

NATURAL HISTORY OF THE HOGAN GROUP

4. BRYOPHYTE FLORA

by G.K. Thomson

ABSTRACT

Eighteen species of mosses and four species of liverworts were identified from the Hogan Group. *Bryum capillare*, *B. dichotomum*, *B. pachythea*, *B. sauteri*, *Ceratodon purpureus*, *Lembophyllum divulgum*, *Ptychomitrium australe*, *Tortella calceyina* and *Triquetrella papillata* are new moss records for the Bass Strait area, and *Frullania deplanata*, *F. pentapleura* and *Lunularia cruciata* are new liverwort records. Collections were made during drought conditions and it is to be expected that the records for species number and distribution are incomplete.

INTRODUCTION

There are no published records for bryophytes for the Hogan Group and the meagre data available for the other islands of Bass Strait probably reflect the incidence of collecting rather than the distribution and abundance of species.

Cliffy Island in the Seal Group was recently surveyed (Hope and Thomson 1971) and included in the flora were *Barbula australasiae*, *Bryum argenteum*, *B. billardieri*, *B. campylotheceum*, *B. microerythrocarpum*, *Sematophyllum homomallum*, *Thuidium furfurosum* and *Tortula princeps*. Some collections have been made in the Kent Group by Mullett & Murray-Smith (1967) who list two species - *Sematophyllum homomallum* and *Weissia controversa*, and by Le Souef *et al.* (1891) who only mention *Funaria hygrometrica*. Garreau (1958) also collected in the Kent Group and reported 14 mosses and two liverworts, but did not enumerate them. Gillham (1961) listed eight of the common mosses and one liverwort - *Breutelia affinis*, *Bryum billardieri*, *Campylopus introflexus*, *Rhacopilum convolutaceum*, *Sematophyllum homomallum*, *Thuidium furfurosum*, *Tortula princeps*, and *Marchantia cephaloscypha* - occurring on various granite islands around Wilson's Promontory, but her list does not claim to be exhaustive. Norman (1966), in a recent paper on Big Green Island in the Furneaux Group, records *Barbula australasiae*, *Bryum billardieri*, *B. campylotheceum*, and *Tortula princeps*. The nearest part of the mainland, Wilson's Promontory, has a very extensive bryophyte flora which is fairly well known (Willis, pers. comm.), but published records are very meagre (for example, Leslie 1925).

During this expedition, it was possible to collect widely on Hogan Island, and less thoroughly on Long Island, but only two collections were made during a very brief visit to East Island by two members of the party.

NOTES ON DISTRIBUTION AND ECOLOGY

Victoria had experienced a record drought throughout the spring and summer preceding the expedition; this was reflected in the poor condition of the residual bryophyte flora. All specimens were barren and the only sporophytes seen were a few withered remnants formed a year and a half previously.

General

Eighteen species of mosses and four species of liverworts were recorded for the Group. Apart from *Barbula australasiae*, *Breutelia affinis*, *Bryum microerythrocarpum*, *Rhacopilum convolutaceum*, and *Weissia controversa*, the moss census for the Hogans includes all the species recorded for the nearby Bass Strait islands. *Bryum capillare*,

B. dichotomum, *B. pachythea*, *B. sauteri*, ? *Campylopus torquatus*, *Ceratodon purpureus*, *Grimmia pulvinata*, *Lembophyllum divulsus*, *Ptychomitrium australe*, *Tortella calycina* and *Triquetrella papillata* are new records for the area. Furthermore, *Bryum argenteum*, *B. sauteri* and *Ptychomitrium australe* have not been recorded for Wilson's Promontory (Willis, pers. comm.), although all could be expected to occur there.

Other than the widespread moss *Sematophyllum homomallum*, only three pleurocarpous species were found (*Lembophyllum divulsus*, *Thuidium furfursum* and *Triquetrella papillata*), and these, as is the case for most pleurocarps, require wet conditions for active growth. It therefore seems unlikely that other pleurocarpous mosses occur in the Group, a possible exception being *Rhacopilum convolutaceum*. Thalloid liverworts are also generally restricted to wet environments, so the total may remain at one species: this is even more likely as the only permanently wet sites are soaks formed by water drainage from the limestone, the water being very hard. It is curious that no calcophiles were found on the calcarenite capping: water again seems to be the limiting factor as the limestone allows very free water seepage and, outcrops in exposed positions. In drought-free conditions more species of leafy liverworts would be expected growing among the grass or in association with mosses. Their apparent absence from the latter type of habitat was surprising and reflects clearly the severity of conditions in the area at the time. Although Hogan Island was currently being grazed by a herd of cattle, coprophiles such as *Tayloria octoblepharis* were not seen.

Hogan Island

Other than in a few crevices and drainage channels, mosses are rare to absent on exposed slopes with north-east to north-west aspects on Hogan Island. Mosses attain their greatest variety and abundance on the southern side of the easternmost cape, where the only records for the three delicate pleurocarps were obtained. This area also supports most of the residual liverworts. Mosses are also abundant, but more restricted in species (*Bryum billardieri*, *B. capillare*, *B. pachythea*, *Ptychomitrium australe*, and *Tortula princeps*) on the southern side of Passage Headland. On the extensive eastern grassy slopes below the light beacon, *Bryum billardieri*, *B. pachythea*, *Grimmia pulvinata*, and *Ptychomitrium australe* grow on or around rock, and *B. billardieri* and *Bryum capillare* in soil between the tussocks. The western slopes are poor in species, *Sematophyllum homomallum* being the most abundant on and around rock sheets, and *Bryum capillare* in soil, but scattered and uncommon.

Long Island

This island is not subject to grazing or regular firing: the vegetation is mostly tussock grass or low scrub with scattered rocks and rock sheets throughout. Practically all the mosses are confined to the clear areas associated with rock sheets. At lower elevations (from just above the spray zone), *Bryum billardieri* and *Tortula princeps* with some *Bryum pachythea* predominate, but *B. capillare* appears about halfway up. *Campylopus introflexus* and *Sematophyllum homomallum* appear at still higher levels, where all species can be found. The different species, however, have no sharp boundaries. The yellowish, slender form of *Bryum billardieri* mentioned in the Annotated List is very common on the south-western slopes of the island. The eastern side is rather steep, with the granite jointed into large, step-like blocks down to the sea. Water drains along the joints under the vertical sides, and this very sheltered and wet habitat yielded *Bryum dichotomum* growing with the fern *Microsorium*. This is the only locality in the Group where *Bryum dichotomum* has been found.

East Island

This island is isolated from the remainder of the Group and appears to be very poor in species, although this conclusion may be influenced by the limited opportunities for collecting. It is, however, also deficient in flowering plant species. *Bryum capillare* was the only moss found, but it is likely that *B. billardieri*, *B. pachythea*, *Campylopus introflexus*, *Sematophyllum homomallum*, and *Tortula princeps* will be recorded subsequently, in view of the similarities between East and Long

Islands. Leafy liverworts may also appear in wet seasons.

ANNOTATED CHECKLIST

H = Hogan Island, L = Long Island, E = East Island

Mosses

(Descriptions of most species can be found in Sainsbury 1955)

Bryum argenteum Hedw. H

Apparently rare. Scattered small groups of stems occur in clumps of *Bryum pachythea* and *Tortula princeps*. The bright, silvery plants are quite distinctive, and are rather more tufted than is usual for this species.

B. billardieri Schwaegr. H, L

Very common, growing in soil in most habitats. Both typical "billardieri" and "truncorum" forms occur, but are linked by numerous intergrading forms. A slender yellowish form, frequently a couple of centimetres or more tall, with short, fairly evenly spaced leaves and weak development of the leaf border, is widespread, growing in soil around the margins of rock sheets. This species should be anticipated to occur on East Island.

B. capillare Hedw. H, L, E

Extremely common, growing in soil. It occupies a very wide range of habitats - fringing rock sheets, in soil between boulders, among grass tussocks, and on open areas of ground. Old capsules were absent, and the plants usually appeared as small, comose "bulbs" of leaves (occasionally the plants were more elongated, especially when growing in dense mats), almost unchanged when dry, and with markedly aristate nerves. Leaf spiralling was absent or insignificant. Innovations, when present, often had the leaves less comose, and such forms strongly resembled the "billardieri" form of *B. billardieri*; the aristate nerve was a good guide for such forms. This was the only species collected on East Island, where it occurred fringing rock sheets.

B. dichotomum Hedw. L

Very rare. A mesic species only occurring in sheltered crevices which form water drainage channels in the cliffs on the eastern side of Long Island. The absence of similar habitats on the eastern side of Hogan Island probably accounts for its absence there. East Island could not be examined sufficiently to check for similar habitats there. The present collection was remarkable in possessing abundant axillary, propaguliferous shoots, a most uncommon condition in Victoria (Willis, pers. comm.), but apparently quite usual in New Zealand (Sainsbury 1955). The description of these propaguli in New Zealand material by Dixon (1926) supports this identification.

B. dichotomum probably never fruits in this permanently wet habitat.

B. pachythea C. Muell. H, L

Very common, forming low tufts on exposed rocks, especially on the south side of Passage Headland, Hogan Island. It rarely occurs in soil. This species was readily verified from a few old residual capsules, although barren material creates little difficulty. This species should occur on East Island.

B. sauteri B.S.G. H

Very rare. Found growing in wet soil and among the wet fibrous root masses of old *Poa* tussocks. It resembles *B. pachythea*, but is more robust, with the leaf nerve only shortly excurrent, and it has small, red-brown rhizoidal gemmae. This species is a recently recognized segregate from the *B. chrysoneuron* complex, known in Australasia only from a few New Zealand collections, and from two collections in eastern Victoria (Willis, pers. comm.).

Campylopus introflexus (Hedw.) Brid. H, L

Very common. A highly variable species, growing on soil and on rock. The typical mainland form has a long, reflexed, hyaline hair-point, but most collections in the Hogan Group have a short hair-point, rarely reflexed, or none at all. This could be a consequence of the dry conditions, the hair-point then not forming, or being shed very early. The characteristic long, linear-subulate, rigid, white-tipped, spreading

leaves and deciduous shoot-tips enable the species to be readily recognized. It should be found on East Island.

C. torquatus Mitt.? L

Very rare. A tall, slender, silky species with long, finely subulate leaves. It is represented by a single collection from Long Island, where it was growing in soil sheltered by low scrub. There is some uncertainty in this identification, the alternative being a form of *C. introflexus*.

Ceratodon purpureus (Hedw.) Brid. H, L

Rare on Hogan Island, but not uncommon on Long Island. It was growing in shallow soil over rock on Long Island, but on the stumps of old burnt *Stipa* tussocks on Hogan Island. A smallish, slender form: when sterile, it resembles *Ptychomitrium*, but the leaves are less dense and do not show the marked spiralling when dry which characterises the latter genus. *C. purpureus* commonly occurs on acid soils, so its occurrence on the granites of the Hogan Group is to be expected, but it also commonly follows *Funaria hygrometrica* as the second stage in plant succession on burnt ground. The vegetation of Hogan Island is more open and disturbed than the vegetation of Long Island, possibly due to the grazing pressure of cattle, and to periodic burning. It is thus hard to understand the much greater abundance of *C. purpureus* on Long Island, which is rarely if ever burnt. The species, however, probably becomes temporarily abundant on Hogan Island following each burn, and when conditions for growth are less severe.

Funaria hygrometrica Hedw. H.

Rare. The few old capsules present provide ready confirmation of this identification. Like *Ceratodon purpureus*, it probably becomes abundant periodically, following burns, and it is even more restricted than *C. purpureus* in its possible habitats, since it only grows on freshly burnt ground, or on similar high-nutrient substrates: this would explain its absence from Long Island.

Grimmia pulvinata (Hedw.) Sm. H

Occasional. It forms small clumps on rocks and boulders on the eastern slopes of Hogan Island. Old capsules were present in some collections. The long, flexuous, white hair-points on the leaves give the small flat tufts a characteristic hoary appearance.

Lembophyllum divulgum (Hook.f. et Wils.) Lindb. H

Not uncommon, but restricted to a small area. This delicate pleurocarp occurs among the rocks on the steep sheltered south side of the easternmost cape. The plants are small for this species, and form small tangled clumps: the leaves are characteristic, being evenly arranged around the stem, cochlear, obtuse, nerveless, with short cells. The collections are quite variable, even in this one locality.

Ptychomitrium australe (Hamp.) Jaeg. H

Extremely common on rocks. This species resembles *Ceratodon purpureus* in leaf structure, but the nerve fails below the apex. The plants are very variable, but are generally more robust and have denser foliage than *C. purpureus*, and the marked spiralling of the dry leaves, their inflexed tips, and their lack of falcate curvature readily distinguish the present species. Plants of *P. australe* on Hogan Island have more crisped, and narrower leaves than is usual in mainland specimens. It is singular that such a common moss on Hogan Island should be rare or absent on Long Island. On Hogan Island it occupies rocks in sheltered areas around headlands and bays on the eastern side, and its absence on Long Island is possibly due to a lack of similar sites there. Such a requirement is puzzling unless the presence of a bay reduces the violence of storms from the east and hence the amount of spray carried inland - it is not hard to visualize Long Island drenched with spray from storm waves battering the cliffs on the eastern side. There is no data available at present concerning the salt tolerance of any of these island mosses.

Sematophyllum homomallum (Hamp.) Broth. H, L

Common. Forms characteristic and often extensive golden-brown carpets at the margins of the larger flat rock sheets. The colour, branched stems and secund leaves are good

field characters. This species may be forming a stage in rock succession, although it seems more likely that the rock merely provides a convenient site for this spreading moss to grow on, in respect of stability, area, water drainage, and perhaps acidity. This species should also occur at higher levels on East Island.

Thuidium furfurosus (Hook.f. et Wils.) Jaeg. II

Uncommon. Stunted yellowish specimens only were found, and were restricted to the saddle and south side of the easternmost cape, growing among grass. The species is common in wet grassy areas on the mainland, so it may be more conspicuous in the Group in drought-free times.

Tortella calycina (Schwaegr.) Dix. L

Not uncommon, growing in soil. The large, robust, yellow-green plants are conspicuous in the field, and the leaf structure is fully diagnostic. When dry, the leaves spiral round the stem, and then the prominent ridge of the nerve gives the leaves a striped appearance, very useful for field determinations, especially in separating the present species from *Ptychomitrium australe*. The absence or rarity of *T. calycina* on Hogan Island is puzzling, since it occurs in similar habitats near the mainland coast. It is also curious that *T. calycina* and *P. australe* occupy similar habitats on the two islands and yet are each restricted to one island: they are similar in size and in the behaviour of the leaves on the dry plants.

Tortula princeps De Not. II, L

Extremely common and widespread throughout the islands, and the Bass Strait region. Plants are highly variable in the Hogan Group: the plants grow in compact tufts, often mixed with *Ptychomitrium australe* and *Bryum pachytheca*, on rocks and in soil. Despite its variability, especially in size, the large, obtuse, hair-pointed leaves are characteristic. The species should also occur on East Island.

Triquetrella papillata (Hook.f. et Wils.) Broth. II

Uncommon. Only found growing on soil on the south side of the saddle leading to the easternmost cape, in association with *Lembophyllum divulsus* and occasionally with *Thuidium furfurosus*. On the mainland the present species forms extensive mats among wet grass and is very common, so it may well become common in drought-free conditions in the Group, especially on Hogan Island, where there are wide expanses of grass, apparently resulting from, and maintained by, frequent burning.

Liverworts

All liverworts found were from Hogan Island, and all were rare.

Fruillania deplanata Mitt.

Forms small purple patches on rocks and in rock crevices on the south side of the easternmost cape. This liverwort should be much more common and widespread throughout the entire Group in wet seasons.

F. pentapleura Tayl.

As for *F. deplanata*.

Lophocolea biciliata (Hook.f. et Tayl.) Mitt.

This species forms small, dense mats on rock in the same area as the above *Fruillania* species. It is a common species throughout the Bass Strait region (Willis, pers. comm.), and should occur widely in the Group under better conditions.

Lunularia cruciata (L.) Dum.

This collection consists of two plants, which were growing in a sheltered rock crevice with *Asplenium*, on the south-west point.

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