surface of tepals covered with a white or silvery pubescence to glabrous, leaves glabrous to white-silvery below, occasionally reddish when young 3
3. Inflorescence and outside surface of tepals glabrous, Kouaoua region..... *G. sinuata*
- Inflorescence axis and outside surface of tepals covered with a white or silvery pubescence 4
4. Leaves needle-like (2–3(–4) mm wide at their widest spot), Thio region and mont Do *G. macmillanii*
- Leaves elliptic ((5)–10–20 mm wide at their widest spot), widespread *G. exul*

G. gillivrayi group

5. Inflorescences pending vertically with a curved axis, globose or shortly cylindrical..... 6
- Inflorescence more or less horizontal with a straight axis, cylindrical, much longer than wide..... 8
6. Leaves 13–20 cm long on sterile branches, 8–12 cm long on fertile branches, lower surface glabrous, inflorescence diameter (from rachis to style end) more than 5.8 cm, Yaté region on peridotite *G. vuniana*
- Leaves generally less than 12 cm long on sterile branches, less than 10 cm long on fertile branches, lower surface usually densely hairy, sometimes glabrous, inflorescence radius (from rachis to style end) c. 5 cm, north-west of New Caledonia on serpentinite .. 7
7. Inflorescence axis and tepals hairy *G. meisneri* var. *meisneri*
- Inflorescences axis and tepals glabrous *G. meisneri* var. *rhododesmia*
8. Inflorescences borne on slender lateral axis or directly on main axis (also slender), in distal position (top of the plant)..... 9
- Inflorescences more broadly distributed on the plant, borne on woody branches (cauliflorous and ramiflorous) or on undifferentiated leafy axis (terminal)..... 10
9. Leaves narrow (less than 5 mm wide), much longer than large (8 times or more), on river banks in the south of the main island.... *G. deplanchei*
- Leaves wider (at least 1 cm wide, but generally more), more broadly lanceolate (at most 5 times as long as wide) widespread (south, east coast, Isles of Pines) *G. gillivrayi*
10. Inflorescence axis and outside surface of tepals glabrous, Mont Dore *G. mondorensis*
- Inflorescence axis and outside surface of tepals covered with red hair, north-west of Grande Terre *G. nepwiensis*

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