PAPERS AND PROCEEDINGS OF THE ROYAL SOCIETY OF TASMANIA, VOLUME 89

Notes on Tasmanian Mosses from Rodway's Herbarium: VI

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The pleurocarpous mosses are included by Rodway in ten families or subfamilies, the great majority of them being grouped together under Hypnaceae and Neckeraceae. Modern treatment would recognise more than double that number of families and in this respect, as well as in allocation of genera according to their true affinities, Rodway's work is out of touch with modern ideas. As, therefore, it is not practicable for me to adhere to his arrangement and at the same time make the necessary modifications, I propose, from now on, to take the families in their order as appearing in Dixon's Classification of Mosses (*Manual of Bryology*, The Hague, Chap. 14), but without grouping them into orders and sub-orders, as shown there.

Family PLEUROPHASCACEAE

The curious moss *Pleurophascum grandiglobum* Lindb., which until recently had ranked as a Tasmanian endemic, is now recognised as constituting a monotypic family rather distantly related to the Dicnemonaceae. A varietal form has lately been found in the Westland District of New Zealand. It deviates from the typical plant mainly in having the leaves entirely without a flagellate apiculus, but it should be mentioned that in Tasmanian material I have found plants in which the apiculus was lacking in some of the leaves. The variety, therefore, is probably not very sharply defined. The moss is recognisable by the long seta and large, yellow, globose capsule. Its presence in New Zealand is as interesting a link between the two floras as is the presence in Tasmania of *Ephemeropsis trentepohlioides* and *Hampeella alaris*.

Family HYPNODENDRACEAE

The plants are robust and handsome, with dendroid secondary stems from a creeping primary stem. The branches are often clustered into a whorl at the apex of the stipe, and the appearance then is that of a miniature tree-fern. The leaves are ovate-acuminate, toothed and singly nerved; the cells narrowly linear. The setae are long, emanating from the base of the branches and often numerous. The only Tasmanian genera are *Hypnodendron* and *Mniodendron*, and in the studies the view is advanced that they are not satisfactorily distinguishable.

Mniodendron comosum (La. Bill.) Lindb. Syn. *Mniodendron comatum* (C.M.) Lindb.; *M. Sieberi* C.M.

The stipes are densely tomentose and with a terminal whorl of branches which may be stout and straight or slender and curved. The branch leaves have their margins variably bistratose and serrate. The nerve is excurrent and of variable width. Rodway's doubt as to the independence of the species in the synonymy seems to be justified, and I believe that in Tasmania, as in New Zealand, only the one variable species is involved.

Hypnodendron arcuatum (Hedw.) Mitt. Syn. *H. spininervium* Hook.; *H. Archeri* Mitt.

Distinguishable from the last species by the naked stipes which usually end in a pinnate complanate frond instead of a whorl of branches. The branch leaves are ovate, with the margins unthickened and serrate, and with the percurrent nerve toothed at the back above. The cells are usually papillose on the dorsal face. In New Zealand the plants are often found on the banks of densely shaded watercourses in the bush. They are green and glossy when dry.

Family RHACOPILACEAE

The genus *Rhacopilum* is included by Rodway in his family Lophidiaceae which corresponds with the modern Hypopterygiaceae. *Rhacopilum* has no real affinity with that group, because the small differentiated median leaves are placed in dorsal rows, whereas in the family mentioned they are true amphigastria and as such are ventrally arranged. The two species given by Rodway for Tasmania, *R. strumiferum* and *R. cristatum,* occur also in New Zealand. They have been kept apart by the robuster habit, stouter seta and more hairy calyptra in *R. strumiferum,* but these characters, as exhibited in New Zealand plants, seem to me to be inconstant and uncertain, and this is evidently the view taken in the Studies.

Family CRYPHAEACEAE

The Studies does not recognise the genus *Dendrocryphaea* as distinct from *Cryphaea,* so if that view is adopted there is only the one genus represented in Tasmania, as in New Zealand. In view of its Australian and New Zealand distribution the species *C. dilatata* might well be expected to be found in Tasmania.

Cryphaea tenella (Schwaegr.) Hornsch. Syn. *C. parvula* Mitt.

This is a slender corticolous moss with very thin, irregularly branched secondary stems, small long-acuminate leaves which are closely appressed when dry, numerous immersed capsules and gemmiform male buds. I have found the leaves and capsules to be usually shorter than 1·2 mm. and 2 mm. respectively as given by Rodway. The Studies treats *C. parvula* as a synonym.

Cryphaea tasmanica Mitt. Differs from the last in the aquatic rupestral habit, the robust dull-green stems which are sparingly branched except for the crowded perichaetial branches, and the orbicular-ovate leaves. The perichaetia are usually homomallous in New Zealand plants.

Family HEDWIGIACEAE

The plants here are robust and rigid, with irregularly branched stems. The leaves are coriaceous, imbricated and nerveless, with papillose cells. Rodway maintains *Hedwigidium* as a separate genus, but it is usually merged in *Hedwigia*. *Rhacocarpus* is the only other Tasmanian genus.

Hedwigia P. Beauv.

Differs from *Rhacocarpus* in the unbordered leaves, without differentiated alar cells, and the immersed capsules. Both of the Tasmanian species have a wide boreal and austral distribution.

Hedwigia ciliata (Hedw.) P. Beauv. Syn. *H. albicans* (Web.) Lindb. Grows in loose hoary tufts on non-calcareous rock, and outwardly resembles *Grimmia laevigata* owing to the diaphanous leaf apex. The leaf margin is recurved below and the cells are strongly papillose. The long flexuose cilia of the perichaetial leaves are very characteristic.

Hedwigia integrifolia P. Beauv. Syn. *Hedwigidium imberbe* (Sm.) Bry. eur. There is a strong outward resemblance here to the last species, but the leaves lack the hair-point and have the margins revolute to near the apex. The cells are only slightly papillose and the perichaetial bracts are not ciliate. Curiously enough the two species have been found growing in close association in New Zealand, New South Wales and Equatorial Africa.

Rhacocarpus Lindb. The genus belongs to the subfamily Rhacocarpoideae and there is no obvious structural affinity with *Hedwigia*.

Rhacocarpus Humboldtii (Hook.) Lindb. Syn. *R. australis* (Hpe.) Par.

This is a well-marked rupestral moss which could not be mistaken for anything else. The leaves are rigid and harsh, nerveless, bordered for a great part of their length with long narrow cells, and produced at the apex into a long flexuose apiculus. The areolation is obscure with fine and dense papillae, with the exception of the orange-red basal cells. The hair-point is similarly tinted. The capsule is far exserted on a seta of variable length. My study of the New Zealand plant has convinced me that the separating characters of *R. australis* are inconstant, and that the Australasian plant should be treated as a regional race of the widely distributed *R. Humboldtii*.

Family PTYCHOMNIACEAE

This family was created by Fleischer to accommodate a group of mosses having in common a plicate capsule and well developed peristome, combined with leaves that are nerveless or nearly so. Two genera are given by Rodway for Tasmania, i.e., *Ptychomnion* and *Glyphothecium*, and I consider that a third, *Hampeella*, is represented by a moss which was published on New Zealand material as a *Glyphothecium* after having been previously discovered in Tasmania by Weymouth, and wrongly determined by Brotherus as *Catagonium politum*. As is pointed out in the Studies (p. 370), the correct spelling of *Glyphothecium* is as given here, and it should be noted that Rodway's account of the genus is incorrect in stating that the capsule is smooth, it being distinctly ribbed when dry.

Ptychomnion aciculare (Brid.) Mitt.

A very handsome moss with rigid flexuose stems, reddish or black tinted, and squarrosely spreading leaves. The tall dark seta and long strongly ribbed capsule are distinctive fruiting characters.

Glyphothecium sciuroides (Hook.) Hampe.

This moss is recognisable in the field by the yellow and rather rigidly spreading leaves. The branches often curve upwards and the appearance is then very striking. Short axillary brood-filaments are often produced in quantity towards the ends of the branches, and paraphyllia are numerous on the stems. The distribution is East Indian as well as Australasian.

Hampeella alaris (Dix. & Sainsb.) Sainsb.

A remarkable moss which is known only from Tasmania and New Zealand. It is difficult to fit comfortably into any of the genera of the family, but I have given reasons for preferring *Hampeella* to *Glyphothecium* for it (*The genus Hampeella C.M. in New Zealand;* Rev. Bry. et Lich. 40 : 94). The Tasmanian plant, which was barren, was collected on Myrtle branches at Blue Tier, Pioneer Track. It is loosely tufted, yellowish and glossy, with finely cuspidate branches and mostly appressed leaves. The latter are remarkable for their polymorphism, the lower ones being oblong-oval or cymbiform, with recurved tips, the upper ones being much narrower, less concave, bluntly pointed. There are long brood-filaments amongst the upper leaves. The leaf cells at the angles are orange or purple and form small but conspicuous auricles. Even without its strongly 8-ribbed capsule it is amply distinguishable from any other Tasmanian moss.

Family LEPYRODONTACEAE

The family is monotypic and the sole genus, *Lepyrodon,* is represented in Australasia and South America. The only Tasmanian species, *L. lagurus* (Hook.) Mitt., has a similar distribution. It is a distinct plant in its close glossy mats which grow on logs, &c. The stems are densely matted together with dark tomentum and the leaves are tightly imbricated, hair-pointed and very faintly nerved. The oblong erect capsule is borne on a seta which, at any rate in the New Zealand race, is often fragile. Rodway's collection contains several gatherings from Mt. Wellington, but no other Tasmanian localities are given. The New Zealand *L. australis* Hpe., which differs in its strongly plicate leaves, should be looked for in Tasmania.

Family PTEROBRYACEAE

A large tropical and subtropical family. The two Tasmanian genera are *Trachyloma* and *Rhabdodontium.*

Trachyloma planifolium (Hedw.) Brid.

This is a frondose, flattened, corticolous moss with pale-green, often whitish scariose leaves. In the species the branches are frequently denuded of leaves at the apex and clothed there with brown brood-filaments,

but Rodway does not mention them, and I did not find them in the only specimen I saw from the collection. These filaments, which constitute a device for asexual reproduction, are a frequent and conspicuous feature in the New Zealand plant.

Rhabdodontium Buftoni (Broth. & Geh.) Broth.

I have only seen a barren scrap of this interesting and monotypic Tasmanian endemic. The Musci supplements Rodway's account and adds an illustration. The capsule is described as completely immersed, the peristome teeth broadly lanceolate, with a rudimentary inner peristome. Vegetatively it is distinct in the long flexuose stems, short branches, and imbricated nerveless leaves which are ovate and shortly acuminate, with narrowly linear cells.

Family METEORIACEAE

In this family the plants are mostly corticolous, with long, tangled, more or less pendulous stems. Two genera, *Weymouthia* and *Papillaria,* are represented in Tasmania. In the former the stems are soft and glossy, often forming large pendulous patches on the bark of trees, the leaves being smooth and of thin texture; whilst in *Papillaria* the habit is more rigid and the leaves are firmer and densely papillose.

Weymouthia cochlearifolia (Schwaegr.) Dixon. Syn. *W. Billardieri* Broth.; *Lembophyllum cochlearifolium* Lindb.

Variations here in the length and nature of the branches, which are well described by Rodway, have led to confusion in the systematic treatment which even went so far as to assign the species to two different families. The Studies keeps up the form with a short seta and turgid capsule as a var. *Billardieri,* but this is done with doubt and my own view is that the variety is too weak to be sustained. *W. cochlearifolia* is distinguishable from *W. mollis* by the more robust habit, the large suborbicular cochleariform leaves which are usually more crowded, and the porose leaf cells.

Weymouthia mollis (Hedw.) Broth. The habit here is normally pendulous and the leaf texture very soft. The leaves are rather distant, oblong, rounded, cucullate at the apex. The Studies mentions difficulties in distinguishing some forms from *Lembophyllum clandestinum,* but I think that the comparatively short (25 μ or less) cells in the upper part of the leaf in the latter plant will always suffice to separate the present species, where the same cells are 40-70 μ long and narrowly vermicular.

Papillaria C.M.

In these frequently pendulous mosses, which form intricate mats on bark, the leaves are lanceolate from an auricled base and the cells are papillose. Fruit is so rare in the genus that the specific characters are almost entirely vegetative. These are often anything but easy to apply because the plants are very variable.

KEY TO THE SPECIES

1.	Plants soft and slender; leaf margin unbordered; cells distinct, with few papillae	4. nitens
	Plants rigid; leaf margin usually bordered with pale cells; upper cells obscure and densely papillose	2
2.	Leaf margin widely bordered in the auricles, narrowly elsewhere; ultimate leaves usually apically forked	3. flavo-limbata
	Border narrow throughout; leaves not apically forked	3
3.	Leaves plicate when dry, nerve stout and prominent at back	1. crocea
	Leaves convex and smooth at back, with apex divergent	2. flexicaulis

1. *Papillaria crocea* (Hpe.) Jaeg. Syn. *P. kermadecensis* C.M.

The dry plant is recognisable by the plication of the leaves which are furrowed at the back on each side of the prominent nerve. Rodway gives the habit as slender, but it is variable, sometimes quite robust. The border of pale smooth cells is variably developed, as is the denticulation of the auricles which is occasionally lacking. The Studies mentions forms where the leaves are not or scarcely plicate. These variations are not surprising in view of the wide East Indian and Pacific distribution, if Dixon's opinion that only one species is involved is correct, a conclusion with which I quite agree so far as my knowledge of the plants extends.

2. *Papillaria flexicaulis* (Tayl.) Jaeg. Syn. *P. filipendula* (H. f. & W.) Jaeg.

I share Rodway's opinion that these are conspecific, but *P. flexicaulis* has priority. The leaves are closely imbricated, convex and smooth at the back, with the apices divergent. The nerve is shorter than in *P. crocea* and the auricles are perhaps usually, but certainly not always, entire. I have never been able to see in *P. filipendula* anything more than a slender form of the present species with finely drawn out leaves.

3. *Papillaria flavo-limbata* (C.M. & Hpe.) Jaeg.

This plant is well marked in its robust habit, orange or yellow colour and turgid branches. The leaves are large, erect or suberect when dry and rather rigidly spaced. They are not plicate and have a very broadly auricled base. The border is wide and conspicuous below. The ultimate leaves of the slenderer branches and filiform prolongations usually end in a piliform flexuose point which is forked at its apex with 2-3 very short branchlets. Forms with greatly attenuated branches are very common.

4. *Papillaria nitens* (H. f. & W.) Sainsb.

The Studies discusses the New Zealand *Meteorium nitens* H. f. & W., which was set up on scanty barren material in Wilson's herbarium at the British Museum, but does not mention the possibility that it might be conspecific with the Australian and New Zealand *Papillaria nitidiuscula* Broth. which is described on the preceding page. My inquiries at the Museum convinced me of the identity of the plants and I proposed the change of genus accordingly (*Critical New Zealand Mosses;* Rev. Bry. et Lich., 21 : 221). It must, however, be conceded that the two genera are weakly defined. A Tasmanian specimen, from East Tamar, is in

Rodway's collection sub nom. *Papillaria intricata* (Mitt.) Jaeg., a Samoan moss which Dixon considers to be quite different. *P. nitens* is distinguishable at once from the other Tasmanian species by the fewness of the leaf papillae, 1-3 only to a cell, which gives the upper areolation an appearance quite different from that of the opaque tissue of the other species where the cells are densely papillose. The branches, other than the earlier ones, are pendulous and slender and the leaves are laxly set, with the broad auricled base arched out from the stem and contracted to a subula which is erect but not appressed. The nerve is short and faint.

Family NECKERACEAE

Modern treatment limits this family to a large group of mosses of robust habit, with flattened secondary stems and complanate shortly pointed leaves which are sometimes transversely undulate. The nerve is either single, or double and faint, the cells smooth and the capsule immersed or exserted. The genera established as Tasmanian are *Neckera* and *Thamnium*. A third, *Homalia,* appears to be doubtful, Rodway stating that the New Zealand *H. falcifolia* is recorded from Tasmania but that there are no Tasmanian specimens in any of the collections. The Studies gives it as indigenous in Tasmania but my inquiry at Kew has not convinced me that this is correct.

Neckera Hedw.

Neckera pennata Hedw. Syn. *N. hymenodonta* C.M. The Australasian *N. hymenodonta* has been kept apart from this widely distributed boreal species by the longer processes of the endostome, but the peristome in the southern plant is so variable in this respect that I do not consider that the separation is justified. In Rodway's account of the Tasmanian moss the processes are stated to be very long, and in one of his specimens they are three-quarters the length of the teeth; but in the same peristome other processes were less than half that height, so I do not think that the account can be accepted without qualification. The plant is easily recognised by the flattened stems and branches, the strongly undulate nerveless leaves and the numerous capsules which are immersed in long bracts.

Thamnium Schimp.

In this genus the leaves are not undulate, the single nerve is well developed and the capsule is exserted on a fairly long seta. It is remarkable that the New Zealand and Australian *T. pandum* (H. f. & W.) Jaeg. has not been recorded from Tasmania because it is, at any rate in New Zealand, quite a common aquatic or semi-aquatic moss. In my opinion the East Indian *T. latifolium* is conspecific, as is also the Australasian and Pacific *T. eflagellare*. *T. pumilum,* which appears to be more plentiful in Tasmania than in New Zealand, grows on stones in streams. Its habit is very slender, with flattened stems and small leaves (0·75 mm.) long. The nerve usually fails about midleaf but is sometimes lengthened, though always ending well below the apex.

Family ECHINODIACEAE

The only genus, *Echinodium* Jur., has a most intriguing discontinuous distribution. It is confined to Madeira and the Azores in the northern hemisphere and Australasia and some Pacific islands in the southern.

Echinodium hispidum (H. f. & W.) Jaeg.

Rodway's description of the habit as flaccid does not hold good in the typical form, and indeed contradicts the specific name. Nevertheless, although the plants are usually robust and rigid, the species is very variable indeed, and slender and delicate forms occur which, whilst showing no structural differences, are very dissimilar in outward appearance. The dark green colour, rigidly imbricated and long acuminate leaves, and the nerve far excurrent in a rigid arista are strong characters. *E. hispidum* is often aquatic but is by no means constantly hygrophilous.

Family LEMBOPHYLLACEAE

The characters in this family are well marked, the stems being robust and woody, often dendroid. The leaves are concave, faintly nerved or nerveless, with rather long cells except at the angles, where they are small, dark, and sometimes inflated. The seta is elongated and the peristome double, with processes and cilia well developed. *Lembophyllum* and *Camptochaete* are the two Tasmanian genera.

Lembophyllum Lindb.

Dixon, in the Studies, treats *Lembophyllum cochlearifolium* as a synonym of *Weymouthia cochlearifolia,* and in my opinion *L. divulsum* is no more than a varietal form of *L. clandestinum.*

Lembophyllum clandestinum (H. f. & W.) Lindb. The plants are robust with stout and woody stems that are irregularly pinnately branched, but not dendroid. The leaves are suborbicular and cochleariform, very closely imbricated so as to make the branches julaceous. The nerve is lacking or faint, and the cells are narrowly oval except at the angles, where they are subquadrate or rounded and form small and dark auricles. In my variety *divulsum* (see *Synonyms of some New Zealand Mosses;* Rev. Bry. et Lich.; 17 : 83), the upper cells are shorter, but there is no very sharp dividing line, and certainly no constant correlation between a more distinct nerve and punctiform upper cells, the two characters on which *L. divulsum* was founded.

Camptochaete Reichdt.

The dendroid, rigid, woody stems distinguish the plants, except in *C. gracilis* the generic position of which is scarcely settled. There is a tendency to produce flattened and elongate forms in which the dendroid habit is less pronounced. *C. deflexa* Wils. is one of these and cannot be considered as having specific standing.

Camptochaete arbuscula (Hook.) Jaeg. The stem leaves are closely imbricated, wrinkled and baggy, shortly acute. In *C. ramulosa* (Mitt.) Jaeg., which is closely related, they are smooth, very rigidly imbricated and with longer points. The seta is usually longer in the latter species, 1-5 cm. as against less than 1 cm.

Camptochaete gracilis (H. f. & W.) Par.; Syn. *C. tasmanica* Broth. A small, slender, soft moss which is usually found on wet rock or stones margining creeks. The stems are irregularly branched, not dendroid, and the leaves are imbricated and often secund. Their dorsal surface is sometimes papillose, and this occurs in *C. tasmanica* which is a form with loose habit and spreading leaves. It is not mentioned in the Musci.

Camptochaete vaga (Hornsch.) Broth. An Australian species which the Musci gives for Tasmania, but which is neither mentioned by Rodway nor in his herbarium. It is characterised by a combination of the dendroid habit in the genus with the suborbicular and cochleariform leaves of *Lembophyllum*. They are shortly and abruptly mucronate.