

## Lichen Leaf Miners

In January, 2014, while participating in a research project at La Fortuna Cloud Forest in Panama (alt. 1200 m), Jean Gagnon observed miner insects making burrows in a *Sticta* sp. (Figure 1). This foliose lichen has both photobionts (green algae & cyanobacteria), but the miner appeared to prefer those parts containing cyanobacteria. Dr Donald Windsor, entomologist at the Smithsonian Tropical Research Institute in Panama City, who has been studying miner insects in vascular plants for over 30 years in Panama, told us that he has never observed this in lichens before.

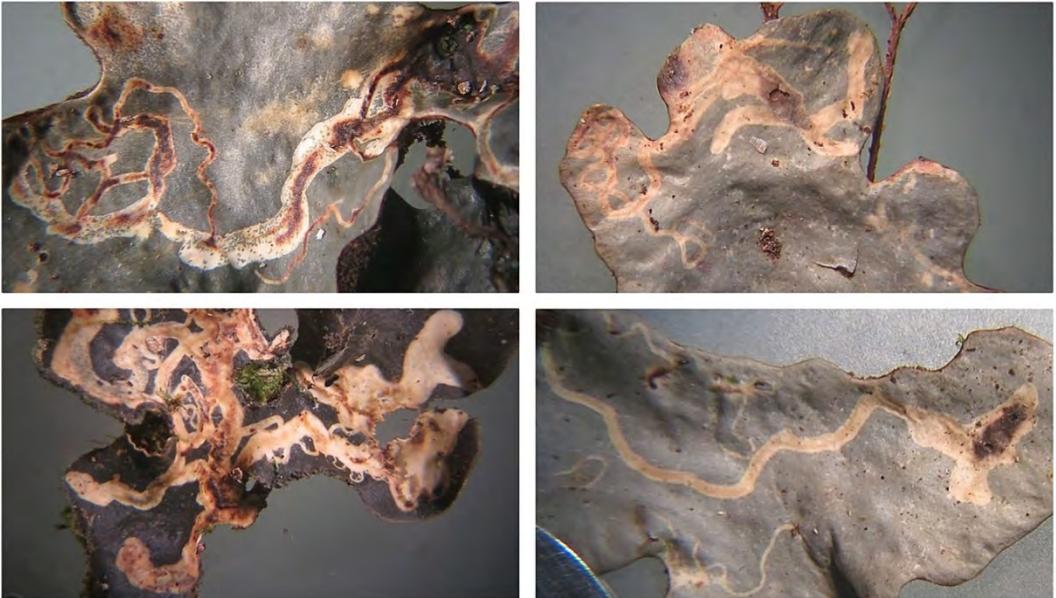


Fig. 1. Leaf miner insect burrows on *Sticta* sp. in the Panama cloud forest (photos D. Windsor).

Jean wrote to Mark Seaward, who has studied lichen-invertebrate associations (e.g. Gerson & Seaward 1977) enquiring whether he had observed such miner insects in foliose lichens or was aware of any literature documenting miner insects on lichens. Although aware of mollusca in this respect, he was at that time not aware of such damage by insects; however, he did mention past work on selective grazing of photobiont (algae and/or cyanobacteria) *versus* mycobiont by invertebrates, particularly psocopteran species (Broadhead 1958). In June 2014, Mark and I visited Maine, USA to give our Annual Lichen Ecology Course at the Eagle Hill Institute at Steuben. During our fieldwork, we came across a second example of lichen grazing, this time associated with *Umbilicaria mammulata* (Figure 2), their abundant thalli, some as large as dinner plates, on very large glacial erratics north of Steuben. Are these the marks of a Mollusc radula? Or could they be the result of grazing by another leaf miner?



Figure 2. Invertebrate damage to *Umbilicaria mammulata* growing near Steuben, Maine, USA

There are relatively few papers that demonstrate actual damage to lichens by insects or gastropods (e.g. Powell 1980, Poykko 2006, Rawlins 1984) and we have been unable to trace any which refer to leaf miners, although there is one which suggests that the foliicolous lichen *Strigula fossulicola* has a preference for colonizing leaves adjacent to the excavations of leaf-mining insects (McCarthy *et al.* 1996)

We would be interested to hear from other biologists who have observed leaf miners on lichens or who have studied them.

### **Acknowledgements**

We thank Dr Donald Windsor for his help and interest and Professor Mark Seaward for comments and suggestions with respect to this short note.

### **References**

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## **My pet hate: combined locality names**

The recording of lichens involves the use of the names of localities. Usually this does not raise any problems. However, difficulties occur where two names are united into a single name, a custom apparently favoured by Ordnance Survey. I believe that such names should not be combined, but that they should remain separate. Three examples are as follows:

1. Clay Coton, not Claycoton. A Northamptonshire village.
2. Eye Brook Reservoir, not Eyebrook Reservoir. A lake in Leicestershire and Rutland.
3. Wood Walton Fen, not Woodwalton Fen. A nature reserve in Cambridgeshire.

For other possible combinations of words, such as whether to use fish pond, fish-pond or fishpond, one can consult the latest editions of the *Oxford Dictionary*, fish pond being accepted usage.

Please send me your own pet hate. It should be relevant to lichens or lichenology.

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