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Nomenclature and typification in *Polyosma* (Escalloniaceae) from New Caledonia, with the description of a new species

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Abstract

The taxonomy of *Polyosma* (Escalloniaceae) in New Caledonia is reviewed. All names validly published in *Polyosma* in this archipelago are discussed and lectotypified when necessary and possible. A new combination is made, *Polyosma subintegrifolia*; and a new species, *Polyosma kouaouana*, is described. Seven species (all endemic) are recognized in New Caledonia: *P. brachystachys*, *P. discolor*, *P. kouaouana*, *P. leratii*, *P. pancheriana*, *P. spicata*, and *P. subintegrifolia*. A preliminary identification key is provided.

Keywords: endemic, Saxifragaceae, serpentine, ultramafic

Introduction

Polyosma Blume (1825: 658) is a genus of shrubs and trees that has traditionally been placed in Saxifragaceae, sometimes in Grossulariaceae, or as the sole member of Polyosmaceae. Molecular phylogenetic studies have indicated affinities with Escalloniaceae (Lundberg 2001; Tank & Donoghue 2010), where it is generally placed now (Angiosperm Phylogeny Group III 2009; Angiosperm Phylogeny Group IV 2016). Escalloniaceae are a heterogeneous assemblage of little known genera: *Anopterus* Labillardière (1804: 85), *Eremosyne* Endlicher (1837: 53), *Escallonia* Mutis ex Linnaeus filius (1782: 21), *Forgesia* Comm. ex Jussieu (1789: 164), *Polyosma*, *Tribeles* Philippi (1863: 382), and *Valdivia* Gay ex J.Rémy (1848: 43), and the sole family of the order Escalloniales (Campanulidae). It should be noted that there has been conflict regarding the phylogenetic placement of *Polyosma*. While phylogenetic studies based on plastid markers placed it as sister to the rest of Escalloniaceae (e.g. Lundberg 2001; Tank & Donoghue 2010), mitochondrial markers suggest instead that *Polyosma* may be the sister group of *Quintinia* de Candolle (1830: 5) of Paracryphiaceae (Soltis *et al.* 2011). This conflict seems better explained for now as a case of horizontal gene transfer (Soltis *et al.* 2011). Considering that Escalloniaceae are still poorly characterised morphologically and the conflicts in molecular data, further change in the family placement of *Polyosma* may not be excluded.

The genus has not been the subject of any large revision recently (but see Esser 2017 for Thailand). There are 103 species names in IPNI and 60–80 species according to Esser & Saw (2015), c. 80 species according to Lundberg (2016). It occurs in South and South-Eastern Asia, from north-eastern India to Indochina, Thailand and Malesia, New Guinea, eastern Australia, New Caledonia and the Solomon Islands, and is apparently absent from Vanuatu, Fiji, and the Pacific Islands further east. The genus was described by Blume (1825) based on three species that he described alongside: *P. ilicifolia* Blume (1825: 658, “*ilicifolium*”), *P. serrulata* Blume (1825: 659, “*serrulatum*”), and *P. integrifolia* Blume (1825: 659, “*integrifolium*”). Hutchinson (1967) cited *P. ilicifolia* as the type of the genus *Polyosma*, but it is rather a lectotype. The last revision for the New Caledonian species was published by Guillaumin (1939). An update is here provided. All specimens at P have been examined and are marked with “!”; specimens in other herbaria were seen online.

Taxonomy

Polyosma brachystachys Schlechter (1907: 117).

Lectotype (designated here):—NEW CALEDONIA. Auf dem Bergen bei Ou-Hinna, 900 m, 7 January 1903, *Schlechter 15694* (B-100296090!; isolectotypes: A-01154252, BR-699809!, HBG-517032!, G-00388949!, L-0035072!, L-0035073!, M-0242297, P-00537656!, P-00537657!, P-00537658!).

In his description, Schlechter (1907) did not provide a collection number but only a locality “in den Wäldern der Berge bei Ou Hinna” and the date of January 1903. His collection number 15694 matches the location and date. There is apparently a single sheet at B that bears the handwritten note “*Polyosma brachystachys* Schltr. n. sp.” (presumably Schlechter’s hand), which is chosen here as a lectotype.

Polyosma discolor Baillon (1873: 343).

Type:—NEW CALEDONIA. s. loc., s. dat., *Pancher & Sebert s.n.* (not found)

Polyosma podophylla Schlechter (1907: 117). Lectotype (designated here):—NEW CALEDONIA. Auf den Bergen bei Oubatche, 1000 m, 20 December 1902, *Schlechter 15515* (B-100278232!, isolectotypes A-01154252, B-100278231!, BR-699842!, E-00265564!, FI-014506!, G-00388957!, HBG-517024!, K-00739769!, L-0035079!, M-0242296, P-00537659!, S-09-11256!)

The protologue of *P. discolor* indicates “Oritur in Austro-Caledonia, ubi leger. cl. *Pancher et Sébert* (herb.)”, but the type specimen of this taxon could not be located at P. There is no reason to believe that it should be located elsewhere since both Pancher and Baillon were affiliated to P. Type material of *Polyosma pancheriana*, described in the same publication, and also a collection of Pancher, is at P. The specimen may be simply misfiled, particularly after the recent refurbishment of this herbarium, and a neotype will not be designated at this time. The specimen *Balansa 1780* (P-02582518!) bears the handwritten “est ? mon *P. discolor* de herb. Sebert”, which suggests that it has been seen by Baillon.

In his description of *P. podophylla*, Schlechter (1907) cited a single collection, N° 15515. There are apparently two sheets at B, both with “*Polyosma podophylla* n. sp.” handwritten, but with two different inks. One bears the note “acc. 22.XII.1903” (B-100278232) and the other “acc. 13.I.1908” (B-100278231). The first one, which is also a better specimen, is chosen as a lectotype. I follow Guillaumin (1920, 1939) in treating *P. podophylla* as identical to *P. discolor*.

Polyosma leratii Guillaumin (1920: 176) ‘*Le Ratii*’.

Type:—NEW CALEDONIA. Plateau de Dogny, September 1909, *Le Rat 825* (holotype: P-00537661!, isotypes: K-000739770!, P-00537662!, P-00537663!)

Polyosma leratii var. *puberula* Guillaumin (1939: 278) ; **syn. nov.** Lectotype (designated here):—NEW CALEDONIA. s. loc., 24 september 1876, *Lécard bois n°31* (P-00537660!). Syntypes:—forêts situées au sud de Canala, 1000 m, 20 November 1869, *Balansa 1783* (P-02582511!, P-02582510!, P-02582512!); *Lécard 93* (P-00639324!); possible syntypes:—*Lécard s.n.* (P-00639325!, P-00639326!)

Guillaumin (1920) cited a single collection in his description of *P. leratii*: *Le Rat 825*. There are three sheets at P. One bears the handwritten “type” with Guillaumin’s signature, and can be considered as the holotype.

In his description of the variety *puberula*, Guillaumin (1939) cited two collections : *Balansa 1783* and *Lécard 93, bois n°31*. Among several collections of Lécard at P, a single sheet bears the additive information “bois N°31” with the handwritten “*Polyosma leratii* var. *puberula*”, “type” and Guillaumin’s signature. It is therefore chosen as a lectotype. The variety name was not indicated in any of the sheets *Balansa 1783* at P or the single sheet labelled “*Lécard n° 93*”. The variety *puberula* only differs from the typical variety by the pubescence of the inflorescence and this does not seem to correlate with ecology or geography. It is not maintained here as distinct.

Polyosma pancheriana Baillon (1873: 342).

Lectotype (designated here):—NEW CALEDONIA. s. loc., s. dat., *Pancher Mus. Néocal. N°17* (P-00537665!, isolectotypes P-00537664!, P-00537666!)

Polyosma comptonii Baker f. (in Rendle *et al.* 1921: 305). Type:—NEW CALEDONIA. Mts Comboui, 28 October 1914, *Compton 2178* (holotype: BM-000600394!)

Baillon (1873) cited a single collection in his description: *Pancher Mus. neo-caled. N.17*. A single sheet bears the handwritten note “*Polyosma pancheriana* H. Bn.” (presumably Baillon’s hand) and is chosen as a lectotype. I follow Guillaumin (1939) in treating *P. comptonii* as identical to *P. pancheriana*.

Polyosma spicata Baillon (1873: 343).

Type:—NEW CALEDONIA. s. loc., s. dat., *Pancher & Sebert s.n.* (not found)

The protologue indicates “In Austro-Caledonia leger. cl. *Pancher et Sébert* (herb.)”, but the type specimen could not be located in P (see *P. discolor*).

Polyosma subintegrifolia (Guillaumin) Pillon **comb. & stat. nov.** Basionym: *Polyosma pancheriana* var. *subintegrifolia* Guillaumin (1920: 177).

Lectotype (designated here):—NEW CALEDONIA. forêts situées au NE de la Conception, vers 700 m, 24 January 1869, *Balansa 1030* (P-02582548!, isolectotypes: E-00346921!, NY-185898!, P-02582546!, P-02582547!). Syntypes:—*Sebert* (P-02582600!) ; forêts situées au-dessus de la Conception, October 1868, *Balansa 602* (P-02582549!, P-02582550!, P-02582551!).

In his description, Guillaumin (1920) cited several collections : *Sebert*, *Lecard*, *Balansa* (environs de la Conception) and *Le Rat 831* (plateau de Dogny). Four sheets at P bear the handwritten name “*Polyosma pancheriana* Baill var *subintegrifolia* Guillaum”: *Lecard s.n.*, *Sebert s.n.*, *Balansa 602* and *Balansa 1030*, only the last three have Guillaumin’s signature. The two *Balansa* collections were made above Conception, and the one sheet of *Balansa 1030* with Guillaumin’s handwriting is chosen as a lectotype because it has well developed fruits. Two syntypes are excluded: *Lecard s.n.* (P-02582593!), which belongs to *P. pancheriana* s.s. and *Le Rat 831* (P-02582588!) from “plateau de Dogny” (doubtful locality), which belongs to *P. brachystachys*.

This taxon displays a combination of characters of *P. leratii* (leaf mostly entire, inflorescences many, some inserted low on branches) and *P. pancheriana* (mostly glabrous, acuminate leaves). A hybrid origin comparable to that of *Cunonia* × *koghicola* H.C. Hopkins, J. Bradford & Pillon (in Pillon *et al.* 2008: 423), which has a similar distribution, may be hypothesized (Hopkins *et al.* 2014).

Polyosma kouaouana Pillon, sp. nov (Figure 1)

A species most similar to *Polyosma spicata* in the size, shape and glaucous aspect of its leaves, and to *Polyosma discolor* in its near sessile fruits, but which differs from both by the leaf margin that is minutely toothed or sinuate and the leaf blade that is bullate.

Type:—NEW CALEDONIA. Kouaoua, Aréha, 500 m, 30 march 1982, *McKee* (leg. J.-F. Cherrier) 40295 (holotype P-04377521!).

Shrub 2–6 m tall, glabrous except on bud, with lenticels on younger wood. Leaves: pseudo-opposite, elliptic with rounded to pointed apex, base triangular, petiole 16–45 × 1–2 mm, blade coriaceous, bullate, 4.5–14 × 2–4.8 cm, lower surface glaucous below, margins with fine teeth (<1 mm long) or sinuses; 6–13 pairs of secondary veins, convex below, concave above. Young inflorescences with very short shiny hairs, 3.5–7.5 cm long, bracts 2 × 0.2 mm. Flowers: pedicel c. 1 mm long ; calyx tube c. 1.5 mm long with 4 spreading tips; corolla 2.5–3 mm long in bud; buds pinkish (fide *McKee 9902*), purple (H. Vandrot, pers. comm.) or reddish green (*Barrabé 934*). Flower at anthesis unknown. Fruits ovoid, 8 × 6 mm, glabrous, smooth, with 2 longitudinal furrows, pyrenes 2 per fruit, 7 × 4 mm. Seeds ellipsoid, 4 × 2 mm.

Ecology and conservation:—Unlike the morphologically similar *P. spicata* and *P. discolor*, this species occurs on ultramafic substrates in maquis and mountain forest, at 500–1000 m elevation. It is known so far from only 4 localities: Kouaoua (Aréha, Montmartre), Mé Maoya (ridge between Baraoua and Houailou rivers), Boulinda (pic Poya), and Paéoua (H. Vandrot, pers. comm.). They are all located within a 40 km radius. This patchy distribution is quite similar to that of *Pancheria ajiaroana* H.C.Hopkin, Pillon & Bradford (2009: 442). All populations may be directly affected by nickel mining, particularly the first one. This species will be assessed by the New Caledonia Plant Red List Authority and would likely qualify as Endangered EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v) (IUCN 2017).

Paratypes:—New Caledonia, Kouaoua: décharge Montmartre, 14 february 1978, *Veillon 3504* (P!); Kouaoua, Mine de Méa, décharge Montmartre, 165°45’52”E, 21°26’29”S, 723 m, 17 august 2009, *Barrabé & Nigote 934* (P!, K, NOU, NY, Z, S); Mt Boulinda, près du Pic Poya, 800 m, 7 november 1984, *Veillon 5830* (P!); Crête entre la haute Houailou et la haute Baraoua (contrefort du Mé Maoya), 28 december 1962, *McKee 9902* (P!).



FIGURE 1. *Polyosma kouaouana* Pillon. **A.** Branch with fruits; **B.** Sinuate leaf margin; **C.** Toothed leaf margin; **D.** Fruit and two pyrenes; **E.** Transversal section of a pyrene and a seed. A, C–E: *McKee* (leg. *J.-F. Cherrier*) 40295; B: *Veillon* 5830. Scale bars: A: 1 cm, B–E: 2 mm.

Notes:—the collection *McPherson* 2933 (P-04362121!) from Mount Mé Maoya is tentatively assigned to this species. It differs by its leaves that are more strongly toothed and more chartaceous. It could be juvenile foliage although this collection is fertile. The collections from the West (Boulinda & Mé Maoya) look somewhat different from those from the type locality (Kouaoua), with leaves that are smaller, not so strongly bullate and the margin that is sinuate rather than toothed in *Veillon* 5830. Further observations are needed before deciding whether this taxon should be further divided.

Preliminary key to the species of *Polyosma* in New Caledonia

[UM= ultramafic substrates, NUM=other substrates]

1. Flowers sessile or with a short pedicelle (1 mm)2
- Flowers distinctly pedicellate (2–4 mm)4
2. Flowers white, completely sessile *P. spicata*
- Flowers purple-blue, shortly pedicellate (1 mm)3
3. Leaf margin entire, NUM *P. discolor*
- Leaf margin minutely toothed, UM *P. kouaouana*
4. Young parts hairy (including apical bud), NUM5
- Young parts glabrous, UM or NUM7
5. Leaf margin generally entire, flower generally white *P. leratii*
- Leaf margin distinctly toothed, flower purple-blue *P. brachystachys*
7. Leaf margin distinctly and evenly toothed, blade somewhat coriaceous, secondary vein distinct, UM, South *P. pancheriana*
- Leaf margin irregularly toothed to entire, blade chartaceous, secondary veins not entirely distinct, NUM, Koghis *P. subintegrifolia*

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