NEW ZEALAND PLANT CONSERVATION NETWORK

TRILEPIDEA

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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.

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NEW ZEALAND

PLANT OF THE MONTH, p. 2

Townsonia deflexa.
Photo: Ian St George.

A revision of the *Sticta filix* group results in a rediscovered species, a new combination and the potential use of these as bioindicators of forest health

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Lichens are an amalgam of a fungus, and green, blue-green or sometimes both, algae. This relationship, a symbiosis, is perhaps best explained as the lichen farming the alga. The alga provides food for the fungus and in turn the fungus provides shelter and protection. New Zealand has c. 2000 different kinds of lichens, many of which are endemic or now scarce in other parts of the world because of changing climate, air pollution or over-collection by people (de Lange et al., 2012).

Since 2015, Unitec researchers have been working with an international team of lichenologists on the New Zealand members of the global lichen family the Lobariaceae. The Lobariaceae is a charismatic group of large foliose lichens found throughout the world. Because of their large size, they are also commonly used for physiological studies of lichen metabolism and as bioindicators of ecosystem health; indeed, one, *Lobaria pulmonaria* (Fig. 1), is effectively the equivalent of the 'lab rat' as the ideal 'model organism' used in laboratory experiments on lichens worldwide.

Fig. 1. *Lobaria pulmonaria* on holm oak (*Quercus ilex*), Illorai Foresta, Sardinia. Photo: P.J. de Lange.

New Zealand is recognized hotspot of diversity for the Lobariaceae and as such has become a popular place for their further study (de Lange et al., 2012; de Lange and Galloway, 2015; Ranft et al., 2018). In-depth research on the New Zealand members of the family by the late David Galloway (de Lange, 2014) helped resolve the nomenclatural mire of names that had been used for the c. 90 or so New Zealand species. David's lichen studies were typical of his time, basing taxonomic decisions and classification schemes on lichen chemistry and morphology.

In the last decade, there has been a renewed global interest in Lobariaceae taxonomy (see Moncada et al., 2014; Ranft et al., 2018). For these studies, researchers have been using molecular methods to sort out perceived species complexes. In New Zealand, Unitec is one of the few tertiary institutions left that teaches about lichens. It also has one of the few (if not now the only) herbarium devoted to lichens. Because of this expertise and resource, Drs Dan Blanchon and Peter de Lange from the Environmental and Animal Sciences Pathway have been involved with lichenologists Dr Thorsten Lumbsch (Field Museum, Chicago, USA), Dr Robert Lüking (Botanic

PLANT OF THE MONTH – *TOWNSONIA DEFLEXA*

Townsonia deflexa. Photo: Ian St George.

The plant of the month for April is one of the gnat orchids, *Townsonia deflexa,* the only *Townsonia* species endemic to the New Zealand region. The species can be found from the lower North Island down to Stewart Island and is generally seen in lowland to high altitude forest, most commonly in beech forest. It is generally in sparse colonies emerging from moss clumps on the forest floor. The plant is hard to see and is often overlooked because it is small and blends in with leaf litter. Each plant has two elliptical leaves, overtopped by one to four motley green and red flowers and has creeping rhizomes with tubers below the ground surface. The lateral sepals of the flowers are distinctively long and pointed downwards.

In New Zealand, the species is most similar in appearance to the related *Acianthus sinclairii*. *Townsonia deflexa* can be distinguished by its smaller petiolate basal leaf, which is distinct from the flowering stem (the basal leaf is attached in *Acianthus*). The sepals of the flowers of *Townsonia* are also caudate (tapering into along tail-like appendage), but are not in *Acianthus*.

The species is currently listed as At Risk—Naturally Uncommon because it has a wide distributional range but is relatively sparse within this area. It is possibly browsed by introduced herbivores but, because of its obscurity, this would be hard to assess.

The genus *Townsonia* includes only two species. The other, *Townsonia viridis*, is an Australian species found in Tasmania. Being an orchid, *T. deflexa* is in the family Orchidaceae. The genus is probably most closely related to the similar looking genus *Acianthus*. There is still some controversy around whether *T. deflexa* is distinct from the Australian *T. viridis*. The genus is named after William Lewis Townson who, though trained in medicine, worked in New Zealand as a pharmacist and collected specimens for Kirk and Cheeseman. The species epithet *deflexa* means 'bent sharply downwards', presumably referring to the angle of the flowers. You can view the NZPCN website factsheet for *T. deflexa* at: http://www.nzpcn.org.nz/flora_details.aspx?ID=330

Garden and Botanical Museum, Berlin, Germany) and Bibiana Moncado (University of Franciso José Caldra, Bogotá, Columbia) on a revision of the New Zealand representatives of the Lobariaceae using a combination of molecular and morphological methodologies.

Fig. 2. *Sticta filix* showing the upper surface (left) and under surface of the thallus. Tupapakukuri Waterfall Track (Fishers Track), Erua Forest.
Photos: Robert Lücking.

One of the first groups they studied is the *Sticta filix* group (Fig. 2). These are large leafy lichens characterized by having a 'holdfast' attachment at the base of the lichen thallus, a dominant green algal partner (photobiont) and a minor secondary blue-green algal partnership. The research team has just published a paper on the group in '*The Lichenologist*' (Ranft et al., 2018) that has resolved the status of two enigmatic lichens previously referred to the genus *Dendriscocaulon* (Fig. 3), and reinstated *Sticta menziesii*, a species previously relegated to synonymy within *S. latifrons*.

Fig. 3. *Sticta dendroides* showing upper and undersides of the thallus—this is the cyanomoph previously known by the name *Dendriscocaulon dendoides*, Tupapakukuri Waterfall Track (Fishers Track), Erua Forest. Photos: Robert Lücking.

Dendriscocaulon is now widely regarded as an artificial genus of lobariaceous lichen that results from a 'failed' or 'failing' partnership in the green *Sticta* lichens. *Dendriscocaulon* form when the green dominant partner of the *Sticta* symbiosis has been lost, leaving the fungus and blue-green algal associate to grow independently as a cyanomorph. When free-living, *Dendriscocaulon* resemble small grey-black or black broccoli (Fig. 3). This was why, for such a long time, they were regarded as another genus. However, on occasions, the same weird structures can be seen protruding from the base of an otherwise seemingly normal 'green' *Sticta*; these observations coupled with modern molecular studies has shown that *Dendriscocaulon* are really just incompletely developed *Sticta* lichens.

As part of their study, Ranft et al. (2018) revisited the New Zealand *Dendriscocaulon*. Previously, two species had been recognized for New Zealand, *D. dendriothamnodes* and *D. dendroides* (Galloway 1985). However, in his last treatment of them, Galloway (2007) already acknowledged the artificial nature of the genus; whilst he retained them, he treated them as "*Dendriscocaulon dendriothamnodes*" and "*Dendriscocaulon dendroides*", mostly because he wasn't exactly sure of their relationships to New Zealand *Sticta* but also because David admitted to me (*in litt*.) he 'liked them as they were'. Now, Ranft et al. (2018) have partially unravelled the status of one "species" *Dendriscocaulon dendroides*, which they shifted to *Sticta* as a new combination *S. dendroides*. They made this new combination because they were unable to discover the green algal dominant *Sticta* that the cyanomorph belongs to and, by making it the name *Dendriscocaulon dendroides*, it is now removed from the New Zealand lichen mycobiota. Further, the new combination correctly assigns that symbiosis to *Sticta*—it will, of course, be interesting to see what green-dominant *Sticta*, the cyanomorph *S. dendroides* is eventually paired with—we may need to look to Australia to find that out! Ranft et al. (2018) also showed that the cyanomorph referred in New Zealand to *Dendriscocaulon dendriothamnodes* is not present here (that cyanomorph forms only in association with the Australian endemic *Sticta stipitata*). Instead, the superficially similar cyanomorphs seen in New Zealand that have been confused with the Australian *D. dendriothamnodes* are associated with *Sticta latifrons* and *S. menziesii*. As expected, the study also showed that *Sticta filix* has its own free-living "*Dendriscocaulon*" cyanomorph.

Fig. 4. *Sticta menziesii*—a species of dense forested situations. Tupapakukuri Waterfall Track (Fishers Track), Erua Forest. Photo: Robert Lücking.

The second part of the paper revived the name *Sticta menziesii* (Fig. 4). This species had been treated as a synonym of *S. latifrons* (Fig. 5) (Galloway 1985, 2007). Ranft et al. (2018) have now shown that *S. menziesii* is morphologically and genetically distinct from *S. latifrons*, with which it sometimes grows, and that it has its own unique *Dendriscocaulon* cyanomorph.

The study also noted that *Sticta menziesii* and *S. dendroides* were confined to what they called 'intact' forested ecosystems. That is, these two lichens favoured forests with low possum, goat and deer densities. *Sticta latifrons*, they noted, was more common in 'open' forest, so it was more often seen in forest damaged by these browsing animals. The potential for *Sticta latifrons* and *S. menziesii* to be used as a 'quick-check' forest health indicator (Ranft et al., 2018) is worthy of further study.

Fig. 5. *Sticta latifrons*—a widespread species favouring high light situations in locations where there is usually moist air movement or ponding (such as fog). Toatoa, Raukumara Range. Photo: Robert Lücking.

Acknowledgements

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Botanical Art Exhibition, "Ngāi Tipu Taketake – Indigenous Flora" Auckland Botanic Garden

Two threatened plants feature in a botanical art exhibition organized by the Botanical Art Society of New Zealand and the Friends of Auckland Botanic Gardens: *Dactylanthus taylorii* and *Sonchus kirkii*. Much of the exhibition, of 56 artworks, takes on more traditionally 'beautiful' native plant subjects—kowhai, harakeke, fuchsia, etc. However, two artists have chosen to these two rather less photogenic rare species. Sue Wickison's painting of *Dactylanthus* includes detailed depictions of male and female flowers, ripe fruit and its pollinator the short tailed bat (one with pollen on its face). Paula Cable has painted native puha (*Sonchus kirkii*), a plant we are forever having to label "not a weed" because people mistake it for one (it has a habit of always moving away from its label).

The exhibition is on until 1 July, in the Auckland Botanic Gardens Visitor Centre. The exhibition then moves to Wellington Botanic Gardens (August 1 – September 9), the Millennium Gallery, Blenheim (November 3 – December 9) and then, hopefully, to Christchurch (TBC).

For more information:
http://www.aucklandbotanicgardens.co.nz/whats-on/events/botanical-art-worldwide-2018/
https://www.botanicalartworldwide.info/new-zealand/

UPCOMING EVENTS

If you have important events or news that you would like publicised via this newsletter please email the Network (events@nzpcn.org.nz):

International Federation of Landscape Architects

55th World Congress: 15–21 July 2018, Singapore at the Sands Expo and Convention Centre. In conjunction with the Singapore Garden Festival. The themes are: 'Biophilic City; Smart Nation; Future Resilience. To register please contact: http://www.ifla2018.com/conference-registration

12th Australian Plant Conservation Conference

Hosted by: Centre for Australian National Biodiversity Research (CANBR) at CSIRO. **Venue:** CSIRO Discovery at the Black Mountain Science and Innovation Park, Canberra. **Date:** 12–16 Nov 2018. • presentations on the latest findings relevant to plant conservation and native vegetation rehabilitation • practical workshops on ecologically sound techniques • field trips demonstrating plant conservation in action • social activities to enhance networking.	**More details:** to be provided in the near future, so stay tuned at www.anpc.asn.au/conferences/2018.

Auckland Botanical Society

Meeting: Wednesday 2 May, at 7.30 p.m. for a talk by at André Bellvé titled 'The distribution of epiphytic *Astelia* spp. and their role as habitat formers. **Venue:** Unitec Room 115-2017.	**Contact:** Maureen Young, email: youngmaureen@xtra.co.nz.
Field trip: Saturday 19 May to Worsfold & Wright Farms, Kaiwaka.	**Leader and contact:** Jack Warden, email: warden899@gmail.com

Waikato Botanical Society

Field trip: Sunday 13 May to Western Bays track – Waihaha River section to Western Bay, Lake Taupo (combined with Rotorua Botanical Society).	**Details:** See below.
Meeting: Monday 14 May at 6.00 p.m. for our Annual General Meeting followed by a talk by Monica Peters on her recent rip to the Auckland Islands.	**Venue:** Room SG03, University of Waikato.

Rotorua Botanical Society

Field trip: Saturday 28 April to Piripai Spit. **Meet:** the car park, Rotorua, at 8.00 a.m. or The Hub, Whakatane, at 9.00 a.m. **Grade**: easy.	**Leader:** Sarah Beadel, ph: 07 345 5912 or 021 924 476; email: Sarah.Beadel@wildlands.co.nz
Field trip: Sunday 13 May to Western Bays track – Waihaha River section to Western Bay, Lake Taupo (combined with Waikato Botanical Society). **Meet:** the car park Rotorua 8.00 a.m. or the Waihaha car park at 9:30 a.m. **Grade: e**asy track condition, medium distance covered.	**Leader:** Chris Bycroft, ph: 07 345 3840; email: chris.bycroft@wildlands.co.nz (email preferred).

Wellington Botanical Society

Field trip: Saturday 5 May to 183 South Karori Road. **Meet:** 9.30 a.m. about 1.8 km down South Karori Rd.	**Co-Leaders:** Chris Horne, ph: 04 475 7025; Jo Schofield; and Sunita Singh, ph: 04 387 9955 or 027 4052 987.
Meeting: Monday 15 May at 7.30 p.m. for Members' Evening. Bring your botanical slides and photographs taken on BotSoc trips, your paintings, drawings and your favourite botanical readings.	**Venue:** Victoria University Lecture Theatre M101, ground floor Murphy Building, west side of Kelburn Parade; enter building off Kelburn Parade about 20 m below pedestrian overbridge.

Nelson Botanical Society

Field trip: Sunday 20 May to Wairoa Gorge remnants. **Meet:** 9.00 am Cathedral steps.	**Contact:** David Grinsted, ph: 03 542 4384, email: davidgrinsted@gmail.com if intending to come.
Meeting: Monday 21 May at 7.30 p.m. for a talk titled 'Madagascar' by David and Elizabeth Grinsted, Beryce Vincenzi and Don Pittham.	**Venue:** Jaycee rooms Founders Park.

Canterbury Botanical Society

Meeting: Monday 7 May at 7.30 p.m. for a talk by Jason Butt on his recent trip to the Chatham Islands, the primary purpose of which was weed management.	**Venue:** Upper Riccarton Library, 71 Main South Road.
Field trip: Saturday 12 May to Burkes Bush, a remnant of podocarp forest on the Port Hills. **Meet:** at 9.00 a.m. at the roadside car park on Cashmere Road opposite Princess Margaret Hospital. **Bring:** lunch, walking boots, rain wear and hat; i.e., be prepared for the usual range of weather at this time of year.	**Contact:** Jason Butt, ph: 021 389 660, email: jasonbutt2@gmail.com if you intend to come.

Botanical Society of Otago

Meeting: Wednesday 9 May at 5.20 p.m. for the BSO Annual General Meeting and Photographic Competition (your photo may be used the BSO Calendar). **Venue:** the Zoology Benham Building, 346 Great King Street, behind the Zoology car park by the Captain Cook Hotel; use the main entrance of the Benham Building to get in and go to the Benham Seminar Room, Rm. 215, 2nd floor. Please be prompt as we have to hold the door open.	**Contact:** Allison Knight, email: allison.knight.nz@gmail.com.
Field Trip: Saturday 19 May for a Fungal Foray Field Trip to Waipori Gorge. Meet: at the Botany Department car park at 8.30 a.m. Leader: David Orlovich.	**Contacts:** David Orlovich email: david.orlovich@otago.ac.nz or David Lyttle, ph: 03 454 5470, email: djl1yttle@gmail.com.