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NOTES ON TASMANIAN MOSSES FROM RODWAY'S HERBARIUM: VII.

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Family NEMATACEAE

Mr. J. H. Willis's outstanding discovery of a scrap of what is probably the New Zealand *Ephemeropsis trentepohlioides* (Ren.) Sainsb. amongst some mosses which he had collected near Mt. Field, National Park, Tasmania, is recorded by him in *Nature* (Nemataceae, a Moss Family new to Australia; 1953; 172: 127). This extraordinary plant is one of the wonders of the bryological world. The gametophyte is reduced almost entirely to a branched protonema, but this primitive structure is associated with a highly developed sporophyte, consisting of a relatively long seta and a capsule with a double peristome, which discloses unmistakable affinity with Hookeraceous mosses. It is probable that this association of such a primitive gametophyte with a highly developed sporophyte can only be explained on the assumption that the former is a reduction or reversion to the primeval gametophyte of the mosses. The plants are on a very small scale, the capsule often being less than 0·5 mm. long, the seta to 2 mm. The protonemal gametophyte forms a dense alga-like mat on twigs and is practically impossible to find unless fruit is present. Even then it is only too likely to be overlooked. Mr. Willis's material was too scanty to allow dissection, but I think that it can safely be referred to the New Zealand species. The only other species, *E. tjibodensis* Goeb., has an East Indian distribution. It shows some differences from the Australasian plant.

Family HOOKERIACEAE

This family, founded by Brotherus, supercedes Lindberg's Pterygophyllaceae which appears in Rodway's work. The plants have soft stems and leaves, the latter being either evenly arranged round the stem (in *Sauloma* and *Daltonia*) or complanately, with the lateral leaves rather asymmetrical (in *Eriopus, Distichophyllum* and *Pterygophyllum*). The flattened stems in the latter group sometimes simulate hepatics, especially where the plants are terrestrial in damp shady stations. In *Eriopus* the nerve is either lacking or shortly double, whilst in *Distichophyllum* and *Pterygophyllum* it is single, though sometimes forked at the apex.

Sauloma H. f. & W. A. small Australasian genus containing 2 or 3 species. Distinguishable from *Daltonia* by the nerveless unbordered leaves.

Sauloma tenella (H. f. & W.) Mitt. The plants are soft and glossy, whitish-green or yellow. The leaves are closely imbricated, lanceolate or oblong-lanceolate, nerveless, with entire and variably recurved margins, and lax, narrowly linear-rhomboid cells. The small capsule, exserted on a seta about 1 mm. long, is contracted below the mouth when dry.

Daltonia Hook. & Tayl. The genus is widely distributed in warm regions and has many published species, though probably a large number will eventually become synonyms.

Daltonia augustifolia Dz. & Mb. Syn. *D. pusilla* H. f. & W. An East Indian moss with which Fleischer, in Musci von Buitenzorg, considers the Tasmanian plant to be conspecific. From what I have seen of the respective species I would not consider them to be satisfactorily separable. Fleischer and Dixon were both inclined to the view that the East Indian moss and *D. pusilla* are scarcely distinct from the Northern *D. splachnoides* Hook. & Tayl., and I understand that this is also Willis's opinion. *D. angustifolia* grows in small dense tufts on bark. Rodway's statement that the habitat is sometimes fern-leaves is interesting in view of the fact that so few of the Australasian mosses are epiphyllous, and also that epiphyllous forms of this and other species of *Daltonia* occur in the tropics. The leaves are symmetrical and closely imbricated round the stem, narrowly lanceolate, nerved to some distance below the apex, and bordered with several rows of narrow cells. The cells at the insertion are isodiametrical and reddish brown. The seta is variably rough in its upper part.

Eriopus (Brid.) C. Mull. The characters here, in addition to the nerve structure, are the strongly bordered leaves and the hairiness or papillosity of the seta.

Eriopus apiculatus (H. f. & W.) Mitt. The leaves are stoutly bordered and practically entire and nerveless. Rodway is in error in describing the seta as strigose; it is usually lowly papillose, though sometimes the papillae may be large and spiky.

Eriopus flexicollis (Mitt.) Jaeg. Syn. *Eriopus tasmanicus Broth.*??

There is an undoubted specimen of this New Zealand species, formerly ranked as endemic, in Rodway's collection. It is from Mt. Wellington, and is labelled "Eriopus". His description of *E. tasmanicus* could apply to *E. flexicollis*, though Dixon (in the Studies) suspects that the former may be referable to the New Zealand endemic *E. cristatus*. The two New Zealand species have much in common, but the upper cells in *E. cristatus* are wider than in *E. flexicollis*, 50-60 μ as against 25-40 μ. The specimens in Rodway's herbarium named as *E. tasmanicus* are referable to *E. apiculatus*.

Distichophyllum Mitt. The Tasmanian and New Zealand species form a rather heterogeneous group, due to the presence in both countries of *D. macrocarpum* which, unlike the others, has unbordered leaves. The plants have a smooth seta, and the calyptra is fimbriate at the base.

Distichophyllum rotundifolium (H. f. & W.) Broth. This is closely related to the next, the separating characters of the present species being the small rounded leaves with a short, stout apiculus and denticulate

margin. From what I have seen of the New Zealand plants the habitat is usually damp rotten logs, whereas in Tasmania it seems to be mostly wet rock.

Distichophyllum crispulum (H. f. & W.) Mitt. The branches are more flattened than in *D. rotundifolium*, the leaves widely oval-oblong, less crisped when dry, nearly entire, and with a longer and slenderer point. The areolation is similar and the fruiting characters are the same.

Distichophyllum pulchellum (H. f. & W.) Mitt. Syn. *D. amblyophyllum* (H. f. & W.) Mitt. This is more robust than either of the preceding, with flattened stems and leaves flaccid and densely imbricated. The latter are broadly spathulate, entire, rounded at the apex, and either with or without a very short apiculus. There is a thin pale border of long and narrow marginal cells. The variety *parvirete* Sainsb., which I published on New Zealand material (Rev. Bry. et Lich., 16 : 47), has the upper leaf-cells much smaller, 7-10 μ in diameter as against 12-20 μ. There are two Mt. Wellington collections of this variety in Rodway's collection, one made by Weymouth and determined by Brotherus as *D. crispulum*, and the other collected by Rodway and labelled *D. pulchellum*. So far as *D. amblyophyllum* is concerned, I do not think that it is anything more than a robust form of the present species, with the leaf apex usually non-apiculate. I have found that the presence or absence of the apiculus is inconstant throughout, sometimes even in a single stem.

Distichophyllum microcarpum (Hedw.) Mitt. This robust species is sharply distinguished by the absence of a border, the rounded leaf apex, and the small upper and outer cells which strongly contrast with the larger central ones. As Rodway mentions, the stems become greatly elongated when growing in mats on wet rock walls.

Pterygophyllum Brid. Of the three species mentioned by Rodway as occurring in Tasmania two, i.e., *P. denticulatum* and *P. nigellum*, are given in the Studies as synonyms of *P. dentatum* (H. f. & W.) Mitt., and it is there pointed out that the specific name "denticulatum" is merely a slip. The third species, *P. Hookeri*, is not known to me and is not present in the collection, but from Rodway's description it would appear to be a robust form of *P. dentatum*, probably referable to the var. *robustum* (H. f. & W.) Dix. From what I have seen of the Tasmanian plants, the leaves seem to be more strongly dentate than they are in the New Zealand race. This moss can usually be recognised in the field by the blackish leaves which are distant and strongly crisped when dry. They do not soak out readily.

Family HYPOPTERYGIACEAE

This is the equivalent of Rodway's family Lophidiaceae, except that the genus *Rhacopilum* is excluded as having no real affinity with the group. The plants differ from all other Tasmanian mosses in having differentiated leaves (amphigastria) produced on the ventral side of the flattened branches. The lateral leaves, in two rows, are complanate. The presence in Tasmania of the New Zealand monotypic *Catharomnion* is doubtful, according to Rodway, there being no specimens in any

collection available to him. The plant is recognisable at once by the ciliate leaf margins. The bristles which Rodway mentions as being mixed with the leaves are in fact reduced leaves, and are properly treated by the Musci as amphigastria. Of the remaining Tasmanian genera, *Lopidium* has stems branched pinnately almost to the base, whereas in *Hypopterygium* the branching is in a suborbicular terminal frond with distant stipe leaves, and in *Cyathophorum* the stems are nearly always simple, rarely singly and dichotomously branched.

Lopidium concinnum (Hook.) Fleisch. Syn. *Lopidium pallens* H. f. & W. The stems here are usually not more than half the length (10-12 cm.) given by Rodway. The fronds are soft, pale and dull, ovate-oblong in outline and pinnately branched, the branches being sometimes rebranched. In the Studies the genus (which is correctly spelt as given here) is not kept apart from *Hypopterygium*, but I think that Fleischer is correct in recognising it as distinct. The habit of growth, leaf-shape, areolation, absence of cilia, &c., are characters that seem to justify generic rank.

Hypopterygium novae-seelandiae C.M. All the Tasmanian plants that I have seen of this would belong to the var. *nudicaule* Dix. (Studies, p. 295), which deviates in having non-tomentose stems. This character, however, is also given by him as helping to distinguish the Pacific *H. rotulatum* (Hedw.) Brid. which occurs in New Zealand and to which a specimen in the collection, from Macpherson Range sub. nom. *H. viridulum* Mitt., seems to be referable. The differences between the two species are rather elusive, being founded on variations in habit, position of the leaves when dry, strength of their marginal toothing and of the nerve, &c. The amphigastria in *H. novae-seelandiae* are small, suborbicular and long apiculate.

Cyathophorum bulbosum (Hedw.) C.M. This handsome moss can be placed at a glance by the narrow undivided fronds, sometimes attaining 20 cm., with large lateral leaves and small orbicular amphigastria. The setae are almost sessile and are produced on the ventral side of the stem. The var. *minus* of the Flora Antarctica appears in Rodway's work as *C. densirete* Broth. It is a small form which, according to the Flora Antarctica, has the leaves more acute and distant than they are in the type. Brotherus distinguishes it by the denser areolation and the very short nerve. The Studies discusses the plant and points out that the length of the nerve is very variable, and that, throughout the plants, there is no constant correlation between small stems and small leaf-cells. This is my own experience, and I fully agree with the statement in the Studies that the limits of the variety are difficult to define.

Family THUIDIACEAE

The only Tasmanian genus is *Thuidium* Bry. eur., where the stems are 1-2-3-pinnate, with numerous paraphyllia, and the leaves are dimorphous, singly nerved, with uniform papillose cells.

Thuidium furfurosum (H. f. & W.) Jaeg. Syn. *T. unguiculatum* H. f. & W.; *T. Stuartii* C.M. This very common and variable ground

moss is nearly always of a yellowish tint. The branching is irregularly bi-pinnate, the branch leaves being imbricated and catenulate when dry, with their tips strongly incurved. The stem-leaves are widely triangular-lanceolate and finely acuminate, the branch-leaves ovate-cordate and finely or bluntly pointed. I reduced *T. sparsum* (H. f. & W.) Jaeg. to a variety *sparsum* in Rev. Bry. et Lich., 21 : 223 (*Critical New Zealand Mosses*). This is a very slender form, with the branch leaves blunt and the cells small and obscure. Intermediates between the variety and the type form are numerous and perplexing. Rodway mentions the absence of paraphyllia on the ultimate branches as being a character to distinguish the present species from *T. laeviusculum*. This may be a sufficient test, but I think that in doubtful cases the character of the ramuline leaves, as given in the Studies, is preferable.

Thuidium laeviusculum (Mitt.) Jaeg. The coloration is usually green, and the plant favours a moist and shaded habitat. The stems are arched and rooting at the tips, with the primary branches forming rather distant and elegant flattened fronds. As the Studies mentions, the branch leaves are imbricated and scarcely altered when dry, with their tips not incurved but erect and parallel to the branch, and with the nerve cristate at the back.

Family LESKEACEAE

A number of genera, including *Thuidium*, were formerly included in this family, but the only Tasmanian genus is now *Pseudoleskea* if the two families are treated as separate. In this genus the branching is irregular, the paraphyllia (in the Tasmanian species) absent, and the stem leaves little differentiated from the branch leaves.

Pseudoleskea imbricata (H. f. & W.) Broth. A slender moss, with crowded curved branches which are terete and julaceous when dry, and of a brown colour. It is found in New South Wales, Victoria and New Zealand. There are no specimens in Rodway's collection, and his description of the plant is misleading and possibly founded on a mistake in identification. The leaves are given as being 1·5 mm. long, though they are seldom more than half that length, and the margins are described as revolute except towards the apex, whereas they are plane or only slightly recurved at the base. The cells are stated to have prominent and nodulose papillae, but I have not seen them distinctly papillose. Moreover, there is no mention of the julaceous, terete, dry stems, which are certainly a striking character. I presume, however, that the species is indigenous in Tasmania, for it is so treated in the Flora Tasmanica, the Musci and the Studies.