Leather-leaf fern's moth fauna

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Leather-leaf fern (*Pyrrosia eleagnifolia* - Polypodiaceae) is a widespread climbing fern often seen carpeting tree trunks or rock faces where it can cover several square metres. Known as Ngarara wehi to Maori, it is widespread lowland fern species in both moist and dry areas, and shaded forest or open sunny sites.

Crowe (2004) illustrated many of New Zealand's many fern moths in a colourful guide to our fern flora, as does Hoare & Ball (2014) in their coverage of some conspicuous New Zealand moth species.

Here I record the moth fauna of leather-leaf fern, noting their life histories and distribution.

Moth fauna

Remarkably seven, six exclusively, New Zealand moth (Lepidoptera) larvae feed on the succulent leaves and sori of this species as follows:

1. The pretty geometrid, the **hook-tip fern looper** *Sarisa muriferata* (Geometridae: Ennominae) has larvae that feed on the leaves in addition to feeding on several other fern species including hounds tongue fern. It dark brown elongate larvae are often found feeding on the foliage of leather-leaf fern where they scrape the thick leaves. It is a widespread lowland moth of indigenous forests throughout New Zealand.
2. A narrow-winged, delicate moth (Fig.1) associated with this fern is the **leather-leaf spore-eater** *Calicotis crucifera* (Stathmopodidae) which has whitish larvae that feed on the fern's sori. Mature fronds of the fern are more elongate than juveniles and have sori on their ventral side. The larvae feed within the sori and as they feed they make a shelter with silk that resembles the sori they have almost consumed, in that way making themselves extremely well camouflaged. The leather-fern feather moth is pure white in colour and very elegant with its distinctive stance, a pose shared

throughout this moth family. The distinctive species is widespread in New Zealand both in forests and suburban and farmed areas where the hostplant has also spread.

Fig.1. Adult leather-leaf spore eater, *Calicotis crucifera* Merrick.

3. Within the moth Family Tortricidae, known as leaf-rollers, two species have larvae that mine the leaves of leather fern. The species are readily separated by the shape of the mine created by the larvae. Firstly the **leather-leaf star-miner** *Philocryptica polypodii* has mines that radiate out from a centre and are mostly "dead-ends" (Fig.2.). This enigmatic moth was described by the leaf-miner connoisseur Morris Watt in 1921 from Wellington material. The pattern created is very distinctive and often commonly seen over a patch of the hostplant. The moth was thought to be completely confined to the North Island until December 2014, when I found it in one place on Banks Peninsula in Prices Valley. This variable moth species although widespread is not often seen as an adult. Based on leaf mining signs it is widespread in lowland forest in the North Island, and has even

adapted to suburban life with colonies on rock walls in Auckland a feature. I know it from Auckland City, Rotorua, Cape Palliser and more recently Banks Peninsula.

Fig.2. The characteristic pattern of mines made by the larva of *Phyllocrypta polypodii*

4. The other tortricid moth is the **travelling fern moth** *Apoctena taipana*, a colourful species that closely resembles *A. conditana* but is not well known, and may be more widespread than my records indicate at present. The species was described from Wellington in 1882.The green larvae tunnel into leather fern's succulent leaves in much the same way as the following scopariines, and in fact were collected with them and confused with them initially! The pupa is formed between joined leaves of the hostplant. I have records of this species from Thomsons Bush – Invercargill, Tuapeka West in South Otago, and possible larvae from Prices Valley – Banks Peninsula. Adults have been found in December and January in the wild.
5. Three scopariines (Crambidae: Scopariinae) have larvae that mine or tunnel into the thick leaves of leather fern. All three are poorly

known and seldom seen as adults. Firstly *Eudonia zophoclaena* is an elegant species that was described from Takapuna, Auckland in 1923 appears to be a North Island endemic. I know it only from Auckland City, three reserves north and northeast of Napier in Hawkes Bay and the Ruahine Forest Park. Adults have been found in the wild in December and January but are not commonly encountered. The larvae mine the leaves moving from leaf to leaf through silk tunnels it constructs as a highway to aid movement between the leaves. The larvae pupate in amongst this tangle of frass, silk and partially mined leaves.

6. The forests of southern New Zealand support "*Scoparia" illota* was described in 1919 from Blue Cliffs on the southern Southland coastline just east of Fiordland National Park. I recognise it only from Invercargill where it is locally common in Thomsons Bush, and in South Westland on the Cascade Road. All my specimens caught in the wild were caught in January. The larvae found in Thomsons Bush were grey with large "spots" mine and join the leaves of the host and form silk tunnels amongst the fronds and roots.
7. Further north the **leather-leaf scoparia** "*Scoparia" molifera (Fig.3),* first described from Ashurst in the Manawatu in 1926, appears to be more common and widespread. I know it from Dunedin, Purakaunui Bay, Waipori Gorge, Taieri Gorge, Otago Peninsula, Prices Valley – Banks Peninsula and Cape Palliser on the southern Wellington coastline. The larvae feed in the same way as the above two fellow scopariines, similarly making a "mess" of the plant with large areas of frass mixed with silk and half-mined leaves. They appear not to depend on camouflaging their feeding damage in contrast to the sori-feeding *Calicotis* larvae. Adults have been found, mostly attracted to light traps, between December and early February.

Summary

New Zealand has a diverse fern flora (Brownsey, 1989) on which a relatively high number of specialist moth species feed (Crowe, 2004; Hoare & Ball, 2014). All of the fern-feeding moths appear to be restricted to ferns. In terms of our moth fauna, the leather-leaf is the most popular, supporting seven moths, six exclusively.

Fig.3. Characteristic damage indicating the presence of larvae of the leather-leaf moth, *Scoparia molifera* Meyrick.

Although there is much still to learn about these moths and their ecology, it is clear that leather-leaf fern is an ecologically important component of our indigenous ecosystems supporting many indigenous invertebrates including these seven endemic moths and should be protected and enhanced wherever possible.

References

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