

First record of Himalayan wineberry (*Rubus ellipticus* var. *obcordatus* (Franch.) Focke., Rosaceae) in New Zealand

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Introduction

On June 4, 2019, during a visit by two of the authors to Gills Scenic Reserve, Albany, an unusual bramble (Figure 1) was observed emerging from a vegetated roadside bank on Gills Road (-36.722828, 174.696011). The bramble was noted growing amongst a dense tangle of pink jasmine (*Jasminum polyanthum* Franch.), blackberry (*Rubus ulmifolius* Schott) and Chinese privet (*Ligustrum sinense* Lour.). Although no flowering or fruiting material was observed a specimen was collected (P.J. de Lange 14393 & D.J. Blanchon, UNITEC 10706) (Herbarium acronyms follow Thiers [2008-onward]), and that specimen was run through the *Rubus* key in Webb, Sykes and Garnock-Jones (1988). Of the species recorded by Webb et al. (1988), the closest match for the Gills Road *Rubus* was Japanese wineberry (*R. phoenicolasius* Maxim.), a species which has superficially similar reddish bristly stems and leaflets whose abaxial surfaces are whitish. However, the Gills Road *Rubus* stem bristles were not glandular; while the leaves of the specimen were 3(5)-foliolate (rather than 3-foliolate), distinctly coriaceous, (rather than chartaceous); adaxially dark green (rather than yellow-green to lime-green); glabrescent, and deeply rugose. Further, the leaflets of the Gills Road *Rubus* had truncate to obcordate, rather than acute to acuminate, apices and the leaf margins differed from *R. phoenicolasius* in being more finely and evenly serrulate.

Unable to determine its identity, images of the *Rubus* were passed to colleagues, one of whom, Sarah Killick, suggested that the specimens might be *R. ellipticus* Sm. a species not yet known from New Zealand but on the Ministry of Primary Industries (MPI) 'watch list'. Google-based searches confirmed a close match, so the specimens were run through the *Rubus* treatment

in the Hawaiian Flora (Wagner, Herbst & Sohmer, 1990). The Gills Road *Rubus* matched the description of *Rubus ellipticus* var. *obcordatus* (Franch.) Focke in all respects. Accordingly, images were sent to the Allan Herbarium (CHR) where they were examined alongside Hawaiian (Hawaii, Kilauea area, near Devastation Trail, W.R. Sykes 322/91, CHR 474161; Hawaii, 27 miles, Volcano, Otto Degener s.n. & Isa Degener, CHR 380402; Hawaii, Near Laukapu Street & Wright Road, 27 Miles, Puna, Otto Degener s.n. & Isa Degener, CHR 182980), Himalayan (Nepal, Solu Khumbu, Dudh Kosi Catchment, Between Lukla & Surkhe, W.R. Sykes 92/00, CHR 537362), and Sri Lankan (Sri Lanka, Nuwara Eliya, surrounding hills, C.F. & R.J. van Beusekom s.n., CHR 305441) specimens of *Rubus ellipticus* by Ines Schönberger, who confirmed the identification as "very likely". A subsequent search of *Rubus* postings on iNaturalist NZ also located another earlier (August 7, 2018) observation of *R. ellipticus* from the same location (<https://inaturalist.nz/observations/15185681>) that had been made by Harshi Tharaka, a contract worker for Wildlands, an environmental consultancy (M. Ford, personal communication, Wildlands Consultants Ltd, August 21, 2019) whilst doing a weed survey. That find, though correctly identified by iNaturalist respondents, is unsupported by a voucher, and had gone unnoticed by the relevant agencies until we drew their attention to it.

A further visit to Gills Road on June 8, 2019 collected additional specimens including flowering material (P.J. de Lange 14395, UNITEC 10775) and samples for DNA sequencing. DNA was extracted using DNeasy Plant Mini Kits (Qiagen, Germany) and following the manufacturer's instructions. The primer pairs *rbcl*-1F (5'-ATG TCA CCA CAA ACA GAA AC-3') and *rbcl*-724R (5'-TCG CAT GTA CCT GCA GTA GC-3') were used for amplification of the *rbcl* cpDNA region (Bafeel et al., 2012) and ITS-u1 (5'-

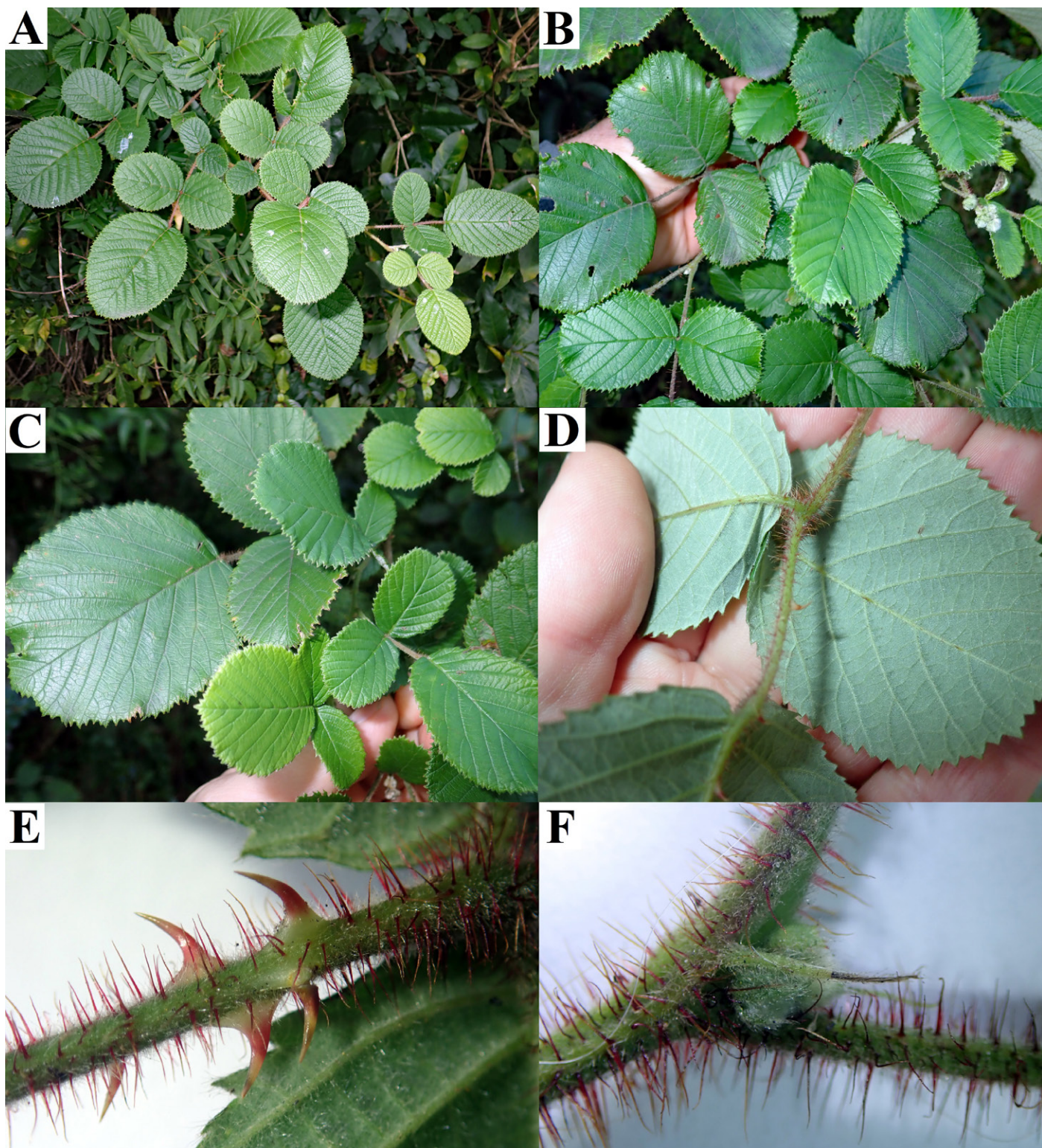


Figure 1 A-F. *Rubus ellipticus*, Gills Road, Albany. **A.** Primocane emerging from surrounding vegetation showing 5-foliolate leaves (an unusual condition in this species); **B.** Floricane, showing an immature inflorescence, and the more usual 3-foliolate leaves, note the dark green, deeply rugose adaxial leaflet surfaces; **C.** Leaves (adaxial surface), note the elliptic truncate leaflets and the finely denticulate lamina;

D. Leaves (abaxial surface) showing the paler whitish-green, finely velutinous leaflet surface, sparingly armed mid vein and rounded leaflet bases; **E.** Portion of stem showing prickles interspersed with red-purple bristles, sparse glandular and dense covering of finer hyaline trichomes; **F.** A portion of floricanes showing stipule, and young vegetative bud. Images: P. J. de Lange

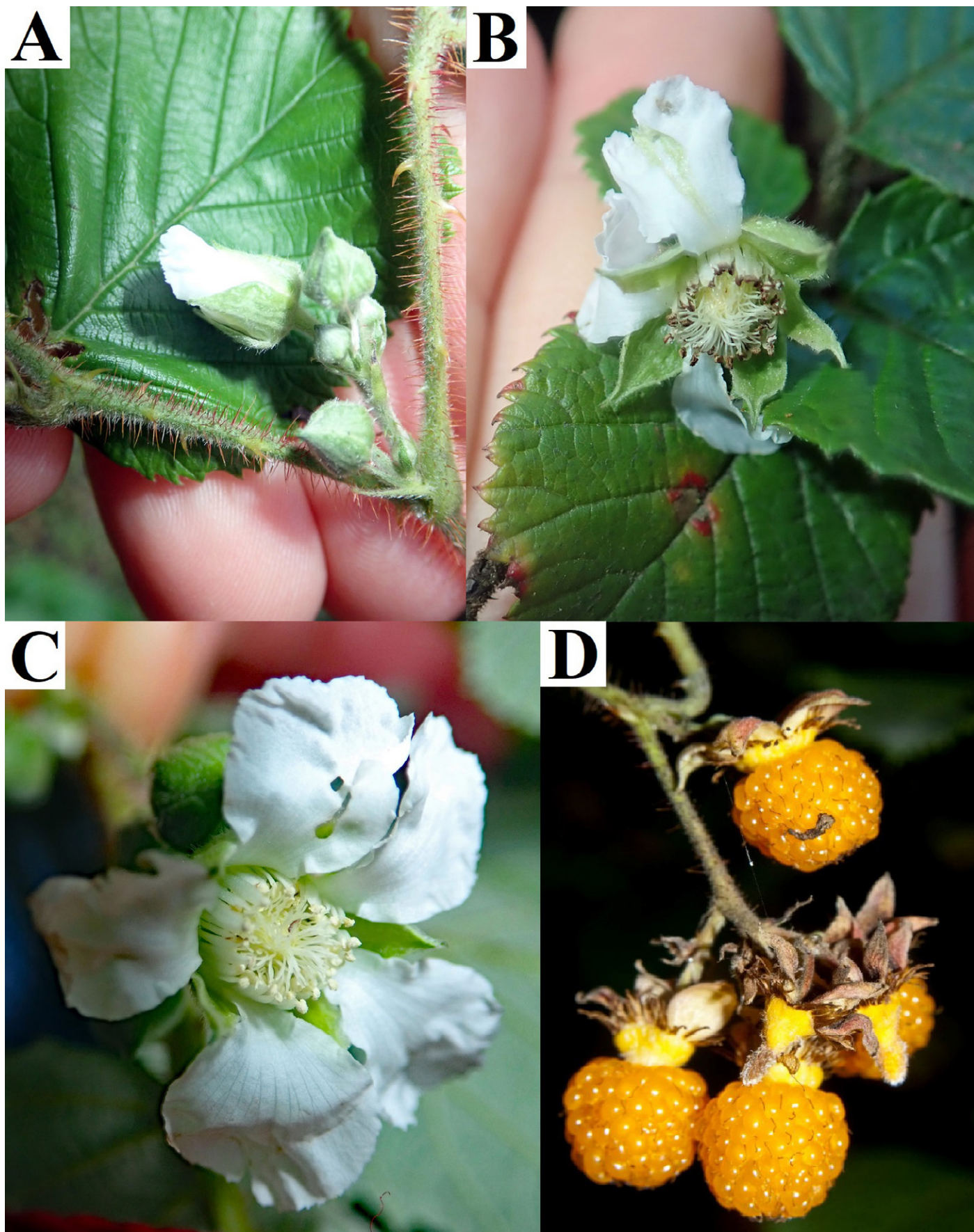


Figure 2 A-D. *Rubus ellipticus*, Gills Road, Albany. **A.** Maturing axillary inflorescence; **B.** Senescent flower showing spatulate petal with praemorse apices; **C.** Freshly opened flower; **D.** Ripe

fruit. Images: P. J. de Lange, except for **D**, taken by 'the plant hunter' (see <https://www.flickr.com/people/sferox/>)

GGA AGK ARA AGT CGT AAC AAG G-3') and ITS-u2 (5'-GCG TTC AAA GAY TCG ATG RTT C-3') were used for amplification of the Internal Transcribed Spacer (nrDNA ITS) region (Cheng et al., 2016). Comparison of the resulting DNA sequences (Genbank accession numbers MN726349 (cpDNA rbcL) and MN718726 (nrDNA ITS)) with published sequences confirmed the identity of the *Rubus* as *R. ellipticus*. Accordingly, the find was reported to MPI who independently confirmed our findings (Laura Goudie, personal communication, Ministry for Primary Industries, Biosecurity, August 6, 2019).

Here we provide a description of *Rubus ellipticus* var. *obcordatus* based on Gills Road specimens, and describe the habitat to formally document the discovery as a new addition to the naturalised flora of New Zealand.

Taxonomy

Rubus ellipticus* var. *obcordatus (Franch.) Focke. *Biblioth. Bot.* 17(Heft 72):199. 1911 (Sp. rub. 199.)

DESCRIPTION (FIGURES 1, 2): Stout, weakly climbing, evergreen shrub; stems 3–5m long, forming thickets several metres wide, primocanes erect, initially purple-brown maturing brownish, ±pubescent, densely invested with purple-brown or purple-red eglandular bristles, pale hyaline and sparse short glandular trichomes, armature mostly sparse, sometimes locally aggregated, glabrous prickles, these spreading or curved, up to 6mm long; floricanes initially greenish, maturing purple-brown, sparsely to moderately pilose with similar investiture to primocanes; bearing sparse, stout, straight to recurved prickles up to 6mm long, and more frequent smaller 3-4mm long, slender, spreading prickles. Leaves persistent, imparipinnate, coriaceous, leaflets 3(5)-foliolate; petiole 20-40mm long, petiolules of lateral leaflets, subsessile sometimes up to 10mm long, those of terminal leaflet 20-30mm long; petiolule and rachis purple-red, bristly, pubescent, with sparse minute prickles; stipules proximally pale green with distal portion darker purple-green, linear to narrowly linear deltoid, 7-11 × 1-3mm, finely pubescent, with intermixed glandular hairs (these increasing in frequency toward apex); leaflets elliptic to broadly obcordate, 40-80(90) × 30-60(90) mm, terminal leaflet largest (60-80(120) × 60-90mm) with those of primocanes often smaller; adaxial leaflet surface dark green, deeply rugose, sparsely pilose, glabrescent, abaxial surface initially

whitish maturing green-white, finely, densely velutinous, pilose, bearing purple-red bristles along veins, adaxially veins impressed, pubescent along midvein midrib bearing sparse, stout recurved prickles and smaller straight ones; leaflet base rounded, margin minutely unevenly serrulate, teeth acute; apex acute, abruptly pointed, shallowly cordate, emarginate or subtruncate. Inflorescences terminal, in dense, short panicles 50-80 × 20-60 mm, flowers (2-)5-10(16) per inflorescence, or present as few-flowered, often paired (rarely solitary) flowers borne in leaf axils; rachis and pedicles greenish, pubescent, furnished with fine purple bristles and sparse straight or recurved short (0.8-1.5mm long) prickles; bracts green, green brown to purple-green, linear, 5-8 finely pubescent. Pedicels 4-6(8)mm long. Flowers 10-15mm diameter. Calyx abaxially pubescent, tomentum pale yellow, velutinous, sparsely furnished with pale purple bristles; sepals ovate, 4-5(6) × 2-3(4) mm, abaxially pale yellow-grey tomentose, with sparse pale purple bristles, apex abruptly acute, sometimes ±acuminate. Petals white, ± spathulate, 7-9 × 8-10mm, equal to or longer than sepals, margin praemorse, ± undulose, base clawed. Stamens numerous, shorter than petals; filaments broadened and flattened basally, anthers cream. Ovary pubescent; styles glabrous, slightly longer than stamens. Fruits not seen.

SPECIMENS SEEN: New Zealand: North Island, Auckland, Albany, Gills Road: *P.J. de Lange* 14393 & *D.J. Blanchon*, UNITEC 10706; *P.J. de Lange* 14395, UNITEC 10775.

NOTES: New Zealand plants are referable to *Rubus ellipticus* var. *obcordatus*, which differs from the type in having obcordate to truncate rather than acuminate leaflets (Wagner et al. 1990). This variety is indigenous to tropical and subtropical continental Asia (China, Nepal, India) as well as Sri Lanka and the Philippines (Becking, 1979; Wagner et al., 1990). However, it is widely naturalised throughout tropical Africa, Australia, Ecuador, Jamaica, Costa Rica and the Hawaiian Islands (Becking, 1979; Parmar & Kuashal, 1982; Wagner et al., 1990).

Of those *Rubus* recorded as naturalised from New Zealand, *R. ellipticus* var. *obcordatus* is, as previously noted, superficially similar to Japanese wineberry (*R. phoenicolasius*). From that species it is easily distinguished by the darker green, deeply rugose, more finely serrated elliptic leaves with obcordate to truncate rather than acuminate leaflets; primocanes and floricanes furnished with purple to purple-brown, purple-

red eglandular bristles, linear to narrowly deltoid linear stipules, and flowers with white obovate to spatulate petals with praemorse apices. At the time of the discovery fruiting material was not present, however, the aggregate fruits of *Rubus ellipticus* are comprised of golden yellow rather than orange-red or dark red drupelets.

To date, *Rubus ellipticus* var. *obcordatus* is only known from private land in the vicinity of Gills Scenic Reserve and from a small area along Gills Road. In that area 14 individuals were noted during inspections by the first author. These specimens ranged in height from 1–5 metres with the tallest individuals having their growth supported by the surrounding vegetation. Most of the vines grow admixed within a heterogeneous assemblage of blackberry (*Rubus ulmifolius*), pink jasmine (*Jasminum polyanthum*), Chinese privet (*Ligustrum sinense*), tree privet (*L. lucidum* W.T.Aiton), mahoe (*Melicytus*

ramiflorus J.R.Forst et G.Forst. subsp. *ramiflorus*), karamu (*Coprosma robusta* Raoul) and *C. macrocarpa* subsp. *minor* A.P.Druce ex R.O.Gardner et Heads × *C. robusta* Raoul.

Subsequent, more comprehensive searching of the area by MPI did not find any further specimens growing in the Gills Scenic Reserve.

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Ines Schönberger is the Collection Manager of the Allan Herbarium, Manaaki Whenua Landcare Research. Through her undergraduate and graduate studies at the University of Regensburg, Germany, she developed a strong botanical knowledge, with specific interests in taxonomy, systematics and ecology. During her PhD research about the biosystematics and taxonomy of the *Ozothamnus leptophyllus* (Compositae) complex in New Zealand at the University of Canterbury, Christchurch, she gained a good understanding of the New Zealand flora. Her current role involves protecting, enhancing and promoting the Allan Herbarium, and maintaining it as a useful scientific resource.

Sarah Killick is a doctoral candidate in the School of Environment, University of Auckland, and a Research Assistant in the Unitec Herbarium, Unitec Institute of Technology. Contact: Sarah.killick@gmail.com