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***Leptinella rotundata* revisited: An unfolding story**

John Rugis, Cameron Kilgour

Introduction

In 2020, one of the authors (John) relocated to Waimauku, west of Auckland near the Muriwai coast. Shortly after the move, John came into contact with the Muriwai Environmental Action Community Trust (MeACT) and local resident Michael (Mike) Fitchett. Mike does pest control as part of the MeACT's Muriwai Penguin Project (Fig. 1) and, for

that work, has access across private land to coastal cliffs and shoreline. Mike mentioned to John that, along one of his trap lines, he spotted what he thought could be the rare plant *Leptinella rotundata*. In February 2021, John accompanied Mike to that site and confirmed that the plant was in fact *L. rotundata* (Fig. 2). A question arose: Was this a new discovery?



Fig. 1. Michael Fitchett attending to a Muriwai Penguin Project breeding box. All photos by J. Rugis on 21 Feb 2021 (unless otherwise stated).



Fig. 2. The threatened – nationally endangered plant, *Leptinella rotundata*, Muriwai coast. Scale bar = 1 cm.

The December 2014 *Trilepidea* article "*Leptinella rotundata* - an enigmatic plant living life on the edge" (Calder 2014) offered background and some clues. It describes the original 1906 discovery by Cheeseman in "Waitakere west" as well as the 2010 rediscovery of *L. rotundata* along the coast north of the Waitakere Ranges by Cam Kilgour (co-author of this article). The *Trilepidea* article raised a number of interesting questions regarding population dynamics. However, it did not include any detail regarding site locations. The article also stated that Cam had moved to Australia which, unfortunately, seemed to put him somewhat out of reach.

The story unfolds

An Auckland Museum Herbarium inquiry revealed that they hold a total of six Auckland west coast *L. rotundata* voucher specimens, the original Cheeseman collection and five collected by Cam in 2010-11. The site description of the northern-most of those five (voucher AK 312881) sounded as though it could be Mike's "new" discovery site, but the G.P.S. coordinates didn't match.

Another line of inquiry, with Auckland Council, revealed that they are aware of four *L. rotundata* sites along the Te Henga Walkway and that they manage three of those sites. An initial site visit to the three managed sites was planned, but that's a story for another writeup. The unmanaged northern-most site sounded like it could be the "new" discovery. With insufficient information at this point, what was needed was input from Cam.

John established email communication with Cam, finding that Cam had in fact fortuitously moved back to New Zealand. But Cam's foggy memory of his discoveries still left doubt as to whether or not Mike's discovery was new. To clear things up, a site visit by Mike, John and Cam was planned.

A side trip

Even before planning the site visit, discussion within the Auckland Botanical Society suggested that the Auckland Botanic Garden may have *L. rotundata*, sourced from the Auckland area west coast, in its collection. Inquiries confirmed that this is the case and the acquisition date matched up with the 2010 discovery by Cam. John visited the Botanic Garden in March 2021, focussing mainly on the coastal plants area. The *L. rotundata* there (Fig. 3) appeared to be in good health but, at well under a square metre in extent, wouldn't have expanded its coverage all that much in the eleven years it's been in the collection. Interestingly, the plant appeared to be migrating towards, and under, the raised visitor boardwalk seen at the bottom of the photo in Figure 3.



Fig. 3. *Leptinella rotundata* in the coastal plants zone of the Auckland Botanic Garden. 11 March 2021.

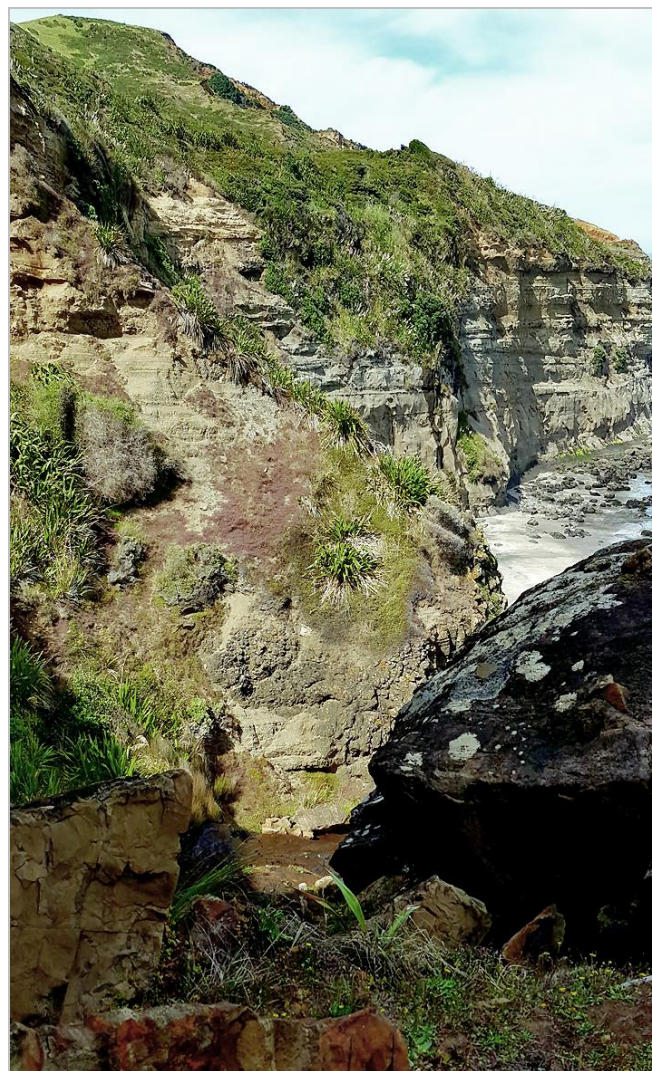


Fig. 4. The discovery site, in shade at the bottom in this photograph, amongst rocks and boulders, looking south-west towards other cliffs, with the Tasman Sea being off to the right.



Figs. 5–7: 5. *Asplenium oblongifolium* (stunted coastal form), with *Dichondra brevifolia* and *Leptinella rotundata* (bottom left). 6. *Muehlenbeckia complexa*. 7. *Tetragonia trigyna* with *Leptinella rotundata*.

The site visit

On 21 May 2021, in excellent weather, John, Mike, Cam and Deb Huijbers set out to investigate Mike's "discovery". After about half an hour walking through planted/regenerating native cover, then through native bush and across a stream, all on private land, we came to the site, part way down from the high point overlooking the Tasman Sea. Memories came flooding back to Cam...

The site is on the edge of an exposed narrow steep sandstone talus slope, well above the sea below. The talus slope is near the base of an even higher cliff face. Yes, Cam had been here before and he generously shared his renewed enthusiasm. Of course, it was still a discovery for Mike, even though he hadn't been first.

To what degree did the *L. rotundata* condition and extent change over the intervening eleven years? The herbarium record (voucher AK 312881) says "population spread over 10-15m, quite sparse with occasional dense patch". We estimated overall total surface area coverage now being under two square metres, sparse in places. This may indicate a reduction in extent, but in the absence of precise definitions for coverage measurements, it's difficult to say.

There were no *L. rotundata* inflorescences present, so it was not possible to determine the gender

composition at this site. On this occasion, Cam did spot a very small "satellite" patch, that Mike and John hadn't noticed before, on the other side of an adjacent boulder.

We decided to concentrate on characterising the site itself, not including the approach and wider surroundings. The site is very exposed to the wind, and that, along with the slope steepness, keeps plant growth in check. The "soil" there is coarse, not quite sandy, over a loose rock base, with sharp-edged grains and very little organic matter. Rocks and boulders do provide some protection from the elements and assist with some water and dampness retention as seen at the bottom of Figure 4. Furthermore, this site is close enough to a waterfall to keep the air feeling moist.

We surveyed associated plants, defined as being located within one metre of *L. rotundata*. Figures 5 to 7 show some of the other species at the site. Some of the plants were small, juvenile and/or weather-beaten, making identification difficult. We identified 29 associated plant species (see Appendix), including seven adventive species, with no species being particularly dominant. This is more than double the number of species recorded with the 2010 herbarium voucher. However, because the herbarium record was probably meant to be indicative rather than comprehensive, this doesn't necessarily mean that the species count has in fact increased that much.

Discussion

Leptinella rotundata appears to grow in patches and, because of its creeping rhizomes, can migrate over short distances, thereby spawning satellite patches. Even though *L. rotundata* is found in open exposed positions, it also requires at least some micro-habitat protection.

The population at the site we visited appears to be more or less stable, but it is literally living on the edge. Coastal erosion, and certainly any increase in coastal erosion rates, could easily wipe it out.

It was good to confirm this as one of Cam's early sites (AK 312881) and we learned that recorded

G.P.S. coordinates, especially those acquired years ago using older technology, can be inaccurate.

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References

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Appendix. Plants associated with *Leptinella rotundata* at the northern-most known Auckland region site. Recorded by Cameron Kilgour and John Rugis on 21 May 2021.

* = exotic species

Ferns

Adiantum cunninghamii
Asplenium oblongifolium

Dicotyledons

Apium prostratum var. *filiforme*
Centella uniflora
Coprosma repens
Dichondra brevifolia
Disphyma australe
Erigeron sumatrensis *
Hypochaeris radicata *

Leontodon saxatilis *
Leptinella rotundata
Lobelia anceps
Lotus pedunculatus *
Lysimachia arvensis *
Muehlenbeckia complexa
var. *complexa*
Oxalis rubens?
Plantago australis *
Plantago raoulii
Salicornia quinqueflora
Samolus repens var. *repens*

Selliera radicans
Senecio lautus
Sonchus oleraceus *
Tetragonia trigyna

Monocotyledons

Ficinia nodosa
Isolepis cernua var. *cernua*
Lachnagrostis billardierei
subsp. *billardierei*
Lachnagrostis littoralis
Poa anceps

Lichens of Arch Hill, Auckland City

Marley Ford

Over multiple excursions (April 2020 - September 2021) to Arch Hill Scenic Reserve during intermittent lockdowns, a list of lichens has been compiled. Previously a list of the native vascular plant flora of the reserve was recorded (Gardner 2020). In his article, Gardner stated that "in an ideal world its equally

educational lichens and bryophytes would have been covered too" (Gardner 2020). This article aims to meet part of this statement, in providing a list of lichens.

Compiling lists helps us to understand the lichen communities in these highly modified urban reserves.