

Distribution of the Mosses Indigenous to New Zealand (SUPPLEMENT No. 1)

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IN *Transactions of the Royal Society of New Zealand*, vol. 76, pp. 162-184, the writer summarized the available information concerning the distribution of the indigenous mosses of New Zealand. As a result of subsequent fieldwork and of an examination of the moss collections of the Plant Research Bureau almost 150 "first known occurrences" of individual species or varieties have been listed for the several botanical districts of New Zealand, which it is the purpose of this paper to record. Stewart Island has been intensively studied during the past two years, but the very numerous "new records" for that area are being dealt with in a separate paper and are here omitted.

As in the previous paper, all new discoveries are credited to the Botanical Districts in which the localities occur, and for the sake of brevity these districts are indicated by the numbers associated with them in the accompanying table. Districts 1 to 7 are located in the North Island, and Districts 8 to 17 in the South Island.

Botanical Districts of New Zealand Mainland.

- | | |
|--------------------------|-----------------------------|
| 1. North Auckland | 10. North-eastern |
| 2. Thames (sub-district) | 11. Western |
| 3. South Auckland | 12. Eastern |
| 4. Volcanic Plateau | 13. Banks (sub-district) |
| 5. Egmont-Wanganui | 14. North Otago |
| 6. East Cape | 15. Fiord |
| 7. Ruahine-Cook | 16. South Otago |
| 8. Sounds-Nelson | 17. Dunedin (sub-district). |
| 9. North-western | 18. Stewart |

The writer desires to thank Dr. H. H. Allan and Miss L. B. Moore for facilitating his study of the moss herbarium housed in the Plant Research Bureau, and for permission to incorporate unrecorded habitats in this paper.

Modifications in Catalogue of Indigenous Mosses.

Since the publication of the initial paper (Martin, 1946) several species new to science or to the mainland have been brought to light, and several others have been shown either to have no existence or at best to be synonymous with other species. These are here indicated.

(a) Mosses inadvertently omitted from initial list—

Grimmia obtusata Hpe. and C. M. Bot. District No. 12.
Taxithelium polystichum (Mitt.) Jaeg. (5, 6).

(b) New Species or Varieties—

Distichophyllum pulchellum (H. f. and W.) Mitt. var. *parvirete* Sainsb.
Orthotrichum sainsburyi Allison (12, 16, 17).

- (c) Campbell Island Species Detected on the Mainland—
Muelleriella crassifolia (H. f. & W.). Otago coast (Allison, 1948).
Schlotheimia campbelliana C. M. Stewart Island (Martin).
- (d) Deletions from Catalogue of Indigenous Mosses—
Barbula rostrata (R. Br. ter.) Dix. Sainsbury (1940) has shown this to be a mixture of *Orthotrichum austro-cupulatum* Dix. et Sainsb. and *Tortula phaea* (H. f. and W.) Dix.
Dicranodontium australe Dix. Sainsbury (1946) points out that specimens so identified are almost certainly *Dicranoloma menziesii*.
Distichophyllum amblyophyllum (H. f. and W.) Mitt. This moss is regarded by Sainsbury as not specifically distinct from *D. pulchellum* (H. f. and W.) Mitt., and should be dropped.
Drepanocladus brachiatus (Mitt.) Dix. Mr. Sainsbury states that Dr. Wynne, of Chicago Nat. Hist. Museum, has merged this species in *D. aduncus* (Hedw.) Moenk.
Macromitrium pusillum Mitt. Specimens so named in New Zealand are not this species, but *M. ligulare* Mitt., according to a private communication from Mr. Sainsbury.
Sainsburia novae-zealandiae Dix. Dixon is said to have withdrawn this genus and species (in a letter to Dr. Steere), as he now regarded the plant as *Fissidens taylori* C. M. Sainsbury also regards the genus as weak, but considers the plants distinct from *F. taylori*.
Sciaromium bellii Broth. There is now fairly general agreement that plants so named are not distinct from *Campyllum relaxum* (H. f. and W.) Broth.
- Several other modifications are pending. In the initial paper the moss *Dicranella vaginata* var. *longifolia* was listed as a species of *Ditrichum* while *Eurhynchium muriculatum* should of course be *E. muriculatum*.

The accompanying map is based on L. Cockayne's map in Vegetation of New Zealand, in Engler and Pruden, *Die Vegetation der Erde*, 14, 2nd edition, Leipzig, 1928, somewhat modified by transferring the boundary separating the Eastern and Western Botanical Districts to coincide with the geographic boundary between Canterbury and Westland and also the boundary between the xerophytic beech forests of Canterbury and the mesophytic forests of Westland. The recently delimited Dunedin sub-district of Thomson and Simpson is also incorporated.

List of Moss Species now First Recorded from the Various Botanical Districts of New Zealand	P. R. B.	W. M.
<i>Acaulon apiculatum</i> (H. f. and W.) Jaeg.	10	
<i>Amblystegium riparium</i> B. and S.	11, 15	
<i>Amphidium cyathicarpum</i> (Mont.) Broth.		9
<i>Andreaea acuminata</i> Mitt.		18
<i>Andreaea australis</i> F. Muell	10	
„ <i>subulata</i> Harv.		5, 11
<i>Barbula australasiae</i> (Hk. and Grev.) Brid.		10, 17
„ <i>torquata</i> Tayl.		11, 16



FIG. 1—Map of New Zealand showing Botanical Districts as defined by L. Cobkayne, slightly modified by the inclusion of the Dunedin Sub-district as defined by Thomson and Simpson, and by the junction of the Eastern and Western Districts being made coincident with Provincial Boundary, as suggested by Martin.

	P. R. B.	W. M.
<i>Bartramia papillata</i> H. f. and W.	14	
<i>Brachymenium preissianum</i> Hpe.		12
<i>Brachythecium albicans</i> B. and S.	16	18
" <i>paradoxum</i> (H. f. and W.) Jaeg.	10	
" <i>plumosum</i> B. and S.	16	
<i>Breutelia affinis</i> (Hook.) Mitt.	1	
<i>Bryum bimum</i> Schreb.	11	
" <i>blandum</i> H. f. and W.	9	
" <i>laevigatum</i> H. f. and W.	14	
" <i>pachytheca</i> C. M.		10
" <i>truncorum</i> Brid.	8, 14	13
<i>Camptochaete gracilis</i> (H. f. and W.) Par.		13, 18
" <i>ramulosa</i> (Mitt.) Jaeg.	15	5
<i>Campyllum decussatum</i> (H. f. and W.) Broth.	14	
<i>Campylopodium euphoroeladum</i> (C. M.) Besch.		5
<i>Campylopus bicolor</i> (Hornsch.) Hook. f.	6	
<i>Catagonium politum</i> (H. f. and W.) Dus.		8, 18
<i>Cheilothela chilensis</i> (Mont.) Broth.	14	
<i>Conostomum australe</i> Swartz.	15	
<i>Cryphaea dilatata</i> H. f. and W.		12, 13, 18
" <i>tenella</i> (Schwaegr.) Hornsch.		11, 18
<i>Cyrtopus setosus</i> (Hedw.) Hook. f.		16
<i>Daltonia novae-zealandiae</i> Mitt.		18
<i>Dendrologotrichum dendroides</i> (Hedw.) Broth.	8, 15	18
<i>Dicnemoloma sieberianum</i> (Hornsch) Ren.	8	
<i>Dicranella jamesonii</i> (Tayl.) Broth.	16	
<i>Dicranoweisia antarctica</i> (C. M.) Par.	16	
<i>Dicranum trichopodium</i> Mitt.	3	18
<i>Dicranoloma fasciatum</i> (Hedw.) Par.	2, 8, 15	18
" <i>grossialare</i> (C. M.) Dix.		18
" <i>integrifolium</i> Dix.	7, 15	18
" <i>leucolomoides</i> (C. M.) Dix.	6	
" <i>pungentella</i> (C. M.) Par.	2, 16, 10	12, 18
<i>Didymodon binnsii</i> (R. Br. ter.) Dix.	7	
<i>Distichophyllum pulchellum</i> (H. f. & W.) Mitt.		8
<i>Ditrichum elongatum</i> (H. f. and W.) Mitt.	15	
" <i>punctulatum</i> Mitt.	14	
<i>Drepanocladus aduncus</i> (Hedw.) Moenk	10	
" <i>uncinatus</i> (Hedw.) Warnst.	8	18
<i>Echinodium hispidum</i> (H. f. and W.) Jaeg.		8
<i>Encalypta vulgaris</i> Hedw.	10, 16	16
<i>Eriodon cylindrotheca</i> (Dix.) Dix. et Sainsb.	16	18
<i>Eriopus cristatus</i> (Hedw.) Jaeg.		5, 13
<i>Eucamptodon inflatus</i> (H. f. and W.) Mitt.	15	
<i>Eurhynchium asperipes</i> (Mitt.) Dix.	11	18
" <i>muriculatum</i> (H. f. and W.) Jaeg.		5, 12, 18
" <i>praelongum</i> Hobk.		8, 18
<i>Fissidens adiantoides</i> Hedw.		11
" <i>asplenioides</i> (Swartz) Hedw.		11, 18
" <i>dealbatus</i> H. f. and W.		16, 18
<i>Funaria hygrometrica</i> Hedw.		13
<i>Goniobryum sub-basilare</i> (Hook.) Lindb.		11, 13
<i>Grimmia apocarpa</i> var. <i>rivularis</i> Webb. & Mohr.		16, 17
" <i>argentea</i> R. Br. ter.	16	
" <i>campestris</i> Burch.	3	
" <i>pulvinata</i> var. <i>obtusa</i> (Brid.) B. & S.	16, 16	13
" " var. <i>basaltica</i> (Mitt.) Dix.	10	
<i>Hedwigia albicans</i> (Web.) Lindb.	14	15
<i>Hedwigidium imberbe</i> B. and S.	16	
<i>Holomitrium perichaetiale</i> (Hook.) Brid.	1, 2, 5, 6, 14	1, 7, 8
<i>Homalia falcifolia</i> (H. f. and W.) H. f. and W.		5, 16
" <i>pulchella</i> H. f. and W.		13
<i>Hypopterygium filiculaeforme</i> (Hedw.) Brid.	11	
" <i>novae-seelandiae</i> C. M.		8
<i>Isopterygium limatum</i> (H. f. and W.) Broth.		10, 12

	P. R. B.	W. M.
<i>Lembophyllum clandestinum</i> (H. f. & W.) Lindb.		8
<i>Leptodontium interruptum</i> (Mitt.) Broth.	5	
<i>Leptostomum inclinans</i> R. Br.		13
<i>Lepyrodon lagurus</i> (Hook.) Mitt.	8	
<i>Macromitrium grossirete</i> C. M.	4, 15	17
" <i>longipes</i> (Hook.) Schwaegr.	8	
" <i>longirostre</i> (Hook.) Schwaegr.		17
<i>Mielichhoferia eckloni</i> Hornsch.		12
<i>Orthodontium sulcatum</i> H. f. and W.	9	18
<i>Orthotrichum beckettii</i> C. M.		13
" <i>hortense</i> Bosw.	16	
<i>Papillaria flavo-limbata</i> (C. M. & Hpe.) Jaeg.		11, 13
<i>Philonotis australis</i> (Mitt.) Jaeg.	8	
" <i>scabrifolia</i> (H. f. and W.) Jaeg.	15	
<i>Pogonatum subulatum</i> (Menz.) Brid.		13
<i>Pottia heimii</i> (Hedw.) B. and S.		18
" <i>serrata</i> R. Br. ter.		16
<i>Pseudo-distichium buchanani</i> (R. Br. ter.) Dix.	11	17
<i>Pterygophyllum dentatum</i> (H. f. & W.) Mitt.		13
" var. <i>robustum</i> (H. f. and W.) Dix.		5, 16
" <i>quadrifarium</i> (Hook.) Brid.	14	5, 13
<i>Ptychomnion aciculare</i> (Brid.) Mitt.		13, 14
<i>Ptychomitrium australe</i> (Hpe.) Jaeg.	7	
<i>Rhacomitrium crispulum</i> (H. f. & W.) H. f. & W.	14	15
" <i>ptychophyllum</i> Mitt.	3	10, 18
<i>Rhacopilum cristatum</i> H. f. and W.		14
" <i>strumiferum</i> C. M.		8
<i>Rhynchostegium fragilicuspis</i> Dix.		12?
<i>Schlotheimia campbelliana</i> C. M.		18
<i>Sematophyllum macrosporum</i> Dix. et Sainsb.		18
<i>Stereodon chrysogaster</i> (C. M.) Mitt.	14	
<i>Tetraphidopsis pusilla</i> (H. f. and W.) Dix.		9, 16, 17
<i>Thuidium laeviusculum</i> (Mitt.) Jaeg.		8, 13
" <i>sparsum</i> (H. f. and W.) Jaeg.		5, 13
<i>Tortula atrovirens</i> (Sm.) Lindb.		7, 16
" <i>bealeyensis</i> R. Br. ter.		13
" <i>papillosa</i> Wils.	1	
<i>Trematodon flexipes</i> Mitt.	15	
" <i>suberectus</i> Mitt.	8, 16	
" <i>weymouthii</i> Bartr. et Dix.	9	
<i>Webera albicans</i> Schimp.		7
" <i>cruda</i> (Hedw.) Schwaegr.		17
" <i>nutans</i> Hedw. <i>longiseta</i> (Hueb.) B. & S.	7, 9	
<i>Weisia viridula</i> Hedw.		14, 18
<i>Weymouthia cochlearifolia</i> (Schwaegr.) Dix.		
var. <i>billardieri</i> (Hpe.) Dix.		8
<i>Zygodon hookeri</i> Hpe.	3	
	75	64

First Records for Botanical Districts of Otago by Allison (1948).

<i>Buxbaumia aphylla</i> Hedw.	16	<i>Eriopus flexicaulis</i> (Mitt.) Jaeg.	17
<i>Barbula torquata</i> Tayl.	17	<i>Fissidens anisophyllus</i> Dix.	16, 17
<i>Brachythecium albicans</i> B. & S.	17	" <i>dealbatus</i> H. f. and W.	17
" <i>subplicatum</i> (Hpe.) Jaeg.	15	" <i>leptocladus</i> C. M. et Rodway	
<i>Ditrichum brevirostrum</i>		var. <i>cheesemanii</i> (C. M.) Dix.	16, 17
(R. Br. ter.) Broth.	16	<i>Grimmia asperitricha</i>	
" <i>clongatum</i>		Dix. et Sainsb.	14
" (H. f. and W.) Mitt.	15	<i>Glyphothecium alare</i>	
" <i>fragilicuspis</i>		Dix. et Sainsb.	16
Dix. et Sainsb.	14	<i>Isopterygium pulchellum</i>	
<i>Encalypta vulgaris</i> Hedw.	17	(Dicks) Jaeg.	17
<i>Eriopus apiculatus</i>		<i>Macromitrium grossirete</i> C. M.	15
(H. f. and W.) Mitt.	16	<i>Mielichhoferia tenuiseta</i> Mitt.	17

<i>Orthotrichum lancifolium</i>	R. Br. ter.	17	<i>Thamnum pumilum</i>	(H. f. and W.) Par.	17
<i>Pottia serrata</i> R. Br. ter.		16, 17	<i>Triquetrella curvifolia</i>	Dix. et Sainsb.	17
<i>Psilopilum bellii</i> Broth.		15	<i>Uloza lateciliata</i> Malta		17
<i>Tetraphidopsis pusilla</i>	(H. f. and W.) Dix.	17	<i>Webera cruda</i> (Hedw.) Schwaegr.		17
			<i>Zygodon rufescens</i> (Hpe.) Broth.		17

Additional Mosses Common to New Zealand and Australia.

The following mosses are additional to those previously listed by me as common to New Zealand and Australia. Those marked with an asterisk were previously listed as endemic to New Zealand.

<i>Amblystegium riparium</i> B. and S.	* <i>Homalia auriculata</i> H. f. and W.
<i>Andreaea australis</i> F. Muell.	<i>Hypopterygium concinnum</i>
* <i>Barbula torquata</i> Tayl.	(Hook.) Brid.
<i>Bartramia norvegica</i> (Gunn) Lindb.	„ <i>rotulatum</i> (Hedw.) Brid.
<i>Brachythecium plumosum</i> B. and S.	<i>Leptobryum pyriforme</i>
„ <i>rutabulum</i> B. and S.	(Hedw.) Schimp.
„ <i>salebrosum</i> B. and S.	<i>Macromitrium ligulare</i> Mitt.
<i>Braithwaitea sulcata</i> (Hook.) Lindb.	* „ <i>prorepens</i> (Hook.) Schwaegr.
<i>Breutelia pendula</i> (Hook.) Mitt	<i>Papillaria amblyocis</i> (C. M.) Jaeg.
<i>Bryum bimum</i> Schreb.	„ <i>crocea</i> (Hpe.) Jaeg.
„ <i>caespitium</i> Hedw.	„ <i>filipendula</i> (H. f. & W.) Jaeg.
„ <i>chryseuron</i> C. M.	„ <i>flavo-limbata</i>
* „ <i>eximium</i> Mitt.	(C. M. and Hpe.) Jaeg.
<i>Camptochaete vaga</i> (Hornsch) Broth.	<i>Plagiothecium denticulatum</i> B. and S.
<i>Campyllum decussatum</i> (H. f. & W.)	<i>Psilopilum australe</i>
Broth.	(H. f. and W.) Jaeg.
„ <i>relaxum</i> (H. f. and W.) Broth.	<i>Rhacomitrium crispulum</i> v. <i>rupestre</i>
* <i>Campylopus appressifolius</i> Mitt.	(H. f. and W.) Dix.
<i>Dicranoloma robustum</i> H. f. and W.	„ <i>lanuginosum</i> (Hedw.) Brid.
Par. var. <i>pungens</i> H. f. and W.	* <i>Rhacomitrium robustum</i> H. f. and W.
<i>Distichophyllum pulchellum</i>	<i>Sauloma tenella</i> H. f. and W.
(H. f. and W.) Mitt.	<i>Sematophyllum tenuirostre</i>
<i>Eurhynchium muriculatum</i>	(Hook.) Dix.
(H. f. and W.) Jaeg.	<i>Stereodon chrysogaster</i> (C. M.) Mitt.
<i>Grimmia apocarpa</i> Hedw. f.	<i>Tortula papillosa</i> Wils.
„ <i>mutica</i> Hpe.	„ <i>princeps</i> De Not.
„ <i>campestris</i> Burch.	<i>Thuidium laeviusculum</i> (Mitt.) Jaeg.
„ <i>obtusata</i> Hpe. and C. M.	<i>Webera nutans</i> Hedw.

Literature Consulted.

- ALLISON, K. W., 1948. Description of a New Species with Notes and Localities for some Otago and Southland Mosses. *Trans. Roy. Soc. N.Z.*, 77,
- BURGES, A., 1932. Notes on the Mosses of New South Wales; Additional Records and Description of a New Species of *Buabaumia*. *Proc. Linn. Soc. N.S.W.*, lvii, 239-244.
- 1935. Notes on the Mosses of New South Wales. II. *Proc. Linn. Soc. N.S.W.*, lx, 83-93.
- DIXON, H. N., 1941. *Sainsburia*, a New Genus of Fissidentaceae. *Bryologist*, vol. 44, pp. 40-41.
- MARTIN, W., 1946. Geographic Range and Internal Distribution of the Mosses Indigenous to New Zealand. *Trans. Roy. Soc. N.Z.*, 76, 162-184.
- SAINSBURY, G. O. K., 1940. *Barbula rostrata* R. Br. ter., an Invalid Species. *Bryologist*, 43 (no. 4), 113-4.
- 1946. *Dicranodontium australe* Dixon. *Bryologist*, 49, 100-102.
- 1947. Some New Zealand Mosses of Hookeriaceae. *Revue Bryologique et Lichenologique*, t. xvi, fasc. 1-2, 47-48.
- 1947. Additions to the Mosses of Victoria. *Victorian Naturalist*, vol. 63, no. 10, 222-3.