Trees and Shrubs

Clematis afoliata A.D.
Coprosma brunnea A.D.
Coprosma propinqua
Coprosma propinqua hybrids
Dodonaea viscosa A.D.
Hebe raoulii var. maccaskillii
Hymenanthera alpina
Linum monogynum A.D.
Muehlenbeckia astonii A.D.
Muehlenbeckia australis
Muehlenbeckia complexa
Myoporum laetum A.D.
Pimelea concinna A.D.
Pimelea sp. aff. prostrata A.D.
Senecio monroi A.D.
Sophora prostrata A.D.

TORTULA PAPILLOSA

by Max Visch

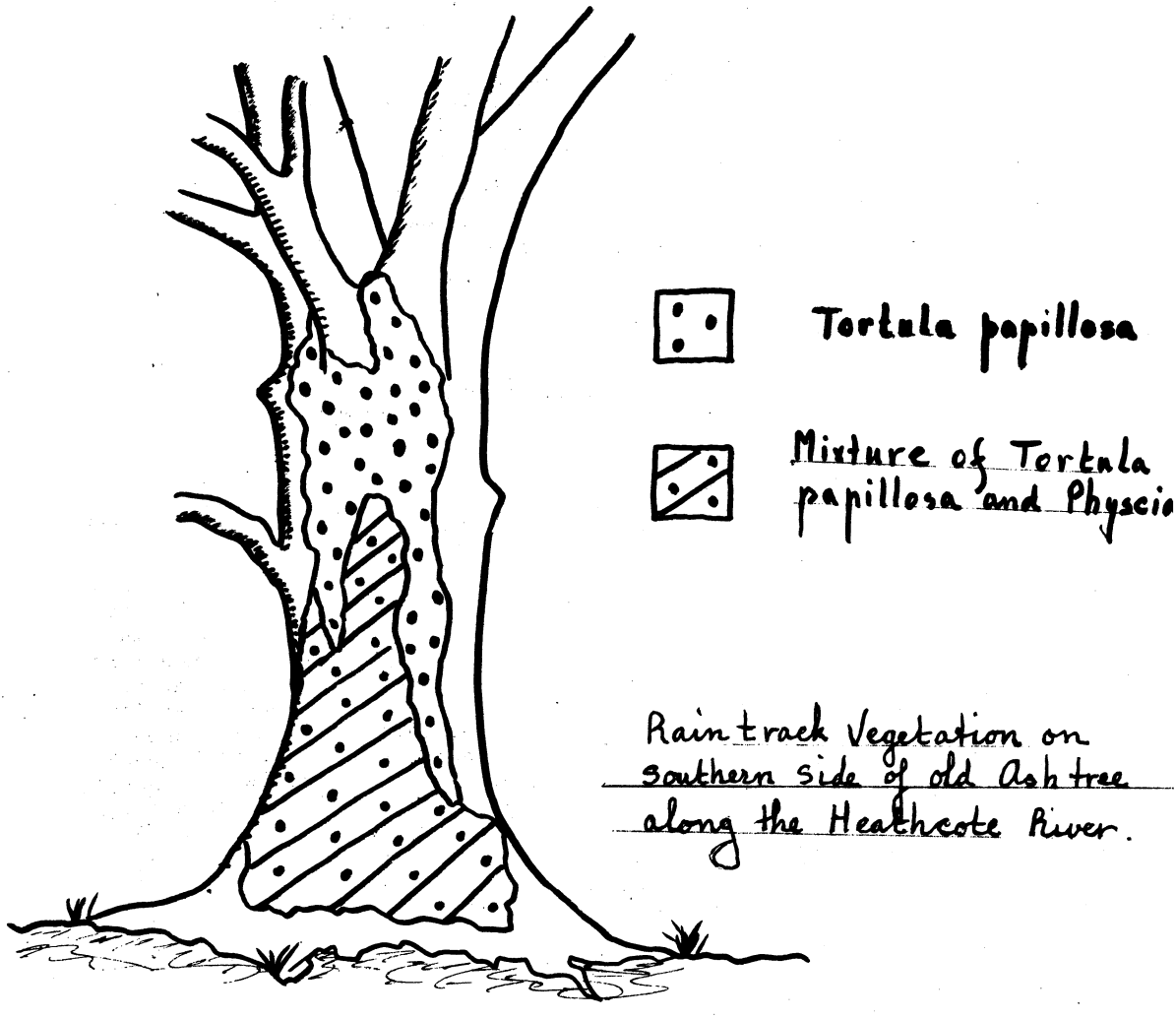
No interested person walking through the New Zealand bush could fail to notice the enormous richness and diversity of mosses, liverworts and lichens that clothe the trunk and branches of almost every tree and shrub. This is in marked contrast to their almost total absence on trees in the Christchurch parks and gardens. No doubt a variety of factors contribute to this scarcity. The dry and windy summer conditions in the city area may well be beyond the tolerance levels of most species. Research in New Zealand and overseas has shown that mosses and lichens are much more sensitive to atmospheric pollution than the higher plants and disappear when pollution levels become intolerant. Daly 1970 has shown that for the Christchurch area the number of species of both mosses and lichens falls sharply as one approaches the inner suburbs with their high levels of atmospheric pollution during the winter. Not all species are equally sensitive either. Quite a few "hardy types" of mosses, lichens and even some liverworts resistant to at least moderate levels of pollution may be found growing on brick and stonework, on concrete paths and kerbs, along street drainage channels and in lawns. A few species may even be found on the bark of trees growing in favourable situations.

Last June as I was walking along the Heathcote River along the base of the Cashmere Hills opposite the Karitane Hospital I noticed some rather large patches of the moss Tortula papillosa covering the trunks of some European Ash (Fraxinus excelsior).

There are quite a number of these trees along the river bank with diameters of up to $2\frac{1}{2}$-3 feet. The trees appear to have been lopped many years ago to judge from the rather broad crowns that many possess. In a few cases the axils of some of the larger branches have formed shallow basins filled with water. These were the trees that had the most luxuriant covering of Tortula papillosa.

It appears that following a fall of rain and probably for some considerable time after, perhaps through cracks caused by rotting of the bowl's rim, water drains down the trunk providing a suitably moist substrata for this moss to grow on. Further down the trunk the moss cover gradually thins out and becomes mixed with such lichens as Physcia. Tortula papillosa was almost exclusively growing on the southern, shaded side of

the trunk and even here when away from the rain tracks it would tend to grow in the bark fissures rather than on the "plateaus" between them. Little moss growth was found on the northern, sun-exposed side of the trees except in those cases where they were being shaded by trees on the other side of the river.



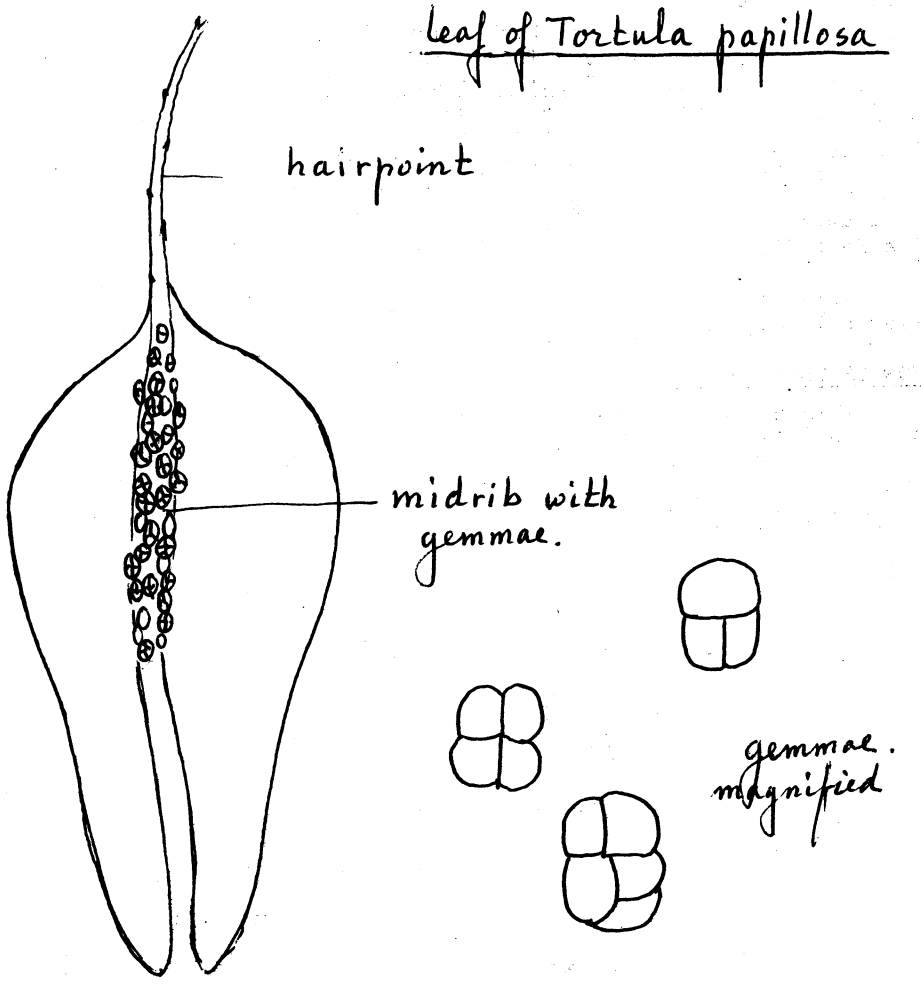
Tortula is represented in this country by at least a dozen species. Most of these are endemic to New Zealand but a few such as T. muralis, T. laevipila, T. princeps and T. papillosa are widely distributed in both hemispheres. This raises the possibility that at least some of these may have been introduced in earlier colonial times.

By far the most common species in Christchurch is T. muralis which can be found growing on stone walls, concrete paths and kerbs in almost every garden. It possesses a long, silvery hairpoint which immediately distinguishes it from another common moss Ceratodon purpureus which is about the same size and which is found in similar situations.

Tortula papillosa probably owes it name to the numerous prominences or papillae that cover much of the underside of its leaves, but which are only visible under the microscope.

It is not a very large moss. The stems rarely exceed 1 cm. in length while the leaves which in the dry state lie closely appressed against the stem range from 1.5 - 3.5 mm. Thus although this moss under favourable conditions may cover large areas of tree trunk, the dark green mats it forms are low and when dry not very conspicuous.

Following some rain, however, the leaves swell up and unfold to expose the light coloured gemmae or "broodbodies" that occur in large numbers on the upper side of the leaves. The gemmae of Tortula papillosa are multicellular, rounded to broadly oval structures concentrated on and along the midrib and used in vegetative reproduction. As a matter of fact they are probably the only means of reproduction for this species in New Zealand as according to Sainsbury no fruiting plants of T. papillosa have ever been found in this country. These ventrally situated gemmae are the most characteristic feature of this species. They can readily be seen with the aid of a good pocket lens and provide an easy method of telling this species apart from T. abruptinervis and T. laevipila which also form gemmae and similarly grow on tree bark.



In these two species however the gemmae occupy a terminal position and are of a very different shape.

Although Allison and Childs also record T. papillosa as growing on cement mortar, my specimens have all come from the bark of Willows, Ash and Cabbage trees. On the Port Hills along the Summit Road it often grows intermixed with Tortula abruptinervis on Hoheria angustifolia.

Most of my collections have been from coastal areas but I also have one from Lake Rubicon where it occurred associated with T. abruptinervis and Calyptopogon mnioides on Willow.

EDITORIAL WANDERINGS

This last season has been a splendid one for ground orchids in the Banks Peninsula area. Our first sighting was on the 6th September, 1975 when 5 plants of Corybas trilobus were found in flower in Gibraltar Bush on the Port Hills. From that date until 31st December, 1975 we found orchids each week in different Peninsula localities.

GIBRALTAR BUSH

The first gully in the bush below Gibraltar Rock is worthy of attention by fern lovers. The ferns noticed on the 8th October, 1975 included many plants of Leptolepia novae-zelandiae, Hymenophyllum sanguinolentum growing on the ground, all others that I have seen on the Peninsula were growing on rocks or trees, and 6 adult specimens of Dicksonia squarrosa, for me the first finding of this tree fern species on the Port Hills. Over two dozen Alsophylla (Cyathea) smithii were growing well with 6 of them thickly covered around the base with that most attractive filmy fern Trichomanes venosum, an otherwise rare fern on the Port Hills.

Numerous splendid specimens of Pterostylis areolata were seen in flower in adjoining country.

MORICE SETTLEMENT RESERVE

This Reserve is well worth visiting in October. On the 15th October, 1975 we found many plants of Pterostylis graminea in the upper part of the Reserve. The lower portion is difficult to traverse due to supplejack. The Reserve contains splendid specimens of Podocarpus spicatus, dacrydioides and totara.

HYMENOPHYLLUM MINIMUM

Another first finding for me was a patch of Hymenophyllum minimum which was found growing under a rock on the Te Oka Road on the 29th October, 1975. As the name implies its toothed leaves are very small. The plant can be distinguished by the spines on the margins and on the backs of the valves. Growing near these ferns were some two dozen plants of Hebe lavaudiana showing their most attractive pink flowers. Not far away on the road bank were seen three patches of that small but interesting fern Grammitis armstrongii. This fern is widely distributed in the Southern Hemisphere.

PTEROSTYLIS FOLIATA

It was in 1970 that we last saw plants of Pterostylis foliata in