

## Notes on Tasmanian Mosses from Rodway's Herbarium: V

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### Family BARTRAMIACEAE

The leaf cells here tend to be short, pellucid and distinctly papillose, and the capsule is usually globose and furrowed. The following key to the genera may be helpful.

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|--|-----------------|
| 1. Peristome teeth conjoined above; operculum beaked   | 2. Conostomum   |
| Peristome teeth not conjoined above  | 2               |
| 2. Leaves more or less plicate   | 3. Breutelia    |
| Leaves not plicate   | 3               |
| 3. Capsule plicate; plants mostly peristomate  | 4               |
| Capsule rugulose; plants gymnostomous  | 5. Bartramidula |
| 4. Leaves quickly narrowed (except in <i>B. stricta</i> ) from a widened or semi-sheathing base; stems without sub-floral whorls or branches | 1. Bartramia    |
| Stems with sub-floral whorls; leaves ovate-lanceolate  | 4. Philonotis   |

#### 1. *Bartramia* Hedw.

*Bartramia Halleriana* Hedw. Syn. *B. norvegica* Lindb. This is the type species and it is widely distributed in the northern hemisphere. It is recognisable by the elongated straggling stems and numerous short, apparently lateral setae. *B. norvegica* is pre-Hedwigian and the name is invalid accordingly.

*Bartramia papillata* H. f. & W. Syn. *B. fragilis* Mitt. Although it is extremely variable as regards robustness and size, it is characterised in all its forms by the contrast between the smooth and hyaline areolation of the rectangular leaf-sheath and the much smaller cells of the subula, which are dense and obscure with low papillae. *B. fragilis* is considered by Rodway to be doubtfully distinct, and is reduced to synonymy in the Studies IV, pp. 226 (1926). The material so named in the collection (from Cradle Mountain) is certainly *B. papillata*.

*Bartramia stricta* Brid. This is much like forms of *B. papillata*, but is separable at once by the gradually tapered leaves from a broad but ill-defined base, the cells of which are firmer and shorter than they are there. It is a widely distributed species, and the relationship is with the New Zealand *B. alaris* Dix. & Sainsb., but the upper cells are much longer, 20-30  $\mu$  as against 10  $\mu$ .

*Bartramia erecta* (Hpe.) Broth. The Musci attributes *B. erecta* to Eastern Australia only, but Rodway cites it from Hobart localities and the collection contains specimens from there. Here too there is a strong resemblance to *B. papillata*, but the leaf-sheath is narrow and the capsule without peristome.

2. *Conostomum* Sw.

Apart from the fruiting characters mentioned in the key, the members of this genus are distinguishable by the quinquefariously arranged leaves which are of solid texture and difficult to soak out.

*Conostomum australe* Sw. This is a larger plant than the following. The stems are very densely matted together with tomentum, and the leaves are conspicuously arranged in five rows. The nerve is very wide and indistinct, excurrent in a smooth and hyaline arista.

*Conostomum pusillum* H. f. & W. The plants here are slender and the stems, though tomentose, are not densely matted together. The leaf arrangement is not so strongly marked as it is in *C. australe* and the nerve is narrower and clearly defined. Both species occur in New Zealand.

3. *Breutelia* Schimp.

The vegetative characters in the genus are robustness of habit, plication of the leaves and the presence in them of a basal marginal area of quadrate cells. The variable development of these characters has led to the creation of several badly defined and unsatisfactory species.

*Breutelia pendula* (Hook.) Mitt. Two of the species treated by Rodway as separable from this, i.e., *B. comosa* Mitt. and *B. divaricata* Mitt. are reduced to synonymy in the Studies. *B. Sieberi*, which is maintained there on account of less differentiated alar cells and longer upper ones, has since been shown by New Zealand material to be inconstant in these respects, and should be reduced accordingly. The plants are extremely variable, but in all its forms *B. pendula* is recognisable by the leaves which are plicate throughout, usually patulous, and from 2.5 mm. to 4 mm. long. I have seen Australian specimens where the alar group is so reduced as to be scarcely noticeable.

*Breutelia affinis* (Hook.) Mitt. Syn. *B. commutata* Jaeg. Differs from the last in the leaves being only plicate at the base, and in the more numerous and smaller alar cells with firmer walls and chlorophyllose contents. The stems and branches are cuspidate, the leaves erect and rigidly appressed when dry. The latter are not quite entire, as stated in Hooker's Handbook and the Studies, there being often, perhaps usually, some denticulation in the upper part of the margin which Rodway describes as serrulate. His opinion that *B. commutata* is conspecific is supported in the Studies.

*Breutelia crassa* H. f. & W. Rodway's collection contains a specimen named as this, which apparently is the plant referred to in his work. The collecting data are:—"November, 1910, Mt. Wellington, 3000 ft." The material is barren and Rodway treats it as probably being only a robust condition of *B. comosa*, i.e., *B. pendula*. It is highly interesting because it is certainly identical with the New Zealand *B. elongata* (H. f. & W.) Mitt. This is a very robust and handsome moss, with flexuose branched stems and leaves which can attain 7 mm. They are markedly plicate, sharply denticulate, with very narrow linear cells that are papillose above, smooth below and more or less porose throughout. The alar group is conspicuous and the cells at the insertion are dark orange-brown. The

Studies describes the leaves as strongly falcate, but they are not invariably so: I have often seen them almost straight. The only other specimen in the collection under *B. crassa* differs in no way from *B. pendula*. This relationship between the giant forms of *Breutelia* that have been published as independent species seems to require investigation.

#### 4. *Philonotis* Brid.

The leaves here are lanceolate and do not have the wide sheathing base of those of *Bartramia*. Their cells are more or less uniform throughout, mostly papillose at their upper ends. With the exception of *P. scabrifolia* the plants are markedly hygrophilous. The subfloral whorls are a good character, but the plants are often barren.

*Philonotis scabrifolia* H. f. & W. This is the only species of the subgenus *Catenularia* C.M. and in the absence of fruit the straggling stems, which are sometimes pinnately branched, have the appearance of a pleurocarpous moss and effectually conceal the true affinity. The colour is a characteristic glaucous or sage green, the leaves are very small with cells and nerve highly papillose. The male flowers are discoid and conspicuous, the capsule is large, and the subfloral whorl is strongly marked.

*Philonotis tenuis* (Tayl.) Jaeg. Syn. *P. fertilis* Mitt. This is a very variable species in size, recurvature of the leaf margin (it sometimes being plane), serrulation of same and papilosity of the cells. Rodway overstates the length of the leaf which he gives as 3 mm., whereas it seldom attains 2 mm. His view that *P. fertilis* is inseparable is no doubt correct, so far as can be judged from the gametophyte.

*Philonotis australis* (Mitt.) Jaeg. This New Zealand species is credited to Tasmania by Rodway in his Additions to the Tasmanian Flora (*Papers & Proc.*, &c., 31st December 1915). The specimen in his collection is evidently the plant there referred to. It is barren, and was collected by Weymouth at St. Mary's Pass and determined by Brotherus. It is a difficult plant in that the leaf shape and habit are as in small forms of *P. australis*, the leaves being shortly pointed and often slightly falcate, whilst the recurved leaf margin and short cells are characteristic of *P. tenuis*. I am inclined to think, therefore, that in the meantime *P. australis* should be treated as a doubtful Tasmanian species.

*Philonotis rigens* Broth. There seems to be no moss so-named in the collection, and Brotherus does not mention it in the Musci. From Rodway's account it might perhaps be a form of *P. tenuis* with plane-margined leaves.

#### 5. *Bartramidula* Schimp.

Plants very slender with a creeping habit and small lanceolate leaves. Capsule gymnostomous and usually either smooth or rugulose, not furrowed.

*Bartramidula pusilla* (H. f. & W.) Schimp. This is a tiny moss with straggling stems and julaceous, slightly curved, branches. The leaves are only about 0.5 mm. long, densely imbricated and broadly lanceolate, with the margins bluntly dentate above. In Rodway's var. *Weymouthii* the capsule is tuberoso at the base, but to judge from what I have seen in the collection this character may not be quite constant. The spores seen were very large, up to 80  $\mu$  in diameter, and sharply papillose. The variety has been reported from Victoria and West Australia, and this is the only known extension of the distribution. As has been already mentioned in Part 2 of these Notes, Rodway (in Additions to the Tasmanian Flora) mistakenly gives the inflorescence as dioicous, he having confused the present plant with the gemmiferous form of *Pleuridium nervosum*. The Flora Tasmaniae states that the inflorescence is synoicous and monoicous. The male buds that I have seen were on a stem or branch that might or might not have been connected with a fertile one.

#### Family SPLACHNACEAE

Plants with short stems, mostly growing on animal droppings. Leaves wide and soft, nerved, with large, lax, smooth and more or less hexagonal cells. Capsule erect and symmetrical, with a conspicuous apophysis and small convex operculum. In a valuable and interesting paper ("The chequered story of two Tasmanian Mosses"; *Victorian Naturalist*, Vol. 67, June 1950, p. 30) J. H. Willis has transferred to *Tayloria*, as being the most acceptable genus, the two species of *Tetraplodon* appearing in Rodway's work, with the result that only the one genus of this family is, rather tentatively, recognised by him for the local flora.

#### KEY TO THE SPECIES OF TAYLORIA

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|---|------------------|
| 1. Apophysis much wider than the capsule .....  | 2                |
| Apophysis not wider than the capsule .....  | 3                |
| 2. Nerve excurrent, leaf margin entire .....  | 1. tasmanica     |
| Nerve failing below apex; leaf margin irregularly toothed .....                               | 2. Gunnii        |
| 3. Leaf margin sharply toothed above; nerve failing .....                                     | 3. calophylla    |
| Leaf margin entire or slightly and bluntly toothed; nerve excurrent in the upper leaves ..... | 4. octoblepharis |

1. *Tayloria tasmanica* (Hampe) Broth. The apophysis here, though distinctly wider than the capsule, is much smaller than in *T. Gunnii*. Willis (loc. cit.) points out that the sporophore has a banded appearance, being dark brown above and whitish below.

2. *Tayloria Gunnii* (W. Wilson in Hook.) Willis; Syn. *T. obtusissima* Broth. ? This is distinguishable from the preceding by the short nerve and the very large discoid apophysis. Willis's apt comparison of the appearance of the capsule and apophysis mentions a "tall Welsh hat". The only specimen of *T. obtusissima* in the collection appears to conform vegetatively to the present species, and it seems from Rodway's account that no fruit has been seen. In that case I think that it must be considered as a somewhat doubtful species.

3. *Tayloria calophylla* (C.M.) Mitt. A robust plant clearly distinguishable by the sharp serrations in the upper part of the lamina and by the failing nerve. It is a New Zealand moss which I have only seen

from the northern part of the North Island, and its occurrence in Tasmania is rather uncertain. Rodway states that the only specimen in the collections is from New Zealand, but Dixon, in the Studies, expresses belief in the wider distribution, though he does not give particulars. The Musci mentions it as a Tasmanian moss.

4. *Tayloria octoblepharis* (Hook.) Mitt. This has a wide Australian and subantarctic distribution. It is a smaller plant than *T. calophylla* and, in addition to the vegetative characters, differs in the peristome teeth being reflexed on to the capsule wall when dry instead of being slightly incurved, as there.

#### Family FUNARIACEAE

Vegetatively the plants here are as in Splachnaceae, but the capsule is usually globose or pyriform and may be erect or cernuous. There is no apophysis, and the peristome, when present, is single or double. The genus *Gigaspermum* which is included here by Rodway, is, with three others, placed by Brotherus in the separate family Gigaspermaceae. The remaining genera, *Physcomitrium* and *Funaria*, have a similar habit and areolation, but in the former the calyptra is mitriform and lobed at the base and the capsule is gymnostomous, whereas in *Funaria* the calyptra is cucullate and the capsule is often peristomate.

*Physcomitrium conicum* Mitt.

A well marked species, allied to the European *P. pyriforme*. The leaves have the marginal cells narrower and longer than the inner ones, and form blunt serrulations by projection of their ends. The nerve fails in the apex. The capsule is pyriform or turbinate, with a wide mouth. The plant, in New Zealand at any rate, grows in quantity on the muddy banks of streams and drains.

*Physcomitrium laxum* H. f. & W. Rodway considers this to be a shade form of *P. conicum*, and gives the locality as the Upper Meander River. The only specimen I have seen is in imperfect fruiting condition and purports to have been collected by Rodway on Mt. Wellington Plateau. The leaf margin is not serrulate and the lamina cells run out from the nerve in regular divergent rows, as in *Tayloria purpurascens* (H. f. & W.) Broth., a New Zealand and subantarctic moss. I am unable to give an opinion as to the standing of *P. laxum*.

*Funaria* Schreb.

Subgeneric rank only is recognised for *Entosthodon*, where the capsule is erect and the peristome is usually lacking, and *Eufunaria*, where a curved and asymmetrical capsule is combined with a more or less perfect peristome. *F. glabra*, *F. hygrometrica* and *F. cuspidata* belong to the latter subgenus and the other Tasmanian species to the former. It is noteworthy that in this genus the processes, when present, are placed opposite to the teeth and do not alternate with them as in a normal double peristome. All the Tasmanian species occur in New Zealand. *Funaria* is one of the few moss genera where hybridism has been established.

## KEY TO THE SPECIES

1. Capsule gymnostomous	2
Capsule peristomate	3
2. Leaves lanceolate-subulate; seta much longer than the capsule and neck	2. <i>producta</i>
Leaves ovate or obovate; seta much shorter than the capsule and neck	1. <i>apophysata</i>
3. Capsule striate	6. <i>hygrometrica</i>
Capsule smooth	4
4. Capsule asymmetrical and curved; peristome large and persistent.	5. <i>glabra</i>
Capsule erect and symmetrical; peristome small and fragile	5
5. Nerve excurrent; imperfect inner peristome present	3. <i>cuspidata</i>
Nerve failing below apex; peristome single	4. <i>gracilis</i>

1. *Funaria apophysata* (Tayl.) Broth.

There is a link here with the Splachnaceae in the very long neck which quite equals the capsule, the two together usually exceeding the length of the seta. The Tasmanian plant has the nerve far excurrent in the topmost leaves, but it fails below the apex in the New Zealand race.

2. *Funaria producta* (Mitt.) Broth.

This is easily recognised by the narrow ovate-lanceolate leaves, narrow cells and pyriform gymnostomous capsule. It formerly ranked as a Tasmanian endemic, but it has been found in the North Island of New Zealand, and I share Mr. Willis's opinion that the Victorian *F. perpusilla* Broth. is conspecific.

3. *Funaria cuspidata* H. f. & W.

Rodway's note on this species is that it is continuous with *F. gracilis*, and there is much to be said for that view. A vague and rudimentary inner peristome is present here and lacking there, but otherwise the fruiting characters entirely agree. In *F. cuspidata* the leaves are erectopatent when moist and the nerve is mostly far excurrent, whereas in *F. gracilis* the leaves are erect and the nerve vanishes below the apex. In the Studies (pg. 193) Dixon comments that no clear line can be drawn to separate *Entosthodon* and *Funaria*. The truth of this statement is illustrated by the fact that *Brotherus*, treating them as subgenera, has assigned *F. cuspidata* to *Eufunaria* and *F. gracilis* to *Entosthodon*.

4. *Funaria gracilis* H. f. & W.

See note to *F. cuspidata*.

5. *Funaria glabra* Tayl. Syn. *F. crispula* H. f. & W.; *F. tasmanica* Hpe.?

A very distinct plant in the strongly arcuate smooth capsule, with its wide mouth and well-developed double peristome. The leaf is distinctly bordered by one or two rows of narrow, often yellowish cells, and its margin is bluntly serrulate above by projection of the cell apices. *F. crispula* is, from Rodway's description and specimen, merely a form of *F. glabra*, and this was his recorded opinion. The only specimen of *F. tasmanica* in the collection seems to agree well with the present species, but I have not seen type material.

6. *Funaria hygrometrica* Hedw.

This is one of the best known mosses in the world, and when in normal fruit it is unmistakable. The long seta is arcuate when young and the capsule is obliquely pyriform, gibbous, sulcate when dry, and incurved at the mouth. The outer teeth of the peristome are spirally arranged and united at their apices in a small disc. The deeply concave leaves are, according to Rodway's description of the Tasmanian plant, elliptic and apiculate. The margin is plane and entire, and the nerve thin and percurrent. The New Zealand plant often has the leaves more gradually pointed than in European forms.

## Family GIGASPERMACEAE

This family contains four small genera of Funarioid affinity where the plants have creeping rhizomatous stems with erect and crowded fertile branches. The areolation is lax, the capsule gymnostomous and almost immersed, with very large spores. In the genus *Gigaspermum*, to which the Australian moss belongs, the leaves are nerveless and the capsule is immersed.

*Gigaspermum repens* (Hook.) Lindb.

In this curious little moss the leaves are imbricated, nearly orbicular, shortly cuspidate. The perichaetial bracts are much larger and slenderly acuminate. They are conspicuous through their size and the hyaline scarious tissue which gives them a whitish appearance. The widely urceolate capsule is almost sessile and is more or less concealed by the bracts. The spores are very large. The Musci gives them as reaching 70  $\mu$  in the genus, and this figure is repeated in the Studies in the description of the present species, but I have seen them far larger, nearly 200  $\mu$  in a Tasmanian specimen. I have not seen *G. tumidum* (Mitt.) which is given in the *Musci* as endemic in Tasmania, but as all the species are said there to be very closely related, I have little doubt that it is conspecific.

