MACROLICHENS OF MOUNT WELLINGTON, TASMANIA

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(with two tables)

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https://doi.org/10.26749/rstpp.123.119 ISSN 0080–4703. 117 York Street, Dynnyrne, Tasmania, Australia 7005 (A VR); Department of Botany, British Museum (Natural History), Cromwell Road, London SW7 5BD, U.K. (PWJ); Division of Analytical Laboratories, Department of Health, PO Box 162, Lidcombe, NSW 2141 (AWA); Tasmanian Herbarium, GPO Box 252C, Hobart, Tasmania 7001 (GK); and CSIRO Tasmanian Regional Laboratories, Stowell Avenue, Battery Point, Tasmania 7004 (DAR), Australia.

A census of the fruticose, foliose and squamulose lichens, also referred to as "macrolichens", was carried out on Mount Wellington, Tasmania, between November 1980 and December 1985. A total of 95 taxa was found, including 32 taxa of *Cladia, Cladina* and *Cladonia*. This contrasts with the findings of a recent survey of macrolichens in Tasmanian rainforests, which reported only eight species from those genera. Mount Wellington had fewer species of *Collema, Menegazzia, Pseudocyphellaria* and *Sphaerophorus*. Thirty-seven species of macrolichens were common to both survey areas. *Ramalea cochleata* is reported from Tasmania for the first time.

Key Words: macrolichens, lichens, Mount Wellington, Tasmania, *Ramalea*.

INTRODUCTION

The lichen flora of Tasmania has not been as thoroughly studied as the flowering plants or bryophytes. Tasmanian lichens were first collected by Labillardière during D'Entrecasteaux's voyage of 1791–94. Other distinguished botanists, such as Robert Brown and Joseph Dalton Hooker, also collected lichens in Tasmania. These collections formed the basis for subsequent studies of this group of plants. The last major revision of the list of Tasmanian lichens was published by the Rev. Francis R. M. Wilson (Wilson 1893). That work contained a list of 151 species, based on his own collections and those of earlier collectors, and included a brief description of each species. Although Leonard Rodway was a significant figure in Tasmanian botany, monographing the phanerogams and bryophytes, he did not study Tasmanian lichens in detail. The history of lichenology in Tasmania, from the early explorers through to the 20th century, has been covered by Kantvilas (1983). An extensive list of lichen collectors in Tasmania prior to 1963 was given by Wetmore (1963), but Kantvilas (1983) noted that the names of Amalie Dietrich and Franz Sieber should have been omitted from that list as neither visited Tasmania.

Mount Wellington, originally known as Table Mountain, rises 1270 m from near the Derwent River, behind Hobart, and has long played an important role in Tasmanian botany. Road accessibility resulted in the mountain being visited by virtually every major plant collector. The wide range of rainfall (from c. 600 mm per annum in the dry sclerophyll foothills to c. 1500 mm per annum in the treeless montane summit region) plus a wide range of geological and soil types (ranging from Permian mudstones and Triassic sandstones in the lower elevations to Jurassic dolerite in the upper regions) provide a multitude of habitat types and broad ecological diversity. This has resulted in Mount Wellington having more than one-third of the known species of Tasmanian flowering plants (Ratkowsky & Ratkowsky 1976) and more than 60% of the known Tasmanian bryophyte flora (Ratkowsky & Ratkowsky 1982). Botanists who have collected lichens on Mount Wellington include R. Brown, J.D. Hooker, R.C. Gunn, W. Archer, T.A. & B. Gulliver, R.A. Bastow, W.A. Weymouth, F.R.M. Wilson, L. Rodway, J.F. Shirley, W.S. Cambell, E. Cheel, A.H.S. Lucas and G.C. Bratt. Thus Mount Wellington has a place of importance in Tasmanian lichenology, as it has in the botany of other plant groups.

THE SURVEY ZONES

Following the pattern of surveys of Mount Wellington in other plant groups (Martin 1940, Ratkowsky & Ratkowsky 1976, 1982), vegetation

zones were defined which were based primarily on the species of eucalypt present. Full details of the vegetation zones were given in Ratkowsky & Ratkowsky (1976) and are summarised briefly in table 1.

SURVEY AND IDENTIFICATION METHODS

The survey zones, visited irregularly between November 1980 and December 1985, were confined mainly to an area similar to that used by Martin (1940). (See Ratkowsky & Ratkowsky 1976, fig. 1, for an approximate boundary of Martin's survey.) The survey area was restricted deliberately because of the difficulty of identifying some lichens in the field. On the bryophyte survey of Ratkowsky & Ratkowsky (1982), no attempt was made to assess the abundance of a species in a given zone, because many species could only be determined with confidence after microscopic examination. Lichen identification is even more problematic, requiring chemical tests and the use of thin-layer chromatography (tlc) for species in many genera.

The results of the present survey (table 2) cannot in any sense be considered to be a complete list of the lichens of Mount Wellington, and must be viewed as a stimulus to others to carry out a more comprehensive study. Attention was directed to the "macrolichens", i.e. species with fruticose, foliose, squamulose or filamentous growth habit. In a few cases, collections were made of crustose species. In view of the difficulty of assessing species abundance, the presence of a macrolichen in a particular zone is indicated (table 2) only by an "X".

TABLE 1

Summary of the Vegetation Zones of Mount Wellington

Zone*	Description	Approximate elevation
1	Treeless upper regions of (i) grassy areas, more or less permanently wet, and (ii) rocky, well-drained areas of shrubs	1220–1270 m
2	Woodlands containing pure stands of *Eucalyptus coccifera*, and treeless marshlands and grasslands at the same elevation	1100–1220 m
3	Woodlands with mixed *E. coccifera* and *E. urnigera* stands, and treeless marshlands and grasslands at the same elevation	800–1100 m
4	Wet sclerophyll forests dominated by *E. delegatensis*	600-800 m
5	Wet sclerophyll forests dominated by *E. obliqua*	below 670 m
6	Sandstone outcrops dominated by *E. johnstonii*, e.g. Snake Plains, The Springs, Sphinx Rock	600–750 m
7	Gully communities, permanently wet, with thick undergrowth of *Bedfordia salicina* and *Olearia argophylla*	below 600 m
8	Dry sclerophyll open forests dominated by *E. pulchella* and *E. viminalis* (on dolerite) or *E. tenuiramis* (on mudstone)	below 500 m

* Zones 3, 4, 5, 6, 7 and 8 correspond respectively to zones 3a, 3b, 4, 5, 6 and 7 of Ratkowsky & Ratkowsky (1976).

TABLE 2

Macrolichens of Mount Wellington

Species	Zone							
	1	2	3	4	5	6	7	8
Baeomyces arcuatus Stirton				x	x			x
B. heteromorphus Nyl. ex Bab. Church. & Mitt.			x	x	x		x	x
Cladia aggregata (Sw.) Nyl.	x	x	x		x	x	x	x
C. fuliginosa R. Filson	x							
C. inflata (F. Wilson) D. Galloway		x						
C. retipora (Labill.) Nyl.	x	x		x		x	x	
C. schizopora (Nyl.) Nyl.				x	x		x	x
C. sullivanii (Müll. Arg.) Martin	x					x		
Cladina confusa (R. Sant.) Follm. & Ahti	x	x		x				
C. mitis (Sandst.) Hustich	x	x						
Cladonia capitellata (J.D. Hooker & Taylor) Church. Bab. var. *capitellata*	x	x	x	x	x	x	x	x
C. capitellata var. *squamatica* Archer						x		
C. cervicornis subsp. *verticillata* (Hoffm.) Ahti	x	x	x	x	x	x	x	x
C. chlorophaea (Flörke) Sprengel		x	x	x	x	x	x	x
C. corniculata Ahti & Kashiwadani	x	x	x	x	x	x	x	
C. cornuta (L.) Hoffm.					x			
C. crispata (Ach.) Flotow		x						
C. cryptochlorophaea Asahina								x
C. fimbriata (L.) Fr.		x			x			
C. furcata (Huds.) Schrader		x						
C. gracilis (L.) Willd. subsp. *tenerrima* Ahti		x						
C. humilis (With.) Laundon var. *humilis*		x	x	x	x	x	x	x
C. krempelhuberi (Vainio) Vainio	x	x	x		x	x		x
C. ochrochlora Flörke				x	x	x	x	
C. pleurota (Flörke) Schaerer	x			x	x	x	x	
C. pyxidata (L.) Hoffm.		x			x			
C. ramulosa (With.) Laundon*	x	x		x	x	x	x	x
C. rigida (J.D. Hooker & Taylor) Hampe	x	x	x	x	x		x	x
C. sarmentosa (J.D. Hooker & Taylor) Dodge				x				
C. scabriuscula (Delise in Duby) Nyl.	x	x	x	x	x		x	
C. subdigitata Nyl.	x	x	x	x			x	
C. sulcata Archer var. *wilsonii* Archer	x	x	x		x			x
C. tessellata Ahti & Kashiwadani		x	x	x	x	x		x
C. weymouthii F. Wilson ex Archer						x		
Collema laeve J.D. Hooker & Taylor							x	
C. subconveniens Nyl.				x				
Flavoparmelia haysomii (Dodge) Hale								x
F. rutidota (J.D. Hooker & Taylor) Hale								x
Hypogymnia billardieri (Mont.) R. Filson								x
H. lugubris (Pers.) Krog	x	x		x	x	x	x	x

cont.

Species	Zone							
	1	2	3	4	5	6	7	8
Hypogymnia mundata (Nyl.) Rassad.				x			x	
H. pulverata (Crombie) Elix							x	
H. turgidula (Bitter) Elix		x	x	x	x		x	
Knightiella splachnirima (J.D. Hooker & Taylor) Gyelnik				x	x	x		
Leptogium victorianum F. Wilson							x	
L. cf. *limbatum* F. Wilson					x	x	x	
Menegazzia platytrema (Müll. Arg.) R. Sant.				x				x
M. subpertusa P. James & D. Galloway								x
Neofuscelia pulla (Ach.) Esslinger					x			x
Neophyllis melacarpa (F. Wilson) F. Wilson					x		x	
Parmelia cunninghamii Crombie							x	
P. salcrambidiocarpa Hale							x	
P. signifera Nyl.	x	x	x				x	
P. tenuirima J.D. Hooker & Taylor						x	x	
Parmelina stevensiana Elix & Johnston								x
Parmotrema chinense (Osbeck) Hale & Ahti								x
P. reticulatum (Taylor) M. Choisy								x
Peltigera dolichorhiza (Nyl.) Nyl.		x	x	x	x		x	x
P. cf. *rufescens* (Weis.) Humb.†				x				
Placopsis gelida (L.) Lindsay					x			
Pseudocyphellaria billardierei (Delise) Räsänen							x	
P. crocata (L.) Vainio	x	x		x	x		x	
P. dissimilis (Nyl.) D. Galloway & P. James				x	x		x	
P. glabra (J.D. Hooker & Taylor) Dodge		x	x	x	x		x	
P. neglecta (Müll. Arg.) H. Magn.								x
P. rubella (J.D. Hooker & Taylor) D. Galloway & P. James				x	x		x	
Psoroma asperellum Nyl.							x	
P. hypnorum (Vahl) S. F. Gray		x						
P. microphyllizans (Nyl.) D. Galloway				x			x	
P. pholidotoides (Nyl.) Trevisan					x			
P. soccatum R. Br. ex Crombie‡				x				
Ramalea cochleata Müll. Arg.					x			
Ramalina inflata (J.D. Hooker & Taylor)					x			x
R. unilateralis F. Wilson					x			
Siphula complanata (J.D. Hooker & Taylor) R. Sant.	x	x						
S. decumbens Nyl.	x	x						
S. fragilis (J.D. Hooker & Taylor) J. Murray	x	x						

Species	Zone							
	1	2	3	4	5	6	7	8
Sphaerophorus tener Laurer				x			x	
Stereocaulon corticatulum Nyl.			x					x
S. ramulosum (Sw.) Räuschel	x	x	x	x	x		x	x
Sticta stipitata Knight		x						
Thamnolia vermicularis (Sw.) Ach. ex Schaerer var. *vermicularis*	x							
T. vermicularis var. *subuliformis* (Ehrh.) Schaerer	x							
Thysanothecium scutellatum (Fr.) D. Galloway			x		x		x	x
Umbilicaria cylindrica (L.) Delise	x							
Usnea capillacea Motyka		x						
U. inermis Motyka	x	x	x		x	x		
U. scabrida Taylor				x				
U. torulosa (Müll. Arg.) Zahlbr.§		x						
U. sp.¶	x			x	x			
Xanthoparmelia mexicana (Gyelnik) Hale								x
X. neotinctina (Elix) Elix & Johnston								x
X. scabrosa (Taylor) Hale					x			x
X. substrigosa (Hale) Hale					x			x
X. tasmanica (J.D. Hooker & Taylor) Hale								x

* Includes a single specimen containing homosekikaic acid together with fumarprotocetraric acid.
† No substances detected by tlc. Upper surface lightly tomentose towards the tips.
‡ Three additional undetermined taxa were also recorded. One contains porphyrilic acid whilst the others contain only unknown substances.
§ Contains usnic and squamatic acids.
¶ Sorediate species containing usnic acid only.

RESULTS OF THE CENSUS

Ninety-five macrolichens collected in the present survey are listed in table 2, in alphabetical order of the genera. The genera *Cladia, Cladina* and *Cladonia* account for 32 taxa, or more than one-third of the lichens in the survey area. For *Cladina*, the nomenclature of Ahti (1984) has been followed. The two species known from Mount Wellington are both widespread (occurring in both hemispheres) and highly variable. Six Tasmanian species of *Cladia* occur on Mount Wellington. These are the same six that occur in New Zealand (Galloway 1985). *Cladia aggregata* is widespread and abundant on Mount Wellington, and is probably the most common lichen. It is intensely polymorphic.

Twenty-four species of *Cladonia sensu stricto* were found. These ranged from the squamulose *C. sulcata* to *C. chlorophaea*, which often bore 4 cm high podetia that sometimes proliferated at the margins to form several tiers. Species with red apothecia or pycnidia included *C. subdigitata, C. pleurota* and *C. weymouthii*. Other conspicuous species included *C. corniculata*, its subulate podetia with slightly branched apices being an easily recognisable character. *C. capitellata* had a readily identifiable growth form, as its cylindrical podetia, devoid of cups, were erect, crowded and up to 6 cm tall. *C. cervicornis* subsp. *verticillata* and *C. krempelhuberi* had cups with central proliferations. *C. tessellata* was recognised readily with podetia up to c. 1 cm tall, bearing large, rounded brown apothecia at their tips. Difficult to separate *Cladonia* species, containing only fumarprotecetraric acid, included *C. sarmentosa, C. ochrochlora* and *C. ramulosa*.

Species of the foliose genus *Pseudocyphellaria* were conspicuous in the survey area. The two most

frequently collected species were *P. glabra*, which had a pale-green upper surface, white medulla and pseudocyphellae, and finger-like marginal isidia, and *P. crocata*, which had a grey or brown upper surface with yellow soredia, white medulla and yellow pseudocyphellae. A further species, *P. rubella*, was readily recognised when wet by the lettuce-green upper surface, covered with silky white hairs. *P. billardierei* and *P. neglecta* were collected only once.

Another genus widespread in the survey area was *Hypogymnia*, found on most substrates, including bark, twigs, litter, rocks and soil. The two most common species were *H. lugubris* and *H. turgidula*. Only two species of the related genus *Menegazzia*, *M. platytrema* and *M. subpertusa*, were collected.

Other widespread genera in the survey area were members of the family Parmeliaceae, with species of *Flavoparmelia*, *Neofuscelia*, *Parmelia*, *Parmelina*, *Parmotrema* and *Xanthoparmelia* being found. Of the 15 species of Parmeliaceae collected, *Parmelia signifera* was most frequent. Except for that species, all other species of the family were found in zones of low elevation.

The most exciting find of the survey was *Ramalea cochleata*, this being the first record of this genus and species in Tasmania. Of the remaining macrolichens, *Baecomyces arcuatus* and *B. heteromorphus* had conspicuous pinkish apothecia and covered soil banks over a wide area. *Knightiella splachnirima* was another species with pink apothecia, but these scarcely protruded above the green basal squamules. Another species with pinkish or light-brown apothecia was *Thysanothecium scutellatum*, easily recognised by its fissured pseudopodetia, which gave it a "shredded" appearance. Three species of *Siphula* were found above 1100 m. *Stereocaulon ramulosum* was a conspicuous, widespread species, growing in all zones. Its thallus was typically up to 250 mm tall, attached to rocks with a strong holdfast, and had numerous cephalodia which gave it a bluish-grey colour. The genus *Usnea* was represented predominantly by *U. inermis*, which grows on dead trees. The genus *Peltigera* was represented in the survey area mainly by *P. dolichorhiza*, which formed large patches over damp soil or litter. In addition to the five species of *Psoroma* listed in table 2, three undetermined species were found.

Several specimens of crustose lichen were found in the survey zones and identified to species level, namely *Dimerella lutea* (Dickson) Trevisan, *Hypocenomyce foveata* Timdal, *Trapelia granulosa* (Hoffm.) V. Wirth and *Thelotrema lepadinum* (Ach.) Ach.

COMPARISON WITH RAINFOREST SURVEY

A comparison between the list of macrolichens from the present survey area and that from a recent survey of the macrolichens of Tasmanian rainforests (Kantvilas *et al.* 1985, Kantvilas & James 1987) shows some striking differences. The total number of taxa found in each of the two surveys is not markedly different: 95 in the present survey and 128 in rainforest. However, only 38 species (listed opposite) were common to the two surveys. The most notable difference is the large number of taxa (32) of *Cladia*, *Cladina* and *Cladonia* on Mount Wellington, compared with only eight species of these genera in rainforests. On the other hand, Mount Wellington tends to be deficient in species of *Menegazzia* (2 v. 14), *Sphaerophorus* (1 v. 9), *Pseudocyphellaria* (6 v. 14) and *Collema* (2 v. 6), compared with rainforest habitats. Differences in the species lists are undoubtedly due to differences in habitat, with rainforest lichens being predominantly epiphytic, whereas the Mount Wellington species are predominantly terricolous.

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Macrolichen Species found both on Mount Wellington (this survey) and in Rainforest (Kantvilas & James 1987)

Baeomyces arcuatus
Baeomyces heteromorphus
Cladia aggregata
Cladia schizopora
Cladina confusa
(= *C. leptoclada* (des Abb.) D. Galloway)
Cladonia chlorophaea
Cladonia ochrochlora
Cladonia rigida
(= *C. squamosula* Müll. Arg.)
Cladonia scabriuscula
Cladonia subdigitata
Collema laeve
Collema subconveniens
Hypogymnia lugubris
Hypogymnia mundata
Hypogymnia turgidula
Leptogium victorianum
Menegazzia platytrema
Menegazzia subpertusa
Neophyllis melacarpa
(= *Gymnoderma melacarpum* (F. Wilson) Yoshim.)
Parmelia cunninghamii
Parmelia tenuirima
Parmelia salcrambidiocarpa
(previously included in *P. testacea* Stirton)
Parmotrema chinense
(= *Parmelia perlata* (Huds.) Vainio)
Peltigera dolichorhiza
Placopsis gelida
Pseudocyphellaria billardierei
Pseudocyphellaria crocata
Pseudocyphellaria dissimilis
Pseudocyphellaria glabra
(= *P. delisea* (Fée) D. Galloway & P. James)
Pseudocyphellaria rubella
Psoroma asperellum
Psoroma microphyllizans
Psoroma pholidotoides
Psoroma soccatum
Sphaerophorus tener
Stereocaulon ramulosum
Sticta stipitata
Usnea capillacea

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