NEW ZEALAND PLANT CONSERVATION NETWORK

TRILEPIDEA

Newsletter of the New Zealand Plant Conservation Network

No. 201

August 2020

Deadline for next issue: Friday 16 September 2020

SUBMIT AN ARTICLE TO THE NEWSLETTER

Contributions are welcome to the newsletter at any time. The closing date for articles for each issue is approximately the 15th of each month.

Articles may be edited and used in the newsletter and/or on the website news page.

The Network will publish almost any article about plants and plant conservation with a particular focus on the plant life of New Zealand and Oceania.

Please send news items or event information to events@nzpcn.org.nz

Postal address:
c/- 160 Wilton Road
Wilton
Wellington 6012
NEW ZEALAND

PLANT OF THE MONTH, p. 2

Gratiola concinna.
Photo: Jeremy Rolfe.

New exotic host for the dwarf mistletoe *Korthalsella salicornioides*

John Barkla (mjbarkla@xtra.co.nz)

On 16 August 2020, while walking the Abel Tasman Coastal Track, I observed and photographed the dwarf mistletoe *Korthalsella salicornioides* [Viscaceae] hemiparasitic on its gorse (*Ulex europaeus* [Fabaceae]) host. One gorse shrub was observed hosting several large plants of *Korthalsella salicornioides* (Fig. 1).

Figure 1. *Korthalsella salicornioides* hemiparasitic on gorse. Abel Tasman National Park, 16 August 2020. Photo: John Barkla.

The site is on gentle hill country, approximately 60 metres above sea level and located about halfway between The Anchorage and Watering Cove. Trackside vegetation here comprises coastal shrubland dominated by kanuka (*Kunzea ericoides*) with manuka (*Leptospermum scoparium*) and prickly mingimingi (*Leptocophylla juniperina* subsp. *juniperina*) both common. Gorse is sporadically present, occupying otherwise bare ground that may be a result of the track's construction and maintenance.

Korthalsella salicornioides was abundant on host kanuka growing in close proximity to the gorse shrub host. I did not observe it on any other associated taxa.

Sultan et al. (2018) documented the host range of New Zealand's *Korthalsella* mistletoes and determined the degree of host specificity in each species based on occurrence data. Of New Zealand's three *Korthalsella* species they found *Korthalsella salicornioides* to be the most host-specific, with 96% of the total records from *Leptospermum scoparium* s.l. [Myrtaceae] and *Kunzea robusta* [Myrtaceae] hosts. Overall, they found the hosts recorded for *Korthalsella salicornioides* comprise 26 taxa from six genera in five families.

The Fabaceae family, of which gorse belongs, has previously been identified as a *Korthalsella salicornioides* host family (Sultan et al. 2018) through the recording of *Sophora chathamica* and *S. microphylla* hosts.

Hosts for *Korthalsella salicornioides* are predominantly indigenous with just three exotic hosts, *Erica lusitanica* (Ericaceae), *E. arborea* and *E. vagans* recorded (Sultan et al. 2018). The inclusion of gorse (*Ulex europaeus*) increases the list of known exotic hosts of *Korthalsella salicornioides* to four.

Reference

Amir Sultan, Jennifer A. Tate, Peter J. de Lange, David Glenny, Jenny J. Ladley, Peter Heenan & Alastair W. Robertson (2018). Host range, host specificity, regional host preferences and genetic variability of *Korthalsella* Tiegh. (Viscaceae) mistletoes in New Zealand. *New Zealand Journal of Botany, 56 (2):* 127–162. DOI: 10.1080/0028825X.2018.1464476

First record of *Zwackhia viridis* (Lecanographaceae) from the Chatham Islands

Andrew J. Marshall (eco@lgm.kiwi) & Peter J. de Lange (pdelange@unitec.ac.nz), School of Environmental & Animal Sciences, Unitec Institute of Technology, Auckland.

Our knowledge of the Chatham Islands lichenized mycobiota is steadily growing from the 48 species recognized from the islands by Galloway (2007). Since 2008 there has been a concerted effort to collect lichens from the islands by visiting lichenologists resulting in a current, as yet unpublished, listing for the islands of c.352 lichen taxa (de Lange unpubl. data). Along the way a new, seemingly endemic lichen, *Lecanora kohu*, has been described from the Chathams (Printzen et al. 2017), a fitting replacement for the previous assumed endemic *Caloplaca maculata* (Galloway 2004) which has since been found on the coastline south of Dunedin, New Zealand (de Lange 2019).

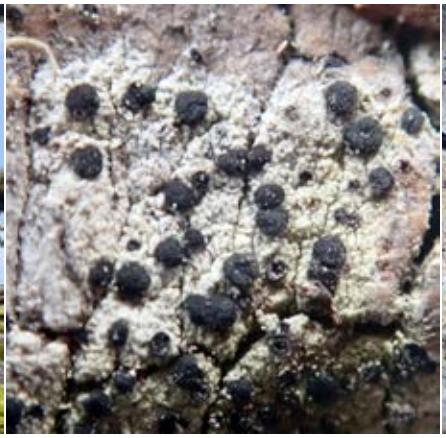
As with other lichen listings for the main islands of New Zealand, the most under-represented groups recorded from the Chatham Islands are those with a crustose growth habit, this despite the fact that 'lichen crusts' are the main contributors to the 2300 lichen taxa currently recognized from the New Zealand archipelago (de Lange et al. 2018; Marshall et al. 2019). Their under-representation in Chatham Islands lichen collections is in part because they can be hard to collect (especially off rocks) and also because they are much harder to identify than many of the larger 'leafy' (foliose) lichens. Crust identification often requires a myriad of chemical spot tests not only of the lichen thallus, but the fruiting bodies internal structure, spore bearing asci and the spores (ascospores) themselves. Noting the colour reactions (or lack thereof) using sodium hypochlorite—the 'C' test, potassium hydoxide—the 'K' test, iodine—the 'I' test, and para-phenylenediamine—the 'Pd' test, is often critical; as also is whether the various lichen structures fluoresce under an ultra-violet light. Even with those tests, and careful measurement of ascus and ascospores, further testing using thin-layer chromatography and DNA sequencing may still be necessary. This is of course a lot of work, such that one identification can sometimes take a day or so of patient dissection and microscopy supplemented with the chemical tests aforementioned. This is worth it though. Lichen crusts are more varied than people would think, they come in all different shapes and sizes, and many are stunningly beautiful, others though truly fit the adage that 'beauty is in the eye of the beholder'.

Accepting then that Chatham Island lichen crusts are still poorly collected, since 2018 there has been renewed effort to sample crustose lichens by the junior author. Most of those collections have ended up at the UNITEC herbarium on the Auckland's Unitec Institute of Technology (now included in a larger New Zealand Institute of Technology) campus. There, staff have started to work over the crustose lichens of the northern North Island, and, as specimens are received, those from the Chatham Islands. Further, as expertise grows in particular genera a concerted effort has been made to collect these. So for example, following the publication on New Zealand *Pyrenula* by Marshall et al. (2019) the call was made to sample better the Chatham Island lichens of this genus. *Pyrenula* are a great example of 'beauty is in the eye of beholder'; most specimens resemble a splotch of dried greenish or whitish-coloured varnish covered in black spots (Fig. 1.). The first step toward their identification requires digging out the black spots (the spore bearing perithecia) and extracting the spores – usually a fiddle and all too often one finds mites have beaten you to it and eaten all of the spores.

Figure 1. *Pyrenula nitidula* as seen growing on the trunk of nikau (*Rhopalostylis sapida*), Nikau Bush Conservation Area, Rekohu / Wharekauri / Chatham Island. Photo: P.J. de Lange.

Despite this all too common annoyance, last year during visits to Rekohu / Wharekauri / Chatham Island, a range of *Pyrenula* lichens were collected. However, lichen crust collections are rarely 'pure'

samples of one species, they often comprise admixtures of several lichens growing interdigitated. One such admixed *Pyrenula* sample came from nikau (*Rhopalostylis sapida*) (Fig. 2) at Nikau Bush Conservation Area. That sample contained a dominance of *Pyrenula nitidula* (Fig. 1, UNITEC 11762), the intended collection. But there was also plenty of *Megalaria maculosa* (Fig. 3, UNITEC 11761), and another innocuous white crustose lichen—some kind of graphid or scribble lichen (Fig. 4, UNITEC 12163).



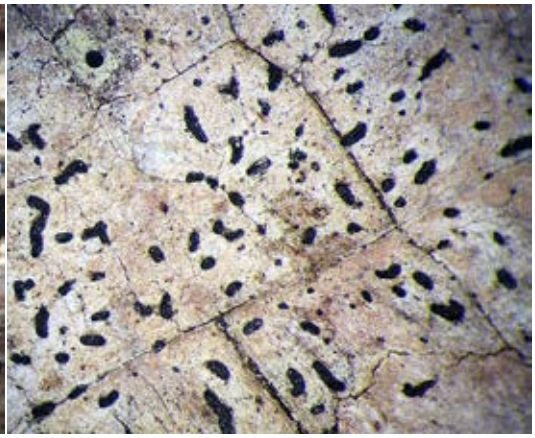


Figure 2 (left).: A stand of nikau (*Rhopalostylus sapida*), Nikau Bush Conservation Area, Rekohu / Wharekauri / Chatham Island. Photo: P.J. de Lange.
Figure 3 (centre): *Megalaria maculosa* as seen on the trunk of nīkau (*Rhopalostylis sapida*), Nikau Bush Conservation Area, Rekohu / Wharekauri / Chatham Island. Photo: P.J. de Lange.
Figure 4 (right): *Zwackhia viridis* as seen on the trunk of nīkau (*Rhopalostylis sapida*), Nikau Bush Conservation Area, Rekohu / Wharekauri / Chatham Island. Photo: P.J. de Lange.

Graphid lichens are the common name given to a grouping of lichens whose fruiting bodies (lirellae) often look like black scribbles or lines (Fig. 5). The one found on the nikau bark sample however, was a clear cut graphid, though in this case the black lirellae were rather unprepossessing (Fig. 4)

Preliminary examination suggested that the graphid 'by catch' in the nikau sample might be a species of *Opegrapha*. However, the Chathams specimen has very long (42.5 × 6–8 µm), fusiform ascospores (Fig. 6), each bearing up to 18 tabular locules (compartments). Unable to resolve the probable species, images were taken and these were sent to Dr Robert Lücking in the Botanischer Garten und Botanisches Museum, Berlin. Robert suggested that the specimen might be a species in the genus *Zwackhia*, and, as we lacked the critical literature, he kindly sent an electronic copy of Ertz (2008).

Figure 5. *Arthonia atra* showing the classic 'scribbly' fruiting bodies (lirellae) that give the common name 'graphid' to these sorts of lichens. This specimen was noted on the trunk of Chatham Island ngaio (*Myoporum semotum*), Kaingaroa Rekohu / Wharekauri / Chatham Island. Photo: P.J. de Lange.

Figure 6. *Zwackhia viridis* ascospore extracted from the specimen collected from Nikau Bush Conservation Area, Rekohu / Wharekauri / Chatham Island. Photo: A.J. Marshall.

Ertz (2008) did a major revision of the bark-inhabiting (corticolous) *Opegrapha* (some of the species treated there as *Opegrapha* are now placed in *Zwackhia*). To work the key to the "*Opegrapha*" in Ertz (2008) also required another range of dissections of the lirellae, including cutting cross-sections of these and then staining those with a precise sequence of iodine and potassium hydroxide to check for

colour reactions (Fig. 7). Though a protracted process the result was a definitive identification of the Nikau Bush specimen as an example of *Opegrapha viridis*—now treated as *Zwackhia viridis*. Key characters of *Zwackhia viridis* noted in the specimen examined included a continuous excipulum, the absence of an iodine (blue) reaction in subhymenial tissue, and the absence of oil droplets in the hymenial gel. The hymenial tissue was however iodine positive (red) with a distinct blue reaction when flushed with potassium and iodine. The thallus of the specimen lacked an ultra-violet reaction. The ascus measured 75 × 62 µm, with apex of the asci presenting a distinct blue ring after flushing with potassium and iodine. The ascospores however, lacked an iodine reaction.

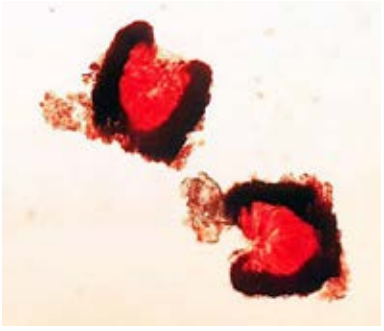


Figure 7. *Zwackhia viridis* hymenial tissue staining red following treatment with iodine. This colour reaction is one of the diagnostic chemical spot tests used to identify this species. The tissue seen here, is a cross-section of the lirellae (fruiting body) that was extracted from the specimen collected from Nikau Bush Conservation Area, Rekohu / Wharekauri / Chatham Island. Photo: A.J. Marshall.

Zwackhia viridis has hitherto not been recorded from the New Zealand archipelago (de Lange et al. 2018), it is an eastern Australian species (Ertz 2008—as *Opegrapha viridis*). With a distribution such as this, its presence on the Chatham Islands probably means it has been overlooked in New Zealand, or more likely, it has already been collected and lodged within our nation's herbaria but such specimens have as yet not been recognised as that species. While it is unlikely that *Zwackhia viridis* has somehow bypassed the larger islands of New Zealand to make landfall on the Chatham Islands, this biogeographic anomaly is still possible. After all, *Leucopogon parviflorus* (Fig. 8), a locally common Chatham Islands shrub mostly seen in the sand country on Rekohu / Wharekauri / Chatham Island is also native to and abundant along the coastline of eastern Australia and Tasmania. This species does however bypass the North, South and Stewart Islands of New Zealand, its only known occurrence outside Australia is the Chatham Islands (de Lange et al. 2003).

Figure 8. *Leucopogon parviflorus* a species of 'mingimingi' abundant on Rekohu / Wharekauri / Chatham Island which is otherwise known only from eastern Australia. It has never been found on the main islands of New Zealand. Photo: P.J. de Lange.

If *Zwackhia viridis* also does this, only dedicated collecting throughout New Zealand and patient hours spent behind a microscope will truly tell. For now, all we can say is that we are still adding to our knowledge of the lichen mycobiota of the Chatham Islands, and for New Zealand as a whole we have added another species, and in this case genus to the national tally of lichens.

Acknowledgements

Thanks to Dr Robert Lücking for helping guide us to the identity of *Zwackhia viridis*.

References

de Lange, P.J. 2019: The ongoing slide to extinction of the enigmatic Chatham Island linen flax (*Linum monogynum* var. *chathamicum*). *Trilepidea 190*: 3–7.

de Lange, P.J.; Heenan, P.B.; Dawson, M.I. 2003: A new species of *Leucopogon* (Ericaceae) from the Surville Cliffs, North Cape, New Zealand. *New Zealand Journal of Botany 41*: 13–21.

de Lange, P.J.; Blanchon, D.J.; Knight, A.; Elix, J.; Lücking, R.; Frogley, K.M.; Harris, A.; Cooper, J.A.; Rolfe, J.R. 2018: Conservation status of New Zealand lichens and lichenicolous fungi, 2018. *New Zealand Threat Classification Series 27*: 1–64.

Ertz, D. 2008: Revision of the corticolous *Opegrapha* species from the Palaeotropics. *Bibliotheca Lichenologica 102*. 176 p.

Galloway, D.J. 2004: New lichen taxa and names in the New Zealand mycobiota. *New Zealand Journal of Botany 42*: 105–120.

Galloway, D. J. 2007: Flora of New Zealand – Lichens (revised second edition). Manaaki Whenua Press, Lincoln, New Zealand.

Marshall, A.J.; Blanchon, D.J.; Aptroot, A.; de Lange, P.J. 2020: Five new records of *Pyrenula* (Pyrenulaceae) for New Zealand. *New Zealand Journal of Botany 58*: 48–61.