

Muelleria

An Australian Journal of Botany



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8 July, 1975

NATIONAL HERBARIUM OF VICTORIA

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*This number of Muelleria is dedicated to
Dr. James Hamlyn Willis
to commemorate his retirement
from the National Herbarium, Melbourne
on 28th January 1972.*



James Hamlyn Willis

and 2-3 mm long). Corolla infundibuliform, rose-
pink; tube 5-7 mm long and \pm 1 mm wide; lobes 4,
broadly obovate to almost rotund, 3-4 x 2-3 mm,
delicately veined, tightly imbricate until full
expansion. Stamens 4, alternating with corolla lobes
and reaching half-way along lobes; filaments very
slender, 3-4 mm long, attached at throat; anthers

Herbæ perennis, parva, prostrata, succulenta, rubescens,
rhizomate tuberiformi prædita, iterum atque iterum dichotome
egerminans, tergetes (5-10 cm latus) formans. Rami carnosii,
rosco-brunnei, minute papillosi, 1-2 mm lati, ramulis ultimis

J.H. Willis (J.H. Willis)

JAMES HAMLYN WILLIS

A biographical sketch.

INTRODUCTION

It is difficult for a modest, highly active and productive scientist with much to carry out still ahead of him, to pause and provide an account of the ground already covered. The age of retirement is a convenient marker in a man's career however, and in Botany the need to refer both to the professional work and the man in the context of that profession is so very great, that Dr. Willis was pressed for signposts to guide botanists, present and future, who have need to refer to his work. The details of the biographical sketch were supplied by Dr. Willis, but these have been re-cast and re-written by others.

HIS LIFE

James Hamlyn Willis was born in the home of a family friend, Nurse Trenery, in Neerim Road, Oakleigh, Victoria, on 28 January, 1910. His father Benjamin James Willis was the eldest son of a family of 16, four of whom had died in infancy, and at the time of James's birth held the post of teller in the Bank of Australasia at Yarram, South Gippsland, where he had served since July 1896. In January 1898 Benjamin Willis had married Mary Elizabeth Giles James, the eldest daughter of a Congregational clergyman Reverend T. H. James, in Rutherglen. Their first child, Rupert Allan, had been born at Yarram on Christmas Eve 1898 and named after the son of the family doctor and close friend, Dr. Lewis Birch. For the birth of her second and only other child Mary Willis travelled to Oakleigh to be attended again by Dr. Birch, who was then practising in that locality. After almost a month's absence from Yarram she returned there with baby James.

In October 1913 Benjamin Willis was promoted to Manager of the Bank of Australasia (now the A.N.Z. Bank) in Stanley, north-west Tasmania. He went there ahead of his family who followed a few weeks later in summertime, travelling overland on a long dusty journey by horse-drawn coach from the port of Burnie, some 80 kilometres south-east of Stanley. The coach took a whole day—now cars travel along the sealed Bass Highway in little more than an hour. James (always known as Jim) did not attend school until the age of nine. Instruction in the "three R's" (reading, writing and arithmetic), with some elementary geography, history and science was ably imparted at home by his father.

Muelleria 3 (2): 71-88 (1975).

In 1924 there was no secondary school within daily travelling distance of Stanley so Jim Willis, at the age of 14, went to board with the Eyers family at 9 Brenbeal Street, Balwyn, in Victoria, while he attended Melbourne High School—just as his brother had done eleven years before. He matriculated at the end of 1927 and, as an open-air life appealed more than an office job, he sat at the annual entrance exam for a three-year scholarship course in the Victorian School of Forestry, Creswick. He passed easily and commenced his training there early in February, 1928. Upon completion of the course in December 1930 he received his Diploma of the Victorian Forests Commission and was posted back to the Creswick district as a cadet field officer with the Commission.

At Creswick a stimulating companionship was forged at once with the Howie family—Charles P. Howie, a plumber, his kindly and motherly wife Annie, invalid son Malcolm and daughter Mavis. Four other older sons (Charles, Norman, Will and Reg) lived elsewhere but occasionally visited their home town which they all loved. The Howies' place at 64 Albert Street became a second home to Jim who spent many of his week-ends there and went on innumerable rambles with Mavis who, like himself, was a keen bush-lover. On 30th May, 1931 the engagement of Jim Willis and Mavis Howie was announced—it was Mavis's 25th birthday.

During October 1932 Willis was appointed to Belgrave, in the Dandenong Forest District, as assistant to the late James O'Donohue. A year later, on 13 October, 1933, he and Mavis were married. After a week's honeymoon at Wilson's Promontory they returned to live in Cockatoo from where Willis managed the Gembrook-Beenak-Tonimbuk end of the Dandenong Forest District. This was at the height of the great financial depression when one was lucky to have any kind of job. Willis's gross salary was only £3.10.0 a week, but prices were proportional and the couple managed to pay their way, renting a 5-room furnished house for the weekly sum of 15/-. Their first child, Ruth Anne, was born on 17 April, 1935.

In June 1936 Willis received an instruction to "report for duty" in five days' time at Maryborough Forest Office. He hurriedly uprooted his family and reached Maryborough on schedule. A house was located by the end of the first week there but just as the furniture was to be moved in he received a further instruction to proceed at once to Bealiba and take charge of that district. Furniture was re-loaded and moved on another 43·5 kilometres to a forest officer's residence on the outskirts of Bealiba. Within three months, in September, another "instruction to proceed" transferred Willis and family to Daylesford, 26 kilometres by road from Creswick.

A year later Willis heard of impending retirements from the National Herbarium in Melbourne and this gave him the chance he was seeking to enter the field of professional botany. He immediately negotiated and was seconded on loan to the Lands Department by the Forests Commission for a short probationary period, after which a permanent departmental transfer was arranged. So, in October 1937 he began a period of distinguished service with the Botanic Gardens and National Herbarium that lasted for 34 years, until his voluntary retirement at the age of 62 on 28 January, 1972. His first appointment on the staff of the Botanic Gardens and National Herbarium commenced on the 2nd August 1939, as Assistant (Herbarium).

Soon after commencing work in Melbourne Jim Willis and his wife decided to settle at Brighton where they have remained ever since—for 16 years in one house on Durrant Street and for the past 21 years at 102 Male Street. Their second child, Ian, was born on 30 December, 1937, and the three subsequent children (David, Helen and Dorothy) were all born at the Brighton Community Hospital. Willis attended the University of Melbourne part-time for lectures and practical classes during 1938 and 1939 and qualified for the Bachelor of Science degree (with honours) which was conferred on 13 April, 1940. At the National Herbarium he received successive promotions and in 1958-59, he spent 14 months abroad as Australian Botanical Liaison Officer at the Royal Botanic Gardens, Kew, England. In May 1961 he was promoted to the position of Assistant Government Botanist, and for the last 15 months of his service he was Acting Director of the Royal Botanic Gardens and National Herbarium until a new Director could be appointed and commence duties. On 24 August, 1974 J. H. Willis received a Doctorate of Science from the University of Melbourne, having submitted his *Handbook to Plants in Victoria* Vol. I (2nd ed. 1970) and Vol. 2. (1973) as a major thesis, together with samples of his other scientific publications.

At home Willis's hobbies extend to collections of rocks, minerals, shells, coins, and postage stamps featuring plant life. His relatively large suburban garden, 73 metres in depth, is tended chiefly and enthusiastically by his wife Mavis, and in it, at most times of the year, it is possible to see 60 or more species flowering simultaneously. He has been a local preacher with the Methodist Church of Australia for 45 years and is in the choir of the Male Street Methodist Church, Brighton, which he and his wife both attend. They are both noted for their active participation in local aid organizations and for their lifetime of warm-hearted practical and sympathetic assistance to relatives, neighbours and friends. For six months in 1972 after Willis's retirement, he and his wife travelled to the British Isles, Holland, Sweden, Norway, Iceland and Greenland. Retirement has seen no slackening in his diverse interests and activities, either in his personal or his professional life.

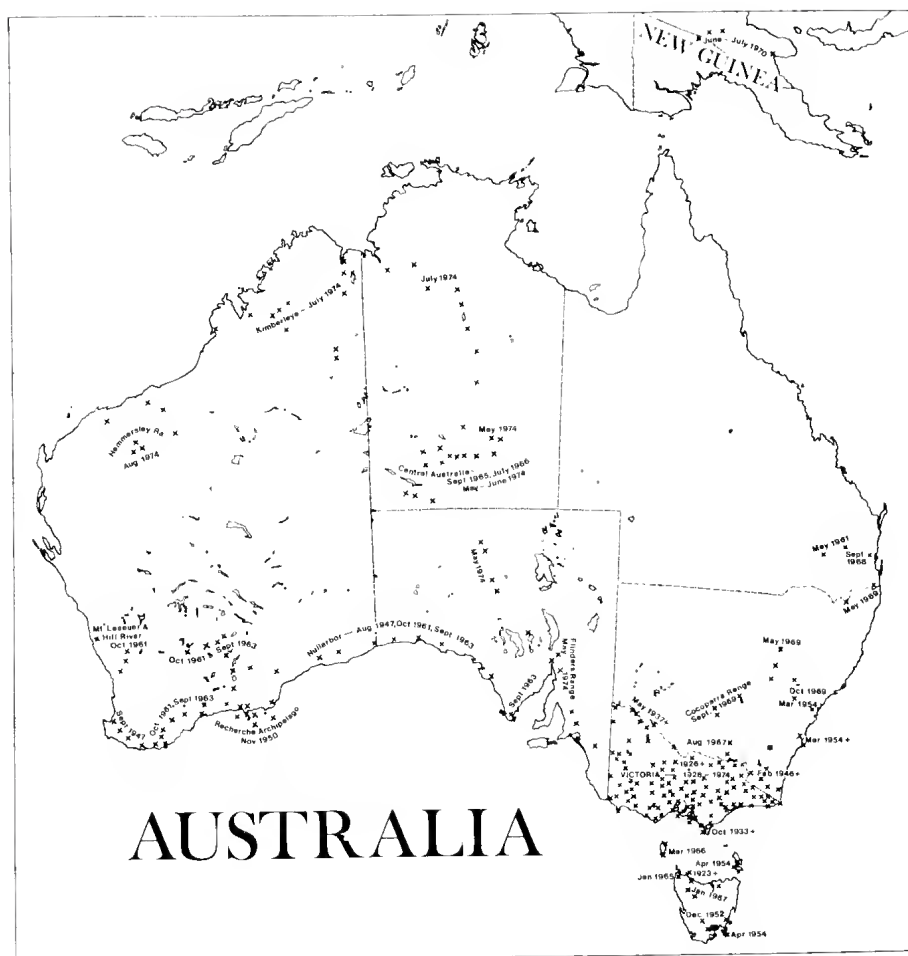


Fig. 1.—Localities in Australia and New Guinea where botanical collections and observations have been made by J. H. Willis.

BOTANICAL AND NATURAL HISTORY ACHIEVEMENTS.

Jim Willis's interest in everything pertaining to natural history, but particularly botany, commenced during his early childhood and has continued unabated to the present moment. His ten boyhood years at Stanley doubtless laid the foundations for a lifetime devoted to biological inquiry. Stanley nestles at the eastern foot of a sheer 150 metre basaltic bluff called "The Nut" although named Circular Head by Captain Matthew Flinders on 5 December 1798. There were high sea-cliffs, a deep harbour, magnificent ocean beaches, flowery heathlands, nearby tall forests and fern-gullies, and the adventuresome boy

spent hours a day beach-combing or exploring the adjacent scrub and cliffs. The shells he collected were stored in a black-wood cabinet presented to him by Mr. & Mrs. Ted Edwards who had also been avid shell collectors. When he was ten his parents presented him with the fourth edition of J. A. Leach's *An Australian Bird Book*. His schoolmaster for his last three years of primary schooling, the late David L. Whitchurch, encouraged him to make a pressed collection of the district's grasses and indicate their various useful properties. On "The Nut", more than 100 kinds of native plants could still be found including the rare and interesting *Asplenium obtusatum*, *Cyathodes juniperina*, and *Helipterum albicans* var. *incanum*. At Christmas 1924, his brother Rupert gave him a copy of Leonard Rodway's *Tasmanian Flora* (1903) inscribed with appropriate verses, the first of which clearly indicates his early botanical interests:

"A budding young botanist, bent on botanical
Study of flora (and fauna) Tasmanical,
Went peering and poking and patiently prying,
For specimens suited for pressing and drying."

Although he had left Tasmania by that time, he spent school holidays with his parents in Stanley and at Lilydale (near Launceston) where Rupert had recently set up in medical practice. At such times Rodway's flora was in constant use.

During his training at Creswick Willis spent much time on practical exercises in the plantation nursery and the indigenous State Forest nearby. He explored and camped with other students, and in September 1929 walked with Lawrie Webster from Dunkeld to Stawell through many parts of the Grampians. The next year he did a marathon walk of about 65 kilometres in one day, from Creswick westward to a forestry camp between Mounts Cole and Buangor. The Principal of the School of Forestry, Mr. Edwin J. Semmens, was an accomplished and inspiring biologist who further whetted Willis's interest in plant life, particularly the fungi. This encouragement strengthened his wish to eventually make botanical science a professional career.

Term holidays were mostly spent at Nathalia in the Goulburn Valley, Victoria, where his father had been transferred in late October 1925. Thus, by the end of 1930 Jim Willis had a fair knowledge of the floristics of both the Creswick and Nathalia regions, and had made plant lists also for Sorrento, the Werribee Gorge, Mount Cole and a few other areas.

In each of the forestry districts to which he was appointed Willis enthusiastically examined and collected the plants of the region. At first his patrol work was done, very effectively, on a push-bike for which he received a small departmental allowance. It was not unusual for him to cover 50-65 kilometres per

day by bicycle among the Dandenong Ranges and Gembrook-Beenak hills. Later, in 1936, he was instructed to patrol by horse.

Upon transferring to the National Herbarium in 1937 Willis entered a new phase of his botanical pursuits, with increased contact with both amateur and professional botanists and increased opportunities to visit new areas. He made his first trip to the Victorian Alps in January 1938, in the company of the late Raleigh A. Black. During the 1940's and early 1950's he shared many fruitful excursions into East Gippsland with the late Norman A. Wakefield. Four other enthusiastic amateur botanists and collectors, met in the course of his official duties at the Herbarium, have remained long-standing friends, viz. Miss Jean Galbraith of Tyers (via Traralgon), A. Cliff Beauglehole of Portland, Keith Rogers of Wulgulmerang and Tom Henshall of Red Cliffs (now at Alice Springs.) A rewarding correspondence was maintained with several older interstate and overseas botanists whose assistance was unstinted. These included Sir John B. Cleland in mycology and J. M. Black (Adelaide), C. A. Gardner (Perth), C. T. White and S. T. Blake (Brisbane), R. H. Anderson and Rev. H. M. R. Rupp (Sydney), moss specialists G. O. K. Sainsbury (Wairoa, New Zealand) and E. B. Bartram (Pennsylvania, U.S.A.)—all now deceased.

Willis's botanical reconnaissances and exploratory trips have taken him all over Victoria and to various parts of all the other Australian States, as well as to New Guinea, but he has seen comparatively little of Queensland. Particularly fruitful journeys were to: Western Australia with the late Sir Russel Grimwade's Expedition in September 1947; the Recherche Archipelago, W.A. (November 1950); Tasman Peninsula, Tas. (April, 1954); Central Australia (September 1965, July 1966, May-June 1974); Copparr Range National Park, N.S.W. (September 1969); Mount Wilhelm, New Guinea (June 1970); the Kimberleys and Hamersley Range, W.A., with A. C. Beauglehole (July-August 1974). In addition he visited both islands of New Zealand during the 40th ANZAAS meeting at Christchurch in January-February 1968. While Australian Botanical Liaison Officer at Kew, England, in 1958-59 he visited practically every botanical institution in the United Kingdom, and several on the European continent, making lasting personal contacts with many British, Dutch, and Scandinavian botanists. On the way back to Australia he spent three botanical weeks in the United States of America, visiting Washington, New York, the Boston-Cambridge area in Massachusetts and several parts of central California.

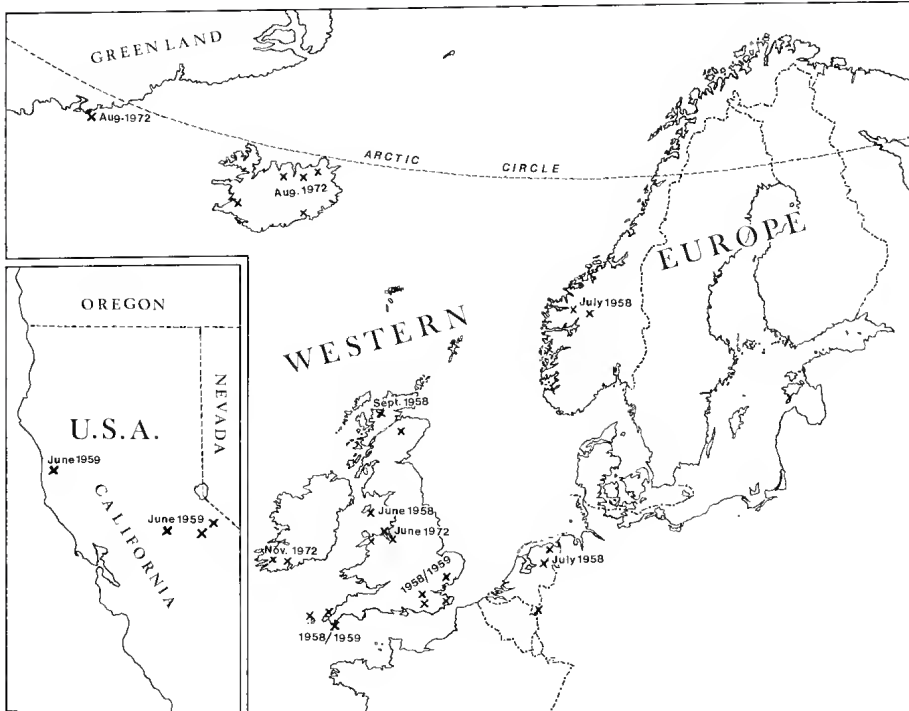


Fig. 2.—Localities in Western Europe and United States of America where botanical collections and observations have been made by J. H. Willis.

Willis has a great interest in biographical and historical topics. He has assiduously built up a file of biographical data on persons connected with Australian botany and the information he has gathered was made available to the compilers from the Australian Academy of Sciences in Canberra who prepared the Hunt Institute for Botanical Documentation's collection of biographical sketches.* For several years in the mid 1940's Willis aided his brother's wife, Margaret, in collecting material for her book *By Their Fruits* (Angus & Robertson, 1949), a biography of the great botanist Ferdinand von Mueller. He has also built up an extensive collection of handwritings of persons and collectors associated with Australian botany.

Throughout his career Jim Willis has actively participated in the work of many committees and organizations, both amateur

* See *Taxon* 23 (4): 613-618 (1974).

and professional, and has given unstintingly of his time and talent to all. His scientific, natural history and horticultural affiliations include ordinary membership of the Royal Society of Victoria, National Trust of Australia (Victoria), Australian Conservation Foundation, David G. Stead Memorial Wildlife Research Foundation, Weed Science Society of Victoria, Victorian National Parks Association, and Save the Dandenongs League, while he holds honorary life membership of the Society for Growing Australian Plants (Victorian Region), Native Plants Preservation Society of Victoria, Brighton Horticultural Society and Field Naturalists Club of Victoria. He first joined the latter organization on 12 December, 1932; several years later he became enthusiastically involved in the Club's activities, edited the *Victorian Naturalist* for two years (May 1948–April 1950) and is still a member of council. He has taken numerous photographic transparencies in colour and frequently uses these for illustrating botanical lectures and natural history travelogues given freely to sundry organizations, scientific and otherwise. To date his total writings (books, pamphlets, papers, essays, obituaries, reviews and notes) amount to 748, of which 175 are contributions to the *Victorian Naturalist* over a period of forty years. For the ten volumes of *The Australian Encyclopaedia* (1958) he wrote 452 separate entries, chiefly botanical, but including several biographies. Among all these writings are the original descriptions of 42 new species of Australian plants, also 20 other new species described in collaboration with fellow botanists, the descriptions of several new varieties, and many new nomenclatural combinations. Willis has made the first known collections in Victoria of 24 species of vascular plants, 30 bryophytes, 46 larger fungi and several lichens. For "special study and for increasing knowledge and appreciation of natural history in Australia" he was awarded the Australian Natural History Medallion for 1960. In 1973 he received the Royal Society of Victoria's silver medal for research. In January 1974 the Faculty of Science, Monash University, appointed him an honorary Fellow. His Doctorate of Science, conferred in August 1974 by the University of Melbourne, has already been mentioned.

The name of James Hamlyn Willis is perpetuated in those of—*Grevillea willisii* Smith & McGillivray (a sprawling shrub of north-east Victoria), *Epilobium willisii* Raven & Engelhorn (a subalpine willow-herb of Victoria and Tasmania), *Oleanites willisii* I. Cookson (a fossil olive from the older lignites at Yallourn), *Pottia willisii* G.O.K. Sainsbury (a minute moss from Standley chasm, Central Australia) and *Steccherinum willisii* M. Geesteranus (an interesting hydroid fungus from the Lamington National Park, south-east Queensland).

LIST OF PUBLICATIONS BY J. H. WILLIS

- 1928—*Polyporaceae* in the Creswick Forest. **Sylvanite* (Dec.): 54–55.
- 1929—Notes on the flora of the Werribee Gorge. *Sylvanite* (Dec.): 35–36.
- 1930—A bird's-eye view of the Creswick flora. *Sylvanite* (Dec.): 40–43.
Impressions of the Grampians. *Sylvanite* (Dec.): 39–41 (in collab. L. G. Webster).
- 1934—The fairyland of fungi. *Sun Nature Book* 5 (“Gems of the Bush”): 53.
- The *Agaricaceae* or “Gilled Fungi”. *Victorian Naturalist* 50: 264–298, tt. xlii–xlv (2 in col.) + 10 text fig.
- “Beef-steak”, “Punk” and “Blackfellows’ Bread”. *Victorian Naturalist* 50: 298–301, tt. xlvi & xlvii + 2 text fig.
- “Vegetable Caterpillars”. *Victorian Naturalist* 50: 302–304, 1 text fig.
- Species gathered during a fungus foray. *Victorian Naturalist* 51: 46–48.
- The Geastrae or “Earth-stars” of Victoria. *Victorian Naturalist* 51: 115–124, t. xxiv + 3 text fig.
- Two remarkable fungi of the springtime (*Morchella conica* & *Gyromitra esculenta*). *Victorian Naturalist* 51: 172–174, 2 text fig.
- 1935—Revision of the *Agaricaceae* or “Gilled Fungi.” *Victorian Naturalist* 52: 68–70.
- List of fungi from Sherbrooke Forest excursion (supplied to and published by H.C.E. Stewart). *Victorian Naturalist* 52: 76.
- Plant life in the Northern Goulburn Valley. *Victorian Naturalist* 52: 140–144, t. xv. + 1 text fig.
- 1936 Notes on the illustrations of fungi (by M. I. Howie). *Victorian Naturalist* 53: 21–22.
- 1937—Spring-time fungi and a giant Boletus. *Victorian Naturalist* 54: 102–104, 1 text fig.
- 1938—A suburban colony of “Earth-stars”. *Victorian Naturalist* 54: 143–144, 1 text fig.
- Excursion to Humphries’ Hill, Frankston. *Victorian Naturalist* 54: 144, (in collab. Dr. E. I. McLennan).
- 1939—April fungi of the forest gullies . . . and the genus *Poria*. *Victorian Naturalist* 56: 3–8, 3 text fig.
- The occurrence of *Astelia nervosa* in Victoria (incl. var. *australiana* var. nov.). *Kew Bulletin* 1939: 173–177.
- 1940—Fungus haunts and habits. *Wild Life* (Melbourne) 2 (7): 7–9 & 46, 1 full-page + 4 text figs.
- A western variety of *Pultenea Muelleri* (var. *reflexifolia*, var. nov.). *Victorian Naturalist* 57: 98–99, 1 text fig.
- 1941—*Victorian Fungi* (—72 pp., 33 illust., publ. Field Nats. Club Vict.).
— Victoria’s floral emblem. *Victorian Naturalist* 58: 67–70.
— Crimson-berries survive on the cliffs at Woolamai. *Victorian Naturalist* 58: 78, t. viii.
- 1942—The Tree Everlasting (*Helichrysum ferrugineum* Less.). *Victorian Naturalist* 58: 163–164.
- Notes on Victorian *Rhamnaceae*. Part 1 (incl. *Pomaderris velutina*, sp. nov.). *Victorian Naturalist* 58: 175–177, 1 text fig.
- Certain Victorian plants urgently needed for assay—by C.S.I.R. *Victorian Naturalist* 58: 181.
- Notes on Victorian *Rhamnaceae*. Part 2 (a. *Pomaderris velutina*; b. *Discaria australis*). *Victorian Naturalist* 59: 67–69.

* Magazine of the Victorian Old Forestry Students’ Association.

- Botanical "Bulls". *Victorian Naturalist* 59: 72.
- Confused taxonomy in the *Ozothamnus* section of *Helichrysum*, and its rectification. *Victorian Naturalist* 59: 84-88 (in collab. P. F. Morris).
- The wonder-lily of Beenak (*Astelia nervosa*). *Victorian Naturalist* 59: 90-91.
- The correct name of our Alpine *Podolepis* (*P. acuminata* R. Br. var. *robusta* Maid. & Betche) comb. nov. *Victorian Naturalist* 59: 120.
- Classifying and mapping of Victorian vegetation. *Quarterly Supplement to "The Gum Tree"* 2 (1): 2-4.
- Plants of the marshes. *Victorian Naturalist* 59: 144.
- 1943—Curious distribution of plants (in Brisbane Ranges). *Victorian Naturalist* 59: 146.
- Statistical notes on the Mallee flora. *Victorian Naturalist* 59: 176-177.
- Deletions from the Victorian flora. *Victorian Naturalist* 59: 195.
- Deletions from the Victorian flora. *Victorian Naturalist* 59: 210.
- Meissner or Meisner? *Victorian Naturalist* 59: 212.
- The FitzGerald "Symposium". *Victorian Naturalist* 60: 2.
- Longevity of leguminous seeds. *Victorian Naturalist* 60: 8.
- The Yarra Bend Public Park. *Victorian Naturalist* 60: 14-15 (in collab. P.N.S. Bibby).
- *Trachymene* and *Platysace*. *Victorian Naturalist* 60: 40-41.
- Plant Names Sub-committee. First list of recommended new and changed vernaculars. *Victorian Naturalist* 60: 125-126.
- 1944—*Dryopteris pennigera*, a new fern record for Victoria. *Victorian Naturalist* 60: 173-175, 1 text fig.
- Corrections in recent Victorian fern nomenclature. *Victorian Naturalist* 60: 196.
- Review of "The Orchids of New South Wales" by H.M.R. Rupp. *Victorian Naturalist* 61: 22 (in collab. W. H. Nicholls).
- Excursion to Seaholme. Salt-marsh flora and mangroves. *Victorian Naturalist* 61: 40-41.
- Loss of Berlin Herbarium. *Victorian Naturalist* 61: 93.
- Plant Names Sub-committee. Second list of recommended new and changed vernaculars. *Victorian Naturalist* 61: 127-128.
- Flower perfumes and their classification. *Victorian Naturalist* 61: 131-136.
- A new combination of *Helichrysum*, *H. thyrsoides* (DC.) comb. nov. *Victorian Naturalist* 61: 147 (in collab. P. F. Morris).
- 1945—Excursion to Beaumaris. Regeneration of plants on fire area. *Victorian Naturalist* 61: 162-163.
- More Botanical "Bulls". *Victorian Naturalist* 61: 175.
- Toorongo sub-alpine flora. *Victorian Naturalist* 61: 176-180, t.vii + text fig.
- *Chlorophytum*, a genus of lilies new to Victoria (and New South Wales.) *Victorian Naturalist* 61: 187-189, 1 text fig.
- A new alpine variety of the "Mallee Everlasting", (*Helichrysum adenophorum* var. *Waddellae*, var. nov.). *Victorian Naturalist* 61: 217.
- The Mallee Everlasting in New South Wales. *Victorian Naturalist* 62: 42.
- Among alpine flowers on the Barry Mountains, Cobbler, Stirling and Buller. *Victorian Naturalist* 62: 111-118 & 132-140, 4 text fig.
- 1946—The Barry Mountains. *Victorian Naturalist* 62: 155.
- Your National Herbarium, what it is and what it does. *Wild Life* 8 (1): 19-22, 9 text fig.
- Some desirable changes among familiar vernacular names. *Victorian Naturalist* 62: 241-242.
- Fascinating western eucalypts. *Wild Life* 8 (11 & 12): 389-393 & 436-439, 22 text fig.

- Some unpublished comments on a Mitchell journal. *Victorian Naturalist* 63: 181–183.
- Plant Names Sub-committee. Third list of recommended new and changed vernaculars. *Victorian Naturalist* 63: 186–188.
- 1947—An undescribed Victorian phalloid fungus (*Mutinus cartilagincus*, sp. nov.). *Victorian Naturalist* 63: 217–219, t. xvi + 1 text fig.
- Botany of the Bogongs. *Victorian Naturalist* 63: 249–250.
- A new name for the Australian Cotton Plant or “Sturt’s Desert Rose” (*Gossypium Sturtianum*, nom. nov.). *Victorian Naturalist* 64: 9–11 t. i.
- Australian flowers for Australian gardens. *Wild Life* 9 (6): 220–223, 9 text fig.
- Plants of Rodondo Island. *Victorian Naturalist* 64: 21–24.
- Flora of the Mud Islands, Port Phillip Bay. *Memoirs of the National Muscum, Melbourne* 15: 138–143.
- Distribution of certain Victorian eucalypts. *Victorian Naturalist* 64: 12.
- Epiphytic orchids of Bass Strait. *Victorian Naturalist* 64: 143.
- Ten thousand wild flowers at home in Australia. *B.H.P. Review* 25 (1): 8–11, text 10 (17 fig. by H. T. Reeves.).
- 1948—Ferdinand von Mueller. *Australian Journal of Science* 10 (5): 136–140.
- Review of “Genera Filicum: The Genera of Ferns” by E. B. Copeland. *Australian Journal of Science* 10 (5): 152–153.
- Review of “Wild Flowers of Australia” by T. Y. Harris. *Victorian Naturalist* 64: 243.
- Vascular flora of the Lake Mountain alps. *Victorian Naturalist* 65: 14–17.
- Plant Names Sub-committee. *Victorian Naturalist* 65: 22.
- Beenak fungus foray. *Victorian Naturalist* 65: 69–70.
- On the nature and distribution of “Moonah” (*Mclaleuca pubescens* Schauer). *Victorian Naturalist* 65: 76–84, 2 text fig.
- Meissner or Meisner? *Victorian Naturalist* 65: 122.
- Item for Australian representative—at the 1950 International Congress in Stockholm (*Allocarya* E. L. Greene v. *Maccoya* F. Muell.). *Australian Herbarium News* 3: 5.
- Winter botanizing on the Mugga Mugga, Canberra. *Victorian Naturalist* 65: 192–195, 1 text fig.
- Longevity of Scented Sun-orchid flowers (*Thelymitra aristata* Lindl.) *Victorian Naturalist* 65: 204.
- 1949—Victorian fern and clubmoss records. *Victorian Naturalist* 65: 214–217 (in collab. N. A. Wakefield).
- List of plant species for Snowy River Gorges. *Walkabout* 15 (2): 41.
- Victorian fern and clubmoss records. *Victorian Naturalist* 65: 279–281 (in collab. N. A. Wakefield).
- Botanical pioneers in Victoria (Also issued in booklet form). *Victorian Naturalist* 66: 83–89, 103–109 & 123–128, 3 text fig.
- A remarkable hailstorm. *Victorian Naturalist* 66: 99.
- Australian Amaryllids. *Plant Life* (incl. *Herbertia*) 5 (4): 51–53.
- Additions to the recorded flora of Lake Mountain. II Cryptogams, excluding algae and fungi. *Victorian Naturalist* 66: 158–159 (in collab. J. R. Garnet).
- *Westringia williamsonii* sp. nov. *Proceedings of the Royal Society of Queensland* 60 (9): 110 (in collab. B. Boivin).
- 1950—The Queensland Bottle Tree. (*Brachychiton rupcstris*). *Walkabout* 16: 18–20, 5 illust.
- *Victorian Toadstools and Mushrooms* (72 pp., 33 illust., publ. Field Nats. Club Vict.).
- America sets a new record in plant longevity. *Victorian Naturalist* 67: 29.

- The chequered story of two Tasmanian mosses, *Tayloria Gunnii* (Wils. in Hook.) comb. nov. & *T. tasmanica* (Hampe) Broth. *Victorian Naturalist* **67**: 30–35, 1 text fig.
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FOUR NEW SPECIES OF PLANTS ENDEMIC
IN THE MACDONNELL AND GEORGE GILL RANGES,
CENTRAL AUSTRALIA

by

J. H. WILLIS*

SUMMARY

The dicotyledonous species *Portulaca filsonii* (Portulacaceae), *Euphorbia sarcostemmoides* (Euphorbiaceae), *Ricinocarpos gloria-medii* (Euphorbiaceae) and *Leucopogon sonderensis* (Epacridaceae) are described as new, and their affinities discussed.

As far as known, all are endemic in the Macdonnell and George Gill Ranges of Central Australia where they are restricted to rocky habitats. Descriptions of at least 15 other endemic seed-bearing plants have been published from time to time for this rich botanical province, the most remarkable being *Macrozamia macdonnellii* (a cycad) and *Livistona mariae* (a lofty palm): several other entities, e.g. *Goodenia* spp., still await publication. Some of these endemics would undoubtedly be categorized as relic populations, persisting from the wetter Pleistocene period in refugial niches of the central mountain mass long after their obliteration elsewhere through excessive aridity of some 4000–6000 years ago (see Chippendale, 1963).†

PORTULACACEÆ

Portulaca filsonii J. H. Willis, sp. nov.

(Sect. *Siphonopetalum*—fide F. Mueller in *Fragm. Phyt. Aust.*, 1877.)

P. armitii F. Muell. (Queenslandiae Borealis) maxime accedens, sed differt sic: foliis bullatis papillois, pedicellis brevioribus, parte inferiore calycis dilatata multo latioreque, corollae tubo brevioris et minus exserto, petalis dimidio brevioribus (3–4 mm longis) atque seminibus asperioribus duplo latioribus (1 mm).

Herba perennis, parva, prostrata, succulenta, rubescens, rhizomate tuberiformi praedita, iterum atque iterum dichotome egerminans, tegetes (5–10 cm latas) formare. Rami carnosus, roseo-brunnei, minute papilloso, 1–2 mm lati, ramulis ultimis 10–20 mm expedite disarticulans, sine appendiculatis stipularibus. Folia opposita, perbreviter petiolata, rotunda vel reniformia, plerumque 5–8 mm longa et lata, carnosus, rufoviridia, tenuiter et acute papilloso, super manifeste bullata venis paucis immersis, subter plana vel paulo rugulosa plus minus purpurea, marginibus integris paululum recurvis. Flores breviter pedicellati, in axillis terminalibus bracteae foliaceae, a bracteolis minutis subulatis subtensi; pedicellus crassus, ± 1 mm longus, in calycis-basin (hemisphaericam usque late pyriformem) repente dilatans. Calyx tubulatus, rubrus, dense

* 102 Male Street, Brighton, Vic., 3186.

† G. M. Chippendale, "The relic nature of some Central Australian Plants", *Trans. Roy. Soc. S. Aust.* 86: 31–34 (1963).

Muelleria 3 (2): 89–101 (1975).

papillosa, 8–9 mm longa; pars basilaris dilatata, cupulata, 2×2 –3 mm, ovarium inseparabiliter includens, deinde subito contracta et cylindracea, ad anthesin duobus lobis liberis (quoque elliptico 2–3 mm longo). Corolla infundibuliformis, rosea; tubus 5–7 mm longus, ± 1 mm latus; lobi 4, late obovati usque paene rotundi, $3\text{--}6 \times 2\text{--}4$ mm, venuste venulosi, arcte imbricati, donec plene expandentes. Stamina 4, a corollae-lobis alternantes; filamenta pergracilia, 3–4 mm longa, ad faucem affixa; antherae flavae, versatiles, oblongae vel late ellipticae, 0.7 mm longae. Ovarium dimidio inferius, hemisphaericum, uniloculare, eius superficies paene plana flava multis lineis radialibus indistinctis ornata; stylus pergracilis, 7–9 mm longus, ad apicem in duas superficies stigmaticas laciniato-papillatas divisus; ovula numerosa, late ellipsoidea, prope medium basis affixa. Capsula rubra, 3–4 mm lata ad maturitatem membranacea, supra medium circumscindens; semina ± 8 per capsulam, rotunda vel guttuliformia, lenticularia, 1 mm lata, rufobrunnea, nitentia sed perminute asperulata.

HOLOTYPE: Kings Canyon, George Gill Range, Central Australia, forming scattered rosettes amongst “buckshot” gravel over slabs of sandstone rock, above the eastern brink of main falls and pool ($24^{\circ} 16'S$, $131^{\circ} 35'E$)—*J. H. Willis* s.n. 30.vii.1966 (MEL 501441).

ISOTYPES: (MEL 501455, and AD, CANB, NT).

OTHER COLLECTIONS EXAMINED: Redbank Gorge, west of Mount Sonder, Central Australia ($23^{\circ} 32'S$, $132^{\circ} 32'E$)—*R. B. Filson*, 14.v.1957 (photo only); Kathleen Gorge, George Gill Range, Central Australia ($24^{\circ} 20'S$, $131^{\circ} 41'E$)—*H. A. Morrison* s.n., 21.vii.1964 (MEL 501442); Bagot Springs, George Gill Range, Central Australia ($24^{\circ} 23'S$, $131^{\circ} 48'E$)—*H. A. Morrison & J. H. Willis* s.n. 28.vii.1966 (MEL 501443); Trepina Gorge, E. Macdonnell Ranges, Central Australia, rocky scarps on south side of gorge, ± 5 km north of Ross River road ($23^{\circ} 33'S$, $134^{\circ} 25'E$)—*J. H. Willis* s.n., 1.vi.1974 (MEL 501444).

Herb small, perennial, prostrate, succulent, reddish, springing from a tuberiform rootstock to 10 mm thick, forming isolated determinate mats 5–10 cm wide, repeatedly and dichotomously branched. *Branches* fleshy, pinkish-brown, minutely papillose, 1–2 mm wide, the branchlets 5–20 mm long, readily disarticulating at the junctions; stipular appendages absent, the branch-axils quite naked. *Leaves* opposite, on very short petioles to 1 mm long, rotund to reniform, mostly 5–8 mm long and wide, readily detaching, fleshy, finely and sharply papillose, reddish-green, prominently bullate above with few deeply immersed veins, plane to slightly rugulose on the purplish underside; the entire margins slightly recurved; cotyledons green, elliptical, $\pm 4.0 \times 1.2$ mm. *Flowers* shortly pedicellate, few together in terminal axils of leaf-like bracts, subtended by several subulate bracteoles ± 0.5 mm long; pedicel thick, ± 1 mm long, dilating abruptly into the hemispherical to broadly pyriform calyx-base which is closely adnate to ovary. *Calyx* tubular, red, densely papillose, 8–9 mm long,

the dilated basal part cupulate, 2 mm long and 2–3 mm wide, inseparably enclosing ovary, thereafter sharply contracted and cylindrical, with the two lobes free at anthesis (each lobe elliptic, obtuse and 2–3 mm long.) *Corolla* infundibuliform, rose-pink; tube 5–7 mm long and ± 1 mm wide; lobes 4, broadly obovate to almost rotund, $3\text{--}6 \times 2\text{--}4$ mm, delicately veined, tightly imbricate until full expansion. *Stamens* 4, alternating with corolla-lobes and reaching half-way along lobes; filaments very slender, 3–4 mm long, attached at throat; anthers versatile, yellow, oblong to broadly elliptic, 0.7 mm long. *Ovary* half-inferior, hemispherical, 1-locular, the upper surface almost flat, yellow, with many faint radial striations (as seen after secession of the calyx-tube); style very slender, 7–9 mm long, divided at summit into two stigmatic, lacinate-papillate surfaces that form a capitate structure $\pm 0.6\text{--}0.7$ mm wide; ovules numerous, attached near centre of base, broadly ellipsoid. *Capsule* red, 3–4 mm wide, membranous at maturity, circumscissing above the median equator; seeds ± 8 per capsule, 1 mm wide, red-brown, highly lustrous, rotund to pip-shaped, lenticular with narrow flange, minutely roughened with scattered echinulae.

This remarkable little plant appears to have closest affinities with *Portulaca armitii* F. Muell. (1877), described from material collected nearly a century ago in the riverine region of North Queensland; but the two species can be distinguished as follows:

- | | |
|---|--------------------|
| Leaves bullate, sharply papillose; pedicels ± 1 mm long;
dilated base of calyx 2–3 mm wide; corolla-tube
5–7 mm long, petals 3–6 mm; seeds ± 1 mm
wide | <i>P. filsonii</i> |
| Leaves non-bullate, not or only obscurely papillose;
pedicels 1–3 mm long; dilated base of calyx
1–1.5 mm wide; corolla-tube 8–10 mm long,
petals 6–8 mm; seeds ± 0.5 mm wide. . | <i>P. armitii</i> |

An exotic species, *P. sedoides* Welwitsch ex D. Oliver (1868) from Angola, West Africa, also bears some relationship in the tetramerous section *Siphonopetalum*; but it is a suberect plant with oval or even lanceolate leaves, sessile flowers in leafy cymes and seeds only 3–7 per capsule. In *Trans. Roy. Soc. S. Aust.* 86 : 8 (1963), G. M. Chippendale had recorded two collections of *P. filsonii* (from Ooraminna and Arltunga) under the name of *P. bicolor* F. Muell. var. *rosea* Maiden & Betche.

Of the four new species now described, *P. filsonii* has by far the widest range, extending across the George Gill and Macdonnell Ranges for at least 331 km between Kings Canyon in the west and Arltunga in the east—with northerly occurrences at Mounts Zeil and Sonder. In all localities it appears to be only very sparsely distributed, the isolated colonies consisting of a few or even single plants.

PLATE 4



Portulaca filsonii—Redbank Gorge, Central Australia.

Photo. R. B. Filson, 1957.



Euphorbia sarcostemmoides (habitat)—Ormiston Gorge, Central Australia.

Photo. J. H. Willis, 1974.

The author takes great pleasure in bestowing the epithet "*filsonii*" as a well merited tribute to his esteemed friend and colleague, Mr. Rex B. Filson, who was first to discover, gather and photograph this rock-loving species in the western Macdonnell Ranges, at Redbank Gorge near Mt. Sonder during May 1957.

EUPHORBIACEÆ

***Euphorbia sarcostemmoides* J. H. Willis, sp. nov.**

(Sect. *Euphorbium*. Subsect *Tirucalli*—fide F. Pax in *PflFam.*, 1896)

Forsan proxime accedit *E. mauritanicum* L. (Africae Australis) qua similis in habitu, amplitudine, atque caulibus nudis, sed manifeste differt: cymis iterum atque iterum dichotomis (haud umbellatis), bracteis floralibus geminatis spathulatis, involucro parviore (2–3 mm lato) glandibus 5 reniformibus percontiguis et lobis involucralibus 5 alternis multo parvioribus fortiter introrsum arcuatis praedito—cf. glandes 5–8 *E. mauritanicae* quae cum lobis magnis bifidis margine ciliatis alternant.

Frutex erectus, glaber, succulentus, caesio-viridans, multo egerminans, 40–150 cm altus. Rami plus minus erecti, alternati, teres, ramulis ultimis 3–5 mm spissis. Folia evidenter absentia (sed fortasse in propaginibus sat juvenilibus praesentia). Inflorescentiae terminales late cymosae, 2–6 cm longae, 3–4 cm latae, quater vel quinter dichotome divisae, quaeque ut videtur unisexualis, ramulis ultimis congestis. Bractee ad basin pedunculi geminae, breviter spathulatae, erubescens, 2–4 mm longae, in marginibus interdum obscure crenatae atque in superficie (concava) plus minus hirsutae. Cyathium sat infundibuliforme, 2·5–3·5 mm longum et latum, intus breviter pilosum; glandes 5, paene contiguae, flavae vel erubescens, glabrae, reniformes, plus minus auriculatae, 1–2 mm latae; lobi intervenientes obscuri, intus arcuati perpilosique. Flores staminati numerosi; pedicelli \pm 1 mm longi, pallidi, crassi, paxilliformes; filamentum \pm 0·6 mm longum; antherae loculi perlate divaricati, pilulares, 0·10–0·25 mm longi et lati. Flos pistillatus usitate solitarius; pedicellus \pm 1·5–2·0 mm longus, purpurascens, crassus, a perianthii-disco inchoato terminatus. Ovarium in disco sessile, purpurascens, glabrum, 1–2 mm longum et latum, triloculare et obtuse triangulare, quaeque superficies a costa obscura ornata; styli 3, in columna per 0·5 mm conjuncti, deinde separati divergentes atque decurvati, apicibus obtusis bifidis \pm 0·5 mm longis. Capsula olivaceo-rubescens, 5–6 mm diametro, tribus angulis rotundatis, ob pedicellum (3–4 mm longum) procul involucro exserta; semina 3, late oblongo-ellipsoidea, 3 mm longa, laevia, in coloribus cremis et roseo-brunneis longitudinaliter maculata, funiculo albo perbrevis (0·2 mm) instructa sed sine caruncula.

HOLOTYPE (with fruits): Kings Canyon, George Gill Range, Central Australia, localized but abundant among hard lateritized sandstone rocks of the plateau-top above eastern brink of main falls and pool (24° 16'S, 131° 35'E)—J. H. Willis & H. Alan Morrison s.n., 30.vii.1966 (MEL 501445-A).

ISOTYPES: (AD, NT).

PARATYPES (with male flowers): *Ibidem*—J. H. Willis & H. Alan Morrison *s.n.*, 30. vii. 1966 (MEL 501445-B, MEL 501456, and AD, NT).

OTHER COLLECTIONS EXAMINED: Kings Canyon, George Gill Range, Central Australia (24° 16'S, 131° 35'E)—H. Alan Morrison *s.n.*, 2.ix.1967 (MEL 501446, and CANB); Ormiston Gorge, Macdonnell Ranges, Central Australia, localized on a south-facing rocky scarp of southern canyon wall (23° 38'S, 132° 44'E)—J. H. Willis *s.n.*, 9.vi.1974 (MEL 501447).

Shrub 40–150 cm high, tufted, erect, succulent, glabrous, grey-greenish and much branched. *Branches* suberect, alternate, terete, the ultimate branchlets 3–5 mm thick. Leaves absent, but doubtless produced on very young growth where probably small and somewhat spatulate—as in the persisting bracts of the floral branchlets. *Inflorescences* each apparently unisexual, terminal, broadly cymose, 2–6 cm long and 3–4 cm wide, dichotomously divided 4–5 times, the ultimate branchlets congested. *Bracts* in pairs at base of each peduncle, shortly spatulate, reddish, 2–4 mm long, sometimes obscurely crenate on margin and more or less hairy on the upper (inner) concave surface. *Cyathium* broadly funnel-shaped, 2.5–3.5 mm long and wide, shortly hairy inside; glands 5, almost or quite touching each other, yellow to reddish, glabrous, reniform and more or less auriculate, 1–2 mm broad; intervening lobes obscure and inarched, very hairy inside. *Staminate flowers* numerous on pale, thick, peg-like pedicels \pm 1 mm long; filament \pm 0.6 mm long; anther loculi very widely divergent, pilular, 0.10–0.25 mm long and wide. *Pistillate flower* usually solitary on a thick purplish pedicel (\pm 1.5–2.0 mm) surmounted by a rudimentary perianth-disk. Ovary sessile on disk, purplish, glabrous, 1–2 mm long and wide, 3-locular and bluntly 3-angled with an obscure rib on each face; styles 3, united in a column for 0.5 mm, then free, divergent and decurved, with blunt bifid tips \pm 0.5 mm long. *Capsule* olive to reddish, exserted far beyond involucre on a pedicel 3–4 mm long, 5–6 mm in diameter, with rounded angles; seeds 3, broadly oblong-ellipsoid, 3 mm long, smooth, longitudinally mottled in cream and pinkish-brown, with a very short (0.2 mm) white funicle but no caruncle.

This new and rather tall spurge seems to bear little relationship to any other species of *Euphorbia* hitherto described from Australia. As a very succulent, leafless, long-lived perennial, its closest affinity is perhaps to the South African *E. mauritanica* L. which it certainly resembles in habit, size and leaflessness at the flowering stage; but there are manifest floral differences, viz.:

Cymes repeatedly dichotomous; floral bracts paired, spatulate; involucre 2–3 mm wide; glands 5, reniform, 1–2 mm broad, closely contiguous, alternating with 5 much smaller, entire and strongly inarched involucral lobes
 *E. sarcostemmoides*

Cymes umbellate; floral bracts about 3, obovate, ciliate; involucre 7–10 mm wide; glands 5–8, subrotund, 1.5–2.5 mm broad, alternating with large bifid lobes having ciliate margins
 *E. mauritanica*

Up to the present, the only known occurrences are at the upper part of Kings Canyon, George Gill Range (type locality), and a much smaller colony on the southern side of Ormiston Gorge, some 126 km to the north-east. It is only to be expected that intermediate occurrences, and perhaps others farther afield, still await discovery.

The specific epithet is in allusion to the very striking resemblance of this plant to erect forms of the widespread caustic-bush, *Sarcostemma australe* (Asclepiadaceae), for which it can easily be mistaken at a distance.

***Ricinocarpus gloria-medii* J. H. Willis, sp. nov.**

Ut videtur ad *R. velutinum* F. Muell. (Australiae Occidentalis intraterraneae) appropinquat, sed differt: foliis angustioribus (1.5–2.5 mm latis), inflorescentias excedentibus, eorum, superficiebus perminute stellato-pilosis vel subglabris (non tomentososis) et nervis mediis obscuris ob margines fortiter revolutos; pedicellis longioribus (8–20 mm); staminibus pluribus (± 80); tribus stylis multo brevibus (3–4 mm), extus plus minus tomentososis, quoque paene ad basin scisso; ovario aequabiliter tomentoso a pilis brevibus (minus quam 1 mm, numquam villosis a pilis 2–3 mm longis).

Frutex plus minus erectus vel diffusus, ramulosus, 75–200 cm altus, partibus junioribus (et infra folia) dense stellato-pubescentibus. Folia anguste linearia, 30–60 \times 1.5–2.5 mm, ascendunt vel suberecta, in superficiebus minute stellata usque subglabra, pilis non impendentibus (stellis majoribus ± 0.1 mm diametro); margines saepe arcte revoluti, ita venam mediam obscurantes. Flores pulcherrimi, pentameri, 3–5 in fasciculis terminalibus, quisque 1.5–2.5 cm diametro, a foliis floralibus multum exceduntur. Plantae aut omnino masculinae aut androgynae; flore femineo per inflorescentiam singulare longius pedicellato, floribus 1–4 masculinis brevius pedicellatis circumdato. Pedicelli 8–20 mm longi, ut in calycibus ab indumento stellato pallide brunneo obtecti, primum summam versus parte bracteolarum linearium (3–5 mm longarum) praediti. Calyx florum masculinorum et femineorum 6–8 mm longa, eius lobi imbricati obtusi 3–4 mm lati. Petala 5 alba vel pallide cremea, late oblongo-elliptica, obtusa, omnino glabra, 8–12 mm longa. Stamina ± 80 , lutea in columna (5–7 mm alta) dense aggregata; pes androphori robustus, 1–2 mm longus; antherae oblongae, reflexae, ± 0.5 mm longae. Ovarium globulare vel ovoideum, 3–4 mm diametro, dense albo-tomentosum a pilis minus quam 1 mm

longis; styli tres 3–4 mm longi, ligulati, quisque usque ad basin in duobus ramis scissus, extus plus minus albo-tomentosi per dimidium inferius. Fruges et semina non visa.

HOLOTYPE (with female flowers): Simpsons Gap, Macdonnell Ranges, Central Australia (23° 41'S, 133° 43'E)—*H. Alan Morrison s.n.*, 19.vi.1972 (MEL 501448).

ISOTYPES: (NT, AD).

PARATYPES (with male flowers only): *Ibiden*—*H. Alan Morrison s.n.*, 19.vi.1972 (MEL 501449, and AD, BRI, CANB, NSW, NT, PERTH).

OTHER COLLECTIONS EXAMINED (male and/or female): Simpsons Gap, Macdonnell Ranges, Central Australia, growing on a talus amongst quartzite rocks and boulders, in partial shade against the foot of tall cliffs about 0.5 km east from car park at entrance to Gap (23° 41'S, 133° 43'E)—*J. H. Willis s.n.* (with H. A. Morrison, A. C. Beaglehole & G. Carr), 15.vi.1974 (MEL 501450 & 501466, and AD, BRI, CANB, NSW, NT, PERTH, BM, K, L); *ibidem* (male flowers only)—*Flora McDonald s.n.*, 16.vii.1966 (MEL 501451).

Shrub more or less erect or spreading, 75–200 cm high, twiggy, the younger parts (and under-side of leaves) closely stellate-pubescent and hoary. *Leaves* narrow-linear 30–60 × 1.5–2.5 mm, their upper surfaces with only minute and non-overlapping stellate hairs (the larger ± 0.1 mm in diameter) or almost glabrous, ascending or suberect; margins strongly revolute so as often to obscure the mid-vein. *Flowers* beautiful and orange-blossom-like, pentamerous, 1.5–2.5 cm wide when fully expanded, borne in leafy terminal clusters of 3–5 and much exceeded by the floral leaves. Plants either exclusively male or the inflorescence consisting of a single, longer-stalked female flower surrounded by 1–4 shortly pedicellate male flowers. *Pedicels* 8–20 mm long, covered as is the calyx with a close pale brownish stellate indumentum, at first bearing a pair of linear tomentose bracteoles (3–5 mm long) towards the top. *Calyx* in both male and female flowers 6–8 mm long, cleft almost to the base into blunt imbricate lobes 3–4 mm wide. *Petals* 5, white or creamy, glabrous, blunt, broadly oblong-elliptic, 8–12 mm long. *Stamens* ± 80, pale yellow, in a dense cluster 5–6 mm high, fused at the base on a short stout column (androphore) 1–2 mm long; anthers oblong, reflexed, ± 0.5 mm long. *Ovary* globular-ovoid, 3–4 mm in diameter, uniformly and densely white-tomentose, with hairs less than 1 mm long; styles 3, ligulate, 3–4 mm long, each one split almost to the base into equal arms, the outer surface more or less white-tomentose for up to half or even two-thirds the total length. Mature fruit and seeds not seen.

PLATE 5



Ricinocarpus gloria-medii (habit)—Simpsons Gap, Central Australia.

Photo. H. A. Morrison, 1974.



Ricinocarpus gloria-medii (male flowers)—Simpsons Gap, Central Australia.

Photo. H. A. Morrison, 1974.

A most restricted species, the only known colony of which occupies less than one hectare at the top of a steep rocky talus near the southern end of Simpsons Gap—only 22·5 km by road west from Alice Springs. Affinities lie with *Ricinocarpos velutinus* F. Muell. (1875), from the Watheroo, Irwin River and Lake Deborah areas of Western Australia; but the principal points of distinction from this shrub may be summarized as follows:

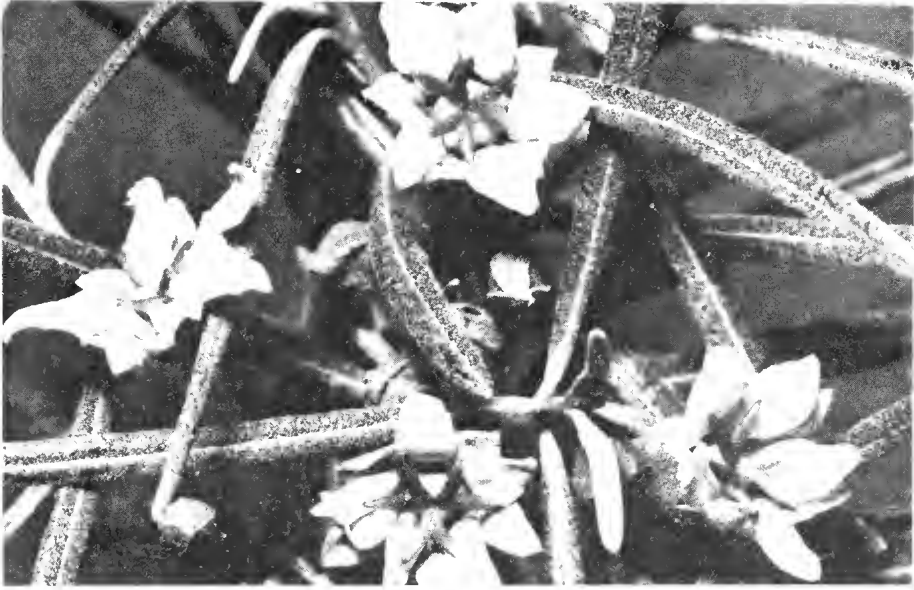
Leaves mostly less than 3 mm wide, not hoary-tomentose on both sides, the larger stellae on \pm glabrescent upper surfaces \pm 0·1 mm wide; inflorescence far exceeded by the floral leaves; pedicels 8–20 mm long; styles 3–4 mm long, split much more than half-way to base, often woolly externally; ovary with uniform indumentum less than 2 mm thick
 *R. gloria-medii*

Leaves mostly 3–5 mm wide, hoary-tomentose on both surfaces, the smaller stellae to 0·2 mm wide; inflorescence as high as the floral leaves; pedicels less than 10 mm long; styles 4–7 mm long, split about half-way to base, glabrous; ovary tomentose and crowned by dense villous hairs 2–3 mm long *R. velutinus*

Fruiting material remains a desideratum.

It is astonishing that a large shrub like *R. gloria-medii*, so near to Alice Springs and so spectacular when in bloom, should have escaped detection until July 1966. At that time Miss Flora McDonald, while participating in an ornithological excursion to the Simpsons Gap area, casually included a small sprig of male *Ricinocarpos* flowers among others to be identified by the writer. The snippet evoked immediate interest, as something new to the Centre, but nothing could be done until more adequate material became available for study. In June 1972 Mr. H. Alan Morrison re-located this occurrence, made photographs “in situ” and brought good material (including the type) back to Melbourne. For sheer magnificence, with flowers resembling orange blossom, *R. gloria-medii* has no rival in the Centralian flora. “Glory-of-the-Centre” thus leapt to mind as an appropriate title for inclusion in the binomial here formally adopted.

PLATE 6



Ricinocarpos gloria-medii (female flowers)—Simpsons Gap, Central Australia.
Photo. H. A. Morrison, 1974.



Leucopogon sonderensis—Mount Sonder, Central Australia.
Photo. H. A. Morrison, 1966.

EPACRIDACEÆ

Leucopogon sonderensis J. H. Willis, sp. nov.

(Sect. *Pleuranthus*. Ser. *Planifoliae*—*fide* G. Bentham in *Flor. Aust.*, 1869)

Ex affinitate *L. mitchellii* Benth. (quocum olim confusa) sed differt sic: superficiebus foliorum siccorum haud nitidis, bracteis et sepalis manifeste albo-ciliolatis, corollae-tubo quam lobis saltem duplo longiore, ovario 4-loculari (cf. 5-loculari in *L. mitchellii*), stylo a pilis minutis sparse oblecto (non glabro), staminum filamentis a corolla liberis non plus quam 1 mm (cf. \pm 2 mm in *L. mitchellii*), atque antheris 1.5–2.0 mm longis.

Frutex erectus vel diffusus ramulosus, 150–200 cm altus, ramulis glabris sed sensim pertenuiter canescentibus. Folia late expansa usque subimbricata (in surculis), glabra, 10–15 mm longa et 2.5–4.0 mm lata, elliptico-lanceolata, ad basin subito contracta in petiolum perbreve, ad apicem gradatim angustantia in acumen pungentem \pm 2 mm longum; superficies leniter concava, sine nitore atque perobscure venulosa; folium contra (subter) a venulis 30–40 flabellate expansis tenuiter lineatum, venis 5 majoribus interioribus paene parallelis. Flores pentameri, inter folia superiora collecti, praecipue uno per axillam; pedicellus pubescens, 1–2 mm longus. Calyx sat angusta, 4–5 mm longa, lobis obtusis minute ciliolatis stricte imbricatis, ad basin a bracteis vaginata; bractee circa 5, perlate ovatae vel rotundae, albo-ciliolatae, parte superiore majore 1.5 mm longo. Corolla alba vel pallide viridis, 7–10 mm longa (quam calyx paene duplo longior); corollae-lobi acuminati, 3 mm longi, intus breviter et sparse albo-hirsuti. Antherae ellipsoideae, \pm 1.5–2.0 mm longae, subsessiles in summa corollae tubi ex quo protrudentes. Ovarium angustum, \pm 3 mm longum, glabrum, quadriloculare; stylus gracilis, sparse pubescens, 5–6 mm longus, stigmatibus capitato 0.2–0.4 mm lato; ovula 2 per loculum, 2–3 mm longa, Drupa coccinea, nitida, late ovoidea, \pm 6 \times 5 mm.

HOLOTYPE: Mt. Sonder, W. Macdonnell Ranges, Central Australia, among rocks near head of long steep gorge, at \pm 1330 m alt. and \pm 0.4 km N.N.E. of cairn on summit (23° 34'S, 132° 35'E)—*J. H. Willis & H. A. Morrison s.n.*, 20.vii.1966 (MEL 501453).

ISOTYPES: (MEL 501452, and AD, NT, NSW).

OTHER COLLECTIONS EXAMINED: At high elevations on Mt. Sonder—*R. Tate* (Horn Exped.), June 1894 (MEL 501454).

Shrub slender, erect or spreading to 150 or even 200 cm tall, the branches glabrous but faintly canescent. *Leaves* widely spreading to subimbricate (on younger shoots), glabrous, 10–15 mm long, 2.5–4.0 mm wide, elliptic-lanceolate (sometimes almost ovate on young shoots), suddenly contracting at the base into a very short petiole and at the apex tapering into a fine pungent point \pm 2 mm long; the upper slightly concave surface dull and very faintly nerved, the lower surface finely lined with 30–40 flabellately spreading veins of which the inner major 5 are almost parallel. *Flowers* pentamerous, concentrated in the upper axils where mostly solitary, on pubescent pedicels 1–2 mm long. *Calyx* rather narrow, 4–5 mm long, the blunt minutely

ciliolate lobes tightly imbricate, ensheathed at base by about 5 very broadly ovate to rotund and similarly white-ciliolate bracts, of which the much larger upper pair measures 1.5 mm in length. Corolla pale greenish-white, 7–10 mm long (almost twice the length of calyx); corolla-lobes acuminate, 3mm long, on their inner surfaces shortly and sparsely bearded with crinkly white hairs; anthers ellipsoid, 1.5–2.0 mm long, almost sessile on and slightly protruding from the summit of the corolla-tube. Ovary narrow, 4-locular, \pm 3 mm long, glabrous; ovules 2 per loculus, 2–3 mm long; style slender, sparsely pubescent, 5–6 mm long; stigma capitate, 0.2–0.4 mm wide. *Drupe* crimson, polished, broadly ovoid, 6×5 mm.

It is remarkable that the large Australian heath family, *Epacridaceae*, should be represented in Central Australia by only a single species, and that one confined to the summit region of Mount Sonder above about 1000 m. Professor Ralph Tate collected the first specimens of it in June 1894, writing on the label "*Styphelia* cf. *Mitchellii*", but in his subsequent *Report of the Horn Scientific Expedition* 3: 177 (1896) he lists the plant as *S. mitchellii* (Benth.) F. Muell. without question. So it has remained—either as *S. mitchellii* or *Leucopogon mitchellii* Benth.—until 1972 when G. M. Chippendale, "Check List of Northern Territory Plants" in *Proc. Linn Soc. N.S.W.* 96: 211 & 253 (1972), listed this unique epacrid as an undescribed species of *Leucopogon*.

Comparison with a type specimen of *L. mitchellii* collected by Major T. L. Mitchell "near Lake Salvator Rosa" (i.e. \pm 119 km southwest of Springsure, in Central Queensland), has shown that the Mount Sonder entity is not conspecific and requires description under a new name. Important differences in the Centralian heath are set out in the following key:

- Surfaces of dried leaves dull (mat); bracts and sepals manifestly white-ciliolate; corolla-tube at least twice as long as the lobes; ovary 4-locular; style sparsely hairy; staminal filaments free from corolla by no more than 1 mm; anthers 1.5–2.0 mm long *L. sonderensis*
- Surfaces of dried leaves lustrous; bracts and sepals almost or quite non-ciliolate; corolla-tube less than twice the length of lobes; ovary 5-locular; style glabrous; staminal filaments free from corolla for \pm 2 mm; anthers to 1.5 mm long *L. mitchellii*

Since this noteworthy shrub is not uncommon in various ravines around the summit area, where endemic, adoption of a geographical epithet is appropriate in the name *Leucopogon sonderensis*.

**GREVILLEA WILLISII (PROTEACEAE)
A NEW VICTORIAN SPECIES**

by

R. V. SMITH* AND D. J. MCGILLIVRAY†

SUMMARY

G. willisii is described, and its affinities with related taxa discussed. Habitat and other notes are given.

***Grevillea willisii* R. V. Smith et D. J. McGillivray, sp. nov.**

Frutex erectus autem diffusus, 2·5 m altus × 3 m latus. Rami fusco-grisei vel griseo-brunnei; ramuli angulari-rotundati, saturate nigro-grisei, a pilis brevibus cirriformibus atque torquatis dense tomentosi. Laminae foliorum maturorum basin versus contractae, breviter sed anguste cuneatae, petiolis hrevibus (3–6 mm longis) praeditae, rigidae, superne laete virentes, subter inter venas primarias dense contexto-tomentosae ob indumentum luteo-griseum usque fuliginium (venis mediis laminae atque loborum primariorum dense vel sparse pilosis ob tomentum laxiorem), lineamento—si lobis absentibus—plus minus ovato, 3–5 cm longae × 2–4 cm latae, profunde pinnatifidae in 3–9 lobos primarios; lobi primarii a simplicibus et oblongo-lanceolatis (vel anguste deltoideis) usque ad ± ohlongo-cuneatos et apices versus trilobatos (interdum bilobatos) variantes—si quando trilobatus, lobus primarius infra medium usitate constrictus deinde in partem superiorem trilobatum dilatatus, lobulis ultimis ± triangularibus et ad apices breviter rigide pungentibus; margo folii firme recurvatus vel refractus; venae mediae folii atque eius lobi primarii infra fortiter prominentes, in superficie tenuiter sed clare notatae (praeterea, in superficie vena intramarginalis subtilis est sed ob recurvatum marginis folii aliquantum obscurata); folia juvenilia in superficie fortiter pubescentia (cf. folia veteriora sparse pilosa vel paene glabra). Inflorescentia 2–4 cm longa, dense spicata horizontalis cylindrata vel subsecunda, plerumque ramulum brevem foliatum terminans vel in axillis foliorum superiorum locata; rhachis lanata; bractae florales breves (1–1·5 mm longae) crassae late ovato-rhomboideae concavae acutae, utrimque dense pilosae. Flores pedicellis dense pilosis brevibus (± 1·5 mm longis) praediti; perianthium plerumque fulvum vel paululum purpureo-brunneum, tamen ad summas laborum saturate purpureo-brunneum, extrinsecus a pilis appressis vel paulo expansis argenteis usque luteo-griseis instructum; tubus perianthii interne glaber, eius parte recta (usque ad summam arcu) 4–5 mm longa et limbo ± 2 mm longo; antherae oblongo-lineares, ± 0·5 mm longae; torus paene rectus usque paulo obliquus; glans hypogyna semi-annularis glabra conspicue elevata, eius margine irregulariter lobato vel dentato; stylus 9–11 mm longus, perconspicuus glaber flavidus, parte inferiori plus minus recta sed parte superiori varie curvata vel arcuata, ad antbesin longitudinaliter canaliculatus, ad fructificationem teretior; discus stigmaticus perobliquus margine crenulato, stigmatate conum humilem (± 0·5 mm altum) ad centrum terminanti; ovarium sessile vel subsessile ± 1 mm longum, a pilis longis erectis argenteo-albis dense obtectum. Fructus immaturi 4–5 mm longi, × 2–3 mm lati, oblique ovoideo-ellipsoidei, extrinsecus a pilis plus minus erectis vel expansis argenteo-griseis usque pallide luteo-griseis dense obtecti, atque vittis

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vel lineis distinctis irregularibus longitudinalibus pilorum nigro-purpureorum. Semina immatura 2 per fructum \pm 3 mm longa \times 1.5 mm lata, elliptica concavo-complanata pallide brunnea, ab ala irregulari sat lata stramineo-lutea et plus minus hyalina instructa.

(Latin description based on Holotype)

HOLOTYPE: VICTORIA: Bundara River Bridge on Omeo Highway, ca. 16 km N.W. of Omeo (direct), ca. 32 km by road from Omeo (close to 20 mile peg on Omeo Highway) 36° 59'S, 147° 29'E, altitude 645 m, R. V. Smith 66/647, 2.xii.1966. (Flowering and young fruiting stage). Erect spreading shrub 2.5 m high, and 3 m across. Leaves bright green above, felted grey below. Flowers in horizontal terminal spikes. Corolla pale fawny yellow. Style pale yellow. Young fruit green with dark almost blackish-purple streaks. Growing amongst large granite rocks by side of road close to Bundara Bridge, in association with *Eucalyptus dives*, *E. rubida*, etc. (MEL 501409).

ISOTYPES: To be distributed A, B, CANB, K, MEL, NSW.

PARATYPE: Ibidem—R. V. Smith 65/20, 21.i.1965. (Mature fruiting stage). Erect to somewhat decumbent spreading shrubs, 1–3 m high, and up to 2.7 m across. Fruits softly pubescent almost sessile, horizontally spreading, yellowish-green with dark purple almost black longitudinal markings and stripes. Growing amongst large granite rock boulders and outcrops above the Bundara River; in association with *Eucalyptus dives* and *E. rubida*, together with *Acacia dealbata*, *Bursaria spinosa*, *Daviesia latifolia*, etc. (MEL 501412).

Duplicates to be distributed as above.

ENGLISH DESCRIPTION (Based on R. V. Smith 66/647, R. V. Smith 65/20, together with several other Bundara Bridge specimens. (q.v. under SPECIMENS EXAMINED):

Large spreading shrubs, mostly erect but occasionally decumbent, 1–3 m high, and 2–3 m across. Stems with a flaky dark grey bark. Branches rounded or slightly angled, densely tomentose with short curled and twisted hairs, and varying in colour from pale grey to dark charcoal-grey, or sometimes almost black. (See also under NOTES.) Branchlets and young shoots strongly angular-rounded, varying in colour from dark charcoal-grey to pale grey, light yellowish-grey, light ferruginous or even pinkish-red. Leaves on petioles 2–6 mm long. Young leaves often ferruginous or pinkish-red in colour, densely pubescent on upper surface with short curled and twisted hairs; intermediate leaves sparsely pubescent above; mature leaves vary from almost completely glabrous above to very slightly pubescent towards the base, or with scattered hairs elsewhere. Laminae of mature leaves rigid, bright green subshining above, densely felted tomentose beneath in between the main veins with a tomentum of short curled or twisted hairs, varying in colour from whitish-grey to yellowish-grey,

or charcoal-grey; main midrib and midveins of primary lobes densely to sparsely hairy with a generally looser tomentum than rest of undersurface. Where tomentum of midrib and other main veins sparse, midrib shows a \pm straw coloured top, and narrow bands of green tissue down the sides; where midrib tomentum dense this is completely masked. Leaves tapering below into a short narrow cuneate base; laminae \pm ovate in basic outline (outline if lobes not present); 3-5 (-6) cm long, 2-4 (-5) cm wide, deeply pinnatifidly lobed into (3-) 5-7 (-9) primary lobes—these varying from a regular arrangement of (1-) 2-3 (-4) pairs of lateral lobes together with a single trifold terminal lobe; to an irregular arrangement of \pm alternately placed lobes. Primary leaf lobes vary from simple oblong-lanceolate or deltoid in shape, to \pm oblong-cuneate with a trilobed tip—in the latter case the lobes are often constricted below the middle, and widen upwards into the trilobed tip—the ultimate lobes being \pm triangular in shape, and terminating in a short rigid mucronate point. Leaf lobing is often very irregular. Even on one leaf the primary lobes may be entire, bilobed or trilobed; or again adjacent leaves may show the primary lobes all entire on one leaf, but regularly trilobed on a neighbouring leaf. Primary leaf lobes 1-1.5 (-2) cm long, (3-) 4-6 (-7) mm at narrowest width, and (5mm) 7 mm—15 mm (-17 mm) at broadest width. Leaf margin strongly recurved or refracted. Main midrib and midveins of primary lobes strongly projecting on lower surface; midveins of secondary lobes and also a short vein running from junction of midrib and midvein of each primary lobe to base of sinus, clearly visible but not strongly projecting. In addition short lateral veins sometimes faintly discernible. On upper surface main veins clearly but finely marked, and in addition a well defined intra-marginal vein which is often somewhat obscured by the recurvature or refracture of the leaf margin. All other veins obscure on upper surface. *Inflorescence* a dense cylindric or subsecund horizontal spike (1-) 2-4 (-5) cm long, mostly terminating short leafy shoots or branches, or in the axils of upper leaves, and borne on short stalks 1-5 mm long—in some cases the short flowering shoot bears only several minute incipient leaves or bracts, and then the inflorescence stalk appears longer—varying from 5 mm to 15 mm. Flower spikes range from about 50 to 150 flowers; *rhachis* densely lanate with irregularly spreading curled or twisted hairs; *bracts* short broadly ovate to ovate-rhomboid, concave, bluntly pointed to acute, rather thick and rigid, densely hairy on both surfaces, (1-) 1.5 (-2) mm long. *Flowers* on densely hairy *pedicels* (1-) 1.5 (-2) mm long. Pedicels generally at least as long as bracts or slightly exceeding them. *Perianth* hairy outside, pale yellow to tawny or slightly purplish-brown tinged on tube, dark purplish-brown or purple tinged at tip, with \pm appressed hairs slightly spreading at tips, and varying in colour from silvery to pale yellowish grey to purple tinged. Perianth tube glabrous

PLATE 7

ROYAL BOTANIC GARDENS
AND
NATIONAL HERBARIUM MELBOURNE
VICTORIA AUSTRALIA

Grevillea willisii F.V. Smith &
D.J. McGillivray

1. VICTORIA, N.E.,
Bundara River Bridge on Omeo Highway, ca
16 km (10 miles) N.W. of Omeo (Australia),
ca 70 km by road (close to 20 mile peg), S^W
29°42', 147° 29'E. Alt. 645m (2115 feet).
Coll. R.V. Smith, 6/6/67, 2/12/1966

Det. R.V. Smith 2/3/1974
Erect spreading shrub 2.5m high, and
N.W. 3m across. Leaves bright green above,
felted grey below. Flowers in horizontal
terminal spikes. Corolla pale fawn yellow.
Style pale yellow. Young fruits greenish
with dark blackish purple streaks. Growing
amongst large granite rocks by side of road
close to Bundara Bridge, in association with
Acalyptus dives, *B. rubida*, etc.

2007 48

MEL501409



NATIONAL HERBARIUM OF VICTORIA

HOLOTYPE

Grevillea willisii F.V. Smith &
D.J. McGillivray

Determined by F.V. Smith, 2/3/1974

HOLO-
TYPE

ROYAL BOTANIC GARDENS
& NATIONAL HERBARIUM
MELBOURNE, AUSTRALIA

Holotype of *Grevillea willisii*—Bundara River Bridge, Victoria.

inside, in some tawny to purple-brown, in others pale yellowish in upper part, and strongly purple tinged in lower part. Perianth ca. 7 mm long—tube (from base to top of arch) (3–) 4–5 mm long, limb ca. 2 mm long. *Anthers* linear—oblong, ca. 0.5 mm long. *Torus* varies from almost straight to slightly oblique. *Hypogynous gland* semi-annular, glabrous, conspicuously raised and with an irregularly lobed or dentate margin. *Ovary* sessile to subsessile, ca. 1 mm long, densely covered with long straight silvery-white erect hairs. *Style* 9–11 mm long, very conspicuous, clear pale yellow when fresh, pale yellow to slightly dingy yellow when dry, glabrous, longitudinally grooved in the flowering stage, becoming smoother and more rounded in the fruiting stage; at first strongly arched but straightening out in the lower part with maturity, although generally with the tip remaining bent over or variously curved or twisted. *Stigmatic disc* [or *pollen presenter*—a term recently adopted by A. S. George (1974)] ca. 0.7 mm wide, very oblique, with a crenulate margin, and rising in the middle to a prominent low cone ca. 0.5 mm high, at summit of which is the stigmatic area. Cone in some cases rising fairly gently, in others contracting rather suddenly and sharply to the summit. *Mature fruits* horizontally spreading, obliquely ovoid-ellipsoidal in shape, thinly woody 9–11 mm long \times 6–7 mm wide, densely hairy outside with \pm straight ascending to quite strongly spreading hairs, varying from pale silvery-grey to yellowish-grey, pale yellow or greenish grey, and with distinct irregular longitudinal streaks or bands of dark purple, purplish-black or very dark brown hairs. *Seeds* 2 per fruit, 6–8 mm long \times 3–4 mm wide, dark brown to almost black, elliptical, compressed, glabrous, very finely wrinkled on the gently convex outer face, and on the \pm flattened central part of inner face. In addition, on the inner face there is sometimes an elliptical groove or furrow just in from the margin, and occasionally beyond this again a low raised elliptical wall or thickening. Margin of seed thickened, and with a somewhat irregular pale yellow hyaline wing—more apparent in the immature than in the mature seed (in the latter it seems to break down somewhat).

HABITAT NOTES: (From R. V. Smith field notes 21-22.i.1965)

G. willisii occurs in abundance in the vicinity of the Bundara River Bridge, where it grows among large granite outcrops and boulders, but in a number of different aspects, slopes and plant associations. It occurs on both sides of the river.

West side of Bundara River: Growing on steep rocky slopes of easterly aspect about the river, in association with *Eucalyptus dives* and *E. rubida*, together with *Acacia dealbata*, *Bursaria spinosa*, *Daviesia latifolia*, and *Micrantheum hexandrum*. It extends on to the more gentle rocky slopes of northerly aspect, where it grows in association with *Eucalyptus dives* and *E. rubida*, together with *Brachyloma daphnoides*, and *Themeda australis*. **East side of Bundara River:** Growing among very large

PLATE 8



ROYAL BOTANIC GARDENS
AND
NATIONAL HERBARIUM MELBOURNE
VICTORIA, AUSTRALIA

Grevillea willisii R.V. Smith &
D.J. Moillibroay

Loc. VICTORIA—N.E.
Bundara River Bridge on Omeo Highway, ca
16 km (10 miles) N.W. of Omeo (direct),
ca 37 km by road (close to 20 mile pd), 46
59'S, 147° 29'E. Alt. 645m (2115 feet).
Coll. R.V. Smith 6/20, 21/1/1965

Det. R.V. Smith 3/9/1974

Erect to somewhat decumbent spreading
woody shrubs 1-3m high, and up to 2.7m
across. Fruits softly pubescent, almost
sessile, horizontally spreading, yellowish-
greenish with dark purple almost black
longitudinal markings and stripes.
Growing amongst large granite rock boulders
and outcrops above the Bundara River in
association with *Eucalyptus dives* and
E. rubida, together with *Acacia dealbata*
~~and~~ *Acacia spinosa*, *Daviesia latifolia*, etc.

PARA-
TYPE

MEL501412

NATIONAL HERBARIUM OF VICTORIA
Melbourne

ROYAL BOTANIC GARDENS
AND NATIONAL HERBARIUM
MELBOURNE, AUSTRALIA

Dicotyledonae

Paratype of *Grevillea willisii*—Bundara River Bridge, Victoria.

granite boulders close to the bridge, in association with *Bursaria spinosa*, *Banksia canei* and *Correa lawrenciana*. Further upstream growing on steep westerly slopes above river among rocky outcrops and boulders, in association with *Eucalyptus rubida* and *E. macrorhyncha*, together with *Bursaria spinosa*, *Daviesia latifolia*, *Tieghemopanax sambucifolius* and *Correa sp.* Extends to the top of the steep rocky slopes above river, and then over on to gentle open slopes beyond into a stand of pure *E. rubida*, together with *Bursaria spinosa*, *Brachyloma daphnoides* and *Themeda australis*. Occurs also on rocky outcrops of northerly aspect, again in association with *Eucalyptus rubida* and *E. macrorhyncha*, together with *Bursaria spinosa*, *Brachyloma daphnoides*, *Daviesia latifolia*, *Acacia buxifolia* and *Cassinia longifolia*.

The Bundara River Bridge occurrence of *G. willisii* appears to be very localised. It was not noted between Anglers Rest and Bundara Bridge. About 0.4–0.8 km N.W. of Bundara Bridge on Omeo Highway (between 20 and 21 mile pegs) a fairly extensive patch of *G. willisii* was found growing among rock outcrops both above and below the road. Beyond this point on the Omeo Highway no other occurrences were seen.

SPECIMENS EXAMINED: Bundara River area: Omeo Highway (Bundarra Bridge), R. A. Black, 10.xi.1939 (MEL 501460) [Flowering material]; near Omeo at Blue Duck Hotel (Anglers Rest), junction of Bundarra and Big River, S. M. Fawcett, xi.1944 (MEL 501459) [Flowering material]; at junction of the Bundarra and Mitta Mitta (or Big) Rivers, H. I. Aston 1259, 23.xi.1964 (MEL 501458); Bundarra River Bridge ca. 16 km N.W. of Omeo, 36° 59'S, 147° 29'E, alt. 645 metres, L. A. S. Johnson 7398 & B. G. Briggs, 20.x.1971. Very spreading, to 3 m tall or more, to almost 3 m in diameter, styles and perianth greenish-cream, on pink granite on slopes near river, in woodland of *Eucalyptus rubida* and *Eucalyptus pauciflora* with *E. dives*, *E. macrorhyncha* and *E. radiata* ssp. *robertsonii* also in the area (NSW) [Flowering material].

OTHER LOCALITIES: Junction of Livingstone Creek and Mitta Mitta River (ca. 16 km north of Omeo). On metamorphic schist (quartzites), on rocky bluff. Altitude 792 m. Straggling shrub 1–2 m high. J. Stirling 112, 1.ix.1882 (MEL 501461). [Vegetative material with very young bud spikes, showing floral bracts, tomentum of lower surface of leaves strongly ferruginous. The collection is interesting as it appears to be the earliest record we have for *G. willisii*]; Upper Mitta Mitta, Clinton, xii.1923 (FRI 16293); Victorian Alps, R. Tate (undated) (MANCH); Cobungra, H. Morgan, xi.1932 (as *Grevillea ramosissima* Meisn.) [Herb, A. C. Beauglehole, 7385—ex Herb. J. Galbraith].

DISCUSSION OF AFFINITIES

On Bentham's classification of *Grevillea*, *G. willisii* belongs to the Section *Eugrevillea*, and to the Series *Hebegynae*. This series includes a number of prickly lobed or "holly-leaved" species—in Victoria *G. repens*, *G. aquifolium*, *G. ilicifolia*, *G. steiglitziana*, *G. dryophylla*; and outside Victoria *G. acanthifolia* and *G. bipinnatifida*.

From all of the abovementioned Victorian species *G. willisii* differs in having the following characters (1) sessile or subsessile ovary (2) pale yellow styles (3) stigmatic disc either round or broadly ovate-oblong in outline (viewed from above), and rising in the middle to a conspicuous cone which is frequently sharply conic or rostrate-conic (cf. the other species with conspicuously stipitate ovaries, red styles, and with the stigmatic disc elongated longitudinally, varying from ovate to elliptic or elliptic-oblong in general outline, and rising in the middle to a low blunt cone). The densely packed flower spike with numerous relatively small flowers, deeply pinnatifidly lobed leaves, and the dense felted tomentum of the underside of the leaves are some of the minor characters which further distinguish *G. willisii* from the other Victorian holly-leaved species.

From *G. acanthifolia* of New South Wales, *G. willisii* differs in the much smaller flowers, shorter pale yellow styles, smaller floral bracts, sessile to subsessile ovary, the longer and often more sharply conic stigmatic disc (cf. the low blunt cone of *G. acanthifolia*), tomentum of perianth limb (short flat lying hairs compared to long spreading hairs in *G. acanthifolia*), and in the densely felted undersurface of the leaves (glabrous or nearly so in *G. acanthifolia*).

From *G. bipinnatifida* of Western Australia *G. willisii* differs in the short compact inflorescence (long, loose, open and somewhat interrupted in *G. bipinnatifida*), shorter pedicels, shorter styles, form of stigmatic disc and hypogynous gland, leaf dissection, tomentum, etc.

The curious conical stigmatic disc of *G. willisii* could suggest affinities with the Section *Conogyne*. This section is characterized however by a cylindrical instead of secund inflorescence, and by the total length of stigmatic disc and cone at least equal to or exceeding the greatest width. (In *G. willisii* total length of stigmatic disc and cone is generally shorter than the greatest width, or just equal to it, but not exceeding it.) The majority of the *Conogyne* species are from Western Australia, and combine a glabrous stipitate ovary with the lack of a hypogynous gland. Exceptions are the eastern species *G. ramosissima* and *G. triternata* with hairy ovaries.

From both these species *G. willisii* can be readily distinguished. *G. willisii* differs from *G. ramosissima* in the shorter stigmatic

cone, glabrous instead of hairy style, short second instead of narrow cylindrical flower spike, leaf shape and lobing, tomentum, etc., and differs from *G. triternata* in the second inflorescence, perianth revolute under limb instead of recurved, sessile instead of shortly stipitate ovary, leaf shape and lobing, tomentum, etc.

G. willisii shows closest affinities to two undescribed taxa—one from Mount Stradbroke, Eastern Victoria, and the other from the Nunniong Plateau area, Eastern Victoria. These taxa are represented in the National Herbarium, Melbourne by three collections made by J. H. Willis, as follows:—

Mount Stradbroke (ca. 16 km north of Wulgulmerang), far Eastern Victoria. Eastern rocky declivities above Suggan Buggan Valley, at ca. 1220 m elevation. *J. H. Willis*, 23.ii.1962 (MEL 501462); Reedy River Valley below Brumby Point, Nunniong Plateau area, far Eastern Victoria. On quartzite cliff faces at ca. 1037 m altitude. *J. H. Willis*, 13.xi.1964 (MEL 501463); and Reedy River gorge, Nunniong Plateau area, far Eastern Victoria. Among rocks above river, at ca. 915 m altitude. *J. H. Willis*, 13.xi.1964 (MEL 501464 and MEL 501465).

The status of these taxa will be decided after field studies, and collection of more adequate material. Briefly, however, the Mount Stradbroke plants differ from *G. willisii* principally in the shape and size of the floral bracts; in the relative length of flowering pedicel to bract (in *G. willisii* the bracts are generally as long as or slightly shorter than the pedicels, whereas in the Mount Stradbroke plant the bracts greatly exceed the pedicels); in the strongly and sharply angled upper branches; in leaf shape and lobing; in the predominantly flat lying hairs of stems and leaf midribs; and in the silky hairy vestiture of the inflorescence. The Nunniong plants resemble the Stradbroke plant in leaf shape and lobing, prominently projecting midrib and midveins of main leaf lobes, predominantly flat lying hairs of stems, midribs and flower rhachis, but differs from the Stradbroke plants in the very small readily deciduous bracts which are very much shorter than the flower pedicels.

NOTES

***Grevillea willisii* and *G. ramosissima*:** In the past at Melbourne Herbarium several specimens of *G. willisii* were incorrectly determined as *G. ramosissima*. These two species differ markedly in floral structure. The Victorian form of *G. ramosissima* (from Pine Mtn.) is readily distinguishable on vegetative characters—with its silvery silky undersurface to the leaves, narrow tapering leaf lobes bearing long pungent points, etc. However, some forms of *G. ramosissima* from New South Wales superficially resemble *G. willisii* in vegetative characters. These forms have a dense tomentum of curled twisted, often ferruginous, hairs on under surface of leaves. They can, however, nearly always be distinguished by the narrow tapering leaf lobes, the much longer pungent leaf tips, and the longer more narrowly

tapering leaf base which runs down into narrow decurrent wings almost to the base of the petiole.

Grevillea flavistyla: A suggested manuscript name for *G. willisii* at one stage was *G. flavistyla*. This name appeared in *The Distribution of Victorian Plants* (D. M. Churchill and A. de Corona, 1972). The name is a *nomen nudum*.

Rock Grevillea: Willis (1972) deals briefly with the present species under *G. sp.* Vern: Rock Grevillea.

Correct Spelling of Bundara: According to the Victorian Place Names Committee the correct spelling is Bundara, and not Bundarra or Bundarra. Bundarra appears on most of the older maps, or occasionally Bundarra. The spelling Bundara is in accordance with the more recent Victorian Department of Crown Lands & Survey maps, and also the Commonwealth 1 : 250,000 Series (1968)—(Tallangatta).

Specimens Examined: The location given above for the S.M. Fawcett collection appears to be slightly misleading, as it suggests that the specimen was collected at or near Anglers Rest. It is almost certain that the collection was made at or near Bundara Bridge—which is close to the junction of the Bundara and the Big River. This is about 1–3 kilometres north of Anglers Rest. After considerable searching around Anglers Rest, R. V. Smith was not able to find *G. willisii* there, whereas it is abundant at Bundara Bridge.

Presence of a micro-lichen: The generally dark grey to blackish colour of the branches is partly due to the presence of dark coloured hairs mixed with the predominantly light greyish white hairs; but is also due to the presence of the black fruiting bodies of a micro-lichen which is present in considerable quantity on both the stems and branches, also on the flowering rhachis, and with scattered occurrences on both the upper and lower leaf surfaces.

The new species is dedicated to Dr. J. H. Willis, whose enthusiasm, industry and skill have greatly enriched our knowledge of the Australian Flora.

ACKNOWLEDGMENTS

The authors particularly wish to thank Dr. J. H. Willis for his kindness in translating a prepared English version of the description into botanical latin. Also our appreciation to Mr. Rex Filson, National Herbarium of Victoria, for providing the information about the presence of a micro-lichen.

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A FRUITING OCCURRENCE OF *Bryum algens* Card. IN EAST ANTARCTICA

by

REX B. FILSON* & J. H. WILLIS†

Only about a dozen species of mosses have been recorded from the large eastern sector of Antarctica, the bryophytic flora of which is very much poorer than that of the western Palmer Peninsula (and its adjacent islands) where at least 67 species occur—*teste* W. C. Steere, 1961. By far the largest genus in the whole antarctic region is *Bryum* with eleven currently recognized species; five of these are represented in East Antarctica, but up to 1974 no fruiting example had ever been found in this region, although *Bryum* fruits are well known from the Palmer Peninsula of West Antarctica.

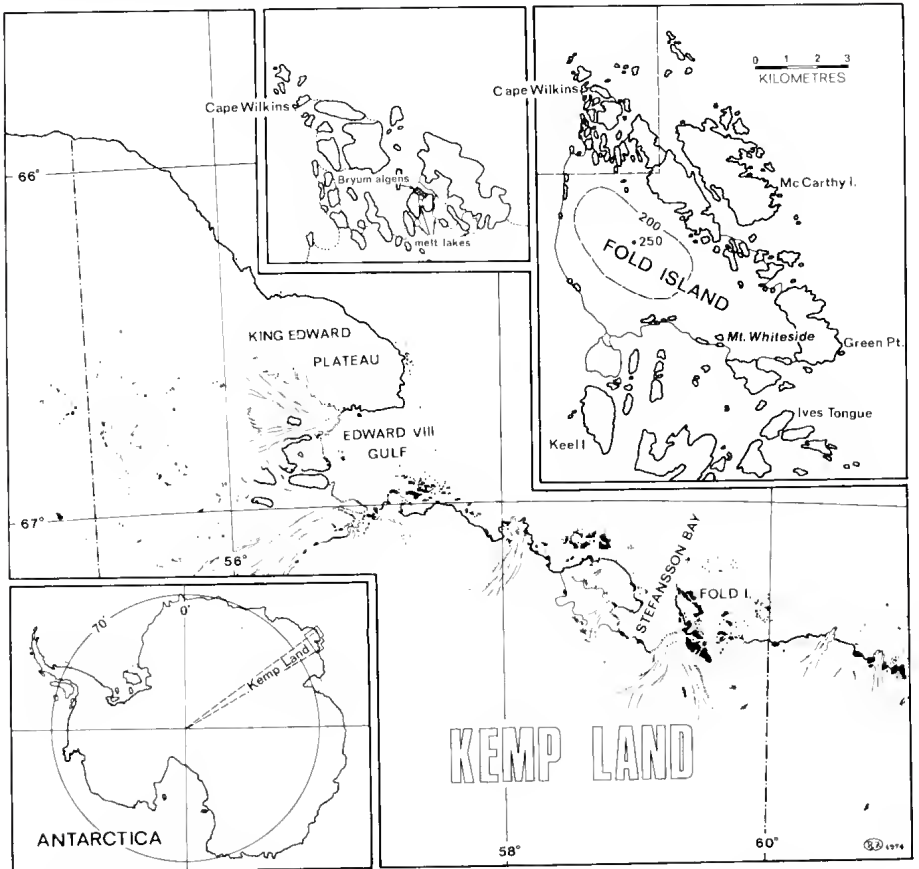


Fig. 1.—Map showing position of Fold Island and location of fruiting *Bryum algens* Card.

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† National Herbarium of Victoria (retired)

Muelleria 3 (2): 112–116 (1975).

During February 1974 abundant and excellent fruits were discovered on a *Bryum* colony inhabiting rocks on Fold Island, Kemp Land. Fold Island is relatively large and lies to the east of Stefansson Bay, Kemp Land, at $67^{\circ} 18'S$, $59^{\circ} 23'E$. The island is capped by an ice dome which rises to a height of 250 m. Large expanses of rock are exposed along the north and eastern sides, with smaller outcroppings along the southern and western parts of the island.

One of us, (R. B. F.) visited this island as a member of the summer 1973–74 Australian National Antarctic Research Expedition (A.N.A.R.E.) survey team. John Manning and Geoff Robinson were already on the island when he arrived and drew his attention to a strange plant that they had found growing in a small valley on the northern side. It proved to be a moss in fruit, and collections were made during a further visit to the area. This *Bryum* occurred on the western side of a northerly-trending valley. A melt-water stream, fed from a large melt lake, was flowing along the bottom of the valley. The plants covered an area of about 100 m square, and this area was also fed by trickling melt-water from a small melt lake in the valley above. Most cushions of moss were sterile; but around the northern side of boulders, where maximum heat from the sun would be concentrated, abundant fruiting material was present.

In most capsules examined, the inner teeth of the peristome had completely disappeared, giving the impression of a single outer peristome. The inner series would appear to be rapidly

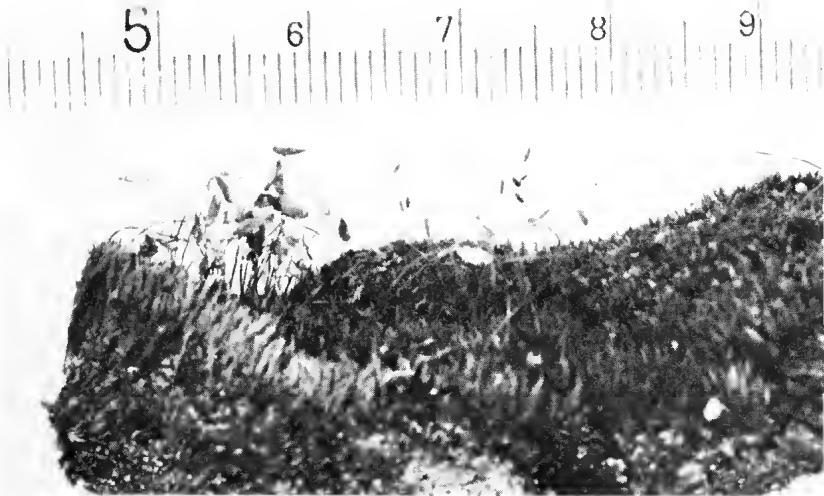


Fig. 2.—*Bryum algens* Card. showing capsules

evanescent, and can only be observed immediately after the operculum falls away. Such a developmental feature may be associated with fructification at the extreme limit of the plants tolerance.

This moss is conspecific with populations at and in the vicinity of Mawson (\pm 135 km eastward), occurrences of which had been published under the name *Bryum antarcticum* Hook. f. & Wils. in R. B. Filson's *The Lichens and Mosses of Mac. Robertson Land* pp. 147–148, t. 40 (1966). The identification at that time was based on comparable material from Mac. Robertson Land examined and reported on by the late bryological doyen E. B. Bartram of Pennsylvania (U.S.A.). Recently Dr. Stanley W. Greene (in Birmingham, U.K.), an authority on Antarctic mosses, has inspected a sample of the fruiting material from Fold Island and he comments thus (by letter, 17. v. 1974):

“I can confirm that it is *Bryum algens* Card. There is no ambiguity about the determination, as the characteristic bracts are present with the excurrent nerve. . . . Dixon and Bartram confused this plant with *Bryum antarcticum*, a totally different species which is morphologically completely distinct from *B. algens* and, indeed, from all other *Bryums* that I know . . . The plant [*B. algens*] fruits very well along the west coast of the peninsula [i. e. Palmer] as far as Marguerite Bay, but I have never seen it in this state . . . in any other collections which I have examined. Your specimen is, therefore, very noteworthy.”

Apparently Dixon and Bartram are not the only ones to have been confused by these two Antarctic species of *Bryum*. Under the original description of *B. algens*, (type from Granite Harbour in Victoria Land), in *Nat. Antarct. Exped.* 5 (1907), J. Cardot compares it with his own two previously listed species, *B. gerlachei* and *B. inconnexum*, but makes no mention of any affinities with the earliest-described species of the region, *B. antarcticum* Hook. f. & Wils. (1847)—type from Cockburn Island in Cockburn Sound, far southern Chile. H. T. Clifford in “New Records for Antarctic Mosses,” *Aust. J. Sci.* 20: 115 (1957) states that he has seen specimens named by Cardot and that *B. algens* is conspecific with *B. antarcticum*. William C. Steere, in his “Preliminary Review of the Bryophytes of Antarctica”, *Nat. Acad. Sci. (Nat. Res. Council)* Publ. 839: 25–26 (1961), accepts both species as distinct, but synonymizes three other of Cardot's binomials (*B. austropolare*, *B. gerlachei* and *B. inconnexum*) under *B. algens*. Finally, Stanley W. Greene in “Studies in Antarctic Bryology I—A basic check list for mosses”, *Rev. Bryol.* 36: 135 (1968), accepts *B. inconnexum* Card. (and its variety *tomentosum* Card.) as distinct from both *B. algens* and *B. antarcticum*. According to Steere, *B. algens* and *B. antarcticum* are co-extensive on the Danco Coast of

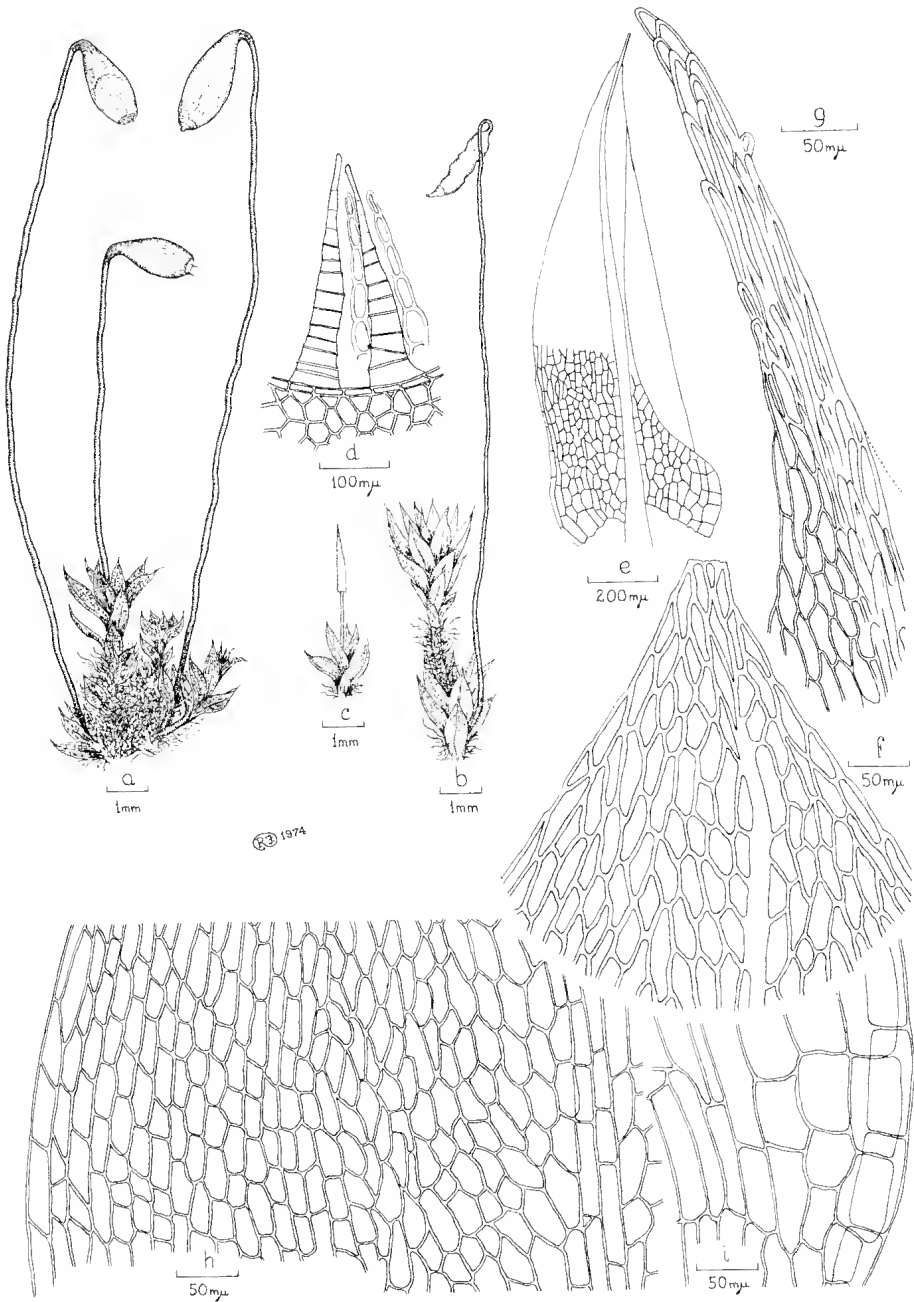


Fig. 3.—*Bryum algens* Card. a—Mature capsules 'in situ', centre capsule has damaged peristome teeth; b—young capsule; c—calyptra 'in situ'; d—(Part of) peristome showing persistent outer and fragile disintegrating inner, teeth; e—leaf; f—arcolation in the upper part of the leaf; g—tip of leaf showing excurrent nerve; h & i—arcolation in the middle and lower parts of the leaf. (all drawings from R. Filson 14996.)

Palmer Peninsula and at McMurdo Strait (or Sound), Victoria Land; otherwise *B. antarcticum* is listed from a wide range of localities—in Melchior Archipelago, Marie Byrd Land, Adelie Land, Queen Mary Land, Emperor Wilhelm II Land and Mac. Robertson Land.

Certainly, there seems little to choose between W. Fitch's original figure of *B. antarcticum* (type), in *Flora Antarctica* 2: t. 153 fig. vi (1847), and J. Cardot's better drawings of *B. algens* (type) the most obvious vegetative differences between these two species seem to be the excurrent nerve and much smaller more numerous cells in upper leaves of *B. algens*—nerves of *B. antarcticum* do not extend into their leaf-apices. In deference to Dr. Greene's modern researches on Antarctic mosses, we now prefer to adopt the name *Bryum algens* for the only species of the genus currently known from Mac.Robertson Land and Kemp Land. It is obvious that all collections from the Antarctic continent (including Palmer Peninsula), hitherto assigned to *B. antarcticum*, need to be critically re-examined—probably most (or perhaps all) will prove referable to the widespread *B. algens*. An excellent photograph (by N. J. Collins) of the large, cushion-forming growth of *B. algens* from Signy Island, South Orkneys, appears in a paper on water relations of mosses by C. H. Gimingham & R. I. L. Smith, *Br. Antarct. Surv. Bull.* 25: 9 (1971).

ACKNOWLEDGMENTS

Special thanks are due to the following:—Dr. George Scott (Monash University) who read the original manuscript very critically and made many valuable suggestions for its improvement; Dr. Stanley Greene (British Antarctic Survey) for identifying this moss; Australian National Antarctic Research Expedition for making possible the visit to Fold Island; Department of Crown Lands and Survey, Melbourne, for secondment to the expedition as official duty; and John Manning (Division of National Mapping) for assistance with locality maps.

STUDIES IN ANTARCTIC LICHENS III:

Notes on *Rinodina olivaceobrunnea* Dodge & Baker,
from the Antarctic and moss-inhabiting species
of *Rinodina* from other parts of the world.

by

REX B. FILSON*

ABSTRACT

In a previous paper (Filson 1966: 42) the author referred all the Antarctic moss-inhabiting *Rinodina* to the one species, *Rinodina archaeoides* H. Magn. In the present paper the author examines several moss-inhabiting *Rinodina* species from the Northern Hemisphere and concludes that the Arctic species *R. archaeoides* is in fact a synonym of the Antarctic species, *R. olivaceobrunnea*.

INTRODUCTION

In the course of investigation into the correct nomenclature for a species of *Rinodina* to be distributed in exsiccata, the author examined several moss-inhabiting species from the Northern Hemisphere. The type specimen of *Rinodina archaeoides* H. Magn. and specimens of *R. archaea* (Ach.) Arn., *R. mniareae* (Ach.) Körb. and *R. turfatae* (Wahlenb.) Körb. were borrowed from the Botanical Museum, Stockholm. These samples were compared with an authentic specimen of *R. olivaceobrunnea* Dodge & Baker, borrowed from Prof. C. W. Dodge.

DISCUSSION

Rinodina archaea (Ach.) Arn. in *Flora* 64: 195 (1881), was found to occur mostly on bark. The thallus is thinly effused over the substrate, pale brown. Hypothallus thin, dendritic, blackish-brown. Apothecia 0.3—0.5 μm diam., brown, disk darker than the margin. Ascospores, $21 \times 13 \mu\text{m}$ have thin walls and septa; the ends are somewhat pointed.

SPECIMENS EXAMINED: Undersaker, Ristafallet, Jämtland, Sweden, G. O. Malme, 17.vii.1910. Siberia, Yeniseysk, Tolstoi, M. Brenner 431e, 27.viii.1876. Siberia, Yeniseysk, Nazimovo, M. Brenner 1021g, 28.viii.1896.

* National Herbarium of Victoria

Muelleria 3 (2): 117–121 (1975).

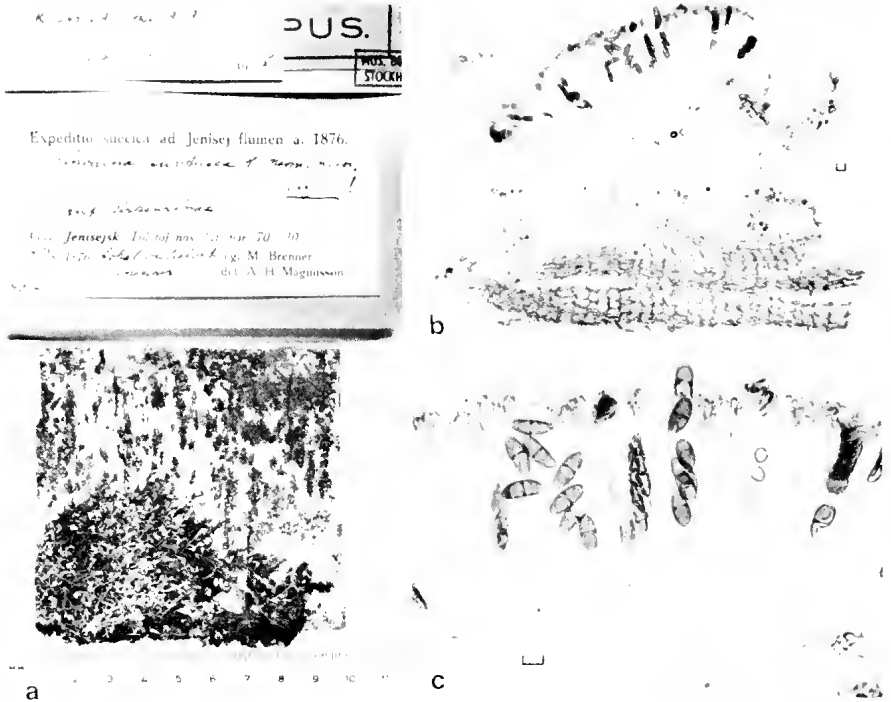


Fig. 1.—a—*Rinodina archaea* (Ach.) Arn. on bark; b—section through apothecium, scale = 10 μ u.; c—hymenium and ascospores, scale = 10 μ u.

***Rinodina mniareae* (Ach.) Korb. Syst. Lich. Germ. 123 (1855).**
 This is a very robust species with a thick dark brown thallus. Apothecia large, up to 1.5 mm diam., strongly convex to hemispheric with a thin margin. Hypothecium pale brown, medulla dark brown to blackish-brown. Ascospores large $36 \times 15 \mu$ m with thick walls and septum. The apical wall thickened to form an inward dimple at each end into the cells. Differs from *R.*

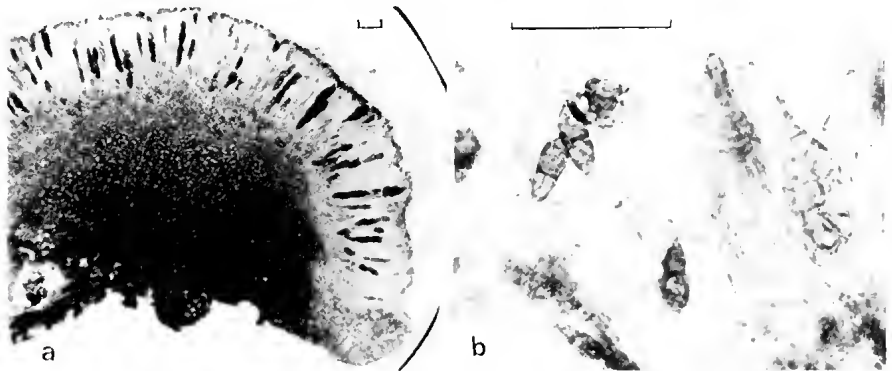


Fig. 2.—*Rinodina mniareae* (Ach.) Korb. a—section through apothecium, scale = 50 μ u.; b—asci and ascospores, scale = 50 μ u.

turfaceae and *R. olivaceobrunnea* in the convex to hemispheric apothecia and the blackish-brown medulla.

SPECIMEN EXAMINED: Björnöya, Nordhamna, Kulbukta, Th. M. Fries, 27.vii.1868.

Rinodina turfaceae (Wahlenb). Körb. *Syst. Lich. Germ.* 123. (1855). This species has large flat to slightly concave apothecia, up to 1.5 (—2.0) mm diam. Hypothecium and medulla pale brown almost hyaline. Ascospores large, $25 - 30 \times 10 - 11 \mu\text{m}$, walls and septum thick, apical wall thickened to form a dimple. This species is very similar to *R. olivaceobrunnea* differing from it in the larger apothecia and the flat to concave disk, narrow crenulate margin and the larger ascospores.

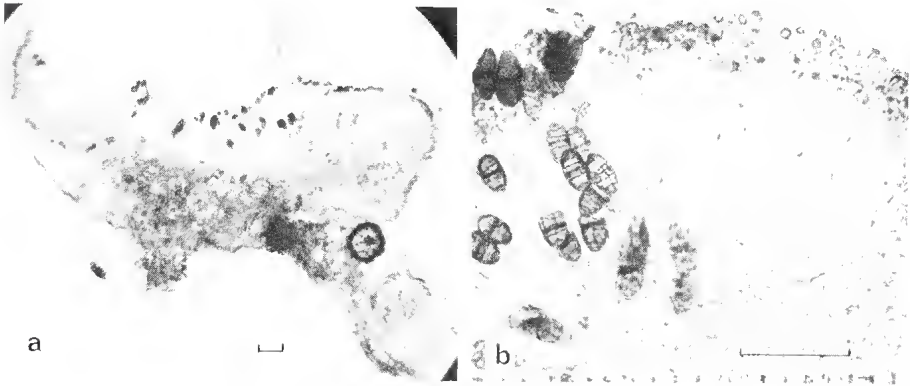


Fig. 3.—*Rinodina turfaceae* (Wahlenb.) Körb. a—section through apothecium, scale = 50 $m\mu$; b—hymenium and ascospores, scale = 50 $m\mu$.

SPECIMENS EXAMINED: Novaya Zemlya, Belusha Bay, Matoschkin, B. Lyngé, 19.viii.1921. Sweden, Torne Lappmark, par Jukkasjärvi, Ortovaare, Erik P. Vrang, Juli 1927. Sweden, Torne Lappmark, par Jukkasjärvi Abiskojokk, A. H. Magnusson, 28.vii.1921. Jämtland, Undersaker, Vallista, G. O. Malme, 15. vi.1914. Sweden, Uppland, T. E. Hasselrot, 12.ii.1947.

Rinodina olivaceobrunnea Dodge & Baker in *Annals Miss. Bot. Gard.* 25: 659 (1938). *Rinodina archaeoides* H. Magn. *Acta Horti Gotoburg.* 17: 278 (1947). The thallus is thinly effused over the leaves and stems of mosses. Apothecia small up to 0.9mm diam., disc slightly concave to convex. Hypothecium and medulla pale brown to hyaline. Ascospores $16 - 21 \times 8 - 9 \mu\text{m}$, walls and septum thick, apical wall thickened to form a dimple. This species can be confused with *R. turfaceae* from which it differs in the smaller slightly convex apothecium, more prominent plane margin and the smaller ascospores. As *Rinodina olivaceobrunnea* Dodge & Baker was published in 1938

and *Rinodina archaeoides* in 1947 the former name must take precedence and the latter be placed in synonymy with it.

SPECIMENS EXAMINED: *R. olivaceobrunnea*, Marie Byrd Land, Mt Rea-Cooper, Siple & Corey R2 (authentic specimen from C. W. Dodge). *R. archaeoides*, Italy, Lombardia, Livigno,



Fig. 4.—a—Type specimen of *Rinodina archaeoides* H. Magn.; b—section through apothecium of (a), scale = 10 $m\mu$; c—hymenium and spores from (b), scale = 10 $m\mu$; d—section through apothecium of *Rinodina archaeoides* from Björnöya, scale = 10 $m\mu$; e—hymenium and ascospores from (d), scale = 10 $m\mu$.

Anzi 460 (Coll. Orig.). Torne Lappmark: Jukkasjärvi, Kopparråsen, A. H. Magnusson, 1.viii.1921. Novaya Zemlya, Belusha Bay, Matoschkin, B. Lyngø, 19.vii.1921. Björnøya, Mt. Misery, Th. M. Fries, 27.vii.1868. Björnøya, Nordhamna, Kulbukta, Th. M. Fries, 27.vii.1868.

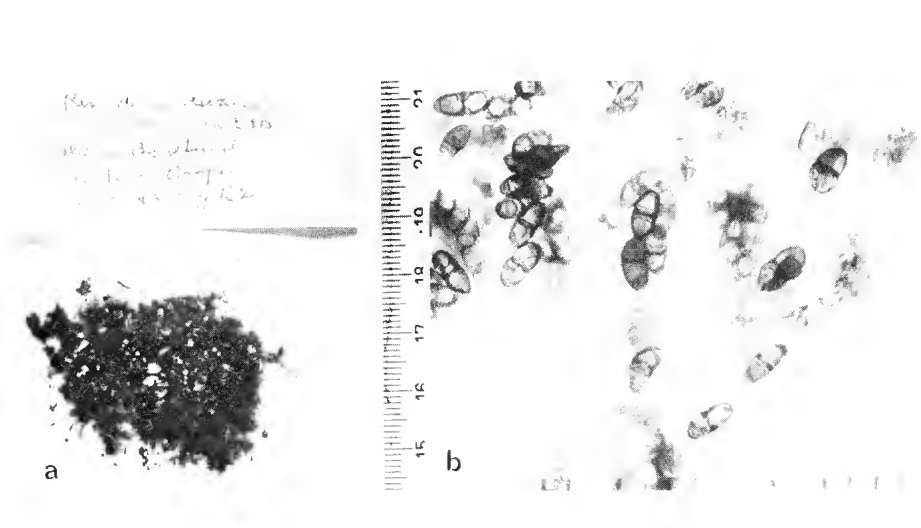


Fig. 5.—a—Authenticated specimen of *Rinodina olivaceobrunnea* Dodge & Baker; b—hymenium and ascospores from (a), scale = 10 μ .

ACKNOWLEDGMENTS

The author wishes to thank the Director, Botanical Museum, Stockholm, for the loan of specimens including the type specimen of *Rinodina archaeoides* H. Magn. and Prof. C. W. Dodge for the loan of an authentic specimen of *Rinodina olivaceobrunnea* Dodge & Baker.

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TRACHYCARPIDIUM IN QUEENSLAND, AUSTRALIA

by

ILMA G. STONE*

INTRODUCTION

A moss collected from Enoggera Creek, The Gap, near Brisbane S. T. Blake 22983 August 1968 (BRI 082325), labelled *Nanomitrium* was found to be a trichostomoid moss which keyed to the genus *Trachycarpidium* in Brotherus (1924). Additional gatherings were made in the same area by the author in August 1969 (Stone 4719 & 4720). The moss grew on a steep earth bank associated with *Ephemerum fimbriatum*, a small *Physcomitrium* species and other small earth mosses.

Trachycarpidium is a small genus of terrestrial mosses with a copious persistent green protonema, strong red-brown rhizoids and a very short stem. The leaves are *Weissia*-like, slightly tortuous when dry, with mostly plane margins. The almost sessile, cleistocarpous, sub-globose, apiculate capsule has no columella and pale yellow exothecial cells, some of which are verrucose; the calyptra is short conic-campanulate.

The Enoggera Creek moss was at first thought to be a new species but a search of the literature revealed its connection with *Astomum brisbanicum* (C. Muell.) Broth. Although it has not been possible to obtain the Type of *A. brisbanicum* (which is missing from Herb. MEL), the very comprehensive type description (Mueller 1871) and the redescription with figures by Roth (1911) apply so well in almost all details to the present moss that it is virtually certain they are conspecific. Both mosses were found in the Brisbane area; *A. brisbanicum* near the Brisbane River by Amalie Dietrich in 1864, and the recent specimens on the bank of a tributary of that river more than 100 years later.

The following change in nomenclature is proposed:

Trachycarpidium brisbanicum (C. Muell.) Stone comb. nov.

Basionym: *Acaulon* (*Pycnocaulon*) *brisbanicum* C. Muell.

Musci Australici praesertim Brisbanici novi. *Linnaea* **37**: 144, 1871.

Synonym: *Astomum brisbanicum* (C. Muell.) Broth. 1901.

Plants very small, pale green, scattered or grouped very closely, surrounded by a persistent copiously branched green protonema and with a robust red-brown rhizoidal system from the base of the stem (Fig. 1a, b). In older plants one or two new fertile shoots may arise from below the vaginula, sometimes, if not always, from a very short thick dark brown rhizoid-

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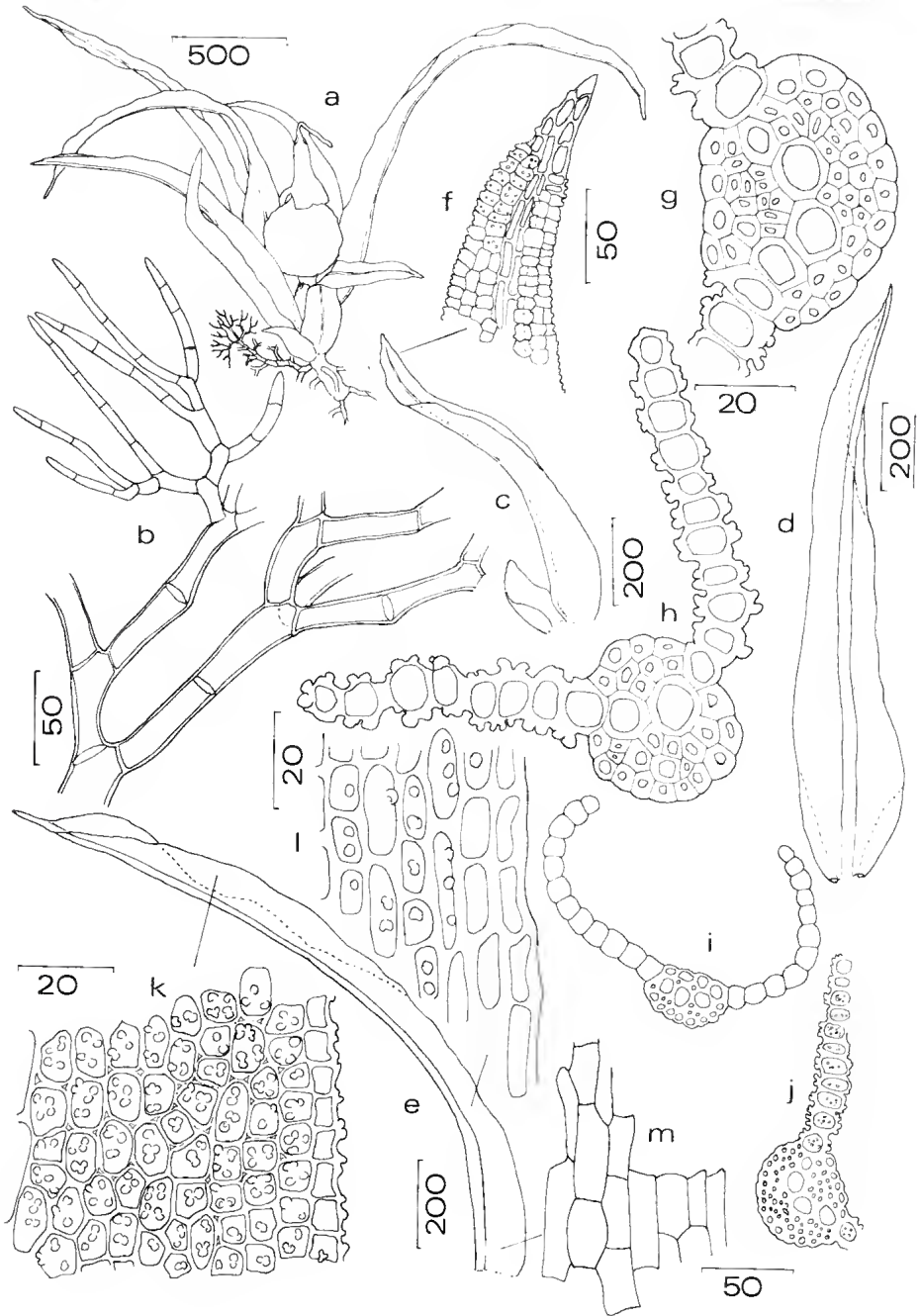


Fig. 1.—*Trachycarpidium brisbanicum*. a.—Plant, showing habit; b.—part of protonema enlarged; c.—outer and intermediate leaf; d.—abaxial surface of leaf below perichaetial leaves, margin inflexed above. Junction between upper papillose cells and lower clear cells indicated; e.—perichaetial leaf; f.—cell detail of upper part of leaf in (c); g.—j.—transverse sections of leaves at various levels; g.—nerve in mid-leaf, 4 deuter cells between stereid bands; h.—above mid-leaf, two deuter cells in nerve, lamina inflexed on one side; i.—concave base, smooth cells; j.—mid-leaf, lamina rather flat; k—m.—cell detail, surface view, from (e); k.—upper leaf; l.—transition zone; m.—leaf base. All dimensions in μm . Drawings made from specimens cleared in lactic acid and mounted on a slide.

like cell rather than directly from the stem as in *Archidium* (Stone 1973).

Stems less than 0.5 mm high with few leaves, mostly less than twelve to a plant, crowded at the apex; the very short ovate outer leaves ca 100–200 μm , the narrowly lanceolate intermediate ones ca 0.8–1.3 mm and the long narrow inner leaves (perichaetial) ca 1.5–2.0 mm long (Fig. 1 c–e). Leaves often erecto-patent at the base, but spreading, squarrose or decurved above; or spreading from the base; mostly sub-flexuose when dry. *Lamina* flat above a concave base, or in mid-leaf inflexed, often more noticeably on one side; *margins* usually entire and plane or slightly undulate, sometimes inrolled a little where the lamina is inflexed. *Nerve* strong, ca 50–60 μm wide in mid-leaf, ca 30 μm above, percurrent in outer leaves to excurrent in a cusp in the inner leaves, often very weak at the insertion, smooth and not covered by lamina cells; in transverse section with adaxial and abaxial steroid bands enclosing 2–4 larger (deuter) cells (Fig. 1 g–j). *Cells* of the basal part of the leaf smooth, thin-walled, clear, ca 9–12 μm wide and $2-4 \times 1$ (a few inner cells near the insertion sometimes 15–20 μm wide); thicker-walled in the transition zone and in the upper part of the leaf narrower ca 7–10 μm , shorter $1-1.5 \times 1$, papillose, often with rounded corners, and very chlorophyllose (Fig. 1 f, k–m, Plate 1 A). The clear cells extend from below further up the margin than adjacent to the nerve (Fig. 1 d), as in *Tortella*, a feature evident also in the other species as noted by Dixon (1942).

Seta extremely short, ca 50 μm ; *vaginula* short and ovate or obovate; *capsule* cleistocarpous, sub-globose, ca 350 μm diameter, with a blunt beak (Fig. 2b); capsule wall pale yellow with an irregularly blistered appearance caused by patches of protuberant exothecial cells, or almost smooth (Fig. 2c–e). The capsule wall is three to four cells thick and no columella was observed within the spore sac, but may well be present in very young capsules. *Calyptra* small, conical above, flaring at the base, slightly crenate on the margin and with a short split; covering little more than the beak of the capsule (Fig. 2a). *Spores* brown, warty papillose (Plate 1B), variable in size within individual capsules and also between specimens, 16–25 μm .

The tiny male plant arises near the base of the female gametophore, probably from the same rhizoidal system; up to 1.0 mm high with copious green protonema and strong rhizoids like the female plant, but fewer shorter leaves and about four short ellipsoidal antheridia; paraphyses very rare, a short filament of narrow cells. Female plants usually with ca 4 archagonia, the aborted ones persisting at the base of the vaginula; no paraphyses seen.

This description is based on specimens I. G. Stone 4719 and 4720 in herbaria MEL, MELU, and of the author.

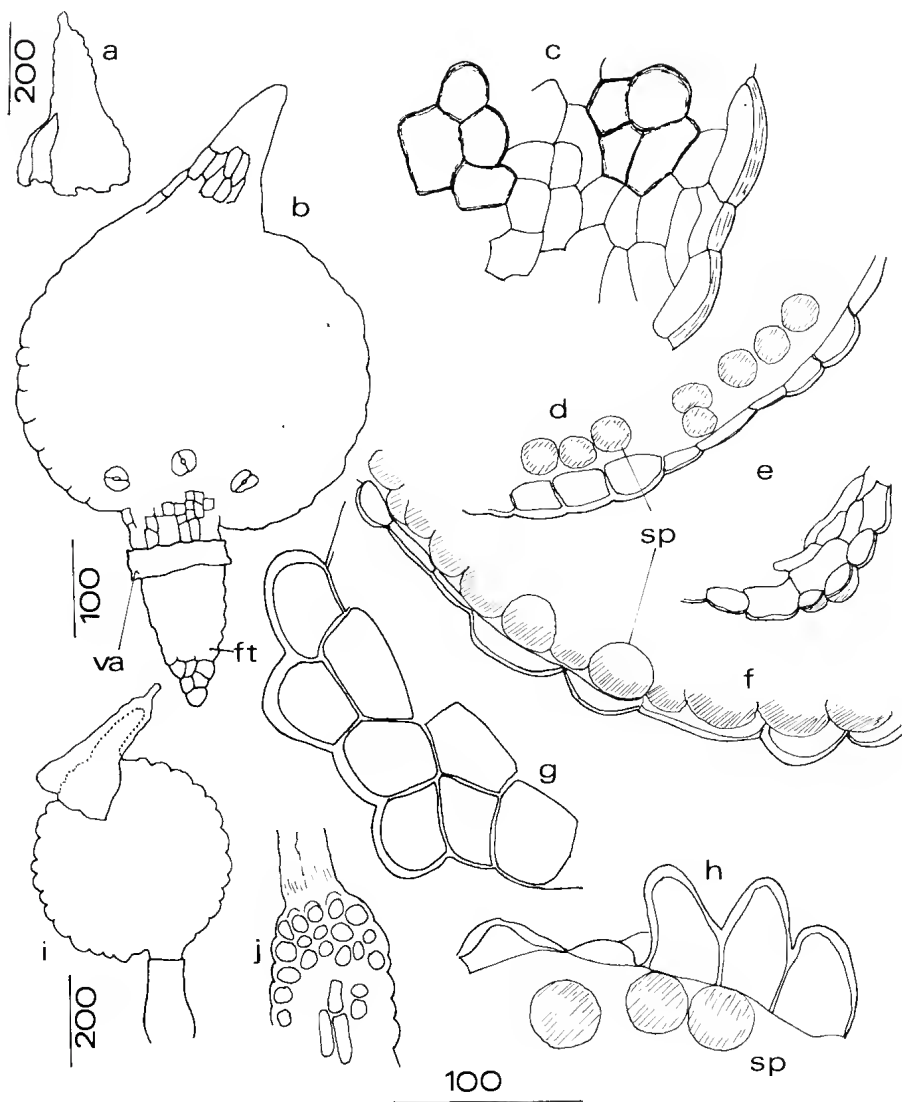


Fig. 2.—a.—e.—*Trachycarpidium brisbanicum*; f, g.—*T. verrucosum*; h.—*T. echinatum*; i, j.—*T. tisserantii*; a.—calyptra; b.—immature capsule showing irregular surface, stomata at the base, short foot; c.—exothecial cells showing different degrees of verrucosity; c.—surface view with patches of verrucose cells; d.—profile; e.—transverse section of capsule wall; f—h.—profile; i.—capsule and calyptra; j.—tip of calyptra in (i) enlarged. *va*, top of vaginula, *ft*, foot, *sp*, spore.
All dimensions in μm . Drawings made from specimens cleared in lactic acid and mounted on a slide.

COMPARISON OF SPECIES

Trachycarpidium is an interesting genus which, until recently was believed to consist of four species. *Trachycarpidium verrucosum* (Besch.) Broth., on which the genus was based was collected in New Caledonia, *T. tisserantii* Dix. et P. Vard. from Africa, *T. echinatum* Dix. from New Guinea, and *T. novae-valesiae* Broth. ex Roth. from New South Wales, Australia. *T. novae-valesiae* was recently shown to belong to the monotypic genus *Bryobartramia* (Stone and Scott 1973). The present species, *T. brisbanicum*, restores the generic name to the Australian moss flora and once more raises the number of species in the genus to four.

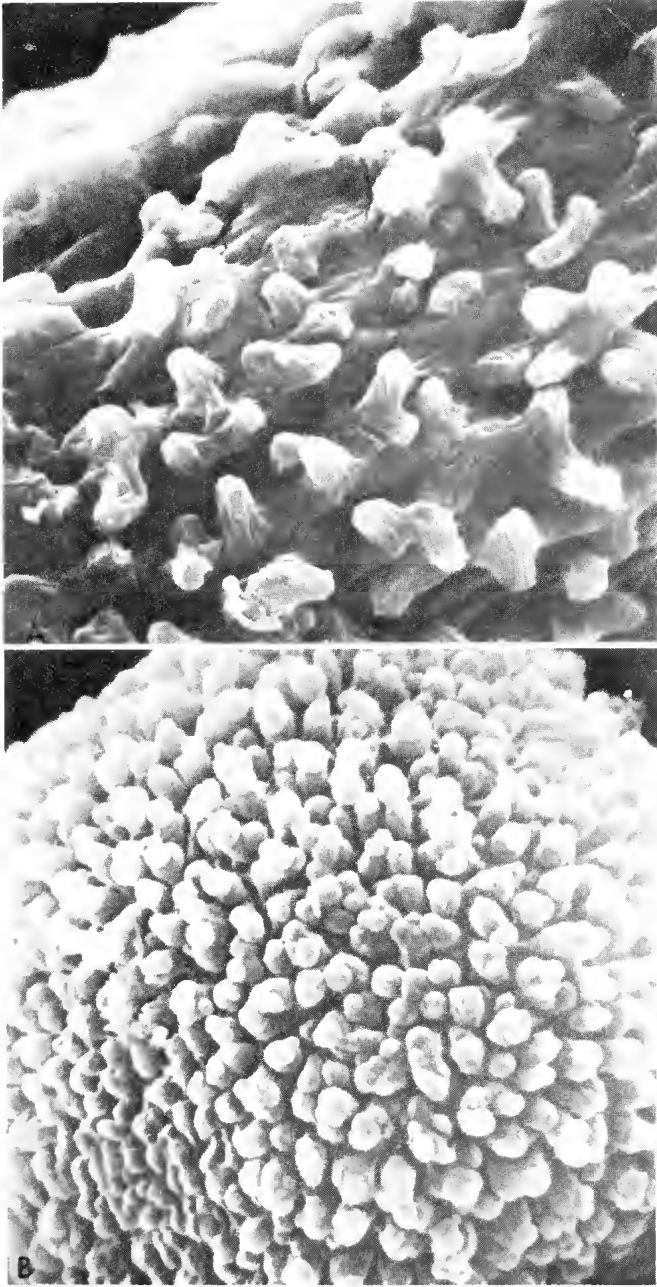
In part of the type of *Trachycarpidium verrucosum* (Besch.) Broth. New Caledonia, *Balansa* No. 2550, 1869, borrowed from the Museum National d'Histoire Naturelle (Paris), the plants with capsules were found to be *Phasconica balansae* C. Muell.

The types of *Trachycarpidium verrucosum*, New Caledonia, *Balansa* 2550; *T. tisserantii* West Africa and Uganda, R. P. V. 2841 and Dix. 4080; and *T. echinatum*, Papua and New Guinea, were examined in the British Museum.

The three samples of *T. verrucosum* in the British Museum again proved to be mixtures and the second species in each case was *Phasconica balansae* (a note to this effect was added in the type folder). Both mosses are very small and superficially similar but sufficiently distinct with dissection and microscopic examination. There is no doubt that Dixon was confused by the mixture of the *Phasconica* with *T. verrucosum* in his comparison with *T. tisserantii* for in his 1920 notes he wrote of the "deoperculate capsules" of *T. verrucosum*.

Dixon (1942) noted that "all the species are very much alike and possibly races of a single species, but they differ in some slight respects". While *T. novae-valesiae* (now *Bryobartramia*) shows some major differences, *T. brisbanicum* could be included in this statement. *Trachycarpidium brisbanicum* is very similar to the other three species in both gametophytic and sporophytic features, the main difference being in the less conspicuous verrucosity of the exothelial cells. There is a difference in the verrucosity of the capsule wall in each of the species (Fig. 2c—i). *Trachycarpidium brisbanicum* has some irregularly developed pustular exothelial cells and though much less conspicuous than in the other three species they are sufficiently developed to indicate the relationship. In *T. verrucosum* and *T. echinatum* the pustular cells are also irregularly developed but to a lesser extent. In *T. verrucosum* the exothelial cells are not all protuberant and there is variation in the height of the bulge. In *T.*

PLATE 9



Trachycarpidium brisbanicum. A.—Upper leaf cells. Scanning electron micrograph of surface papillae (shrinkage of specimen has occurred). Papillae mostly branched, sometimes simple, \times ca 2880. B.—Spore. Scanning electron micrograph of surface papillae. \times , ca 6600.

tisserantii the cells are domed and very regular, practically every exothecial cell being involved, whereas in *T. echinatum* patches of cells are highly verrucose and almost pointed.

The calyptra is similar in those species where it has been seen. Potier de la Varde (1927) remarked on the early loss of the calyptra and on his inability to find one in *T. tisserantii*. However in the specimens at the British Museum calyptras were seen and were essentially similar to those of *T. brisbanicum*, usually slightly rough with protruding cells (Fig. 2 i, j). Neither Bescherelle (1873) nor Brotherus (1924) mention the calyptra of *T. verrucosum* but C. Mueller (1901) described it as "bell-shaped, very similar to some *Sporledera* spp., covered with coarse warts". Dixon (1942) did not mention the calyptra of *T. echinatum*.

In *T. brisbanicum* the perichaetial leaves are longer in proportion to their width compared with the other species, and the spores are smaller, 16–25 μm compared with 25–40 μm . Both Bescherelle and Brotherus described the leaf margin of *T. verrucosum* as recurved in mid-leaf; however, the type specimens which I examined showed the margin, where it was not plane, to be slightly inrolled, as in *T. brisbanicum*.

In the original description of *Acaulon brisbanicum* by Mueller (1871) no mention was made of the unusual exothecial cells but this is understandable as they are not always well-developed and are scarcely noticeable in some capsules; in all other features the description fits the Enoggera Ck. specimens. However Mueller (1901) recognised the relationship between *verrucosum* and *brisbanicum* when he grouped them both as species of the genus *Acaulon* section *Pycnocaulon*, together with *Acaulon lorentzii* C. Muell. from South America.

Roth (1911) noted the close resemblance between *Astomum brisbanicum* (C. Muell.) Broth. and *A. lonchophyllum* Roth and grouped these two, together with *Astomum lorentzii* (C. Muell.) Broth. in the subgenus *Pycnocaulon* of the genus *Astomum*. It is probable that the two latter species also belong to *Trachycarpidium*.

The genus *Trachycarpidium* is closely related to *Astomum* having many similar features, particularly in the leaves, and may eventually come to be included in *Weissia*, sub-genus *Astomum* as have both *Astomum* and *Phasconica* by Crundwell and Nyholm (1972). However, until further knowledge of the variability of this curious genus has been obtained and experimental work done it seems best to group these four clearly related species together in *Trachycarpidium*.

ACKNOWLEDGEMENTS

I wish to thank Mr. R. Ward, University of Melbourne for the Scanning electron micrographs, Dr. H. J. Swart, University of Melbourne and Dr. G. A. M. Scott, Monash University for help with translations.

I am grateful to the Directors of the following institutions for providing me with access to specimens from their collections: the British Museum (Natural History), the Botanic Museum and Herbarium, Brisbane, the National Herbarium, Melbourne, the Botanical Museum, Helsinki, and the Musee National d'Histoire Naturelle, Paris.

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**STUDIES IN ANTARCTIC LICHENS IV: Notes on
Umbilicaria aprina Nyl.**

by

REX B. FILSON*

SUMMARY

The occurrence of *Umbilicaria aprina* Nyl. in Antarctica is confirmed. On the basis of thallus morphology *Umbilicaria spongiosa* Dodge & Baker and *Umbilicaria antarctica* var. *subvirginis* Frey & Lamb are proposed as synonyms of *Umbilicaria aprina*.

INTRODUCTION

Previously the author referred all of the rhizinate *Umbilicaria* specimens from Mac. Robertson Land, Antarctica to *Omphalodiscus antarcticus* (Frey & Lamb) Llano. (Filson 1966:59). Kashiwadani (1970) and Lindsay and Brook (1971) have similarly referred rhizinate *Umbilicaria* specimens from other regions in Antarctica to *O. antarcticus*.

Lindsay (1972) suggested that two species were involved; *Umbilicaria antarctica* from the Antarctic Islands and Peninsula region, and *U. aprina*, a Northern Hemisphere species on the Antarctic Continent. This present study supports this suggestion confirming the presence of *U. aprina* in mainland Antarctica.

DISCUSSION

Llano in his treatment of *Umbilicaria* (*Omphalodiscus*) *antarctica* (1950: 76-78) clearly had not seen the type specimen of this species, stating that he had not seen fertile specimens. The description he gave for *U. antarctica* Frey & Lamb, was very similar to that of *U. spongiosa* Dodge & Baker and it seems certain that he was confused as to the identity of *U. antarctica*. This confusion led to Filson (1966:60) placing all of the rhizinate *Umbilicaria* material from Mac. Robertson Land under *O. antarcticus*.

The author has recently examined the type specimen of *U. antarctica* (figs. 3 & 4) and considers it to be significantly different from other rhizinate *Umbilicaria* specimens found on mainland Antarctica. The specimen is large, 16 cm wide on its widest axis, upper surface light buff, browning towards the margins, smooth, not at all rugulose hardly even wrinkled, margins deeply lacerate. Lower surface is sooty black with a dense coverage of rhizines around the margins extending inwards for 4-5 cm, zone around the umbilicus bare. Rhizines variable, thin or thick, terete or flattened, simple or branched, black at the base, pale towards the tips.

* National Herbarium of Victoria

This specimen is the largest, smooth surfaced sample that the author has seen. Although there are no habitat details available it is possible that the specimen may have been collected from a very sheltered environment. Many small pale coloured and smooth surfaced rhizinate *Umbilicaria* specimens from Mac. Robertson Land are similar in thallus morphology.

Umbilicaria antarctica var. *subvirginis* Frey & Lamb (fig. 6a) is very similar to most rhizinate *Umbilicariaceae* found on mainland Antarctica. Dodge (1948: 148) confirmed this by placing the variety *subvirginis* Frey & Lamb as a variety of *U. spongiosa* Dodge & Baker. Llano (1950: 93) suggested that despite some morphological and anatomical differences the var. *subvirginis* was not distinct and should merely be treated as a synonym of *Umbilicaria* (*Omphalodiscus*) *spongiosa*. Dodge (1973: 124) apparently still considers it to warrant separation and made the new combination *O. spongiosa* var. *subvirginis* (Frey & Lamb). This author has examined both the type of *Umbilicaria antarctica* var. *subvirginis* from Cape Sastrugi, Evans Cove, Victoria Land, (74° 59'S., 163° 47'E.) and a portion of the type of *Umbilicaria spongiosa* from Lichen Peak, Marie Byrd Land, (76° 55'S., 145° 20'W.) and considers them to be the same taxon.

Lindsay (1972: 14) suggested that *U. spongiosa* was very similar to *Umbilicaria aprina* Nyl. The type specimen of *U. aprina*, from Dedschen Mountains, Abyssinia (Nylander 31742) and several recent collections from Iceland have been examined. A comparison of these specimens with the type specimens of *U. antarctica* var. *subvirginis* and *U. spongiosa* and all the recent collections of rhizinate *Umbilicaria* from Antarctica and housed in the National Herbarium, Melbourne, suggested that they were conspecific.

The holotype of *U. aprina* consists of two large and two smaller fragments, (see fig. 1a) the two larger fragments being dissimilar. On one fragment (fig. 1a(i)) the upper surface (fig. 7a) is smooth and rugulose, warm brown to buff, the lower surface (fig. 7d) is black, not very rhizinate, rhizines thick terete or flattened, simple or branched, mostly black with pale tips. This fragment corresponds closely to *U. spongiosa*. On the second fragment (fig. 1a(ii)) the upper surface is warm brown to buff and smoother and less rugulose. The lower surface of this fragment (fig. 7b) is black, densely rhizinate, rhizines simple or branched, terete, black at the base but mostly pale. This fragment corresponds closely to specimens of *U. aprina* collected in Iceland (fig. 2).

One sample of *U. aprina* collected at Herðubreðarlínder, Central Highlands, Iceland, contained six lichen thalli of which four are illustrated (fig. 2). These specimens vary considerably in their surface texture and rugosity; some being rugulose around the umbo and quite smooth towards the margins (fig.

7c), while others are rugulose to the margins (fig. 7e). The colour of the upper surface varies from light grey to pale brownish grey. The lower surface (fig. 7f) is mostly sooty black and the degree to which it is covered with rhizinae varies from complete coverage to having a wide bare zone for some distance out from the umbilicus.

In Antarctica under some conditions *U. spongiosa* forms tightly compressed thalli with ascending margins (fig. 6c). These thalli have in the past been mistakenly referred to var. *subvirginis*. This same tightly compressed form also occurs in Iceland (fig. 6b). There seems no reason to apply sub specific rank to such forms caused by environmental conditions.

From the fragment of the type specimen of *U. spongiosa* (fig. 5a) it appears that this is a very old and weathered sample. The upper surface (fig. 8a) is very rugulose, warm brown to buff, with a thick amorphous layer. The lower surface (fig. 8b) is densely rhizinate, rhizines simple or branched, terete or flattened, black at the base but mostly pale. This sample compares favourably with other old weathered specimens collected in Mac.Robertson Land by the author (Filson 4455 fig. 5d).

The present study has indicated that *U. aprina*, *U. spongiosa* and *U. antarctica* var. *subvirginis* are conspecific. It is evident that *U. antarctica* will have to be examined more carefully in the field in order to clarify its taxonomic relationship since the type from Signey Island, South Orkneys (60° 43'S., 45° 38'W.) appears quite different to any other specimens seen by the present author. Lindsay (1974, *pers. comm.*) stated that:

“The type of *Umbilicaria antarctica* in BM is a large, well-developed specimen and in some ways, e.g. colour of the dorsal surface, colour and development of rhizinae on ventral surface, is not typical of much of the material of *U. antarctica* I saw in the South Orkneys.”

It appears from this that the type of *U. antarctica* may be atypical and its differences may be attributed to environmental conditions.

ACKNOWLEDGMENTS

The author is indebted to Dr. D. C. Lindsay who first determined the Antarctic *Umbilicaria* as *U. aprina* Nyl. and who also gave helpful comments during the course of this study. He wishes to thank The Director, British Museum (Natural History), The Director, Botanical Museum, University of Helsinki and Prof. C. W. Dodge for the loan of type specimens. He offers special thanks to Dr. Hörður Kristinsson for collecting weathered specimens of *U. aprina* in Iceland and for the loan of specimens from the herbarium of the Akureyri Museum of Natural History.



Fig. 1. -- a -- Type specimen *Umbilicaria aprina* Nyl. from Dedschen Mountains, Abyssinia; b -- section through upper cortex, scale = 10 μ ; c -- section through lower cortex, scale = 10 μ .

NATTURUGRIPASAFNIÐ A AKUREYRI

Museum rerum naturalium Akureyrense

HERBARIUM

Umbilicaria aprina

Loc. Central Highlands: Herðubreiðar-

Hab. lindir, on rock.

Alt. 400 m

Dat. 22 August 1974

No. 1775

Leg. Hörður Kristinsson

Det. Hörður Kristinsson

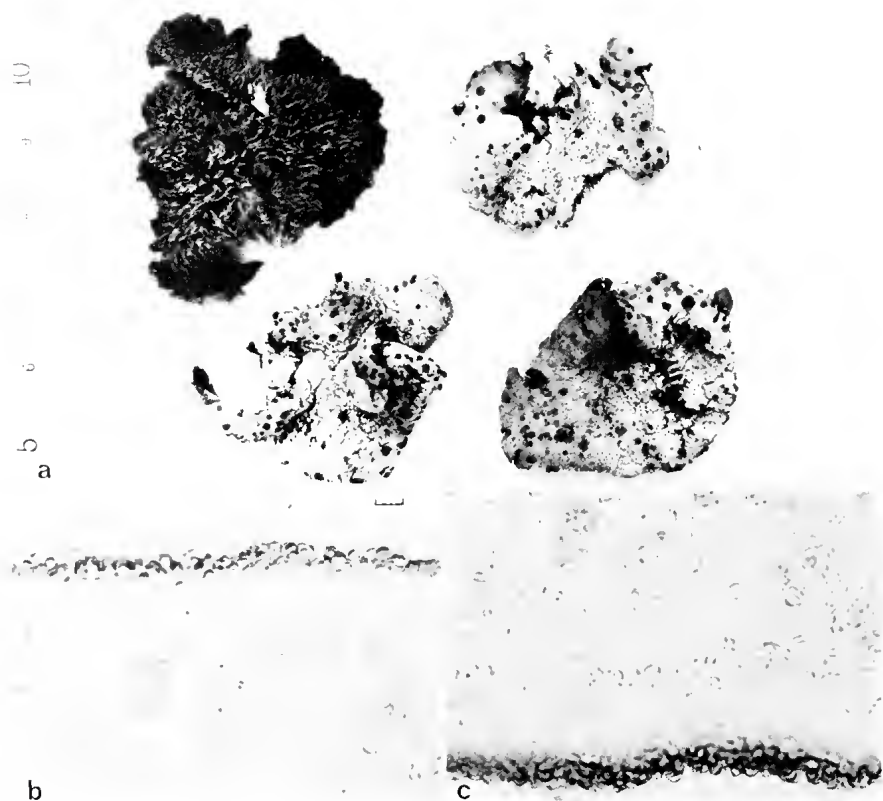
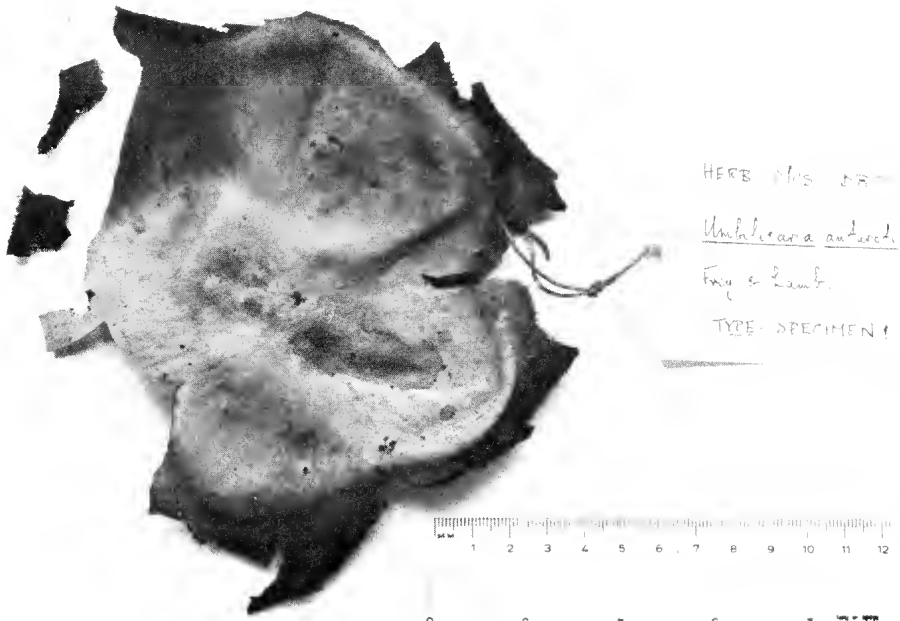


Fig. 2. — a — Weathered specimen of *Umbilicaria aprina* Nyl. from Central Highlands, Iceland; b — section through upper cortex, scale = 10 μ ; c — section through lower cortex, scale = 10 μ .



Umbilicaria antarctica Frey & M. Lamb
in Trans. Brit. Mycol. Soc., XXII, 270 (1939).

Type specimen from

Antarctica: South Orkneys, Signy Island,
leg. A. G. Bennett, 1915.

Fig. 3. — Upper surface of Type specimen *Umbilicaria antarctica* Frey & Lamb from Signy Island, Antarctica.

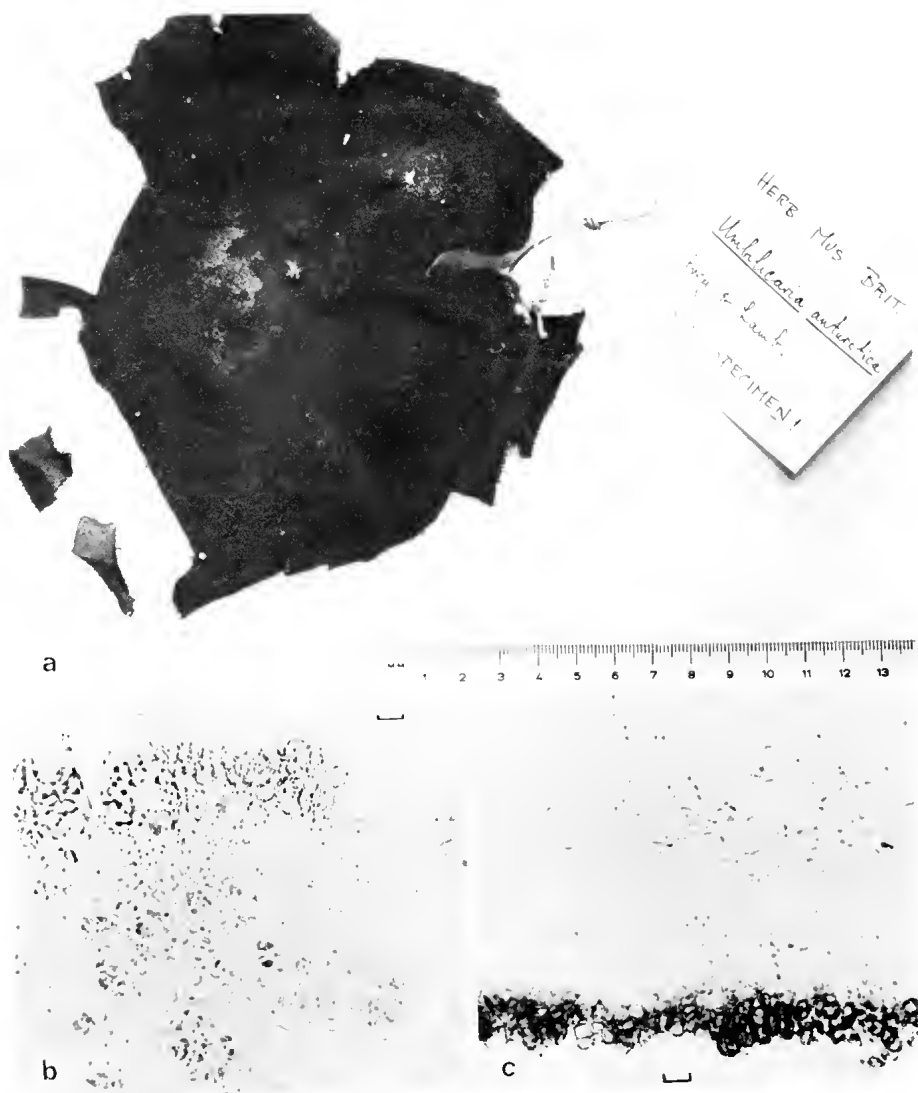


Fig. 4. — a — Lower surface of Type specimen *Umbilicaria antarctica* Frey & Lamb from Signy Island, Antarctica; b — section through upper cortex, scale = 10 μ ; c — section through lower cortex, scale = 10 μ .

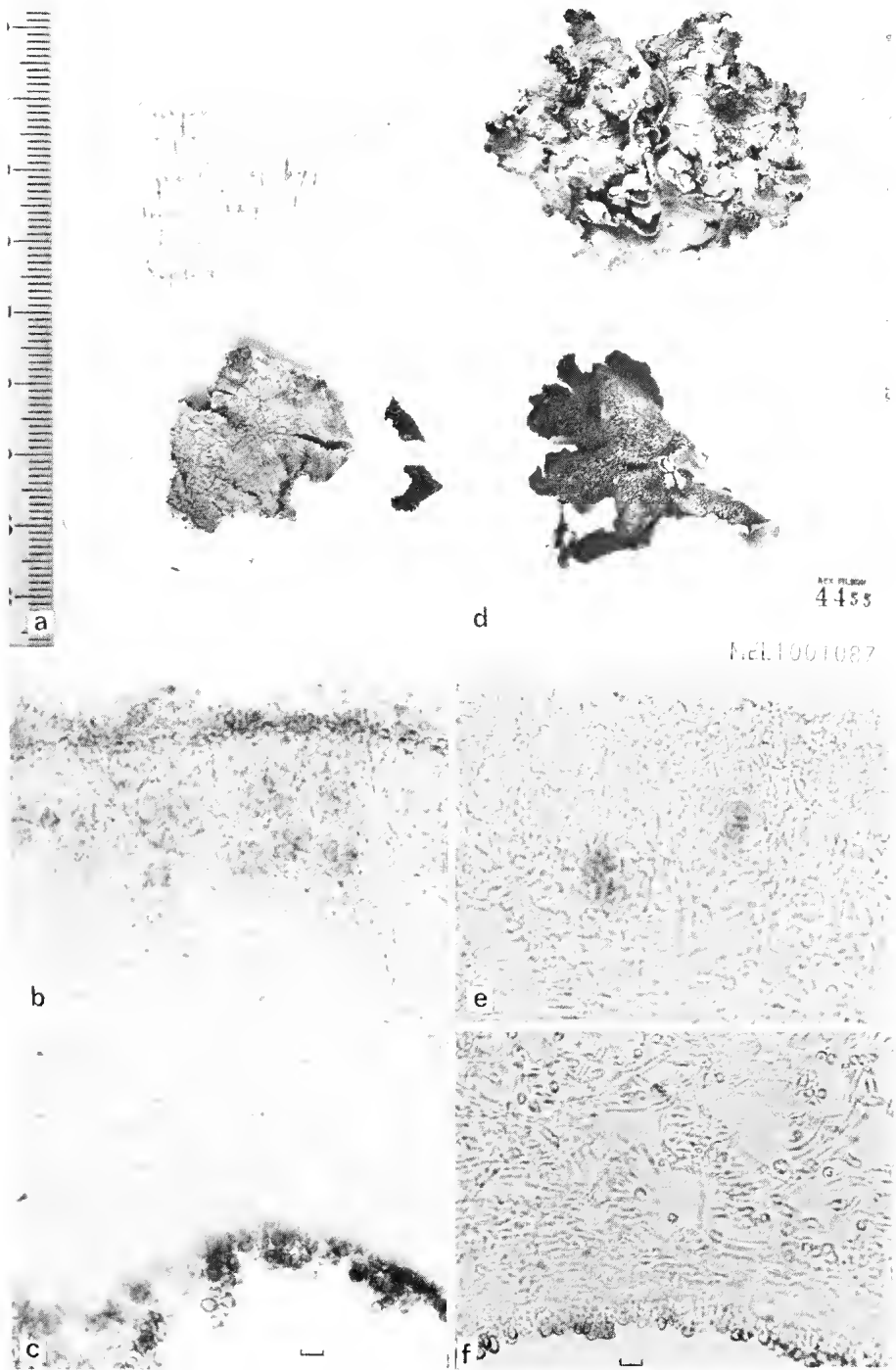


Fig. 5. — a — Portion of Type specimen *Umbilicaria spongiosa* Dodge & Baker from Lichen Peak, Marie Byrd Land, Antarctica; b — section through upper cortex; c — section through lower cortex, scale = 10 $m\mu$; d — specimen of *U. aprina* Nyl. from Field Rock, Mac. Robertson Land, Antarctica; e — section through upper cortex; f — section through lower cortex, scale = 10 $m\mu$.

TYPE SPECIMEN
Umbilicaria antarctica var.
subvirginis Frey & Lamb

British Antarctic Expedition.
 "Terra Nova" 1910.

Umbilicaria velleata Ach

4/2

a



Lichens of Iceland
Umbilicaria aprina Nyl.

Hi. .: Jökuldalur við Jökulsárlóni, 1000 m. Á basalti á gær, sem sýnir út úr fjallshíðinni norðan megin í dalnum.
 7. Júní 1967.

l. . . et det.:
 Hódur Kristinnsson

Number 23056

DUKE UNIVERSITY HERBARIUM

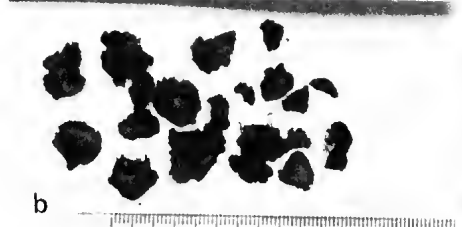


Fig. 6. — a — Type specimen *Umbilicaria antarctica* var. *subvirginis* Frey & Lamb from Cape Sastrugi, Evans Cove, Antarctica; b — small thalli of *Umbilicaria aprina* Nyl. with upturned margins from Iceland; c — small thalli of *U. aprina* Nyl. with upturned margins from Mount Burnett, Mac. Robertson Land, Antarctica.

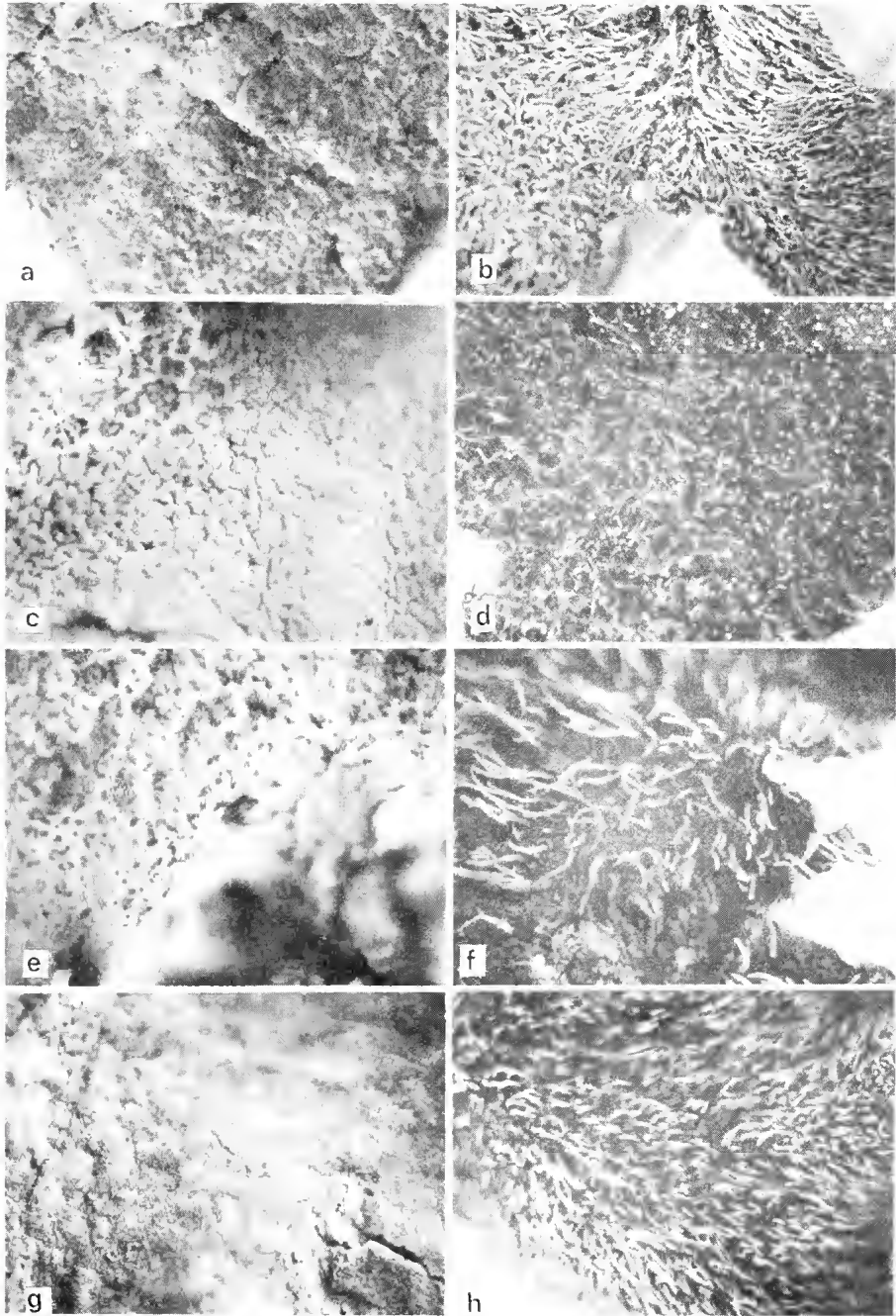


Fig. 7. — a — Upper surface of fragment (i) Type specimen (fig. 1a) *Umbilicaria aprina* Nyl.; b — lower surface of fragment (ii) Type specimen *U. aprina* Nyl.; c — upper surface *U. aprina* Nyl. (fig. 2a) illustrating specimen with rugulose surface around the umbo, becoming smooth towards the margin; d — lower surface of fragment (i) Type specimen (fig. 1a) *U. aprina* Nyl.; e — upper surface *U. aprina* Nyl. (fig. 2) illustrating specimen with rugulose surface to the margin; f — lower surface *U. aprina* Nyl. (fig. 2); g — upper surface *U. aprina* Nyl. (fig. 5d); h — lower surface *U. aprina* Nyl. (fig. 5d).

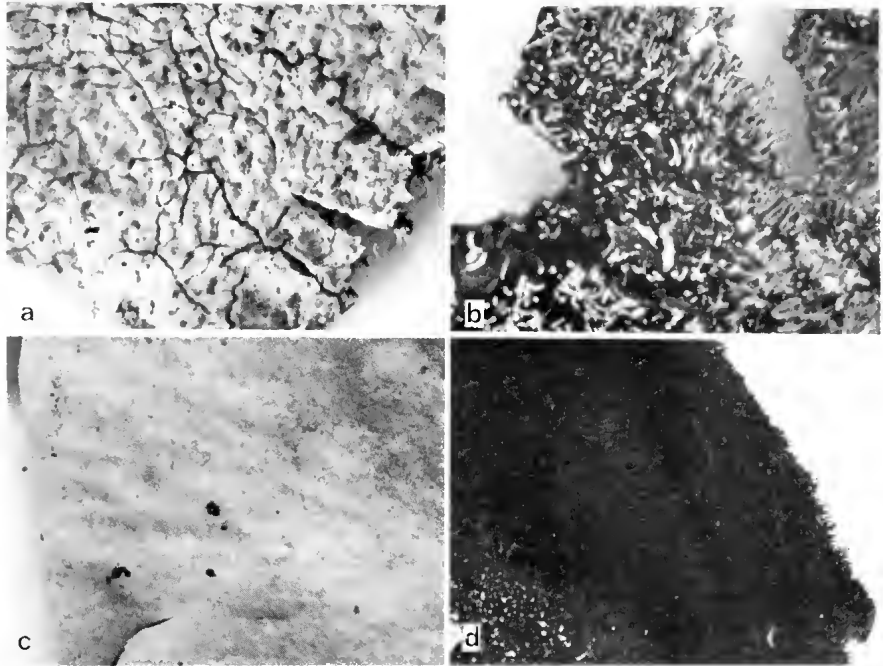


Fig. 8. — a — Upper surface Type specimen *Umbilicaria spongiosa* Dodge & Baker (fig. 5a); b — lower surface Type specimen *U. spongiosa* Dodge & Baker (fig. 5a); c — upper surface Type specimen *Umbilicaria antarctica* Frey & Lamb (fig. 3); d — lower surface *U. antarctica* Frey & Lamb (fig. 4a).

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A NEW GREVILLEA SPECIES FROM WESTERN VICTORIA

by

W. M. MOLYNEUX*

Grevillea microstegia. W. M. Molyneux spec. nov.

Frutex usque ad 60 cm altus, sed 200–400 cm latus, densus interdum vagans; caulis principalis breviter ascendens, mox paene prostratus; rami prope prostrati, saepe implicati vel eorum extremitates oblique arcuatae; folia bipinnatipartita, in lobos numerosos angustos spinosos divisa, in superficiebus mature glabra sed subter pilos paucos breves dispersos gerentia: racemi secundi, varie deflexi vel penduli, pendunculis tenuibus pubescentibus praediti; perianthium parvum (ca. 10 mm longum); bracteae florales minutae (ca. 0·25 mm longae), aut praemature deciduae aut interdum persistentes; stipes ex toro obliquo paene centraliter emergens; fructus oblique ellipsoideus, stylo persistenti.

HOLOTYPE: Victoria, Mount Cassel, central eastern ranges of the Grampians Mountains, 14·5 kilometres west-north-west of Moyston, W. M. Molyneux, M. Tonkin and R. Tonkin, 27.ix.1970 (MEL 501440).

ISOTYPES: at MEL, NSW, CANB, K.

ALSO EXAMINED: Mount Cassel, lower and higher ridges and slopes, W. M. Molyneux and R. V. Smith, 17.xi.1970; Mount Cassel, W. M. Molyneux, ii.1972, 12.xii.1972, 2.xii.1973.

A dense or sometimes straggling *shrub* to 0·6 m high, 2–4 m wide; *main stem* shortly ascending, soon becoming almost prostrate; *branches* intertwined, building up densely upon each other, ends often curving sideways in an arc, or ascending, glabrous or scarcely hairy (except when young). *Leaves* bipinnatipartite, petiolate, narrowly cuneate up to the \pm deltoid laminae, 30–40 m long, 20–40 m wide, divided into 5–11 prickly lobes each 1–2 mm wide and 4–5 mm apart, either entire or again divided into mostly 2–3 short secondary lobes, rarely lobed again; margins revolute; upper surfaces glabrous, dark green, mid vein inconspicuous; under surfaces light green, glabrous, or with few scattered hairs; primary veins prominent, secondary veins obscure; new leaves pink, pubescent on both surfaces. †*Inflorescences* arising from lateral branchlets, subterminal, or occasionally terminal, on pubescent *peduncles*, 13–20 mm long; rachis 20–30 mm long, densely pubescent; *racemes* ca. 30-flowered, secund, variously deflexed or pendulous, 20–30 mm long, ca. 19 mm wide at anthesis; *Floral bracts* inconspicuous, 0·25 mm long, 0·5–1 mm wide, variously concave, broadly

* Belfast Road, Montrose.

† All observations were made from fresh material.

deltoid to \pm rhomboidal when flattened, with spreading hairs on the back; deciduous before anthesis, or occasionally persistent; *pedicels* ca. 1.0 mm long *torus* oblique. *Perianth* red ca. 10 mm long, narrow, clothed in spreading or appressed silky hairs outside; glabrous inside, varying in colour from brown to yellow; *gland* three-quarters annular, 0.25–0.50 mm wide; *ovary* covered in long, silky, spreading hairs; *stipe* ca. 1.5 mm long inserted \pm centrally on torus; *style* red, 7–12 mm long, narrow, glabrous to the base where densely silky; *pollen presenter* very oblique, ca. 1.0 mm broad, terminating in a centrally located stigma. *Fruits* obliquely ellipsoidal, ca. 10 mm long, ca. 7 mm wide and deep, densely hairy, greenish-grey when fresh, drying grey, with irregular longitudinal purple markings; *style* persistent, withered, on old seed capsules.

FLOWERING: September to December.

DISTRIBUTION: Confined to the ridge tops and higher slopes of the southerly ridges of Mount Cassel, at elevations between ca. 600 and 650 m, where occurrences are sporadic over ca. 3.0 kilometres. Plants were seldom observed more than 30 m below the ridges on eastern or western slopes. Associated with stringy-bark forests with dense understorey, which includes species of *Epacris*, *Acacia*, *Astroloma*, *Phebalium*, on lower ridges and on margins of moist sandstone shelves in association with *Micromyrtus ciliata* and *Leptospermum nitidum* at higher elevations.

DISCUSSION

Judging from seedling growth in its native habit, this species reproduces sexually rather than vegetatively. It would then bear further investigation to determine why it has such a limited distribution. One reason for this limitation may be the susceptibility of established plants to drought conditions. During the dry summer of 1972-73, a large number of plants of advanced age died, and this was followed the next season with substantial seedling regeneration.

Under cultivation, the growth habit of *G. microstegia* is still very dense, but forms a more upright shrub, although still retaining the characteristic of the branches to sweep sideways, up to 90°, sometimes quite sharply or in a gradual arc.

G. microstegia has its closest affinity to a known taxa in *G. dryophylla* N. A. Wakefield, which differs in having leaves with broader, more rounded segments, which are pubescent on the upper surface, under surface variously clothed in ferruginous or grey hairs, peduncles shorter and stouter, racemes bearing up to 50 flowers, a more oblique torus, shorter hairs on the ovary which is born on a stipe sited more consistently towards the top of the torus, length and thickness of style are similar, but



HOLO-
TYPE

MEL501440

ROYAL BOTANIC GARDENS
AND
NATIONAL HERBARIUM, MELBOURNE
VICTORIA AUSTRALIA

GREVILLEA MICROSTEGIA R.F. Molyneux

Loc. VICTORIA: Mt. Carrrel, central
eastern ranges of the Trawlings
Mountains, 17.5 kilometres
west-north-west of Moyston.

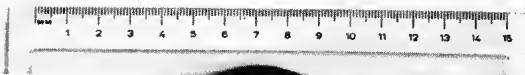
Note. Confined to the ridge tops
and higher slopes at elevations
between 600 & 650 m.

Flowering: September to December

Coll. W.M. Molyneux, M. Tonkin and
R. Tonkin, 27.ix.1970

Det. W.M. Molyneux.

ROYAL BOTANIC GARDENS
AND NATIONAL HERBARIUM
MELBOURNE, AUSTRALIA



Holotype specimen of *Grevillea microstegia*.

the stigma is raised and more prominent, floral bracts small but narrower and more acute.

The nearest affinity to the new species would appear to be an as yet unnamed *Grevillea* occurring in dry sclerophyll forests on Mount Ben Major and surrounding areas, ± 22 kilometres north of Beaufort in western Victoria; although there are features which link the two, table 1 illustrates the major features which were consistently different in specimens of both populations examined.

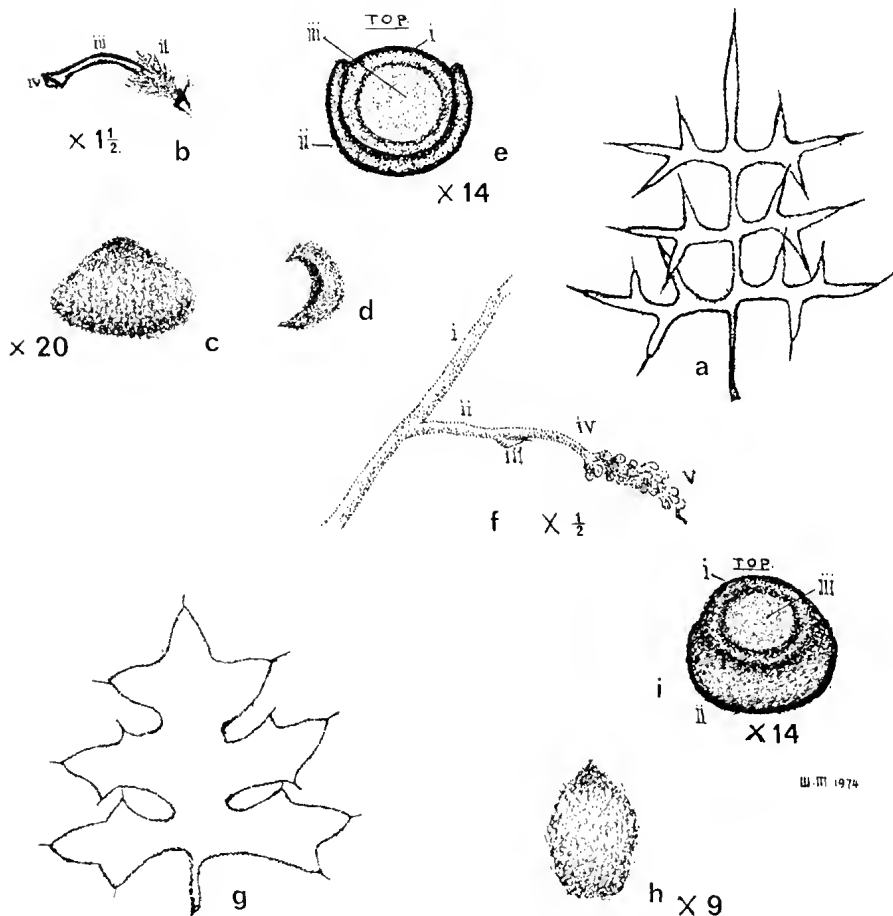


Fig. 1—Comparison of *Grevillea microstegia* and the undescribed *Grevillea* species from Ben Major region. a-f. *G. microstegia*: a. leaf; b. pistil, i. torus, ii. densely hairy stipitate ovary, iii. style, iv. pollen presenter; c. dorsal view of floral bract; d. lateral view of floral bract; e. torus from above with stipe of ovary removed, i. torus, ii. gland, iii. base of ovary stipe illustrating central location on torus; f. i. stem, ii. lateral branch, iii. incipient leaf, iv. peduncle, v. raceme of immature flowers. g-i. *Grevillea* sp.: g. leaf; h. dorsal view of floral bract; i. torus from above with stipe of ovary removed, i. torus, ii. gland, iii. base of ovary stipe illustrating location towards top of torus.

Of interest is the situation of the colonies in relation to each other; separated geographically in an east-west line by 68 kilometres, they grow on different soil types; *G. microstegia* on sandstone, or in humus soil composed of decomposed sandstone and loose sandstone scree, with the greater number of plants growing either on top of flat ridges or on easterly slopes; the undescribed *Grevillea* from the Ben Major area grows on auriferous soils usually associated with dry sclerophyll forests; most plants examined were growing on westerly slopes or just on or below the ridges. The seedling leaves of *G. microstegia* are much larger than mature foliage, being longer and broader; the lobes usually average 11 with some leaves having 13 primary lobes which are hairy, broader than the mature foliage, and with many more secondary lobes. The undescribed *Grevillea* has similar seedling leaves to the adult, but primary lobes are more often 7-9.

In applying the specific epithet, I considered the small floral bracts to be one of the major distinguishing features.

<i>Grevillea microstegia</i>	<i>Grevillea</i> sp.
1. Transverse Section of young stems \pm Pentagonal in shape with irregular longitudinal striations.	Transverse Section of young stems terete without striations.
2. Leaves mostly longer than wide; lobes ca. 5-11, 1.0-2.0 mm wide, ca. 4-5 mm apart and usually less than 3 cm apart on branches.	Leaves quite often as wide as they are long; lobes ca. 5-7 and ca. 5-10 mm wide, usually more than 3 cm apart and up to ca. 4-5 cm apart on branches.
3. Peduncles ca. 13-20 mm long; pubescent.	Peduncles ca. 13-23 mm long, almost glabrous; threadlike.
4. Floral bracts small, ca. 0.5 mm long; deltoid, \pm rhomboidal.	Floral bracts ca. 2 mm long; ovate, elliptical.
5. Gland three-quarters annular; ca. 0.25-0.50 mm wide.	Gland half to three-quarters annular, ca. 0.5 mm wide.
6. Ovary densely covered in long, spreading hairs on a stipe ca. 1.5 mm long, inserted \pm centrally on torus.	Ovary pubescent on a stipe ca. 1.0 mm long, inserted towards the top of the torus.
7. Style 7-12 mm long.	Style 7-9 mm long.

Table 1.—Comparison of *Grevillea microstegia* and the undescribed *Grevillea* sp. from the Ben Major area, from observations made on living plants in the field and under cultivation and on own Herbarium material.

ACKNOWLEDGMENTS

Thanks are due to Mr. D. McGillivray of the National Herbarium, Sydney for his constructive comments, and to Dr. J. H. Willis for the Latin diagnosis.

STUDIES IN ANTARCTIC LICHENS V: Lichenes Antarctici
Exsiccati, Fascicle I, with additional notes on the taxonomy
of each species

by

REX B. FILSON*

INTRODUCTION

Fascicle I of *Lichenes Antarctici Exsiccati* was issued on the same day as this paper was published. The specimens were collected in February 1974 by the author and members of the 1973-74 Australian National Antarctic Expedition to the Southern Prince Charles Mountains. It was proposed to collect all species occurring in the Mac.Robertson Land region and to issue them in a numbered set. Unfortunately this was not possible as there was not time to visit areas where some species grew in sufficient quantity. As a result five species recorded in Filson (1966) are not represented in the collection. They are *Buellia foecunda* R. Filson, *Buellia* aff. *subpedicellata* (syn. *Buellia filsonii* Dodge 1973: 313), *Heppia antarctica* Dodge, *Lecidea capsulata* Dodge & Baker and *Lecidea woodberryi* R. Filson.

Caloplaca athallina Darb. has not been recorded previously as occurring in Mac.Robertson Land. This year, it was collected from two localities, Mawson Rock and Ufs Island. Unfortunately there was insufficient material at both of these sites to make up the number of sets required. However it was found in abundance on Fold Island in adjacent Kemp Land enabling it to be included in the exsiccata.

Usnea acromelana Stirt. is also recorded here as being new for Mac.Robertson Land.

In addition to the main set held in the National Herbarium, Melbourne (MEL), twenty-five sets were prepared and twenty-two sets have been forwarded to the following institutions:

Academiae Scientiarum, Brno, Czechoslovakia (BRNU)
Akureyri Museum of Natural History, Iceland
Botanical Institute ANSSR, Leningrad (LE)
Botanische Staatssammlung, München (M)
British Antarctic Survey Herbarium, Birmingham (BIRM*)
British Museum (Natural History) London (BM)
Conservatoire et Jardin botaniques, Geneve (G)
Duke University, North Carolina, U.S.A. (DUKE)
Farlow Herbarium, Massachusetts, U.S.A. (FH)
Herbarium Australiense, C.S.I.R.O. Canberra, Australia (CANB)
Institute of Systematic Botany Uppsala, Sweden (UPS)
Museum National d'Histoire Naturelle, Paris (PC)
National Herbarium of Canada (CAN)
Natural History Institute, Tokyo, Japan (TNS)

* National Herbarium of Victoria.

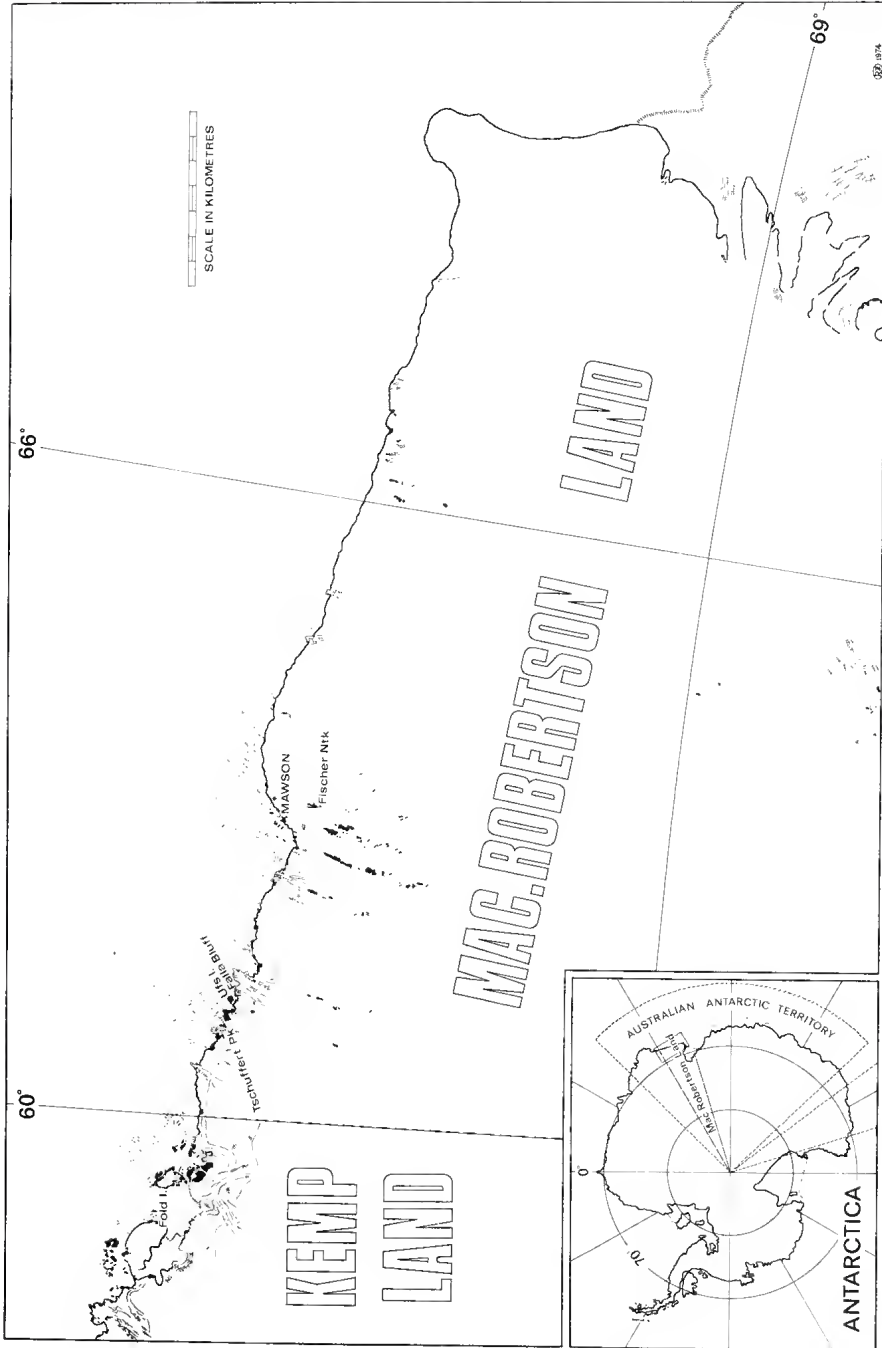


Fig. 1.—Map showing locality of the collections

Rijksherbarium, Leiden, Netherlands (L)
 Smithsonian Institution, Washington, U.S.A. (US)
 University of California, Irvine, U.S.A.
 University of Colorado, Boulder, U.S.A. (COLO)
 University of Helsinki, Finland (H)
 University of Oslo, Norway (O)
 University of Saskatchewan, Canada (SASK)
 University of Wisconsin, U.S.A. (WIS)

LICHENES ANTARCTICI EXSICCATI

issued by Rex B. Filson

NATIONAL HERBARIUM OF VICTORIA (MEL)

No. 1. *Acarospora gwynnii* Dodge & Rudolph

in *Ann. Miss. Bot. Gard.*, **42**: 144. pl.15, 2. 1955

ANTARCTICA. MAC.ROBERTSON LAND: West side of Mawson Rock, growing on pebbles in a shaded crevice.

1 February 1974

Rex Filson 14821

DISCUSSION: It is probable that all species of *Acarospora* subgenus *Xanthothallia* from the Antarctic Continent represent the one species. The minor differences between the five species described do not seem to be sufficient to warrant separation. The size of the thallus appears to be the most definite feature which divides them. The apothecial measurements given for each are similar and certainly well within the range of one another. There is some confusion in Dodge (1973); *Acarospora gwynnii* is separated from *A. petalina* Golubkova & Savicz in the key, by having a thecium (hymenium) 125 μm high (p. 146) whereas in the text it is shown as 230 μm (p. 150). In the type description of *A. petalina* the authors of the name state "thecium epithecio incluso 160–261 μm ". The present author considers that these two species are identical; *A. gwynnii* being described from a small (young) sample and *A. petalina* from larger and more robust specimens.

Of the others, the author feels that from the descriptions of *A. emergens* Dodge and *A. knowlesii* Dodge, that they too fall within the acceptable range of *A. gwynnii* and are probably the same taxon. It seems most likely that *A. xanthophana* (Nyl.) Jatta is a wrong determination and the samples from Cockburn Island and Thurston Island should be referred to *A. gwynnii*. Prof. W. A. Weber (1968:30) has examined the type of *A. xanthophana* and considers it to be synonymous with *A. schleicheri* (Ach.) Massal.

Prof. W. A. Weber (1968:24) also suggests that *A. gwynnii* is synonymous with *A. chlorophana* (Wahlenb. ex Ach.) Massal. This author does not agree with this finding and considers *A. gwynnii* distinct from specimens found in Australia which are referable to *A. chlorophana*.

The thallus of *A. chlorophana* is thin, flat to slightly hemispheric. It cracks and divides into areolae 0.2 — 0.4 mm diam. On the other hand the thallus of *A. gwynnii* is thick and pulvinate. This condition is consistent with specimens found in open exposed positions as well as those growing under rocks where they would be sheltered from all wind-blown sand and ice. The thallus is closely appressed, radiate, up to 3 mm diam. and does not divide into separate areolae.

No. 2. ***Acarospora williamsii*** R. Filson

in *ANARE Sci. Rep. Ser. B (II) Bot.* **82**: 31. 1966

ANTARCTICA. MAC.ROBERTSON LAND: West side of Mawson Rock, growing along cracks in the granite and on rock adjacent to the cracks in sheltered position.

1 February 1974

Rex Filson 14823

DISCUSSION: The relationship of this species with others in section *Phaeothallia* (H. Magn.) Räs. found in the Antarctic needs further investigation. The three species reported in Dodge (1973:146) appear to be similar and eventually all may prove to be conspecific with *A. badiofusca* Th. Fr. The type specimen of *A. williamsii* was collected growing over and between fine gravels. This habitat gave rise to a more bullate form than the specimens presented here, most of which are growing on the rock surface.

No. 3. ***Alectoria minuscula*** (Nyl. ex Arnold) Degel.

in *Nytt Mag. Naturv.* **78**: 286. 1938. *Imbricaria lanata* var. *minuscula* Nyl. ex Arnold, *Verh. zool-bot. Ges. Wien*, **28**: 293. 1878.

ANTARCTICA. MAC.ROBERTSON LAND: Fischere Nunatak, on small pebbles on the summit.

6 February 1974

Rex Filson 14838 & Craig Austin

DISCUSSION: The specimens included in this exsiccata are tending towards f. *congesta* (Zahlbr.) M. Lamb and f. *crustacea* (Lynge et Schol.) Degel. The present author agrees with Lamb (1964:28) and Lindsay (1972:10) that these forms do not have taxonomic significance and are only modifications caused by the harsh Antarctic environment.

No. 4. ***Biatorrella cerebriformis*** (Dodge) R. Filson comb. nov.

Candelariella cerebriformis Dodge in *BANZ Antarct. Res. Exped. Rep.* **7**: 184. 1948. *Biatorrella antarctica* J. Murray, *Trans. Roy. Soc. N.Z. Bot.* **2**: 60. 1963.

ANTARCTICA. MAC.ROBERTSON LAND: Fischer Nunatak, abundant on pebbles along the summit.

6 February 1974

Rex Filson 14837 & Craig Austin

DISCUSSION: It seems fairly obvious from the descriptions that *Biatorrella antarctica* J. Murray and *Candelariella cerebriformis* Dodge are the same taxon. Whilst the author feels that this species is more robust than others in the genus *Biatorrella* he

does not agree with the diagnostic features of the genus *Biatorrellopsis* Dodge (1965:513): in particular that the thallus is stipitate and attached by a gomphus. All of the specimens seen by the author are attached to the substrate by the lower cortex or by thin white hyphae which sometimes penetrate deeply into the cracks between the rock crystals.

These specimens were collected from a south and south-westerly aspect in very exposed positions, and would be constantly buffeted by high wind and wind-blown ice particles.

No. 5. *Buellia frigida* Darb.

in *Nat. Antarct. Exped. 1901-1904 Nat. Hist.*, 5: 7. 1910 *Rinodina frigida* (Darb.) Dodge, in *BANZ. Antarct. Res. Exped. Rep.* 7: 259. 1948

ANTARCTICA. MAC.ROBERTSON LAND: West side of Mawson Rock, on flat areas and on small stones in moraine.

1 February 1974

Rex Filson 14813

DISCUSSION: *Buellia frigida* is perhaps the most common lichen in the Antarctic, being found in most places where lichens occur. Its variable colour and polymorphic growth, change according to environmental conditions. This has led to it being described under numerous specific epithets and to it being included in several genera. Most of this confusion has arisen because workers on Antarctic lichens have not had the opportunity to spend time in the field in Antarctica, but have had to base their findings on fragmentary material, collected by someone else. The collectors are usually engaged in some other scientific task and only pick up a few lichen samples as a side interest without taking notes on the particular habitat of the specimens.

No. 6. *Buellia grimmiae* R. Filson

in *ANARE Sci. Rep. Ser. B. (II) Bot.* 82: 37. 1966.

ANTARCTICA. MAC.ROBERTSON LAND: Falla Bluff, growing over the tops of *Bryum algens* Card. in wet situations after melt.

9 February 1974

Rex Filson 14921

DISCUSSION: These specimens growing over *Bryum algens* Card. with *Candelariella antarctica* R. Filson and *Rinodina olivaceobrunnea* Dodge, were collected from a moss patch about 1 m × 2 m. The area was on a slight depression on a rock slab below snow drifts that provide ample water during melt.

No. 7. *Buellia lignoides* R. Filson.

in *ANARE Sci. Rep. Ser. B. (II) Bot.* 82: 38. 1966

ANTARCTICA. MAC.ROBERTSON LAND: Fischer Nunatak, abundant on rock platforms on western side of the outcrop.

6 February 1974

Rex Filson 14841 & Craig Austin

DISCUSSION: This lichen is easily separated from other closely related species by the intense violet-blue reaction with iodine.

No. 8. *Caloplaca athallina* Darb.

in *Wiss. Ergbn. Schwed. Sudpolar-Exped. 1901-1903* 4 (II): 9. 1912 *Pyrenodesmia athallina* (Darb.) Dodge & Baker, in *Ann. Miss. Bot. Gard.* 25: 621. 1938

ANTARCTICA. KEMP LAND: Fold Island, forming large patches over *Bryum algens* Card. on flat areas on the western side of outcrops. In sheltered damp positions.

11 February 1974

Rex Filson 14962

DISCUSSION: Contrary to the original description *Caloplaca athallina* does possess a thallus, which is very pronounced in sterile samples. Darbishire's original specimen appeared to be copiously fertile (vide photograph in Darb. 1912, pl. 2:14) and if his material was scanty he possibly did not detect the thallus.

Unfortunately this lichen appears to be nearly always covered with an algae or parasitised by other lichens, which present a wide variety of colour forms. The area from where this collection was made, demonstrated thalli with apothecia coloured from bright orange to brown, brownish-black to black and yellow pruinose. All of these colour forms are represented in the specimens distributed. In the exsiccata both fertile and sterile samples are included, some being composed only of crowded apothecia.

No. 9. *Caloplaca citrina* (Hoffm.) Th. Fr.

in *Nova Acta Sci. Uppsal.*, Ser. 3 3: 218. 1861. *Pyrenodesmia mawsoni* Dodge, in *BANZ. Antarct. Res. Exped. Rep.* 7: 232. 1948. *Caloplaca mawsonii* (C. W. Dodge) D. C. Lindsay, in *Mcddr. norsk Polarinst.* 101: 12. 1972.

ANTARCTICA. MAC.ROBERTSON LAND: West side of Mawson Rock, growing over moss cushions.

1 February 1974

Rex Filson 14817

DISCUSSION: The specimens presented are typical of those found growing over mosses in Antarctica. All of these specimens, and in fact all specimens seen by the author are sterile. Lindsay (1972:12) mentions sparingly fertile specimens from Vestfjella, Dronning Maud Land. Dodge (1973:261) reports fertile samples from Granite Harbour, Victoria Land. (For further discussion on this species see Filson 1974 a :1)

Apothecia of *Lecanora expectans* Darb. are scattered throughout the samples in the exsiccata.

No. 10. *Caloplaca elegans* (Link.) Th. Fr. var. *pulvinata* (Dodge & Baker) J. Murray.

in *Trans Roy. Soc. N.Z.* 2: 64. 1963 *Polycauliona pulvinata* Dodge & Baker, in *Ann. Miss. Bot. Gard.* 25: 268. 1938. *Xanthoria elegans* (Link.) Th. Fr., in *Nova Acta Reg. Soc. Scient. Upsal.*, Ser. 3 3: 169. 1861.

ANTARCTICA. MAC.ROBERTSON LAND: West side of Mawson Rock, on flat areas of charnockitic granite.

1 February 1974

Rex Filson 14827

DISCUSSION: *Caloplaca elegans* var. *pulvinata* is a very variable lichen in the Mac.Robertson Land region. So much so that it has previously been recorded as four separate species in two genera. *Gasparrinia harrisoni* Dodge, "*Gasparrinia citrina* Dodge", *Polycauliona sparsa* Dodge & Baker and *Polycauliona johnstoni* Dodge. The colour of the thallus grades from greenish-yellow in shaded situations to bright red-orange when exposed to direct sunlight. Depending on the environment the thallus is either radiate and continuous or discontinuous and scattered.

This species when growing under the harsh Antarctic conditions always appears more pulvinate than similar specimens found growing elsewhere. In order to separate this form from the typical, the author prefers to uphold the "*var. pulvinata*" even though it is perhaps only a modification caused by environment.

Some authors place this species in *Xanthoria* but this author prefers to retain it in *Caloplaca* sect. *Gasparrinia* because of its close adnation to the substrate and the texture of the upper cortex.

No. 11. ***Candelariella antarctica*** R. Filson comb. & nom. nov.

Protoblastenia citrina Dodge, in BANZ. Antarct. Res. Exped. Rep. 7: 222. 1948.

ANTARCTICA. MAC.ROBERTSON LAND: West side of Mawson Rock, growing over moss cushions.

1 February 1974

Rex Filson 14817

DISCUSSION: The species has a granulose sorediose, non-radiate thallus which has a negative reaction with KOH. The apothecial disk is greenish-yellow which also has a negative reaction with KOH. The genus *Protoblastenia* Steiner belongs in the family Caloplacaceae, all members of which have a positive reaction with KOH on the apothecial disk.

As the chemistry of this species is more consistant with *Candelariella* Müll. Arg. a new combination is warranted and as *C. citrina* is an earlier homonym used by B. de Lesd. in *Ann. Cryptog. Exot.* 5: 120. 1932, it has been necessary to find a new name for this entity.

No. 12. ***Lecanora melanophthalma*** (Ram.) Ram.

in *Memoir. Acad. Roy. Sc. de l'Institut. de France* 6: 133 (1823) 1827. *Lichen melanophthalmus* Ram. apud Lam. et DC., *Flore Française* edit. 3, 2: 376. 1805. *Lecanora rubina* Ach. var. *melanophthalma* (Ram.) Zahlbr. forma *exsulans* (Th. Fr.) Zahlbr., in *Cat. Lich. Univ.* 5: 660. 1928. *Squamaria chrysoleuca* (Sm.) Ach. var. *melanophthalma* (Ram.) Zahlbr. forma *exsulans* Th. Fr., in *Nytt. Mag. Naturv.* 40: 208. 1902. *Lecanora exsulans* (Th. Fr.) Dodge & Baker, in *Ann. Miss. Bot. Gard.* 25: 570. 1938.

ANTARCTICA. MAC.ROBERTSON LAND: West side of Mawson Rock, on small stones scattered amongst moss cushions in depressions along melt water run-offs.

1 February 1974

Rex Filson 14814

No. 13. *Lecanora melanophthalma* (Ram.) Ram.

in *Memoir, Acad. Roy. Sc. de l'Institut. de France* 6: 133 (1823) 1827. *Lichen melanophthalmus* Ram. apud Lam. et DC., *Flore Française* edit. 3, 2: 376. 1805. *Lecanora rubina* Ach. var. *melanophthalma* (Ram.) Zahlbr. forma *exsulans* (Th.Fr.) Zahlbr. in *Cat. Lich Univ.* 5: 660. 1928. *Squamaria chrysoleuca* (Sm.) Ach. var. *melanophthalma* (Ram.) Zahlbr. forma *exsulans* Th.Fr., in *Nytt. Naturv.* 40: 208. 1902. *Lecanora exsulans* (Th.Fr.) Dodge & Baker, in *Ann. Miss. Bot. Gard.* 25: 570. 1938.

ANTARCTICA. MAC.ROBERTSON LAND: West side of Mawson Rock, growing over cushions of *Bryum algens* in depressions along melt water run-offs.

1 February 1974

Rex Filson 14815

DISCUSSION: *Lecanora melanophthalma* is a very variable lichen. It is found growing either on rock or over mosses. The author has been unable to borrow the type specimen of *L. melanophthalma* but it appears that it differs from *L. rubina* in chemistry. Samples of this lichen from Antarctica seem to be more pulvinate and closer adnate to the substrate than *L. rubina* and none have demonstrated the sub-foliose habit of typical *L. rubina*. All of them are KOH—which is the reaction reported for *L. melanophthalma* (Harmand: 931). This reaction combined with the more adnate habit seems to suggest that this material should be separated from *L. rubina sens strict*.

The author has examined the Type specimen of *Lecanora chrysoleuca* (Sm.) Ach. *melanophthalma* (DC.) Th.Fr.f. *exsulans* Th.Fr. and considers it to be typical *L. melanophthalma*. It clearly demonstrates the pulvinate growth habit and the variation in colour of the apothecial disk.

No. 14. *Lecidea phillipsiana* R. Filson

in *ANARE Sci. Rep. Ser. B (II) Bot.* 82: 51. 1966

ANTARCTICA. MAC.ROBERTSON LAND: West side of Mawson Rock, growing on rocks in and around depressions containing moss beds.

1 February 1974

Rex Filson 14816

DISCUSSION: *Lecidea phillipsiana* is a very common lichen in the Mac.Robertson Land region occurring on most rock outcrops. The specimens in this set are typical of the species though the spores are a little longer ($< 15 \times 4 \mu\text{m}$) than those described in Filson (1966: 51).

No. 15. *Physcia caesia* (Hoffm.) Hampe

in *Furnr. Naturh. Topogr. Regensberg* 2: 250. 1839. *Lichen caesius* Hoffm., *Enum. Lich.* 65. 1784. *Parmelia variolosa* Dodge & Baker, in *Ann. Miss. Bot. Gard.* 25: 593. 1938. *Parmelia coreyi* Dodge & Baker, l.c. 595. 1938. *Parmelia johnstoni* Dodge, in *BANZ. Antarct. Res. Exped. Rep.* 7: 191. 1948.

and *Lecanora expectans* Darb.

in *Nat. Antarct. Exped. 1901-1904 Nat. Hist.* 5: 7. 1910.

ANTARCTICA. MAC.ROBERTSON LAND: West side of Mawson Rock, growing over moss cushions.

1 February 1974

Rex Filson 14825

DISCUSSION: This sample is the "*Parmelia variolosa* Dodge & Baker" form, i.e. small lobes, bleached white to yellowish-white on the top by contact with snow and frozen particles. The thallus, growing over the tops of cushions of *Bryum algens*, is narrow, strongly concave and pressed into the moss heads. In all of the specimens distributed there are apothecia of *Lecanora expectans* Darb. Unfortunately adequate material was not available of *Physcia* thallus with the apothecia of *Lecanora* attached to it. However most of the samples demonstrate how confusion has arisen in the past with these two genera growing so closely together (see Filson, 1974a:4). The colour of the apothecial disk of *L. expectans* varies with age and exposure; young apothecia in sheltered positions are pale reddish-brown with prominent margin whereas in older specimens the disk is black and the margin erodes.

No. 16. *Physcia caesia* (Hoffm.) Hampe

in *Furnr. Naturh. Topogr. Regensburg* 2: 250. 1839. *Lichen caesius* Hoffm., *Enum. Lich.* 65. 1784. *Parmelia variolosa* Dodge & Baker, in *Ann. Miss. Bot. Gard.* 25: 593. 1938. *Parmelia coreyi* Dodge & Baker, l.c. 595. 1938. *Parmelia johnstoni* Dodge, in *BANZ. Antarct. Res. Exped. Rep.* 7: 191. 1948.

ANTARCTICA. MAC.ROBERTSON LAND: Mawson Rock, growing over gravels under sheltered overhangs on rock platforms near East Bay.

5 February 1974

Rex Filson 14835

DISCUSSION: This is the "*Parmelia coreyi*—*Parmelia johnstoni*" form, i.e. broad, convexed lobes with rounded ends. The colour of the upper surface varies from near white pruinose, grey to grey-brown, depending upon the position in which it was growing. If samples No. 15 and No. 16 are compared, narrow concave and broad convexed lobes will be observed on each. Apothecia of *Lecanora expectans* have been located growing in association with the lobes of this form, though none are in evidence on the specimens distributed.

No. 17. *Rhizocarpon flavum* Dodge & Baker

in *Ann. Miss. Bot. Gard.* 25: 552. 1938. ? *Rhizocarpon antarcticum* Räs., in *Ann. Bot. Soc. Zool.—Bot. Fenn. Vanamo* 21: 4. 1946. fide Runemark (1956:90).

ANTARCTICA. MAC.ROBERTSON LAND: Fischer Nunatak, abundant on rock along cracks and areas damp after snow melt.

6 February 1974

Rex Filson 14839 & Craig Austin

DISCUSSION: *Rhizocarpon flavum* Dodge & Baker grows along cracks and in places that remain damp after snow melt. It is not very common but it does grow abundantly in some localities. The west side of Fischer Nunatak is one such place where all of the cracks and small depressions in the rock surface are carpeted with this distinctive yellow lichen. By contrast only

a few small patches occur along a crack on the western side of Mawson Rock.

From the description given by Räsänen (1956: 90) it would appear that *Rh. antarcticum* is synonymous with this species; the internal dimensions and chemistry appear to be the same.

No. 18. *Rinodina olivaceobrunnea* Dodge & Baker

in *Ann. Miss. Bot. Gard.* **25**: 659. 1938. *Rinodina archaeoides* H. Magn., in *Medd. Fran. Goteborgs Bot. Tradg.* **17**: 278. 1947.

ANTARCTICA. MAC.ROBERTSON LAND: Tschuffert Peak, abundant on moss cushions in depressions below snow drifts.

9 February 1974

Rex Filson 14906

DISCUSSION: In a previous paper (Filson 1966: 41 & 42) the author identified this species with *Rinodina archaeoides* H. Magn. and suggested that it might be synonymous with *R. olivaceobrunnea* Dodge & Baker. Since that time he has examined the type specimen of *R. archeoides* and an authenticated specimen of *R. olivaceobrunnea* and it is evident that these two taxa are the same (see Filson, 1975a).

No. 19. *Umbilicaria aprina* Nyl.

Synopsis *Lichenum* **2**: 12. 1863. *Umbilicaria antarctica* var. *subvirginis* Frey & Lamb. in *Trans. Brit. Mycol.* **22**: 272. 1939. *Umbilicaria spongiosa* Dodge & Baker in *Ann. Miss. Bot. Gard.* **25**: 566. 1938.

ANTARCTICA. MAC.ROBERTSON LAND: West side of Mawson Rock, growing on pebbles and flat rock faces in sheltered positions.

1 February 1974

Rex Filson 14820

DISCUSSION: The author has compared the type specimen and recent collectings of *Umbilicaria aprina* Nyl. with the rhizinate *Umbilicaria* found growing on the Antarctic Continent and concludes that they are the same taxon. For further discussion see Filson 1975b.

No. 20. *Umbilicaria decussata* (Vill.) Zahlbr.

in *Cat Lich. Univ.* **8**: 490. 1942. *Lichen decussatus* Vill., *Hist. Plant. Dauphine* **3**: 964. 1789. *Omphalodiscus decussatus* (Vill.) Schol., in *Nyt. Mag. Naturvid* **75**: 23. 1934. *Umbilicaria subcerebriformis* Dodge, *BANZ. Antarct. Exped. Rep. Ser. B.* **7**: 149. 1948.

ANTARCTICA. MAC.ROBERTSON LAND: Fischer Nunatak, abundant on rock faces in a westerly aspect.

6 February 1974

Rex Filson 14840 & Craig Austin

No. 21. *Umbilicaria decussata* (Vill.) Zahlbr.

in *Cat. Lich. Univ.* **8**: 490. 1942. *Lichen decussatus* Vill., *Hist. Plant. Dauphine* **3**: 964. 1789. *Omphalodiscus decussatus* (Vill.) Schol., in *Nyt. Mag. Naturvid* **75**: 23. 1934. *Umbilicaria subcerebriformis* Dodge, *BANZ. Antarct. Exped. Rep. Ser. B.* **7**: 149. 1948.

ANTARCTICA. MAC.ROBERTSON LAND: Tschuffert Peak, abundant on rock and small pebbles in a northerly aspect.

9 February 1974

Rex Filson 14901

DISCUSSION: "*Umbilicaria decussata* extends from pole to pole in the Western Hemisphere. In the Arctic and the Antarctic regions it is undoubtedly circumpolar" (Llano 1950:80). Previously the specimens from Mac.Robertson Land were determined as *Umbilicaria subcerebriformis* Dodge (Dodge 1955:144). Whilst Professor Dodge still retains the specimen which he first examined under this species (Dodge 1973: 126) he transferred all of the collections noted in Filson (1966:61), which he has not examined, to *Omphalodiscus Bakeri* Dodge (1973: 121).

U. decussata varies greatly in the harsh Antarctic conditions sometimes the upper surface is smooth and pale olive-brown, sometimes extremely rugulose and dark brown to greyish-black, depending on the degree of exposure. The author has examined a portion of the type specimen of *Omphalodiscus bakeri* and finds that it is midway between these two forms. It is dark olive-brown and rugulose. He considers Antarctic populations of *U. decussata* compare favourably with specimens of this species found growing in the Australian alpine regions.

No. 22. *Usnea acromelana* Stirt

in *Trans. Proc. N. Z. Inst.*, **30**: 388. 1898. *Neuropogon acromelanus* (Stirt.) M.Lamb, in *Journ. Linn. Soc. Lond. Bot.* **52**: 218. 1939.

ANTARCTICA. MAC.ROBERTSON LAND: Falla Bluff, abundant on western side of valleys orientated north and south.

9 February 1974

Rex Filson 14910

DISCUSSION: Most of the coastal outcrops of Mac.Robertson Land have been visited with the purpose of studying the lichen populations and this is the only locality where *Usnea acromelana* has been found. An interesting observation is that *Usnea antarctica* was not found on this outcrop.

Large areas of *U. acromelana*, up to 1 m in diameter were located in sheltered habitats between the boulders in an easterly aspect. The specimens agree well with the descriptions in Lamb (1968: 5) and specimens from other areas seen by the author, though they seem to be a little blacker than those from the Windmill Islands (Filson 1974b:34).

No. 23. *Usnea antarctica* Du Rietz.

in *Svensk. Bot. Tidskr.* **20**: 93. 1926. *Neuropogon antarcticus* (Du Rietz) M. Lamb, in *Journ. Linn. Soc. Lond. Bot.* **52**: 210. 1939.

ANTARCTICA. MAC.ROBERTSON LAND: Tschuffert Peak, abundant on pebbles in damp areas below snow drifts.

9 February 1974

Rex Filson 14900

DISCUSSION: *Usnea antarctica* only occurs on six outcrops on coastal Mac.Robertson Land, where it is fairly abundant. This species differs from *U. acromelana* in having eroded, convex patches of soredia on the branches. The lower parts are ver-

rucose rugose and slightly foveolate. *U. acromelana* on the other hand has smooth lower parts and the soredia is pulvinate to subglobose.

No. 24. ***Xanthoria mawsonii*** Dodge

in *BANZ. Antarct. Res. Exped. Rep.* 7: 236. 1948.

ANTARCTICA. MAC.ROBERTSON LAND: Mawson Rock, common along cracks in rock platforms overlooking East Bay.

18 February 1974

Rex Filson 14993

DISCUSSION: Previously this author has stated (Filson 1966: 5) that he did not observe any relationship between penguin rookeries and the Antarctic plant life. This although true in relation to the rookeries is not true with respect to the perching sites. The rock areas below perching sites around Mawson are very rich in *Xanthoria mawsonii*.

The relationship between this species and *X. candelaria* Kickx. f. *antarctica* (Wainio) Hillm. is uncertain and when this genus is revised the author feels sure that *X. mawsonii* will be relegated to an Antarctic modification of *X. candelaria*. Many authors are already referring this taxon to the latter species. The present author is retaining the specific epithet *mawsonii* for this exsiccata as Mac.Robertson Land is the type locality for the species and he considers it best to wait until a revision of the genus is completed.

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BOOK REVIEWS

W. R. GUILFOYLE. R. T. M. Pescott.

Published by Oxford University Press
August, 1974.—xvii, 153 pp. Recommended
price: \$9.75.

In 1974 the name of Guilfoyle raises the real estate value of properties for sale in Victoria. At the national level, it provides Australian landscape designers with a reliable standard of measurement. The international reputation of his achievements were summarised, in the published account of a visit in 1973, by the Arboretum of the Barnes Foundation from Pennsylvania where they refer to the Royal Botanic Gardens in Melbourne in the following terms:

“It is difficult to conceive a garden in which the three objectives of botany, horticulture and landscape design are more skilfully combined than in this one”

We know little of the man who enriched our national resources with these aesthetic and scientific assets. A stone tablet in the Gardens states that he retired in 1909 after 36 years in office; the longest tenure of any Curator or Director. The Government Gazettes of the period show he was appointed as a supernumerary employee from 21.7.1873 until he was appointed to the full-time staff from 1.7.1876, on a salary of £500. Controversy, reverence, romanticism but predominantly the unknown, dominate the verbal legends that have survived Guilfoyle. His written work is largely technical and professional.

Mr. R. T. M. Pescott, the fifth successor to Guilfoyle, has produced the first biography of the man. In spite of the difficulties of such an undertaking, the author's careful researches have led to a splendid publication, full of surprises and with sources of information always well documented.

The first chapter on the Guilfoyle family provides a useful perspective for the later chapters which explore William and his background in more detail.

Born in England on 8th December, 1840, he came to Australia with his parents when he was less than ten years old. His father Michael had been trained under Joseph Knight, of the Royal Exotic Nursery, in King's Road, Chelsea, who sent Michael to many parts of Britain to layout parks and gardens. In Australia, Michael established an exotic plant nursery close to Sydney and developed it into a family business with his sons. William, the eldest son, was educated with the aid of relatives and tutors before he went to Lyndhurst College and then to a private school. He was taught English, science and classics, all of which are reflected in his writings. In 1867 Ferdinand von Mueller proposed him for Fellowship of the Linnean Society, and later he joined other scientific societies.

After botanical excursions to sub-tropical areas in Northern New South Wales, and Southern Queensland, and as botanist on a South Sea Islands expedition with H.M.S. "Challenger" in 1868, during which he collected plants for the Botanic Gardens in Sydney, he settled on his father's newly acquired property in the Tweed River District. There, with two brothers, he grew a wide range of sugar cane varieties, tobacco, maize, opium, cotton, coffee, and peanuts, from 1869 until 1873.

Mr. Pescott's account of von Mueller's removal from office and the appointment of Guilfoyle in 1873, is the most objective that I have read on this controversial issue. His re-discovery of Sayce's plan for the domain, published in 1873, has been reproduced on the inside covers and anyone familiar with Mueller's Garden and the present Gardens, can see how the plan was transposed from the Domain to the Botanic Gardens. The years from 1873 until his marriage in 1889, retirement in 1909 and death in 1912 are well explored by the author in a sensitive and interesting style. The reader may be left with the sense that there is still more information hidden in the family archives. If such untapped sources remain in existence this biography may stimulate them to come to the surface.

—D. M. CHURCHILL

The Kew Record of Taxonomic Literature relating to Vascular plants for 1971. Published by Her Majesty's Stationery Office, London, 1974.—ix, 394 pp. £14.00 net.

The *Kew Record* seems likely to become one of the major tools of taxonomic botanists working with vascular plants. It is intended that publication will be on a yearly basis.

This work has been compiled in England by the staff of the Herbarium, Royal Botanic Gardens, Kew. This account of its contents has been summarized from the Introduction by the Director, Professor J. Heslop-Harrison. It covers literature about flowering plants, gymnosperms and ferns. All papers relevant to taxonomy in the broad sense have been included, but papers in related fields, such as pure genetics, cytology and physiology, with no evident taxonomic significance, have been omitted. Wherever possible the entries have been placed under systematic groups, and the sections on nomenclature, chromosome surveys, chemotaxonomy, anatomy and morphology, palynology, embryology and reproductive biology include only general papers which cannot conveniently be referred to a systematic group. Papers on phytosociology which have usually

been omitted have on occasion been included for botanically poorly known areas.

As many botanists have regional, rather than world-wide interests the world has been divided into 7 major regions (Australia and New Zealand is No. 7) and the code number (s) appear in the left-hand margin for each relevant entry.

All new names, at whatever rank, have been included, with the exception of cultivars. In questions of validity of publication the requirements of the *International Code of Botanical Nomenclature* have been strictly adhered to, and where interpretation of this has been in doubt the suggestions made in *Regnum Vegetabile* 60: 42-57 (1969) have generally been adopted.

New names listed as validly published appear in **bold face**. Names proposed as new but not validly published appear in roman type. Names not proposed as new (i.e. species names under which new infra-specific taxa are named) are given in *italic type*.

The *Kew Record* will overlap largely the coverage of the *Index Kewensis*. It is intended however that the latter will continue publication as a five-yearly cumulation and will increase its scope to cover all names of spermatophytes including those at infra-generic and infra-specific levels.

At first sight the provision of a list of abbreviations used for periodicals seemed unnecessary. However, investigation showed that it included a number of periodicals which were not in the *World List of Scientific Periodicals 1900-1960* 4th ed. (1964). Apart from that the main difference seen was in spelling abbreviations of adjectives used in the title with a capital letter instead of the small letter used in the World List.

—MARY A. TODD

Poisonous plants of Australia. Selwyn L. Everist.
Published by Angus and Robertson, Sydney
and London. 1974—xvi, 684 pp., 64 col. pl., 64
b. & w. photographs, 42 fig. Recommended
price: \$45.00.

Selwyn Everist is director of the Queensland Herbarium and of the botany branch of the Queensland Department of Primary Industries. He is also a part-time lecturer on poisonous plants and toxicology to veterinary students at the University of Queensland, and for many years has had a close association with

farmers, graziers, medical practitioners and veterinarians. His great knowledge of botany and wide experience with plants in relation to animal husbandry have placed him in a unique position as a suitable author for *Poisonous plants of Australia*. The book reflects his deep knowledge of the subject and will quickly become a standard reference work for all who are closely connected with botany, human health, and the management and care of domestic stock.

Poisonous plants of Australia is divided into two sections and has three useful appendices. Section one contains general information, with short chapters on the history of plant poisoning, toxic substances in plants, factors affecting the toxicity, how evidence of plant toxicity is obtained, how to investigate grazing areas for possible poison plants when stock poisoning is suspected, and how to prevent and treat poisoning. Precautions necessary to prevent or minimize plant poisoning in stock are summarized in seven points.

Section two, comprising the bulk of the book, contains the descriptions of individual poisonous plant species—there are separate chapters for seed-bearing plants; ferns and fern allies; fungi, lichens and algae. Native, naturalized, sown pasture plants, crop and garden plants are included—over 800 species in all. The botanical name (with authority) and common name or names (whenever possible) are given, together with any nomenclatural notes or synonyms necessary to allow comparison of this work with other texts. Under each species there are notes on description; distribution and habitat; conditions of poisoning; poisonous principle; toxicity, symptoms and lesions; prevention and treatment. Where a plant has different effects on different animal species the variation is indicated. Toxicity to humans, and symptoms shown by humans are also separately described.

The three appendices all take the form of easily scanned charts, with the plant species arranged alphabetically in each. Appendix 1 indicates the presence or absence (as far as is known) of each poisonous plant species for each Australian State. Appendix 2 charts each species against its recorded symptoms, and appendix 3 charts each species against the toxic substances it is known to possess.

Illustrations, including good colour photographs, cover one-fifth to one-quarter of the species included in the book. Copious references are given throughout the text and relevant bibliographies appear at the end of each section or plant family. The text is written simply but clearly throughout, and with an avoidance of technical terms whenever possible. Its usefulness to the farmer and grazier is therefore enhanced, without detracting from its value to professional botanists, medicos, and veterinarians. A comprehensive index to botanical and common names and toxic substances completes the book.

A number of species suspected of poisoning, or with a potential for poisoning (e.g. *Chilocarpus australis*; *Vinca minor*) have been included but some (e.g. *Lavatera plebeia*; *Petalostigma quadriloculare*) have been omitted. Readers may find themselves wondering if the omissions are intentional and warranted or due to an oversight (the latter cause of omission is a problem which every compiler has to struggle with, but no one completely overcomes). No doubt some of the plants which have previously been recorded as possibly poisonous have now been shown to be only very doubtfully so or else completely above suspicion. A list of these would have been an aid to any reader noticing their absence from *Poisonous plants of Australia*.

In summary—a well-produced, clearly written, information-packed book which fills a long-time gap in the list of authoritative reference works on varying aspects of Australian botany.

—HELEN I. ASTON

Author and Classified Catalogues of the Royal Botanic Gardens Library, Kew, England. (Author 5 vols., Classified 4 vols.) Published by G. K. Hall & Co., Boston, Mass., U.S.A., 1974. Recommended price (outside U.S.A.): Author catalogue \$462.00; classified catalogue US\$374.00.

The Library of the Royal Botanic Gardens, Kew, is one of the largest botanical libraries in the world. Scientific research in the Gardens is carried out in various fields, particularly in taxonomy and phytogeography in the Herbarium and in cytology, anatomy, physiology and biochemistry in the Jodrell laboratory.

These volumes give a reproduction of its Author and Classified subject catalogues and thus give a valuable (and for taxonomic work close to complete) guide to the works published by individual authors and to the literature available on many botanical subjects. The library is particularly rich in early botanical works and in works on plant taxonomy and distribution. It also covers economic botany, botanical travel and exploration as well as other disciplines of botany.

Owing to the high cost of the work the publishers have distributed only the title page, preface and first 32 pages of the Author Index for review. This much is enough to show that the work will be a mine of information for workers in smaller Herbaria with less extensive libraries. Much time will be saved by workers who discover the names of existing works on the

subject in which they are interested at an early stage of their investigations. They can then seek the work or, as will be necessary for many of rarer works, photocopies of the relevant parts.

An idea of the scope of this publication can best be given by an extended quotation from its preface.

“The Author and Classified Subject Catalogues cover the Library’s holdings of books, pamphlets and separates (reprints). The Classified Catalogue includes an alphabetical subject index to its main systematic subject section.

“Some analytical entries are included, notably the biographical section of the Classified Subject Catalogue. Because the Classified Subject Catalogue has been compiled relatively recently, a small section of earlier separates has not yet been classified and therefore appears only in the author catalogue . . .

“The subject order of the Classified Catalogue has been specially adapted to the needs of the staff at Kew. Those familiar with the Dewey Decimal Classification will notice that much of the material is arranged by that scheme, but that for systematic works, the Bentham & Hooker Botanical Classification has been used; also for floras, the basis is a special geographic schedule used in the Kew Herbarium.”

The publishers state that the approximately 102,000 cards in the Author Catalogue and 80,000 cards in the Classified Catalogue have been reproduced by offset on permanent/durable, acid-free paper with overlapping cards on 10" x 14" pages and that the 5-volume Author Catalogue and 4-volume Classified Catalogue have been bound in Class A library bindings.

It seems likely that many taxonomic botanists in smaller Herbaria will be grateful for this access to the catalogues of the very extensive literature available in the Library at Kew.

—MARY A. TODD



