

**ADDITIONS TO THE FLORA OF THE KAIJENDE  
HIGHLANDS, PAPUA NEW GUINEA:  
OCCURRENCE RECORDS, SYNONYMIES, AND  
DESCRIPTIONS OF NEW TAXA**

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The new taxa *Cypholophus treubii* var. *aciculata* (*Urticaceae*), *Polyosma rampae* (*Polyosmaceae*) and *Psychotria apiculata* var. *altigena* (*Rubiaceae*) are described from montane environments in the Kaijende Highlands of Papua New Guinea. A supplementary description is provided for *Solanum nolense* (*Solanaceae*), previously known only from a fruiting collection. Synonymies are suggested for species in *Cypholophus*, *Psychotria*, and *Rubus* (*Rosaceae*).

*Keywords.* *Cypholophus*, *Polyosma*, *Psychotria*, *Rubus*, *Solanum*.

INTRODUCTION

The New Guinea cordillera ranks with Costa Rica-Chocó, Atlantic Brazil, Andes Amazonia and northern Borneo as one of the world's five principal centres for tracheophyte diversification (Barthlott *et al.*, 1996, 2005). Particularly on the Indonesian side, many districts in central New Guinea consist of uninhabited wilderness, and are collectively the largest intact repository for plant life in Papuasia.

As part of a long-term plan for documenting this resource, Conservation International and its partners are currently implementing a series of multi-disciplinary surveys of the Dividing Ranges. The initiative straddles the Indonesia–Papua New Guinea border, encompassing a floristic region suspected of harbouring large numbers of rare or undiscovered taxa. The 2005 Kaijende survey was the lead operation on the bi-national itinerary (see Richards, in press, for a comprehensive summary), and was immediately followed by the widely publicized Foja I expedition to West Papua. The following account presents the latest findings from these serial explorations of poorly known environments.

POLYOSMACEAE

***Polyosma rampae* Takeuchi, sp. nov. Fig. 1.**

Affinis *Polyosma occulta* Reeder sed foliis et inflorescentiis minoribus differt. – Type: Papua New Guinea, Enga Province, Kaijende Highlands, Waile Creek, 3100 m, 4 ix 2005, *Takeuchi, Towati & Ama* 20148 (holo LAE; iso A, L).



FIG. 1. *Polyosma rampae* Takeuchi. A, immature racemes. Pedicels are tri-bracteate at the top, the central bract being nearly twice as large as the flanking ones. B, fruits (Takeuchi, Towati & Ama 20148).

Terrestrial undershrubs, 2 m tall. *Branchlets* corymbiform, straight-ascending, glabrous, subapical axes 0.5–2.0 mm diameter, compressed, furrowed or striate, older axes cylindrical; surfaces dull black to brunnescent, elenticellate. *Leaves* opposite or spiral, crowded, spreading, glabrous; petioles 4–12 × 0.4–0.7 mm, planoconvex or dorsally channelled, black; lamina oblanceolate, (12–)15–27 × 5–11 mm, thin-textured when dried, frangible, bifacially olivaceous; base cuneate, equal; margins reflexed or not, callose-serrulate, serrulations 1–2 per side (rarely absent), black; apex acute, abruptly or gradually 1.0–1.5 mm mucronate; venation reticulate-brochidodrome, secondary veins 4–10 pairs, diverging 55–75° from midribs at centre of lamina, arcuate, closing by inframarginal looping nerves; veins adaxially planate or obscurely impressed, abaxially prominent, copiously areolate, reticulum conspicuous. *Inflorescence* racemose, terminal, erect, 1.5–2.0 cm long, concealed by bracts except at anthesis, axial surfaces glabrous, black; peduncle 4–10 × 0.5–1.0 mm; remaining axis 10–16 × 0.4–0.8 mm; pedicels 0.5–2.0 mm long, articulated at the base; bracts ternate, foliaceous, linear-elliptic, glabrous, entire, persistent, central bract largest, (10–)13–18 × 2.5–3.0(–5.0) mm, lateral bracts 8–12 × 1 mm. *Flowers* 2–8, tetramerous, externally sericeous; calyx tube cylindrical, 1.0–1.5 × 0.8–0.9 mm, lobes narrowly deltate, 1.2 × 0.5 mm; corolla gamopetalous, salverform, internally glabrous, tube 11–12 × 0.8–1.0 mm, lobes valvate, lanceolate or triangular, c.1.5 × 1.0 mm; stamens antesepalous, free, erect, approximately

equal in length to corolla tube, filaments  $8.5 \times 0.2$  mm, laxly pilosulous, anthers c.2.5 mm long, sinuate or not; ovary inferior, bilocular; style cylindrical,  $12.0\text{--}12.5 \times 0.2\text{--}0.3$  mm, exerted, proximally appressed-hairy, distally papillate and hirtellous; stigma weakly expanded, subcapitate. *Fruits* ellipsoid-ovoid, (5)–6–7  $\times$  3.5–4.0 mm, monospermous, bilocular, crowned by the umbonate style base; epicarp black, pusticulate, not ribbed, laxly furnished with appressed hairs c.0.2 mm long, glabrescent.

*Field notes.* Leaf-lamina fleshy, bifacially green; corolla light purple.

*Distribution.* Known only from the type locality, near the Porgera gold mine (Fig. 2).

*Habitat.* Margin of mossy montane forest and along subalpine streams dominated by *Decaspermum alpinum* P.Royen, *Melicope rubra* (Lauterb. & K.Schum.) T.G.Hartley, *Olearia platyphylla* Mattf., *Pittosporum ramiflorum* (Zoll. & Mor.) Miq. and *Psychotria chrysantha* Merr. & L.M.Perry.

*Etymology.* Rampa Hormel is a founder of the Global Environment Project Institute and a sponsor of Conservation International biosurveys.

#### Notes

- 1 The foliaceous bracts and bilocular ovary are indicative of a relationship to *Polyosma occulta*. The latter species has enlarged bracts causing calyces to be hidden from view (hence the species epithet, ‘to conceal’). In *Polyosma rampae* the bracts are much larger, such that the entire raceme is obscured, with the flowers becoming clearly visible only near anthesis.
- 2 *Polyosma rampae* is easily distinguished by its small leaves and by the markedly reduced, pauciflorous inflorescence (Table 1). The leaf-blades and racemes are the smallest of any *Polyosma* Blume species from eastern Malesia.
- 3 Unlike *Polyosma occulta*, *P. rampae* is glabrous or glabrescent on all parts except the perianth.
- 4 The Papua New Guinea National Herbarium (LAE) has two specimens (NGF 20483 and 36833) of *Polyosma occulta*, each bearing determination slips (from L) as *P. consimilis* Schulze-Menz. The second name is unpublished. *Polyosma occulta* is known only from Murray Pass in the Wharton Range of Central Province.
- 5 The collection localities from the expedition are referenced to Enga Province, in recognition of Papua New Guinea’s current administrative structure. Under the former territorial system, the present-day Enga would have been part of the Western Highlands.

#### ROSACEAE

**Rubus diclinus** F.Muell., Trans. Roy. Soc. Victoria 1: 5 (1889). – Type: Papua New Guinea, Mt Knutsford, Mt Musgrave, *MacGregor* s.n. (MEL, fragment at K fide Kalkman, n.v.). **Fig. 3.**

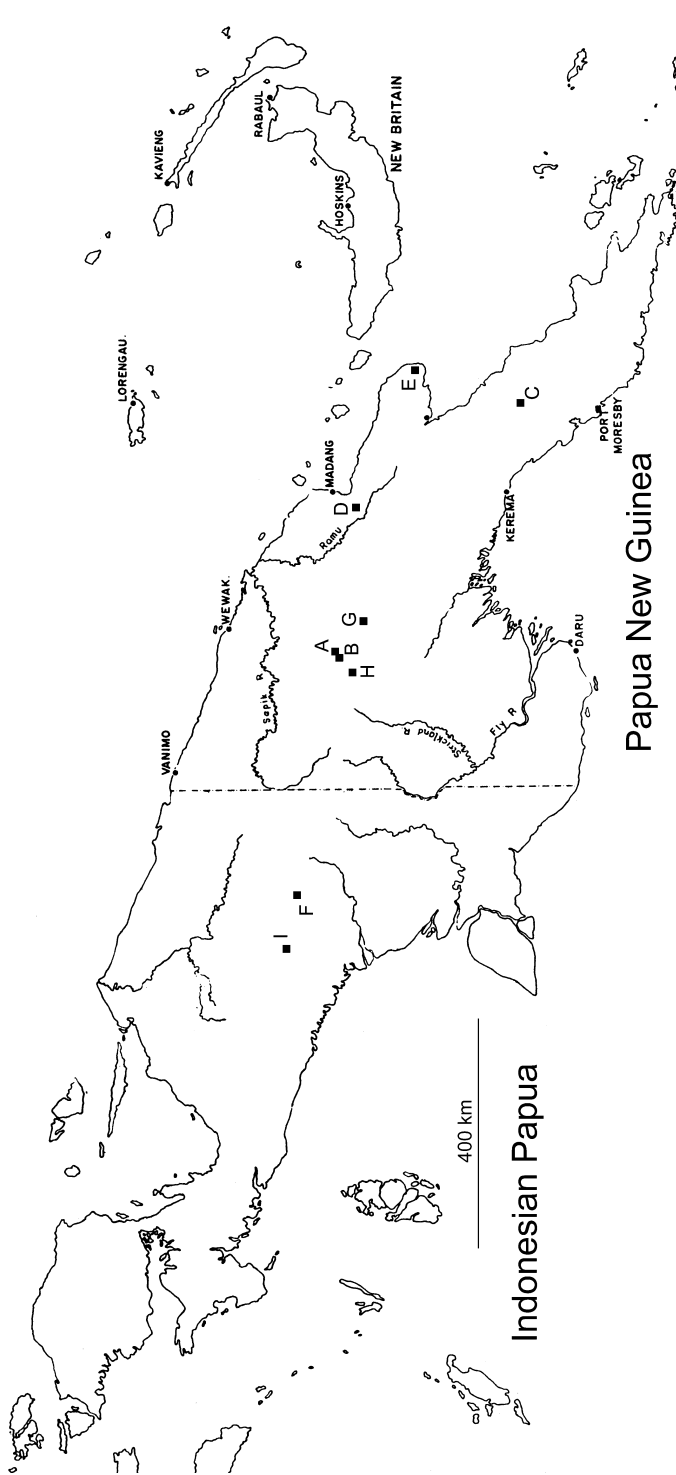


FIG. 2. Principal localities from the text. A, Porgera; B, Waile Creek; C, Murray Pass, Wharton Range, type locality for *Polyosma occulta*; D, Kani-Gebirge, type locality for *Psychotria sphaerothyrsa*; E, Sattelberg, type locality for *Psychotria apiculata*; F, Noord-Fluss (Lorentz River) at Geluks-Hügel, type locality for *Psychotria versteegii*; G, Nol [Sol], type locality for *Solanum nolense*; H, Lake Tawa; I, Treub and Hellwig Mts, type locality for *Cypholophus treubii* and *C. vaccinioides*.

TABLE 1. Comparison of principal character states in *Polyosma occulta* and *P. rampae*. Entries for *Polyosma occulta* extracted from Reeder (1946) and refined by examination of *NGF* 20483 and 36833

<i>Polyosma occulta</i>	<i>Polyosma rampae</i>
Vegetative parts velutinous or subsericeous	Vegetative parts glabrous
Lamina elliptic or oblong-elliptic, (3.0–)3.5–8.0 × (1.5–)2.0–4.0 cm, margins 3–5-toothed or callose	Lamina oblanceolate, (1.2–)1.5–2.7 × 0.5–1.1 cm, margins 1–2 callose-serrulate (or entire)
Racemes (3–)5–10 cm long; axes subvillous-velutinous; bracts ternate, to 9 × 2 mm, appressed-hairy	Racemes 1.5–2.0 cm long; axes glabrous; bracts ternate, to 18 × 5 mm, glabrous
Flowers 8–25; perianth sericeous; calyx (3.5–)4.0–4.5 mm long; corolla (pre-anthetic) 11.5–12.5 × 1.5 mm	Flowers 2–8; perianth sericeous; calyx 2.5 mm long; corolla (anthetic) 12.5–13.5 × 0.8–1.0 mm
Stamens 4, filaments laxly pilosulous	Stamens 4, filaments laxly pilosulous
Ovary bilocular; style sericeous; stigma capitate	Ovary bilocular; style proximally sericeous, distally papillate and hirtellous; stigma subcapitate
Fruits ellipsoid-subglobose, 8–9 × 6–7 mm, appressed-hairy	Fruits ellipsoid-ovoid, (5–)6–7 × 3.5–4.0 mm, glabrescent

*Rubus tsiri* P.Royen, Phanerog. Monogr. 2: 77 (1969). – Type: West New Guinea, Mt Jaya (Carstensz), Camp VIII–IX, anno 1914, *Kloss* s.n. (holo BM, n.v.).

*Rubus trigonus* Kalkman, *Blumea* 37: 378 (1993), **syn. nov.** – Type: Papua New Guinea, Eastern Highlands District, Mt Otto, south slopes, 3040 m, 10 viii 1959, *Brass* 30932 (holo A!; iso BO, K, L, LAE!, NY).

The Kaijende collections (*Takeuchi, Towati & Ama* 20093A, 20225) have the leaf characteristics of *Rubus diclinus* and the flower dimensions of *R. trigonus*, effectively disputing the previously recognized distinctions in Kalkman (1987, 1993a, 1993b). With terminal leaflets 40–71(–77) × 25–47(–62) mm, sepals 7–9 mm long, and petals 10–14 mm long, the Kaijende sample measurements fall between Kalkman’s (1993b) diagnostic couplets. The intermixing of species profiles is also reflected in characters other than those employed in Kalkman’s key. For example, the Kaijende *Rubus* L. has exclusively pinnate venation (i.e. without basal digitate nerves) in the manner of *R. diclinus*, but the flowers are strictly unisexual as for *R. trigonus* (polygamous in *R. diclinus*).

Although eight *Rubus* species were recorded at Kaijende (Takeuchi, in press) these do not include *R. diclinus* or *R. trigonus* in the narrow sense adopted by current taxonomy. In the absence of evidence for hybridization, the existence of intergrading characters indicates that the *diclinus*–*trigonus* facies comprises a single continuum of variation. The newer gatherings argue for the recognition of one polymorphic taxon, in place of Kalkman’s narrow segregates.



FIG. 3. *Rubus diclinus* sensu lato. Staminate plant. The combination of large flowers and small leaves is a characteristic feature of Kaijende populations (Takeuchi, Towati & Ama 20225).

#### RUBIACEAE

***Psychotria apiculata*** Warb., Bot. Jahrb. Syst. 13: 439 (1891). – Type: Papua New Guinea, Sattelberg, anno 1889, *Warburg* 21452 (lecto BM, n.v. [chosen in Sohmer, 1988]).

*Psychotria sphaerothyrsa* Valetton, Bot. Jahrb. Syst. 61: 99 (1927), **syn. nov.** – Type: Papua New Guinea, Kani-Gebirge, 1000 m, 9 i 1908, *Schlechter* 17174 (lecto A! [chosen in Sohmer, 1988]; isolecto BM, C, K, L, LAE!).

*Psychotria versteegii* Deb & N.Gangop., Taxon 31: 546 (1982), **syn. nov.** – *Psychotria polyneura* Valetton, *nom. illeg.* (= *P. versteegii*), Nova Guinea 8: 493 (1911). – Type: SW New Guinea, Noord-Fluss, v 1908, *Branderhorst* 359 (lecto L, n.v. [chosen in Sohmer, 1988]; isolecto BO!, L).

***Psychotria apiculata*** Warb. var. ***altigena*** Takeuchi, var. **nov.**

A *Psychotria apiculata* var. *apiculata* laminiis pubescentibus fructibus majoribus usque ad 6–8 × 6–7 mm differt. – Type: Papua New Guinea, Enga Province, Kaijende Highlands, Lake Tawa, 2350 m, 30 viii 2005, *Takeuchi, Towati & Ama* 19940 (holo LAE; iso A, L).

Small trees 5 m tall, outer bark smooth, wood straw-coloured. *Branchlets* fistulose, compressed, subapical diameter (2–)4–5 mm; surfaces fuliginous, lacking lenticels; internodes 2–7 cm. *Stipules* persisting, deltate-ovate, 17–20(–26) × 9–18(–21) mm, entire (or apically notched), papery, glabrous. *Petioles* (15–)20–31 × 1–2 mm, planoconvex, black, pilosulous, glabrescent. *Lamina* elliptic to obovate, 15–21 × 6–10 cm, subcoriaceous, brunnescent or fuscous, adaxially glabrous, with or without ellipsoid cystoliths, abaxially ramentaceous; base cuneate, symmetrical; margins entire; apex abruptly 1 cm acuminate; venation reticulate-brochidodrome, secondary veins (11–)14–17 per side, arcuate, diverging 45–65° from costae, distally uniting with 1 or 2 inframarginal veins: the inner vein (2–)4–6 mm from margins, the outermost one (if present) weaker, filiform, obscure, c.1 mm from margins; principal veins planate or slightly raised above, prominent below; reticulum copiously areolate, coarse, irregular, conspicuous. *Inflorescence* not seen. *Infructescence* terminal, paniculate, 10–12 × 15–17 cm, triaxial or to 1.5 cm peduncled, ascending, ebracteate, axes ± densely papillate-puberulent. *Drupes* asymmetrically obovoid, 6–8 × 6–7 mm when ripe, c.1 mm stipitate, glabrous, crowned by the calycine remnant; pyrenes 2, hemispherical, lacking dorsal ridges, endosperm ruminant.

*Field notes.* Branchlets ant-inhabited, smooth, green, fleshy; lamina coriaceous, rugose, adaxially very dark green, abaxially yellow-green; panicle axes pale green; drupes orange.

*Distribution.* Known only from the type locality (Fig. 2).

*Habitat.* Mossy montane forest on limestone, with many *Astronia ledermannii* Mansf., *Octamyrtus pleiopetala* Diels and *Symplocos cochinchinensis* (Lour.) S.Moore subsp. *leptophylla* (Brand) Noot.

#### Notes

On the current revision for Papuanian *Psychotria* L. (Sohmer, 1988) the Kaijende collection (*Takeuchi, Towati & Ama* 1994) is closest to *P. sphaerothyrsa*, a species with documented occurrences in the Kani Mts (the type locality), Aitape (West Sepik Province), Crater Mt (Chimbu and Eastern Highlands Province), and Sogeri (Central Province). The earliest record for *Psychotria sphaerothyrsa* was previously thought to have originated in West Sepik Province (Sohmer, 1988), but from Schlechter's itinerary it is apparent that the type must have been obtained near present-day Walium (05°36'S, 145°27'E), in the Ramu basin of Madang.

Although the relationship is not accepted in the current revision, *Psychotria sphaerothyrsa* is clearly allied to the facies represented by *P. apiculata* and *P. versteegii*. The three species had been separated by earlier authors on the basis of non-diagnostic character sets relating primarily to leaf shape and venation, and to the branching pattern of the inflorescence.

Most of the LAE specimens identified as *Psychotria sphaerothyrsa* or *P. versteegii* by Sohmer (1988) are actually ticketed (in Sohmer's hand) as *P. apiculata*. Hartley 10783 is identified as two different species (Sohmer, 1988), being cited first under *Psychotria apiculata* and later as *P. versteegii* (ibid.). The confusion in annotated material is symptomatic of the difficulties in drawing reproducible separations within the *apiculata* facies. In Valeton's time, it is understandable how elements of that complex might have appeared as discrete entities from the few specimens available for study. With the much larger number of collections now in existence, the intergradations between previously recognized species concepts can be discerned from tabulation of their collective variation (Table 2).

Sohmer's (1988) key will not separate the members of the *apiculata* group in conformity with his determinations on cited specimens. The species descriptions and their accompanying commentaries (ibid.) are similarly problematic. To take the most conspicuous example, ant-inhabited branches are explicitly identified as a unique characteristic of *Psychotria versteegii* (Sohmer, 1988), although such adaptations are present in other Papuasian congeners, including *P. sphaerothyrsa*. Both of the collections cited under the latter species by Sohmer (1988) clearly have

TABLE 2. Compilation of principal character states in the *Psychotria apiculata*-*sphaerothyrsa*-*versteegii* complex. Entries extracted from Sohmer (1988) and modified by comparison with cited specimens

<i>Psychotria apiculata</i>	<i>Psychotria sphaerothyrsa</i>	<i>Psychotria versteegii</i>
Branchlets often fistulose, ?myrmecophilous	Branchlets fistulose, inflated, ant-inhabited	Branchlets usually fistulose, inflated, ant-inhabited
Stipules valvate, entire, glabrous, ovate-deltate, to c.1 cm long	Stipules valvate, entire, glabrous, ovate, c.1 cm long	Stipules valvate, entire, glabrous, ovate-deltate, 5-10 mm long
Leaf-blades elliptic to elliptic-ob lanceolate, 10-22 × 5-13 cm	Leaf-blades elliptic to elliptic-ovate, 15-22 × 8-15 cm	Leaf-blades obovate-ob lanceolate to subelliptic, 9-25 × 4-10 cm
Secondary veins 12-20(-24) per side	Secondary veins (15-)20-28 per side	Secondary veins 9-17(-22) per side
1 or 2 submarginal veins present	1 or 2 submarginal veins present	1 or 2 submarginal veins present or absent
Inflorescence triaxial or monoaxial, axes white, papillate-puberulent, caducously furfuraceous at the primary nodes or not	Inflorescence triaxial or monoaxial, axes pale green to whitish-green, papillate-puberulent, caducously furfuraceous at the primary nodes	Inflorescence triaxial or monoaxial, axes white, papillate-puberulent, caducously furfuraceous at the primary nodes or not
Drupes red, obovoid-globose, 4-5 × 3-5 mm	Drupes red, obovoid, 3-4 × 3-5 mm	Drupes red, obovoid, 3-5 × 3-5 mm
Pyrenes without dorsal ridges, endosperm ruminant	Pyrenes without dorsal ridges, endosperm ruminant	Pyrenes without dorsal ridges, endosperm ruminant



myrmecophilous stems of the sort supposedly found only in *Psychotria versteegii*. Contrary to discussions of their inter-relationship, all three species of the *Psychotria apiculata* complex can exhibit structural indications of myrmecophily. Other criteria employed in the dissection of this group (viz., the number of leaf secondary veins and presence/absence of triaxial inflorescences) are just as intractable because of the character-state overlap across interspecific lines. A more practical solution is to recognize only one, variable species, adopting as a unifying principle the presence of a papillate puberulence on the inflorescence of all three segregates, within the context of their other shared attributes.

*Psychotria apiculata* var. *altigena* is distinguished by its ramentaceous lamina (glabrous in *Psychotria apiculata* var. *apiculata*), large fruits to 8 × 7 mm, and by the occurrence on limestone karst. The type collection was obtained at an unusually high elevation (2350 m). In its strict circumscription by Warburg, *Psychotria apiculata* has been recorded primarily from habitats below 250 m (Sohmer, 1988). The species sensu lato (as *Psychotria apiculata* var. *apiculata*) generally does not ascend above 1000 m.

#### SOLANACEAE

***Solanum nolense*** Symon, J. Adelaide Bot. Gard. 8: 115 (1985). – Type: Papua New Guinea, Southern Highlands Province, between Nol [Sol] and Mendi, 6 km from Nol [Sol], 2840 m, 24 vi 1977, *Symon & Katik* 10688 (holo ADW; iso CANB, K, L, LAE!).

*Solanum nolense* was previously known only from a fruiting collection obtained near Nol and Mendi [the first locality should have been reported as ‘Sol’ (06°03’S, 143°40’E) of Mendi electorate; since there is no geographic reference for ‘Nol’ in Southern Highlands Province the epithet is actually a misnomer]. The Kaijende specimen (*Takeuchi, Towati & Ama* 19904) keys directly to the species and closely matches the type and its description.

Although Symon (1985) notes that the branches in *Solanum nolense* are mostly unarmed, the latest gathering is densely aculeate over the entire length of the stem axis. The inermous character of the type is coincidental.

A complete specimen with fruits and anthetic flowers was obtained at Lake Tawa (05°35’53”S, 142°50’16”E), from which a supplementary description of the inflorescence is provided below. Unlike most Papuanian congeners, the petals in *Solanum nolense* are white.

*Inflorescence* supra-axillary or inserted about halfway between nodes. *Flowers* bisexual, pentamerous, solitary (or to 5-fasciculate). *Pedicels* (8–)12–19(–24) mm long, distally and weakly expanded, flaccid; hairs stellate, stipitate or not, fulvous, hyaline, central ray porrect, lateral rays planate, divaricate. *Calyx* cupuliform, 4–5 mm long, adaxially glabrous, abaxially with indument as the pedicels, cleft

± halfway, lobes linear or linear-acuminate, 2–3 mm long. *Corolla* campanulate or infundibular, white, united at the base; lobes lanceolate, 7–8 × 2.2 mm, bifacially stellate-tomentulose except on basal margins; hairs congested, obscuring surfaces, arms radiating in all directions. *Stamens* antesepalous, glabrous, erect; filaments slender, 0.5–0.7 mm long; anthers coherent, enclosing the gynoecium, conoid-oblongoid, 3.5–5.2 × 0.9–1.0 mm, subequal or with 2–3 anthers slightly enlarged, opening by apical pores, bright yellow. *Ovary* globular, 0.6–0.7 mm diameter, glabrous; style cylindrical, 5–6 mm long, stellately hairy, the indument proximally dense, lax towards the summit; stigma punctiform.

#### URTICACEAE

**Cypholophus treubii** H.Winkl., Bot. Jahrb. Syst. 57: 583 (1922). – Type: Indonesia, West Papua, Treub Mts, N slopes, 2400 m, 17 ii 1913, *Pulle* 1087 (not found).

*Cypholophus vaccinioides* H.Winkl., Bot. Jahrb. Syst. 57: 583 (1922), **provisional syn. nov.** – Syntypes: Indonesia, West Papua, Hellwig Mts, 2600 m, 2 i 1913, *Pulle* 877 (not found); between Hellwig-Gebirge and Alkmaarbiwak, *Römer* 724 (not found).

**Cypholophus treubii** H.Winkl. var. **aciculata** Takeuchi, var. **nov.**

A varietate typica fere omnibus partibus (stipulibus exceptis) persistentibus strigosa differt. – Type: Papua New Guinea, Enga Province, Waile Creek, 3250 m, 8 ix 2005, *Takeuchi, Towati & Ama* 20277 (holo LAE; iso A, CANB, K, L, US).

Chamaephytes 0.5–2.0 m tall, dioecious. *Stems* procumbent or repent, cylindrical, marked by longitudinal ridges, strigose, periderm grey to greyish-brown. *Branchlets* terete, compressed, (or quadrangular), ascending, (0.5–)1.0–3.0 mm diameter, inconsistently annulate-cicatricatous, furrowed or not; hairs strigose (or suberect), harsh, acicular, 0.2–0.5 mm long, white. *Leaves* decussate, equal, spreading. *Stipules* linear-deltate, 3–7 × 0.5–1.5 mm, persisting, paired, distinct, glabrous, scarious, usually crisped. *Petiole* 1–3(–5) × 0.4–0.8 mm, appressed-hairy, channelled above, rounded beneath. *Lamina* elliptic, oblong-elliptic, or lanceolate-elliptic, (6–)9–16(–20) × (2.5–)3.0–6.0(–8.5) mm, firm, adaxially glabrescent, abaxially acicular-strigose on veins; base obtuse; margins entire on the proximal 1/2–2/3 interval, distally with (1–)2–5 serrations per side, strigose; apex acute; cystoliths punctate-pusticulate, crowded; glands 2–5-seriate, minutely pateriform, 0.1–0.2 mm diameter, adaxial, discolorously black; venation brochidodrome-plinerval, lateral veins 4–8 pairs, inconspicuous, diverging 45–70° from the midrib, joining with stronger inframarginal veins ascending from the base; reticulum coarse, tessellate; costae adaxially impressed, higher order nervation invisible, veins planate or weakly raised below. *Female inflorescence* unknown. *Male inflorescence* axillary from foliate and aphyllous nodes, glomerate; flowers tetramerous, obovoid in bud, 1.0–1.5 × 0.7–1.3 mm, sessile or to c. 1 mm pedicellate, base obscured by chaffy bracts; perigonium valvate, cleft ± halfway,

anthetic lobes triangular, 0.6–1.0 × 0.5–1.1 mm, corniculate, strigose at the apex and on margins, glabrous inside; stamens antetepalous, incumbent, glabrous, anthers 2-celled; pistillode obovoid, stipitate. *Fruits* unknown.

*Field notes.* Leaf-blades firm or coriaceous, adaxially nitid green, abaxially glaucescent; male flowers in red axillary glomerules.

*Distribution.* Known only from the type locality (Fig. 2).

*Habitat.* Mossy subalpine forest on the margin of *Cyathea* savanna and along subalpine streams (Fig. 4).

*Additional specimens examined.* PAPUA NEW GUINEA. Enga Province, Waile Creek, *Takeuchi, Towati & Ama* 20144 (A, BISH, K, L, LAE); *Takeuchi, Towati & Ama* 20283 (A, LAE, MO).

#### Notes

*Cypholophus vaccinioides* and *C. treubii* were previously known with certainty only from the West Papuan syntypes cited by Winkler (1922). The Kaijende expeditionary report (Richards, in press) is the first published reference to these species since their original description.

*Cypholophus treubii* is a dominant undershrub in the Waile Creek subalpine zone, typically occurring alongside more familiar plants such as *Pipturus montanus* P.Royen and *P. pullei* H.Winkl. Several undetermined gatherings from Morobe



FIG. 4. Kaijende Highlands. *Cyathea* treefern savanna at Waile Creek-Omeke, type locality for *Cypholophus treubii* var. *aciculata*. The new variety typically occurs in the forest contact adjoining these open areas. The rangeland (foreground) is composed primarily of *Cyathea dicksonioides* Holttum and *C. atrox* C.Chr. var. *inermis* Holttum, with a grassy underlayer (in descending frequency) of *Chionochloa archboldii* (Hitchc.) Conert, *Arundinella furva* Chase, *Deschampsia klossii* Ridl. and *Poa keysseri* Pilger subsp. *keysseri*. The forest (background) is composed primarily of *Decaspermum alpinum*, *Eurya brassii* Kobuski, *Ilex archboldiana* Merr. & L.M.Perry, *Prunus pullei* (Koehne) Kalkman, *Quintinia kuborensis* P.Royen, *Symplocos cochinchinensis* var. *orbicularis*, *Syzygium alatum* (Lauterb.) Diels, *Vaccinium apiculatum* Sleumer and *Xanthomyrtus compacta* (Ridl.) Diels.

Province (e.g. NGF 16169) also belong with *Cypholophus treubii* sensu lato, their identity having been overlooked by earlier collectors.

The *Cypholophus vaccinioides*–*treubii* complex is one of the most easily recognized morphospecies in the genus. With nanophyllous leaves conspicuously marked by multiseriate disc-glands, the facies is unmistakable once the generic membership of the plants is established. The true range of this urticate has been obscured by its superficial resemblance to *Pilea* Lindl. and its unusual appearance compared with other *Cypholophus* Wedd. species. In modern collections of *Cypholophus treubii* sensu lato, the collectors have often been unable to place their specimens in the correct genus.

Winkler (1922) separated *Cypholophus vaccinioides* and *C. treubii* primarily on the basis of leaf size, number of lamina serrations, and the presence or absence of annulate abscission scars on stems (Table 3). Population-based samples from the Kaijende expedition encompass or connect the character states regarded as diagnostic by Winkler, to such an extent that the range of interspecific variation is expressed even on individual branches. Although Winkler's species are probably conspecific, their syntypes are not present at BO or L (the most likely repositories), and the presumed equivalence has not been confirmed by physical examination of historical material. The synonymy is thus presented provisionally, pending the outcome of a more exhaustive search of international herbaria. Since both binomials were established in the same publication, *Cypholophus treubii* is the name chosen for retention, its diagnosis being closest to the Kaijende populations from which the new variety is recognized.

*Cypholophus treubii* var. *aciculata* is distinguished by its unusually dense indument of acicular-strigose hairs on all vegetative parts except stipules. Both *Cypholophus vaccinioides* and *C. treubii* var. *treubii* are glabrous plants. Other specimens of *Cypholophus treubii* from Papua New Guinea (e.g. Hartley 11269, Hoogland 9712, NGF 16169) have at most widely scattered hairs and are glabrous to the naked eye.

#### ACKNOWLEDGEMENTS

The Kaijende Highlands expedition was funded primarily by Conservation International and the Porgera Joint Venture (operators of the Porgera gold mine). My activities in Papuan botany are supported by the National Science Foundation (exploration grant DEB 0315930), the Arnold Arboretum, and the Herbaria of Harvard University.

The Kaijende assessment was organized by Stephen Richards (herpetologist, South Australian Museum) and Bruce Beehler (ornithologist, Conservation International). Walter Kittredge and the curatorial staff of Harvard University Herbaria assisted with loans of critical specimens. Kanchi Gandhi, David Middleton, John Pipoly III, and Jan-Frits Veldkamp provided helpful responses to taxonomic inquiries. Edy Sambas (BO), Alex Sumadijaya (BO) and Gerard Thijssse (L) kindly obtained information on specimens at their respective institutions.

TABLE 3. Compilation of principal character states in the *Cypholophus vaccinioides*–*treubii* complex

<i>Cypholophus vaccinioides</i>	<i>Cypholophus treubii</i>	<i>Cypholophus treubii</i> var. <i>aciculata</i>
Dioecious shrub, stature unknown	Dioecious shrub; 1 m tall	Dioecious shrub; 0.5–2.0 m tall
Branchlets glabrous	Branchlets ± glabrous	Branchlets densely strigose, hairs harsh, persisting
Branchlets quadrangular or subterete, channelled, not annulate	Branchlets quadrangular, channelled, annulate- cicatricatous	Branchlets compressed, terete (or 4-angled), channelled or not, annulate or not
Stipules caducous, oblong, length unknown, apex obtuse, indument unknown	Stipules probably persisting, linear, 3–5 mm long, apex obtuse, base abaxially setose	Stipules persisting, linear-deltate, 3–7 mm long, apex attenuate, surfaces bifacially glabrous
Petiole up to 1 mm long	Petiole 1–2 mm long	Petiole 1–3(–5) mm long
Leaves decussate, equal or subequal	Leaves decussate, subequal	Leaves decussate, equal
Lamina elliptic, 5–9 × 3–5 mm	Lamina oblong, 12–22 × 6–9 mm	Lamina elliptic, oblong- elliptic, or lanceolate- elliptic, (6–)9–16 (–20) × (2.5–)3.0–6.0 (–8.5) mm
Lamina glabrous	Lamina adaxially ± glabrous, abaxially setose or puberulent	Lamina adaxially glabrescent, abaxially acicular-strigose on veins, densely strigose on margins
Lamina apex with two crenations, margins entire below the apex	Lamina crenato-serrate in upper half of blade, base subentire	Lamina with (1–)2–5 serrations per side, margin entire in the lower 1/2–2/3 of blade
Lamina glands foveolate, 1–3-seriate	Glands foveolate, in several series	Glands pateriform, 2–5-seriate
Male perigonium tetramerous; lobes hairy, not corniculate	Male perigonium tetramerous; lobes glabrous, obtuse (or subumbonate)	Male perigonium tetramerous; lobes strigose, consistently corniculate
Pistillode subglobose, sessile	Pistillode obovoid, stipitate	Pistillode obovoid, stipitate
Female flowers sessile	Female flowers sessile	Female flowers unknown

Two anonymous reviewers made many effective criticisms which are appreciatively acknowledged.

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*Received 22 January 2007; accepted for publication 16 April 2007*