

was a large shrub that I seemed to know. Sure enough, when I keyed it out it turned out to be *Dodonea viscosa*, the akeake, and common throughout South Africa crossing over into Botswana near Gaborone where it is commonly planted as a hedge or garden ornamental.

I couldn't find a bryophyte anywhere until I spotted what looked like a lichen on the ground behind the house. Closer inspection of the circular white patches made me suspicious so I soaked it in water and within minutes I had a bright green thallose liverwort similar to those found in the Australian deserts. In amongst them were some moss strands and nearby I found a small brown patch of what turned out to be very pretty little moss, deep green with a strong, golden costa. My books haven't arrived yet so it will be a wee while until I can come up with names for them.

As for lichens, I have found a few, which I have collected and will try to name once I find a source for lichen identification. Sadly, none of the libraries has anything on southern African cryptogams. Those lichens I have found are very small, one *Physcia*-like, the others all crustose, corticolous things that don't do me any favours. To date, no *Ramalinas* for Jennifer but it's early days.

Lichens on twigs in the Dunedin area

A Knight & J Bannister

Several trends emerged from the lichens brought in from around Dunedin for the recent BSO workshop. Firstly, nearly all the specimens collected were on deciduous, exotic trees and shrubs, such as red currant, apple, pear, silver birch, magnolia, dogwood and maple. The most commonly collected lichens from urban sites (Kew, Highgate, Maori Hill and Macandrew Bay) were *Lecanora carpinea*, a spreading flat white crust, *Physcia adscendens*, grey-white with cilia, the eye-catching bright orange *Xanthoria parietina*, and orange *Teloschistes chrysophthalmus*, also with cilia.

Next most common were the grey-green, shrubby, (**fruticose**) lichens *Usnea oncodes* (*U. arida* in the *Flora of NZ Lichens*) and *Ramalina celastri*, which has strap-like lobes. These last three species tended to be small and tatty in the city and to grow more luxuriantly in the semi-rural areas of Sawyers Bay and Seacliff. The first 4 are widespread, cosmopolitan lichens, and it is interesting to speculate whether they arrived in New Zealand before or with the introduced trees on which they perch so readily. All flourish in a high light environment, so did they just take advantage of the increased light available in a new, deciduous habitat or did they arrive on exotic trees? They can sometimes be found on indigenous garden specimens, or on exposed twigs on the outer edges of our evergreen native forest, but are seldom found within it.

First, we divided the lichens into 3 main types, **foliose**, **fruticose** and **crustose**, as grouping morphological types is the first step towards using identification keys.

Foliose lichens have lobes with a distinct upper and lower surface, which can be lifted up from the substrate, to which they are attached over a wide area, often by rhizines. It's easy to tell the ones with wide, raised, leafy lobes, like *Parmotrema chinense*, or *Parmelina labrosa*, but we found other foliose lichens which were quite flat against the

bark, like *Parmelia borreri*, *Xanthoria parietina*, *Physcia jackii* and the small, green, very flat-lobed *Hyperphyscia adglutinata*. Their lobe edges had to be prised up quite carefully to examine the lower surface and so determine that they were not crustose. Still other foliose lichens have quite narrow, raised lobes, like *Physcia adscondens* and *Hypogymnia physodes*, which could at first glance be mistaken for shrubby fruticose lichens, if it were not for their broad attachment to the **substrate**. *Hypogymnia* was not brought in from any urban areas, but is common on twigs and posts in reserves around the city, such as Ross Creek, Flagstaff, Swampy Summit and Mt Cargill.

Fruticose lichens grow out from a holdfast on the substrate. They can be upright and 'shrubby' as orange *Teloschistes chrysophthalmus* is, or dangle down, like some of the larger, grey, strap-like *Ramalina celsatris* specimens seen. A cross-section of their 'branches' can be round (**terete**), as in *Usnea* spp, or flattened, as in *Ramalina* spp.

Crustose lichens are often so closely adpressed that they are liable to be mistaken for the bark itself and so tiny that they are missed altogether, despite their bright colours and unusual shapes. They cannot be removed without removing some of the bark, so must be collected with care. The white crust lichen, *Lecanora carpinea*, is so widespread on deciduous trees around Dunedin it could easily be mistaken for white bark. Closer inspection with hand lens or microscope reveals numerous, round, crowded fruiting bodies (**apothecia**). These apothecia are covered with a fine white crystalline powder (**pruina**), which turns yellow on addition of a small drop of household bleach (hypochlorite, '**C**' reagent). The crystalline pruina is possibly a defence against grazing by invertebrates, such as mites and snails. Some very cute hairy mites did crawl out of our lichens! Other crustose lichens seen on our Dunedin twigs, but not all fully keyed out, included *Haematomma babingtonii*, with blood-red apothecia, fertile *Caloplaca*, *Arthonia*, *Buellia* and *Rinodina* and members of the family Graphidaceae, which have squiggly, elongated apothecia that look a little like hieroglyphics.

Brief Glossary (see BSO newsletter no. 38 and references for more terms)

Ascus: Sac in the fruiting body (apothecium) containing sexual fungal spores. See fig. on front cover.

C reagent, C test: Colour, often fleeting, when a drop of hypochlorite (household bleach) reacts with part of a lichen.

Cephalodia: Different coloured lumps in or on the thallus, containing cyanobacteria.

Cortex: Discrete outer layer of thallus on upper, and sometimes lower, surface.

Cyphellae: lined pits on the lower cortex of the thallus of some foliose lichens.

Hyphae: Thread-like filaments of the fungus that forms the structure of the lichen.

Maculae: Pale blotches on the upper cortex, caused by lack of algal cells below

Medulla: A layer of loose hyphae below the algal layer.

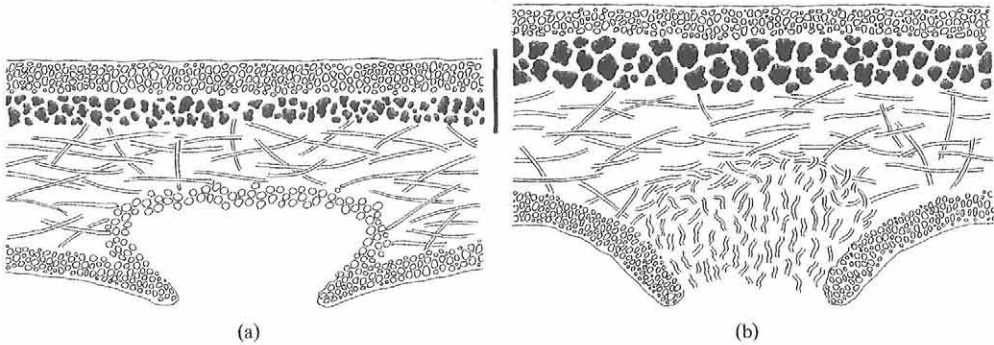
Podetia: The fruiting branches or stalks in Cladoniaceae are called podetia.

Pruina: Frost-like coating of minute crystals, often of calcium oxalate

Pseudocyphellae: Round or slit-like breaks in the upper or lower surface (cortex), exposing the inner hyphae of the medulla. Not smoothly lined.

Terete: Cylindrical, round in cross section.

Thallus: the lichen body, usually with distinct lobes in foliose lichens, a shrubby appearance in fruticose lichens and a closely attached crust in crustose lichens.



Cross section of (a) *cyphella* (*Sticta*) and (b) *pseudocyphella* (*Pseudocyphellaria*). Note **algal layer** of black dots under upper **cortex** and above the strands of fungal **hyphae** making up the inner **medulla**. *The Lichen Flora of Great Britain and Ireland*, OW Purvis et al, eds., 1992. (UK website <http://www.nhm.ac.uk/botany/lichen/twig> also has lichen terms)

Table of Lichens on twigs in the Dunedin area, identified at the July workshop.

Lichen	Notes
Foliose	
<i>Hyperphyscia adglutinata</i>	On red currant. Small, flat and easy to overlook.
<i>Parmelia cunninghamii</i>	Fine white lines (pseudocyphellae) breaking the surface.
<i>Parmelina labrosa</i>	Powdery granules (soredia) on 'lips' of lobes.
<i>Parmotrema chinense</i>	More common in outlying areas. Long, dark, cilia .
<i>Physcia adscendens</i>	Common in urban areas. Cosmopolitan.
<i>Physcia jackii</i>	Less common. Previously called <i>Physcia stellaris</i> in NZ.
<i>Punctelia borreri</i>	Round spots (pseudocyphellae) on upper surface.
<i>Punctelia subrudecta</i>	Sorediate centrally. Cryptic marginal pseudocyphellae.
<i>Xanthoria parietina</i>	Common in urban and outlying areas. Flat, fertile, orange.
Fruticose	
<i>Ramalina celsa</i>	Struggling in city, luxuriant at Sawyers Bay and Seacliff
<i>Ramalina inflexa</i>	Only brought in from Seacliff.
<i>Teloschistes chrysophthalmus</i>	Common, 'shrubby', orange. Healthier away from city.
<i>Usnea arida</i>	Miserable in city, bigger and bushier further out.
Crustose	
<i>Arthonia</i> sp	Irregular, flat, black apothecia on thin green crust.
<i>Buellia</i> sp	Tiny round black apothecia (fruiting bodies).
<i>Caloplaca</i> sp	Tiny, round, rusty orange apothecia.
<i>Haematomma babingtonii</i>	Round, red apothecia, with a white rim, on a white crust.
<i>Lecanora carpinea</i>	Widespread white crust covering large areas of bark.
<i>Rinodina</i> sp	Tiny round brown apothecia with a paler rim.

Useful References:

- WM Malcolm & DJ Galloway *New Zealand Lichens, Checklist, Key and Glossary*, Museum of New Zealand, Te Papa, 1997
 DJ Galloway *Flora of New Zealand Lichens*, Government Printer, Wellington, New Zealand, 1985