

MOSSES AND THEIR DISTRIBUTION IN THE AUSTRALIAN CAPITAL TERRITORY

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ABSTRACT

Ramsay, Helen P.¹ & Streimann, H.² (¹School of Botany, University of New South Wales, Kensington, N.S.W. Australia 2033; ²Herbarium, National Botanic Gardens, Canberra A.C.T. Australia 2601). *Telopea* 2(5): 559-574. — The Australian Capital Territory is geographically located on the Southern Tablelands of New South Wales. The area is physiographically and climatically diverse with alluvial terrain to high ridges reaching 1900 m. More than 180 species from 39 families and their distribution within the A.C.T. are recorded. Data on distribution in other regions of N.S.W. and in other Australian states are also given. Affinities are mainly with temperate mosses of southern Australia.

INTRODUCTION

The Australian Capital Territory (A.C.T.), although a discrete political territory, is geographically located on the Southern Tablelands of New South Wales. In area it covers 2357 sq. km with more than half being occupied by rugged mountainous catchment areas (Learmonth 1973). Canberra, the capital city of Australia, lies on a plain 600 m above sea level and approximately 100 km from the coast on the western side of the Great Dividing Range in the A.C.T.

The physiography of the A.C.T. can be divided into: (i) high ridges and steep hillslopes; (ii) rolling terrain; (iii) gently undulating terrain; (iv) alluvial terrain. The Murrumbidgee River and its tributaries, the Molonglo and Cotter rivers, pass through the Territory. The Murrumbidgee and Molonglo drain from the Great Dividing Range, while the Cotter originates in the ranges west of Canberra. On the western boundary are the Brindabella-Bimberi Ranges that connect with the Snowy massif. The Scabby-Boboyan Ranges form the southern boundary. A number of peaks within these ranges reach 1800 m with Bimberi Peak 1903 m in the south the highest. They form a dissected plateau, part of the Kosciusko peneplain, cut across by folded and steeply dipping Ordovician and Silurian slates, schists, slaty shales and grit, Silurian volcanics, with some Palaeozoic porphyry, granite, and Devonian igneous rocks. Alluvial flats form the Canberra basin, a rain-shadow area often having less than 600 mm rainfall (Learmonth 1973).

Great variations in climate occur between the Canberra plain and the higher peaks on the western ranges. There are numerous rain-shadows in the deeper valleys, but the main rain-shadow is the Canberra plain itself. It is dry during the summer, most of the rainfall being derived from a few downpours, but high evaporation rates, about 1600 mm annually, reduce its effectiveness. On the ranges the precipitation may reach 1500 mm per year, and is more uniform. In winter, inversions cause fogs and some of the grasslands in the higher valleys may have evolved from the settling of cold air. In addition, Canberra gets about 100 days of frost per annum, with a large range of diurnal temperatures in both winter and summer. Less is known of the climate at higher altitudes but data in Table 1 (see page 563) illustrate some of the variation at different altitudes.

Snow occurs on the ranges above 1220 m and on the higher parts (above 1500 m), where it may lie for 3 to 4 months. Soils tend to correlate to topography, geology and the climatic influences over long periods.

DISTRIBUTION WITHIN THE A.C.T.

Vegetation in the A.C.T. has affinities with elements from Mt Kosciusko, the Victorian Alps and Tasmania. The zonations of the A.C.T. vascular flora are mostly altitudinal. Little has yet been done on the altitudinal distribution or the ecology of the non-vascular flora except on Mt Ainslie and Black Mountain. Much of the vegetation has been greatly modified by man since European settlement (Pryor 1954).

Natural features or major roads have been used to define five topographically separate divisions of the A.C.T. for this project (see Fig. 1). The Brindabella Ranges division encompasses almost all the topographical environments found in the A.C.T. The following are short descriptions of each division. (Jervis Bay is excluded as it is geographically in a separate part of New South Wales and unrelated floristically to the rest of the A.C.T.)

Division 1. BOOTH RANGE (east side of Gudgenby Road)

Three vegetation types predominate here. At higher altitudes (>700 m) *Eucalyptus delegatensis* - *E. dalrympleana* form wet sclerophyll forest. In the broad upper valley systems *E. pauciflora* - *E. stellulata* savannah woodlands are present, while in the northern area between the Booth and Clear Ranges *E. melliodora* - *E. blakelyi* woodlands occur (Burbidge & Gray 1970). There has been very little disturbance to the area except for grazing in the north. Most of the area is in the Namadgi National Park.

The altitude ranges from 640 m to 1600 m (Mt Clear) with foliated granodiorite as the predominant rock.

Division 2. SOUTHERN RANGES (south of Orroral and west of Gudgenby road)
The vegetation comprises mostly *Eucalyptus delegatensis* - *E. dalrympleana* wet sclerophyll forest with scattered pockets of *E. pauciflora* - *E. stellulata* savannah woodlands along the larger stream valleys. The higher ranges have alpine woodlands of stunted *E. pauciflora* and grasses (Burbidge & Gray 1970). Small areas of *Sphagnum* swamp are scattered throughout this region. Least disturbance has taken place in this division. The Namadgi National Park includes a large area here as well as Division 1.

The main rocks are foliated granodiorites that form large spectacular outcrops. Along the Cotter Valley, from near the confluence of the Orroral and Gudgenby rivers to the southern border, sandstone and greywacke are found. The altitude ranges from 840 m to 1903 m (Bimberi Peak, the highest peak in the A.C.T.).

Division 3. BRINDABELLA RANGES (north of the Orroral-Cotter Hut roads)
The vegetation in this division varies greatly from tree-fern-shaded, humid gullies at the Tidbinbilla Nature Reserve to alpine woodlands of *Eucalyptus pauciflora* on the higher parts of the ranges adjacent to the N.S.W. border. The undulating lowlands along the Murrumbidgee and Paddys rivers carries *E. melliodora* - *E. blakelyi* savannah woodland with *Casuarina cunninghamii* along the banks. However, much of this is now grazing land or *Pinus radiata* plantations. *Eucalyptus macrorhyncha* - *E. rossii* dry sclerophyll forest occurs on northerly and westerly faces of the mountains. Also a section of *E. fastigata* - *E. viminalis* wet sclerophyll forest occurs along the Cotter Valley with a scattered dense understorey of Compositae, Myrtaceae and Rhamnaceae (Burbidge & Gray 1970). Extensive, scattered *Sphagnum* swamps occur at high altitudes on tributaries of the Cotter River. Within the area, moist gullies with tree-ferns and numerous "coastal" moss species, e.g. *Camptochaete* and *Hypnodendron*, are present.

Most of this area, including Mt Gingera, is foliated granodiorite, although a section of greywacke, slate and sandstone occurs at Mts Aggie, Franklin and Ginini. Mt Corree is covered by volcanic rocks and part of the Tidbinbilla Range is

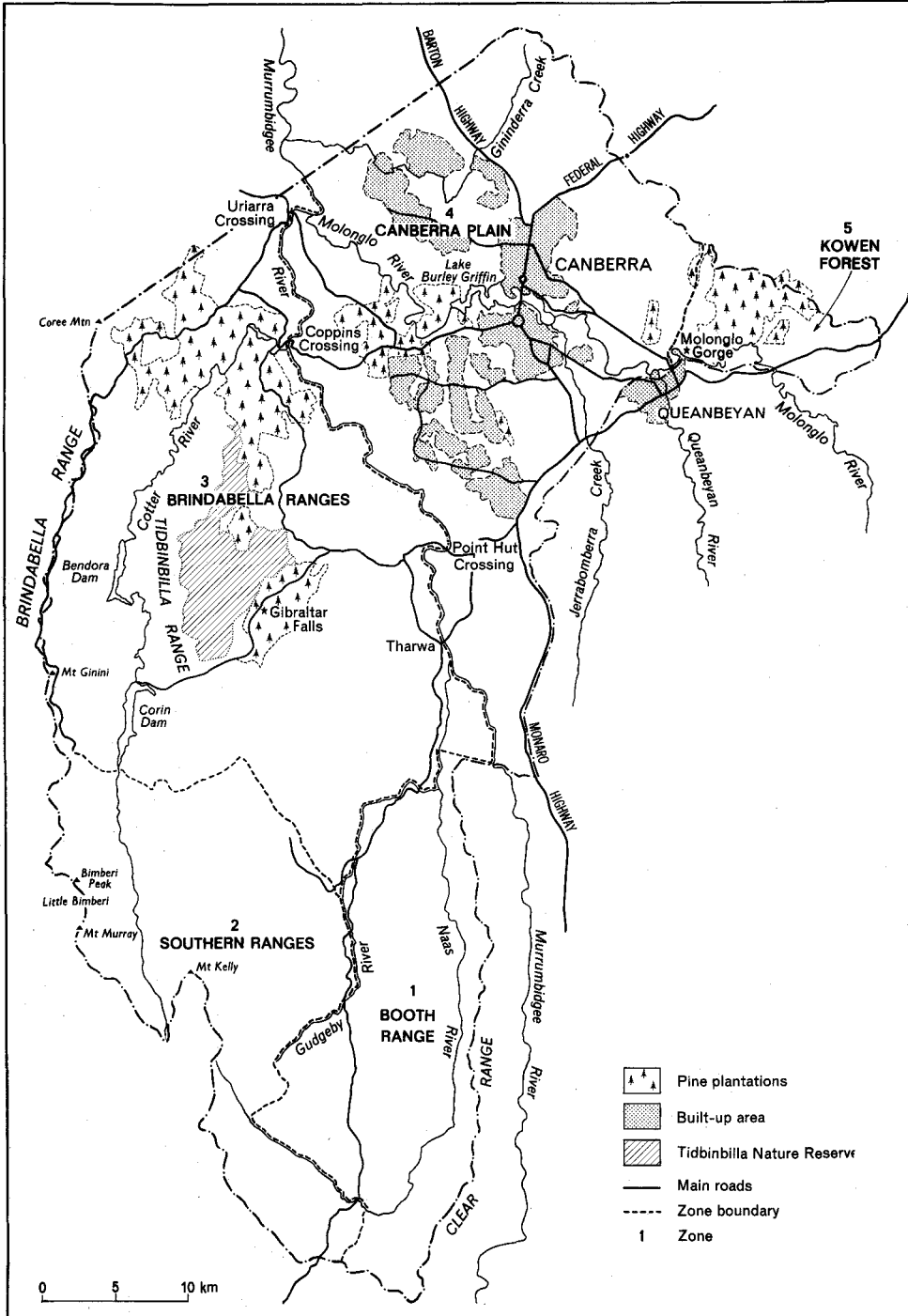


Fig. 1. Australian Capital Territory showing division into areas defined for this study.

quartzite. Volcanic rocks cover extensive areas in the north. The altitude varies between 410 and 1856 m (Mt Gingera).

Division 4. CANBERRA PLAIN (bounded on south-east by Sutton Road and west by the Murrumbidgee River)

This plain has several outcropping mountains — Black Mountain, Mts Majura and Ainslie, and Red Hill. The area is predominantly a mixture of acid volcanic rocks and porphyry. The altitude varies between 410 and 890 m (Mt Majura). The plain is drained by the Molonglo and Murrumbidgee rivers while most of the smaller streams are seasonal.

Much disturbance has been caused by grazing and urbanization. As a result, a large proportion of the original *Themeda-Poa* grasslands of the river flats and the *Eucalyptus melliodora* - *E. blakelyi* savannah woodlands now occur only in small pockets. There are small sections of *E. rossii* - *E. macrorhyncha*, with the most extensive being around Black Mountain.

Division 5. KOWEN FOREST (east of Sutton Road)

Eucalyptus rossii - *E. macrorhyncha* dry sclerophyll forest predominates and savannah woodlands occur along the northern boundary of the A.C.T. Extensive *Pinus radiata* plantations occur in this division.

Folded sedimentary rocks (greywacke, slate and sandstone) form the underlying strata that generally developed shallow, gravelly soils. Most of the area is hilly or rolling country with a steep section along a fault line near the Sutton Road. Further steep sections are encountered along the Molonglo River. This is now a nature reserve and a popular recreation area. The altitude varies between 610 and 920 m.

COMPILATION OF DATA

The following data, presented in Table 2, have been compiled from field work and herbarium specimens held in the Herbarium Australiense (CANB), and the Herbarium, National Botanic Gardens (CBG) in Canberra; the National Herbarium of New South Wales (NSW), the Herbarium, University of New South Wales (UNSW), the Ray Herbarium, University of Sydney (SYD) and the private collection of Professor D.G. Catcheside.

Names follow those in use according to Index Muscorum plus supplements (Wijk et al. 1959-1969; Crosby 1977, 1979; Crosby & Bauer 1981) together with information from Scott & Stone (1976), Catcheside (1980) and other taxonomic publications. For synonyms, *nomina nuda* and further information see Census of New South Wales mosses (Ramsay 1984). Families are arranged according to Crosby & Magill (1981), with genera and species listed alphabetically in families.

KEY TO SYMBOLS USED FOR DISTRIBUTION

LHI	Lord Howe Island	FWP	Far Western Plains
C	Coast	N	North
T	Tablelands	C	Central
WS	Western Slopes	S	South
WP	Western Plains	NSW	New South Wales

- > 3 collections in the subdivision
- no sighted or cited specimen from the subdivision
- ? specimen or cited locality inadequate for reliable record
- * number of specimens ≤ 3
- Q — Queensland, V — Victoria, T — Tasmania, Y — Northern Territory,
- S — South Australia, W — Western Australia

TABLE 1. CLIMATIC DATA FOR CANBERRA AND BULLS HEAD.

Location	Alt (m)	Temperature (°C)						Rain	Evap ^a
		Jan.		July		Extremes			
		Av. max.	Av. min.	Av. max.	Av. min.	Max.	Min.	Av. annual (mm)	
Canberra	600	27.5	13.0	11.1	-0.4	42.2	-10.0	633	1600
Bulls Head*	1320	21.3	9.7	5.2	-2.0	35.1	-12.2	1009	—

*Junction Brindabella and Bendora Dam roads.

TABLE 2. MOSSES AND THEIR DISTRIBUTION IN THE A.C.T.
(families arranged according to Crosby & Magill 1981)

Name	Distribution						
	A. C. T.					N.S.W.	OTHER STATES
	1 Booth Ra.	2 S. Ranges	3 Brindabella	4 Canberra	5 Kowen		
1. SPHAGNACEAE							
<i>Sphagnum cristatum</i> Hampe	★	●	★	○	○	NCCCT	QVT
[<i>S. magellanicum</i> Brid.]							
<i>S. falcatulum</i> Besch.	○	★	★	○	○	ST only	QVT
<i>S. molliculum</i> Mitt.	○	★	○	○	○	CCTST	VT SW
[<i>S. cymbifolioides</i> C. Muell., <i>S. subsecundum</i> auct. non Nees]							
2. ANDREAEACEAE							
<i>Andreaea australis</i> Mitt.	○	●	★	○	○	ST only	VT
<i>A. mutabilis</i> Hook. f. & Wils.	★	●	★	○	○	CTST	VT
[<i>A. rupestris</i> auct. non Hedw.]							
<i>A. nitida</i> Hook. f. & Wils.	○	○	★	○	○	ST only	VT

○ — not collected ★ ≤ 3 collections ● > 3 collections

Name	Distribution						
	A. C. T.					N.S.W.	OTHER STATES
	1 Booth Ra.	2 S. Ranges	3 Brindabella	4 Canberra	5 Kowen		
3. FISSIDENTACEAE							
<i>Fissidens asplenioides</i> Hedw.	★	○	●	●	○	CT WS	QVTYSW
<i>F. crassipes</i> Wils. ex B.S.G.	○	○	★	○	○	CCT ST	VTS
<i>F. humilis</i> Dix. & Watts	○	○	★	★	○	CCT ST	QVTSW
						SWP	
<i>F. leptocladus</i> C. Muell. ex Rodway . . .	★	★	●	★	○	CT SWS	QVTSW
<i>F. pungens</i> C. Muell. & Hampe	○	★	★	★	○	CT CWS	QVTYSW
<i>F. rigidulus</i> Hook. f. & Wils. ssp.							
<i>rigidulus</i>	★	★	●	○	○	CT CWS	VT
<i>F. taylorii</i> C. Muell.	●	○	●	●	●	CT WS	VTSW
						NFWP	
<i>F. tenellus</i> Hook. f. & Wils.	○	○	★	★	○	LHINCC	QVTS
						CT ST	
<i>F. vittatus</i> Hook. f. & Wils.	○	★	●	★	○	NC CCT	VTSW
						CWS SWS	
						NFWP	
5. DITRICHACEAE							
<i>Ceratodon purpureus</i> (Hedw.) Brid. . .	●	●	●	●	★	LHI CT WS	QVTYSW
						NWP FWP	
<i>Distichium capillaceum</i> (Hedw.) B.S.G.	○	○	○	★	○	ST SWS	V?T
<i>Ditrichum cylindricarpum</i> (C. Muell.)							
F. Muell.	○	★	●	★	○	ST only	VTS
[<i>D. elongatum</i> (Hook. f. & Wils.) Mitt.]							
<i>D. difficile</i> (Dub.) Fleisch.	★	●	●	●	○	CT WS	QVTSW
<i>Eccremidium pulchellum</i> (Hook. f. &							
Wils.) C. Muell.	○	○	○	★	○	CCCWS	QVTYSW
						SWS NWP	
<i>Pleuridium arnoldii</i> (R. Br. ter.) Par. . .	○	★	○	○	○	ST only	V
<i>P. krauseanum</i> Par.	○	○	○	★	○	ST only	V
<i>P. nervosum</i> (Hook.) Mitt.	○	○	★	●	○	ST only	QVTSW
7. SELIGERIAACEAE							
<i>Blindia robusta</i> Hampe	○	★	○	○	○	CT ST	VT

8. DICRANACEAE								
<i>Campylopus austro-subulatus</i> Broth. & Geh.	○	○	○	★	○	ST only	VS	
<i>C. clavatus</i> (R. Br.) Wils.	○	★	★	★	○	LHI C T WS	QVTYSW	
<i>C. introflexus</i> (Hedw.) Brid.	★	●	●	●	★	LHI C T WS	QVTYSW	
<i>C. pallidus</i> Hook. f. & Wils.	★	○	●	○	○	LHI C C T ST	QVTSW	
						CWS		
† <i>Dicnemoloma pallidum</i> (Hook.) Wijk & Marg.	○	○	●	○	○	LHI C T WS	QVTS	
<i>Dicranoloma billardieri</i> (Brid.) Par.	○	○	●	○	○	NCCCT	QVTS	
<i>D. dicarpum</i> (Nees) Par.	○	○	★	○	○	NCCCT	QVT	
<i>D. robustum</i> (Hook. f. & Wils.) Par. var. <i>setosum</i> (Hook. f. & Wils.) Sainsb.	○	★	★	○	○	CC T	T	
<i>Trematodon amoenum</i> (C. Muell.) Stone & Scott	○	○	○	★	○	CT	V	
<i>T. flexipes</i> Mitt.	○	★	○	○	○	ST only	VT	
<i>T. mackayi</i> (R. Br. ter.) Broth.	○	★	★	○	○	ST only	VT	
13. ENCALYPTACEAE								
<i>Encalypta vulgaris</i> Hedw.	★	★	●	○	●	NC SCT WS	VTS	
14. POTTIACEAE								
<i>Acaulon integrifolium</i> C. Muell.	○	○	★	★	★	CT CWS	VYSW	
<i>Barbula calycina</i> Schwaegr.	○	○	○	★	○	LHI C C T ST	QVTSW	
[<i>Tortella calycina</i> (Schwaegr.) Dix.]						WS NFWP		
<i>B. crinita</i> Schultz	○	○	★	●	★	CCT ST	VTSW	
						NWS CWS		
						SWP SFWP		
<i>B. hornschurchiana</i> Schultz	○	○	○	★	○	ST only	VTSW	
<i>B. torquata</i> Tayl. ‡	○	○	○	★	○	CC C T ST	VTYSW	
						CWS SWS		
						WP FWP		
<i>B. unguiculata</i> Hedw.	○	○	○	★	○	ST only	VT	
<i>Bryoerythrophyllum jamesonii</i> (Tayl.) Crum	○	○	★	○	○	ST only	VT	
[<i>B. binnsii</i> (R. Br. ter.) Wijk & Marg.]								
<i>Desmatodon convolutus</i> (Brid.) Grout	○	○	○	●	○	CCT WS WP	QVTYSW	
						FWP		
<i>D. recurvatus</i> (Hook.) Mitt.	○	○	★	★	○	NT ST	VS	

† Retained here as *Dicnemoloma* although Crosby (pers. comm.) and Crosby & Magill (1981) point out this name is preceded by *Sclerodontium*.

‡ = *Didymodon* in Catcheside (1981).

Name	Distribution						
	A. C. T.					N.S.W.	OTHER STATES
	1 Booth Ra.	2 S. Ranges	3 Brindabella	4 Canberra	5 Kowen		
POTTIACEAE (cont'd)							
Gymnostomum aeruginosum (Sm.) Zander	○	○	●	○	○	CCT ST WS	QVTYSW
[<i>G. calcareum</i> Nees & Hornsch.]							
Leptodontium paradoxum Stone & Scott	○	○	★	★	○	ST only	VSW
Pottia starckeana (Hedw.) C. Muell.	○	○	○	★	○	ST only	VS
P. truncata (Hedw.) B.S.G.	○	○	○	●	○	CC ST	VTS
Tetrapterum cylindricum (Tayl.) Jaeg.	○	○	○	★	○	T WS NFWP	QVTSW
Tortula muralis Hedw.	★	○	○	●	○	NC CCT	VTSW
T. papillosa Wils.	★	★	★	●	★	CC SCT	VTSW
T. princeps De Not.	●	●	●	●	★	CWS SWS CC SCT WS	VTSW
T. rubra Mitt.	○	★	○	○	○	SWP SFWP	V
Triquetrella papillata (Hook. f. & Wils.) Broth.	★	○	●	●	★	ST only	V
Weissia controversa Hedw.	★	★	●	●	●	CC SCT WS	VTSW
W. novae-valesiae (Broth. ex Roth)						LHI CT SW	QVTSW
Stone	○	○	★	○	○	NWP NFWP	
						CC ST	
14A. LYOBARTRAMIACEAE							
Lyobartramia novae-valesiae (Broth.) Stone	○	○	○	★	○	ST CWS SWS	VSW
15. GRIMMIACEAE							
Grimmia laevigata (Brid.) Brid.	●	★	●	★	○	LHI CT WS NWP SFWP	QVTSW
G. pulvinata (Hedw.) Sm.	●	●	●	★	★	LHI CT WS NWP NFWP	QVYSW
G. trichophylla Grev.	●	●	★	★	○	CT ST SWS	QVTSW
Racomitrium crispulum (Hook. f. & Wils.) Hook. f. & Wils.	★	●	●	○	○	T	VTW
Schistidium apocarpum (Hedw.) B.S.G.	●	●	●	●	★	CT WS	QVTSW

16. GIGASPERMACEAE											
<i>Gigaspermum repens</i> (Hook.) Lindb.	○	★	★	★	○	CC SC T NWS CWS WP NFWP	QVTYSW				
19. FUNARIACEAE											
<i>Funaria apophysata</i> (Tayl.) Broth.	○	○	★	★	★	CC T WS NFWP	QVTYSW				
<i>F. glabra</i> Tayl.	○	○	★	○	○	CT WS NFWP	QVTYSW				
<i>F. gracilis</i> (Hook. f. & Wils.) Broth.	○	○	★	★	○	NC CC ST NWS SWS	VTYSW				
<i>F. hygrometrica</i> Hedw.	○	○	★	●	★	LH I C T NWS SWS CWS SFWP	QVTYSW				
<i>Goniomitrium acuminatum</i> Hook. & Wils.	○	○	○	★	○	CC ST CWS	QYSW				
<i>G. enerve</i> Hook. & Wils.	○	○	○	★	○	CC NT ST NWS CWS NWP NFWP	VSW				
<i>Physcomitrium pyriforme</i> Brid. [<i>P. conicum</i> Mitt.]	○	○	★	○	○	CC ST	VT				
21. SPLACHNACEAE											
<i>Tayloria octoblepharum</i> (Hook.) Mitt.	○	★	●	★	★	CT	QVTSW				
24. BRYACEAE											
<i>Brachymerium coarctum</i> Bosch & Lac.	○	○	○	★	○	NC CC	T				
<i>B. exile</i> (Dozy & Molk.) Bosch & Lac.	○	○	○	★	★	ST only					
<i>B. cf. preissianum</i> (Hampe) Jaeg.	○	○	○	★	○	CC	QVTYSW				
<i>Bryum cf. altisetum</i> C. Muell.	○	○	★	★	○	ST only	VA				
<i>B. apiculatum</i> Schwaegr. [Ochi (pers. comm.) identified A.C.T. specimens as <i>B. apiculatum</i> and put <i>B. nitens</i> into synonymy; the former name is not used in main census.]	○	○	★	★	○	NC CC CT ST	Q				
<i>B. argenteum</i> Hedw.	★	★	●	●	○	LH I C T WS FWP	QVTYSW				
<i>B. cf. australe</i> Hampe	★	○	★	○	○	CC ST	VT				
<i>B. billardieri</i> Schwaegr. var. <i>billardieri</i>	○	●	●	●	●	LH I C T WS	QVTSW				
<i>B. blandum</i> Hook. f. & Wils. var. <i>blandum</i>	★	○	★	○	○	CT ST	VT				
<i>B. caespitium</i> Hedw.	○	○	★	○	○	CC CT ST NWS	VTS				

Name	Distribution						N.S.W.	OTHER STATES
	A. C. T.							
	1 Booth Ra.	2 S. Ranges	3 Brindabella	4 Canberra	5 Kowen			
BRYACEAE (cont'd)								
B. campylothecium Tayl.	○	○	★	★	○	LHI CT ST CWS SWS SWP	VT SW	
B. capillare Hedw.	★	★	●	★	★	LHI CCT ST WS NFWP	QVTYSW	
B. coronatum Swaegr.	○	○	○	★	○	LHI CCT ST CWS	QW	
B. dichotomum Hedw.	★	○	★	●	★	LHI CCT ST SWS NFWP	QVTS	
B. erythrocarpoides (C. Muell.) Hampe† [<i>B. curvicolium</i> Mitt., <i>B. clavatum</i> Hook. f. & Wils].	○	○	★	★	○	LHI NC CC T CWS	QVTS	
B. laevigatum Hook. f. & Wils.	★	★	●	★	★	NCCC ST SWS	VT	
B. cf. muehlenbeckii B.S.G.	★	○	○	○	○	CC ST		
B. pachythea C. Muell.	★	○	●	●	○	CCT ST CWS	QVTYSW	
B. cf. pallens Sw.	○	○	★	○	○	ST only		
B. pseudotriquetrum (Hedw.) Gaertn.	○	★	○	★	○	CC ST	VT	
B. subapiculatum Hampe	○	○	★	○	○	ST only		
Leptobryum pyriforme (Hedw.) Wils.	○	○	★	●	○	CC ST	VTS	
Mielichhoferia bryoides (Harv.) Wijk & Marg.	○	★	●	●	○	SC CT ST	VTS	
Orthodontium lineare Swaegr.	○	○	●	○	○	CC T	VT SW	
Pohlia nutans (Hedw.) Lindb.	○	●	●	●	○	CC T	VT?S?W	
P. wahlenbergii (Web. & Mohr) Andrews	●	★	●	○	○	NT ST SWS	VT	
25. LEPTOSTOMATACEAE								
Leptostomum inclinans R. Br.	★	●	○	○	○	NC NT ST NWP	QVT	
30. MITTENIACEAE								
Mittenia plumula (Mitt.) Lindb.	○	★	●	○	○	CCT ST	QVTW	

† see Ochi (1980).

32. RHIZOGONIACEAE							
<i>Leptotheca gaudichaudii</i> Schwaegr.	○	●	●	○	○	SCT CWS	QVT
<i>Pyrrhobryum mnioides</i> (Hook.) Wils.	★	●	●	○	○	CT	QVT
<i>Rhizogonium bifarium</i> (Hook.) Schimp.	★	★	○	○	○	CC NT ST	VT
<i>R. distichum</i> (Sw.) Brid.	○	○	★	○	○	NC CC CT	QVT
<i>R. novae-hollandiae</i> (Brid.) Brid.	○	○	★	○	○	ST	VT
NC CC CT						ST	
33. HYPNODENDRACEAE							
<i>Hypnodendron vitiense</i> Mitt. ssp.	○	★	●	○	○	CT SWS	QVT
<i>australe</i> Touw							
34. AULACOMNIACEAE							
<i>Aulacomnium palustre</i> (Hedw.)	○	●	★	★	○	NC ST	VT
Schwaegr.							
35. MEESIAEAE							
<i>Meesia muelleri</i> C. Muell. & Hampe	★	●	●	○	○	ST only	V
<i>M. triquetra</i> (L.) Aongstr.	○	○	●	○	○	ST only	V
37. BARTRAMIACEAE							
<i>Bartramia hampei</i> (Mitt.) Catcheside	○	○	○	●	○	NT ST CWS	VTW
<i>B. papillata</i> Hook. f. & Wils.	★	●	●	●	●	CC T WS	VTSW
<i>B. aff. stricta</i> Brid.	○	○	★	○	○	CC T NWS	QVTSW
<i>Breutelia affinis</i> (Hook.) Mitt.	★	★	●	●	●	SWS	
<i>B. pendula</i> (Sm.) Mitt.	★	●	●	★	○	CC SCT WS	VTSW
<i>Conostomum curvirostre</i> (Mitt.) Mitt.	○	★	★	○	○	CT NWS	VTW
<i>C. pentastichum</i> (Brid.) Lindb.	○	★	○	○	○	ST only	V
<i>C. pusillum</i> Hook. f. & Wils.	○	★	★	○	○	ST only	VT
<i>Philonotis scabrifolia</i> (Hook. f. & Wils.)	○	○	●	●	★	CT ST	VT
Braithw.							
<i>P. cf. tenuis</i> (Tayl.) Reichdt.	○	★	●	★	★	T CWS	VTSW
LHI NC CC						CT ST SWP	QVTSW
NFWP							
41. PTYCHOMITRIACEAE							
<i>Ptychomitrium australe</i> (Hampe) Jaeg.	★	★	●	●	●	LHI NC SC	QVTSW
T NWS CWS						SWP	
42. ORTHOTRICHACEAE							
<i>Macromitrium ligulare</i> Mitt.	○	★	○	○	○	LHI NC SC	QT
<i>Orthotrichum cupulatum</i> Hoffm.	○	○	★	○	○	T	V
<i>O. longithecum</i> R. Br. ter.	●	●	●	○	○	ST only	V
ST CWS						SWS	V

Name	Distribution						
	A. C. T.					N.S.W.	OTHER STATES
	1 <i>Booth Ra.</i>	2 <i>S. Ranges</i>	3 <i>Brindabella</i>	4 <i>Canberra</i>	5 <i>Kowen</i>		
ORTHOTRICHACEAE (cont'd)							
<i>O. rupestre</i> Schleich. ex Swaegr.	★	●	★	○	○	ST SWS	VT
<i>O. tasmanicum</i> Hook. f. & Wils.	★	●	●	○	○	CC CS CT ST	QVTS
<i>Zygodon intermedius</i> B.S.G.	○	●	●	○	○	SC CT ST SWS	VTW
<i>Z. menziesii</i> (Swaegr.) Arnott	○	○	★	○	○	ST only	VTSW
44. RACOPILACEAE							
<i>Racopilum cuspidigerum</i> (Swaegr.) Aongst. var. <i>convolutaceum</i> (C. Muell.) Zant. & Dijkstra	★	○	○	★	○	LHI CT CWS	QVTSW
47. HEDWIGIACEAE							
<i>Hedwigia ciliata</i> (Hedw.) Ehrh. ex P. Beauv.	●	●	●	○	○	CT WS WP	QVTSW
<i>H. integrifolia</i> P. Beauv.	●	★	●	○	○	CT CWS SWS	VTSW
<i>Rhacocarpus purpurascens</i> (Brid.) Par.	○	○	○	★	○	C CT ST	VTW
48. CRYPHEACEAE							
<i>Cryphaea tasmanica</i> Mitt.	○	★	○	○	○	CT ST	VT
51. PTYCHOMNIACEAE							
<i>Glyphothecium sciuroides</i> (Hook.) Hampe	○	○	★	○	○	ST only	VT
59. PHYLLOGONIACEAE							
<i>Catagonium politum</i> (Hook. f. & Wils.) Dus. ex Broth.	○	★	★	○	○	LHI NCT	QVT
60. NECKERACEAE							
<i>Leptodon smithii</i> (Hedw.) Web. & Mohr <i>Thamnobryum pumilum</i> (Hook. f. & Wils.) Nieuwl.	★ ○	★ ○	○ ★	○ ○	○ ○	C CT ST WS LHI CT	QV QVT

61.	LEMBOPHYLLACEAE <i>Camptochaete arbuscula</i> (Sm.) Reichdt. <i>Lembophyllum divulsum</i> (Hook. f. & Wils.) Lindb.	○	○	●	★	○	LHI CCT ST	QVT
		★	○	●	★	★	NC SCT	QVTS
65.	HOOKERIAEAE <i>Achrophyllum dentatum</i> (Hook. f. & Wils.) Vitt & Crosby <i>Distichophyllum microcarpum</i> (Hedw.) Mitt. <i>D. pulchellum</i> (Hampe) Mitt. <i>Sauloma tenella</i> (Hook. f. & Wils.) Mitt.	○	●	●	○	○	LHI CT	VTS
		○	○	★	○	○	SC CT ST	VTS
		★	○	★	○	○	CCT ST	QVTS
		○	○	★	○	○	NT ST	VT
68.	HYOPTERYGIACEAE <i>Hypopterygium rotulatum</i> (Hedw.) Brid.	○	○	●	★	○	LHI CT	QVTS
70.	FABRONIACEAE <i>Fabronia australis</i> Hook. <i>F. brachyphylla</i> C. Muell.	●	○	●	●	★	CCT ST CWS SWS SWP NFWP NC CC ST	QVTSW Q
		○	○	★	○	○		
71.	LESKEACEAE <i>Pseudoleskea imbricata</i> (Hook. f. & Wils.) Broth.	●	●	●	★	★	CT WS	VTS
72.	THUIDIACEAE <i>Anomodon tasmanicus</i> Broth. <i>Thuidium furfurosum</i> (Hook. f. & Wils.) Reichdt. <i>T. furfurosum</i> (Hook. f. & Wils.) Reichdt. var. <i>sparsum</i> (Hook. f. & Wils.) Sainsb. <i>T. laeviusculum</i> (Mitt.) Jaeg. <i>T. subglaucinum</i> Card.	○	○	●	○	★	ST only	VTSW
		★	★	●	○	○	LHI CT NWS SWS NWP	QVTSW
		★	★	●	★	★	SC NT	QVTSW
		○	●	★	○	○	CNT ST	QVT
		○	○	★	○	○	ST only	—
73.	AMBLYSTEGIACEAE <i>Acrocladium chlamydothylum</i> f. & Wils.) C. Muell. & Broth. <i>Calliergonella cuspidata</i> (Hedw.) Loeske	○	○	●	○	○	NC NT ST	VTS
		○	★	○	○	○	ST only	VT

Name	Distribution						
	A. C. T.					N.S.W.	OTHER STATES
	1 <i>Booth Ra.</i>	2 <i>S. Ranges</i>	3 <i>Brindabella</i>	4 <i>Canberra</i>	5 <i>Kowen</i>		
AMBLYSTEGIACEAE (cont'd)							
Campyllum polygamum (B.S.G.) C. Jens.	○	★	★	○	○	CC ST	V
Cratoneuroopsis relaxa (Hook. f. & Wils.) Fleisch.	●	●	●	★	○	NT ST	VTS
Drepanocladus aduncus (Hedw.) Warnst.	★	★	○	○	○	ST only	VTS
D. fluitans (Hedw.) Warnst. [also known as <i>Warnstorfia fluitans</i> (Hedw.) Loeske]	○	★	○	○	○	ST only	VTS
D. uncinatus (Hedw.) Warnst. [also known as <i>Sanionia uncinata</i> (Hedw.) Loeske]	○	★	○	○	○	ST only	VT
Leptodictyum riparium (Hedw.) Warnst.	●	○	★	○	○	NCCCNT ST CWS NWP	VS
74. BRACHYTHECIACEAE							
Brachythecium albicans (Hedw.) B.S.G.	○	○	○	★	○	ST only	VT
B. paradoxum (Hook. f. & Wils.) Jaeg.	○	●	●	○	○	NT ST	VT
B. plumosum (Hedw.) B.S.G.	○	○	★	○	○	CNT ST	—
B. rutabulum (Hedw.) B.S.G.	○	★	●	○	○	CC SC T	VTS
B. salebrosum (Web. & Mohr) B.S.G.	★	○	●	●	○	SC ST	VT
Eurhynchium austrinum (Hook. f. & Wils.) Jaeg.	★	○	●	○	○	NC SC NT ST SWS	VT
Rhynchostegium cf. dentiferum (Hampe) Jaeg.	○	○	★	○	○	CT ST	V
R. laxatum (Mitt.) Par.	○	○	●	○	★	CT ST	VT
R. tenuifolium (Hedw.) Reichdt.	○	★	●	●	●	LHI C T CWS SWS	QVTSW
77. SEMATOPHYLLACEAE							
Sematophyllum amoenum (Hedw.) Mitt.	○	○	●	○	○	LHI CCT	QVTSW
S. contiguum (Mitt.) Mitt.	○	○	●	○	○	LHI NC CT ST	QVTS
Wijkia extenuata (Brid.) Crum	○	○	●	○	○	LHI C T NWP	QVT

78.	HYPNACEAE							
	<i>Hypnum cupressiforme</i> Hedw.	●	●	●	●	●	LHI CT WS NWP	QVTSW
	<i>H. cupressiforme</i> Hedw. var. <i>cupressiforme</i>	★	★	●	★	○	SC ST	VT
	<i>H. cupressiforme</i> Hedw. var. <i>filiforme</i> Brid.	○	○	○	★	○	ST only	V
	<i>H. cupressiforme</i> Hedw. var. <i>mossmanianum</i> (C. Muell.) Ando . . .	○	○	★	○	○	ST only	VT
83.	POLYTRICHACEAE							
	<i>Atrichum androgynum</i> (C. Muell.) Jaeg. var. <i>androgynum</i>	○	○	●	○	○	LHI CC SC T CT NWS	QVT QVT
	<i>Pogonatum subulatum</i> (Brid.) Brid. <i>Polytrichastrum alpinum</i> (Hedw.) G.L. Smith	○	○	★	○	○	ST only	VT
	<i>Polytrichum commune</i> Hedw.	○	●	●	★	○	NCT	QVT
	<i>P. juniperinum</i> Hedw.	●	●	●	●	★	CC SC T WS	QVTS
84.	DAWSONIACEAE							
	<i>Dawsonia longiseta</i> Hampe	○	○	★	●	○	CCT ST WS SWP	QVTS

SUMMARY OF DATA

A total of 180 species are recorded from 39 families. There are no type specimens for which the collection site is listed in the A.C.T. Species that have been attributed to the A.C.T. in Scott & Stone (1976), but for which no specimens have been located, have not been included here.

Species diversity within the five areas described varies greatly. Kowen Forest (Division 5) contains only 34 of the listed species. This area is the smallest with less variation in habitat and has been affected by cultivation, e.g. *Pinus radiata* forests. The Brindabella Ranges (Division 3) have a great range in altitude and habitat from river flats to alpine regions and also have the greatest diversity — 137 species. Although the Canberra Plain (Division 4) is most influenced by settlement, with the City of Canberra and grazing properties covering extensive areas, the moss flora is as diverse (89 species) as in the Southern Ranges (Division 2) (83 species) where there are greater differences in altitude and vegetation and little disturbance has occurred. This latter area is perhaps undercollected at present. The Booth Range (Division 1), which also has had little disturbance by settlement or grazing, has a surprisingly low species number (55 species). Again the area may be undercollected at present.

The relationships and distribution of mosses in the A.C.T. are primarily with temperate species in southern Australia, mainly Victoria and Tasmania. Of the species represented, only 69 occur also in Queensland and most of these are species that have a wider extra-Australian range. There are 35 taxa that have been collected only in the Southern Tablelands of New South Wales although all but two, *Thuidium subglaucinum* and *Brachythecium plumosum*, occur elsewhere in Australia.

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*For a full reference list see Ramsay, H.P. (1984), Census of New South Wales mosses, *Telopea* (2)5: 455-533.