

Register of type specimens of mosses in Australian herbaria

General introduction and Part I. Special collections at NSW: Lord Howe Island, Vanuatu (New Hebrides)

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Abstract

Ramsay, Helen P.¹, Julie Seur², Peter G. Wilson² and Tracey Goodwin¹ (¹School of Biological Science, University of New South Wales, Kensington 2033 NSW Australia; ²National Herbarium of New South Wales, Royal Botanic Gardens, Sydney 2000 NSW Australia) 1990. Register of type specimens of mosses in Australian herbaria. General introduction and part 1. Special collections at NSW: Lord Howe Island, Vanuatu (New Hebrides). *Telopea* 3(4): 571–592. This is the first of a series of papers forming a register of type specimens in Australian herbaria. Here we deal with Lord Howe Island and Vanuatu (New Hebrides) mosses named by Brotherus & Watts (1915a, b). The register is a specimen-based approach detailing the basionym, reference, label data for each type specimen held, if more than one, the category of type and where possible the location of the holotype or lectotype if known. Included is data from recent studies, revised names or notes on action required such as lectotypification if this has not been done.

General introduction

The need for access to type specimens by monographers is well understood but the difficulties in locating such specimens can often make the work very time-consuming. Koponen (1982) outlined methods for recording the data required for a TYPE specimen register as used at the Botanical Museum, University of Helsinki (H). S. W. Greene (1984) put forward a proposal for a new approach to the production of type registers not on a **specimen-based** but on a **literature-based** approach. The **specimen-based** approach locates 'putative types' in the herbarium followed by a literature search to confirm the status of each specimen. Even when the specimen is found to agree with the details, the location of duplicates may not be known hence the status as holotype, isotype etc. may not be clear or easy to determine.

Early bryologists rarely designated a holotype, often naming many syntypes, making later lectotypification necessary. This latter requirement in modern taxonomy poses problems when recording 'types' from many unrelated species, as the total literature for all will not be known. Monographers are helping to improve the situation in recent revisions, e.g. Koponen (1979), Iwatsuki and Crosby (1979), Lewinsky (1984), Vitt and Ramsay (1985).

Some examples of published registers or catalogues for bryophytes are those of Hattori and Noguchi (1960), Clarke (1973), Shetler et al. (1973), Walther & Martienssen (1975), Grolle (1976), Pocs (1977), Ireland & Ley (1984).

Early botanists in Australia always sent specimens for identification to Europe where taxonomists were active and the unusual flora attracted great attention. As Australia was a colony of Britain, plant specimens were largely deposited at Kew or the British Museum. Whilst representative collections were sometimes

retained in Australia the type descriptions were usually based on specimens sent to the European specialists and the holotype retained there. In many cases duplicates were not retained in Australia. Early descriptions of Australian bryophytes were made by Carl Müller, Brotherus, Mitten, Dixon, and the holotypes were retained in their herbaria now located at Helsinki (Brotherus), New York (Mitten), British Museum (Dixon) while the Carl Müller herbarium was largely destroyed in Berlin in 1943.

The proposal of S.W. Greene (1984) to produce a **literature-based** catalogue for these latter types would enable the isotypes and syntypes in herbaria throughout the world to be sought. W.W. Watts, who made extensive collections in Australia (New South Wales, N. Queensland, Victoria and Lord Howe Island), sent his collections to Brotherus for identification. Brotherus and Brotherus & Watts published lists and descriptions of new species [in the majority of cases Brotherus wrote the description, but Watts did sometimes provide him with an outline] based on material at H-BR, and these would therefore be the types (see Ramsay 1980). In most cases a series of specimens, collected at different times and from different localities (syntypes), were listed with the description and no holotype designated. Although the National Herbarium of New South Wales contains the bulk of Watts' collections most are duplicates of the various types and syntypes held at H-BR. Consequently, there are very few holotypes present in NSW, and most of the syntypes are isosyntypes.

The type method as understood today was not practised widely in bryology until recently (Koponen 1982). Bryology in Australia is in the early stages of revival (since the 1970s) as cryptogams were generally sadly neglected in the main herbaria until fairly recently (Ramsay & Seur in press). Within the last ten years the situation has greatly improved and bryophytes are now being actively curated in all major Australian herbaria. There are, as yet, only two people appointed with research interests in bryophytes in charge of these collections in Australian herbaria: Streimann (CBG), and Bell (AD), curation being an organisational rather than a research activity. In spite of this, the collections are now much more accessible for loan and study by monographers.

The following study was undertaken to determine what collections of moss-types were held here in Australia. Exchange between early Australian and overseas workers resulted in a number of isotypes or syntypes for exotic species being deposited here in Australian herbaria, particularly at NSW and MEL. Types for both Australian and exotic specimens lodged in Australian Herbaria (exotics only in NSW) are being studied and the results will appear as a series of publications.

Data collection

The register has been compiled from those specimens located in Australian herbaria which were annotated as type or sp. nov. i.e. 'putative types'. Recent revisions and descriptions of new species have enabled typification for some specimens to be clearly stated. A survey of literature based on data from Index Muscorum (Wijk, Margadant and Florschütz 1959–1969) and supplements (Crosby 1977, 1979; Crosby and Bauer 1981, 1983, 1987; Bauer and Crosby 1986) has enabled others to be classified. The register lists the original name given (basionym) and is arranged alphabetically with cross-referencing for name changes. The work, begun in 1973 as an extension of studies for a Census of New South Wales Mosses (Ramsay 1984), follows closely the format used by

Clarke (1973), (i.e. details on the original packet such as name, dates and locality, collector, herbarium number) and remarks added later. In addition, the present status of the specimen, by reference to literature and to collections in major overseas herbaria, is given when known or suggested when not. Many names have been absorbed into synonymy by later revisions and the most recent references are included together with the original one. In addition, latitudes and longitudes have been included for the localities, to assist overseas workers.

Specimens from the following herbaria have been studied: AD, BRI, CANB, CBG, HO, MEL, MELU, NSW, PERTH, SYD, and the private herbaria of I. G. Stone and D. G. Catcheside whose type specimens will be or have been deposited in MEL, MELU (Stone) and AD (Catcheside). A survey of literature relevant to the specimens in Australia has identified the great dearth of types for Australian species in Australian herbaria.

The data were entered and collated using dBaseIII program and the following format for continued access and analysis.

Type Specimens Register

1. Original name attached to the specimen [BASYNYM]
2. Reference to original description [REF]
3. Specimen Label Data [LABEL]
4. Specimen(s) cited in Protologue [PROTO]
5. Herbaria holding types
 - A. Australian [AUSTR]
 - B. Non-Australian [NON]
6. Present name, reference to recent treatment [REC]

Entry of data

BASYNYM: The names are arranged alphabetically according to genus and species.

REF: Journal reference to protologue is given. A complete list of references appears at the end of the Register.

LABEL: Label data are given for each specimen located with this name. Where two specimens have identical data this is noted at the end of the data entry. Where labels differ, even in minor ways, each is entered separately. Each entry is numbered sequentially 1, 2, 3 where multiple entries occur.

PROTO: Specimen citations from the protologue are given in inverted commas exactly as in the original publication with misspellings etc. If there are no locality details in the protologue but they appear elsewhere in the text they are included in square brackets. If misspelling of a locality is confusing or incomplete, clarification is given in square brackets.

AUSTR: The herbarium in Australia holding type specimens is given. The status of the type is indicated when known. Collector's numbers are listed for each herbarium holding specimens.

NON: Where holotypes or syntypes from which the protologue was derived were most likely to be held in overseas herbaria, the information was sent to the relevant herbarium (e.g. Brothrus names to H-BR) for confirmation.

REC: Where a new name has been published for the taxon, the new name is listed and the original one is recorded as a synonym. The presently accepted name or new combination is listed together with the reference. If the combination is a later homonym, the earlier name is given and the reference cited if it refers to a non-Australian collection. Where based on an Australian collection, the details will be found alphabetically in the Register. Where lectotypification is required this is stated. Other relevant information not included elsewhere such as latitude and longitude of the type locality, is recorded here.

The location of some types, thought to be in Australia, cannot be determined, e.g. Vitt and Ramsay (1985) have been unable to locate types for some *Macromitrium* species all thought to be at MEL. The Register has not included names *in schedis*, but *nomina nuda* are appended, for clarification only, as a separate list.

Presentation of data

The register has been prepared in the hope that it will be of value to workers wishing to trace types. If there are any errors or misinterpretations it would help if the senior author could be notified quickly to enable rapid circulation of the corrections.

The senior author accepts responsibility for all errors and misjudgments. Entry of the manuscript into the computer (thanks to Tracey Goodwin, Julie Seur) will enable lists to be circulated to individual herbaria in return for their assistance.

The work will appear in several parts as listed below, compiled by the senior author with assistance from others.

Register of Type Specimens held in Australian Herbaria

- Part I. Special collections at NSW: Lord Howe Island, Vanuatu (New Hebrides).
- Part II & III. Australian mosses.
- Part IV. Specimens at NSW determined as *sp. nov.* by Carl Müller.
- Part V & VI. Exotic mosses at NSW: (to be arranged and published in geographical regions: New Zealand, Papua New Guinea, Asia, Pacific Islands, Europe, Africa, America N & S.)

A separate publication 'Hepatic types in the National Herbarium of New South Wales (NSW) and the Ray Herbarium, Sydney (SYD)' is being prepared.

Acknowledgements

The authors gratefully acknowledge assistance given by G.A.M. Scott from notes on types at H-BR made whilst there on leave in 1980 and F. Ramsay for assistance in recording some data. The project and most of the recording was carried out by the senior author.

We gratefully acknowledge a grant from the Australian Biological Resources Study that enabled P. Wilson to check literature and to sort and record some

specimen data. The Royal Botanic Gardens Trust provided assistance during 1984–1987 for Julie Seur to check and locate type specimens, assist with literature and sort the moss collections at NSW. June Sawyer provided label information for collections held at BRI. R. Filson & P. Volleberg assisted with information on types in MEL and R. Orchard at HO. Help was also given by D.G. Catcheside who examined the Flecker Herbarium, Cairns which was then housed at Atherton, Qld but has now been absorbed into the Australian National Herbarium (CANB). Heinar Streimann kindly helped with information from CBG and literature from his Catalogue of Australian Mosses (in press). The co-operation of the Directors and staff of all the Herbaria visited has been greatly appreciated. It would have been impossible to provide the data on specimen numbers in H-BR without the effort in time by Dr P. Isoviiita and Mr M. Piironen. We are particularly indebted to them for their help. Marshall Crosby (MO) kindly provided lists of Carl Müller's Australian types, a list of names based on types recorded for Australia extracted from the world list in the up-to-date computer files for Index Muscorum held at MO. This has proved of value for cross-checking names and authors.

Part I. Special collections at NSW: Lord Howe Island and Vanuatu (New Hebrides)

The collections listed in this section are based primarily on specimens cited in publications by Brotherus & Watts (1915a, 1915b) and held at NSW. All the Lord Howe specimens were collected by W.W. Watts in 1911 whereas those from Vanuatu (formerly New Hebrides) were not collected by Watts but sent to him, mainly by Dr W. Gunn, whilst he was Curator of Bryophytes at the National Herbarium of New South Wales (Ramsay 1980). The specimens were incorporated into his herbarium and given a number by him.

The numbering system used by W.W. Watts needs to be understood by those referring to his specimens. Each geographical area, (e.g. Lord Howe Island, New Hebrides, New South Wales) where he collected or from which he obtained specimens, was given its own set of numbers. Thus numbers related to Lord Howe Island specimens should be recognised as LHI 530 whereas those from North Queensland would be NQ 530, New Hebrides (Vanuatu) NH 530 and so on. Specimens from other collections were also given numbers by him. Understanding his system will prevent confusion when the same number appears on different specimens. Watts sent specimens from his collections to many overseas herbaria on exchange. Those related to his publications with Brotherus went to Helsinki (H-BR) and duplicates were retained at NSW while some duplicates were sent also to other herbaria. As holotypes were not designated in their publications and the herbarium holding not cited, it has been assumed here that the specimen examined by Brotherus and held in H-BR will be the holotype if a single specimen is cited. Where a series of syntypes were cited and no lectotype has been chosen this has been noted. Thus in most cases the collections at H-BR take priority over those at NSW, but where there is any doubt, as Watts examined all specimens, the specimen at NSW has been named as lectotype.

Register of Type Specimens at NSW: Lord Howe Island

(The latitude and longitude for Lord Howe Island as represented by Mt Gower is 31°36'S 159°05'E ; for convenience Lord Howe Island is abbreviated as LHI in label data in this study)

***Bryum aequicollum* Broth. & Watts (1915a: 372)**

LABEL:

1. Second open gully, S. of King's, LHI, *W.W. Watts* 213a, 15.vii.1911.
2. Mt Gower, LHI, *W.W. Watts* 360, 1-4.viii.1911
3. Open gully just S of King's, LHI, *W.W. Watts* 147d,
4. Rocks S. of King's, LHI, *W.W. Watts* 207, 15.vii.1911.
5. Mt Gower, LHI, *W.W. Watts* 408, 1-4.viii.1911.

PROTO: 'Among rocks one mile south of King's (n 207); open gully south of King's (n 147d, 213a); Mt Gower (n 360, 408); also Northern Hills and sea cliff, Middle Beach.'

ISOSYNTYPE: NSW (*Watts* 147d, 207, 213a, 360, 408)

SYNTYPE: H-BR (*Watts* 147d, 207, 213a, 360, 408)

REC: [= *B. dichotomum* Hedw., based on specimens cited by Ochi (1970: 17): *Watts* 147d, 213a, 360 from H. Not lectotypified by Ochi.]

***Bryum diversinerve* Broth. & Watts (1915a: 371)**

LABEL:

1. Sea cliffs, Middle Beach (to south), LHI, *W.W. Watts* 105, 7.vii.1911.
2. Second open gully S. of King's, LHI, *W.W. Watts* 190, 15.vii.1911.
3. Northern Hills, LHI, *W.W. Watts* 283, vii.1911.

PROTO: 'Sea cliff, Middle Beach (n 105); Northern Hills (n 283); gully, south of King's (n 190).'

SYNTYPE: NSW (*Watts* 190); ISOSYNTYPE: NSW (*Watts* 105, 283)

SYNTYPE: H-BR (*Watts* 105, 283)

REC: [= *B. erythrocarpoides* C. Muell.: specimens cited by Ochi are *Watts* 283, 105 and *Watts* 332 as *B. howeanum* from H; not lectotypified by Ochi (1970: 29). Annotated = *B. erythrocarpoides* C. Muell., T. Seki 1975 on H-BR collections]

***Bryum howeanum* Broth. & Watts (1915a: 373).**

LABEL:

1. North Head, LHI, *W.W. Watts* 500, viii.1911.
2. North Head, LHI, *W.W. Watts* 503, viii.1911.
3. North Head, LHI, *W.W. Watts* 501=500-viii.1911. (second specimen 501 not annotated=500).
4. North Head, LHI, *W.W. Watts* 510

PROTO: 'North Head. (n 500, 501, 503, 510).'

ISOSYNTYPE: NSW (*Watts* 500, 501, 503, 510)

SYNTYPE: H-BR (*Watts* 500, 501, 503, 510)

REC: [= *B. campylotheceum* Tayl.: specimens cited by Ochi (1970: 51) are *Watts* 485, 500, 500a, 510, 522, all from H; not lectotypified by Ochi.]

***Bryum leptothecioides* Broth. & Watts (1915a: 374)**

LABEL:

1. S. of Robins', LHI, *W.W. Watts* 100, 6.vii.1911
2. North Head, LHI, *W.W. Watts* 491, viii.1911

3. North Head, LHI, *W.W. Watts* 494, viii.1911 (2 specimens).
4. North Head, LHI, *W.W. Watts* 506?a, viii.1911.
5. Northern Hills, LHI, *W.W. Watts* 284a, vii.1911.
6. Northern Hills, LHI, *W.W. Watts* 235a, 21.vii.1911.
7. Blenkenhorpe's Beach, LHI, *W.W. Watts* 489, viii.1911. Syntype.
8. Gully S. of King's, LHI, *W.W. Watts* 180, 15.vii.1911. Syntype.
9. Open gully just S of King's, LHI, *W.W. Watts* 176, 13.vii.1911 or 15.vii.1911
10. Open gully just S. of King's (Mt. Lidgbird), LHI, *W.W. Watts* 162, 13.viii.1911. Syntype.
11. Open gully above King's, LHI, *W.W. Watts* 151, 13.vii.1911.
12. Rocks and soil beyond G. Wilson's, LHI, *W.W. Watts* 66, 5.vii.1911 Syntype.

PROTO: 'Rock by sliprails south of Robin's farm (n 100); gully south of King's, base of Mt. Lidgbird (n 151, 152, 162, 176, 180); Blenkenhorpe's Beach (n 489, 526); Northern Hills (n 235a, 284a); rock & soil back of Gower Wilson's (n 66); North Head (n 491, 494, 506a).'

SYNTYPE: NSW (*Watts* 151); ISOSYNTYPE: NSW (*Watts* 66, 100, 162, 176, 180, 235a, 284a, 491, 494, 506?a).

SYNTYPE: H-BR (*Watts* 66, 100, 162, 176, 180, 235a, 284a, 489, 491, 494, 506a)

REC: [= *B. capillare* L. ex Hedw., no specimens mentioned by Ochi (1970: 48). Not lectotypified by Ochi]

***Bryum limbifolium* Broth. & Watts (1915a: 373)**

LABEL:

1. In drip of fall, Head of 'Dinner Run', LHI. *W.W. Watts* 332, 29.vii.1911 Type

PROTO: 'Growing in drip of a waterfall at the head of the 'Dinner Run' on the eastern side of Mt. Lidgbird' [No number given].

ISOTYPE: NSW

HOLOTYPE: H-BR

REC: [= *B. erythrocarpoides* Ochi (1970: 17). Note on specimen in H-BR 'No.332 determined as *B. howeanum* Broth. & Watts n. sp. rev. Ochi 14.1.1968 = *B. curvicolium* Broth'. The specimen at NSW was not so annotated but called *B. limbifolium* by Watts and needs checking against the H-BR specimen]

***Bryum philonotideum* Broth. & Watts (1915a: 372)**

LABEL:

1. Blenkenhorpe's Beach, LHI, *W.W. Watts* viii.1911.
2. Rocks, Blenkenhorpe's Beach, LHI, *W.W. Watts* 526 viii.1911.

PROTO: 'Rocks, Blenkenhorpe's Beach (n 526)'

ISOTYPE: NSW; PARA: NSW (*Watts* no number)

HOLOTYPE: H-BR

REC: [= *B. dichotomum* Hedw.; Ochi (1970: 17) cites specimen in H as Type. Specimen 1 above is missing the number 526 but is otherwise identical and is therefore determined here as a paratype]

***Ectropothecium howeanum* Broth. & Watts (1915a: 379-380)**

LABEL:

1. Gully, back of 'The Pines', LHI, *W.W. Watts* 530
2. 'The Pines', LHI, *W.W. Watts* 533
3. Gully, back of 'The Pines', LHI, *W.W. Watts* 533 19.vii.1911.

PROTO: 'on rocks in deep gully at back of 'The Pines' July 1911 (n 530, 533)'

ISOSYNTYPE: NSW (*Watts* 530, 533)

SYNTYPE: H-BR (*Watts* 530, 533)

REC: [Although all specimens do not have full label data the locality and numbers are correct. Not yet lectotypified]

***Echinodium parvulum* Broth. & Watts (1915a: 376)**

LABEL:

1. 'Run' above 'Scaly Bark' LHI, *W.W. Watts* 517 viii.1911

PROTO: "In 'Run' above 'Scaly Bark', Mt. Lidgbird (n 517)."

ISOTYPE: NSW

HOLOTYPE: H-BR

REC: [= *E. umbrosum* (Mitt.) Jaeg. var. *umbrosum* Churchill, (1986: 128); specimen in H-BR annotated as Holotype on packet by G. Scott 11.5.1976]

***Fissidens amblyothallioides* Broth. & Watts (1915a: 366)**

LABEL:

1. Gully S. of King's, LHI, *W.W. Watts* 153 13.vii.1911

2. Open paddock beyond G. Wilson's, LHI, *W.W. Watts* 78 5.vii.1911

3. Edge of sideling on way to King's, LHI, *W.W. Watts* 102 6.vii.1911

4. Gully beyond King's, LHI, *W.W. Watts* 145 13.vii.1911

5. Open gully S. of King's, LHI, *W.W. Watts* 157 13.vii.1911

6. Open gully just S. of King's, LHI, *W.W. Watts* 163 =157 13.vii.1911

7. Open gully beyond King's, LHI, *W.W. Watts* 178 =157 15.vii.1911

8. Dinner 'Run', LHI, *W.W. Watts* 327 29.vii. 1911

9. North Head, LHI, *W.W. Watts* 494 viii.1911

PROTO: 'Gully, south of King's (n 153, 157, 178, 145, 163); North Head (n 494 ex p.); edge of sideling on way to King's (n 102); paddock. at north end of Island (n 78); Dinner 'Run' (n 327).'

ISOSYNTYPE: NSW (*Watts* 78, 102, 145, 153, 157, 163, 178, 327, 494)

SYNTYPE: H-BR (*Watts* 78, 102, 145, 153, 157, 163, 178, 327, 494)

REC: [Data for *Watts* 78 in NSW differs from protologue in mention of G. Wilson's but specimen is annotated type. A lectotype needs to be chosen]

***Fissidens arcuatulus* Broth. & Watts (1915a: 368)**

LABEL:

1. Ground on way to Johnson's from Robin's, LHI, *W.W. Watts* 118 8.vii.1911

PROTO: 'On ground beyond Robin's farm (n 118)'

ISOTYPE: NSW

HOLOTYPE: H-BR

REC: [no additional information]

***Fissidens longiligulatus* Broth. & Watts (1915a: 367)**

LABEL:

1. Mt Gower, LHI, *W. W. Watts* 382 1-4.viii.1911 [mixed with *Echinodium hispidum*] sent to Brotherus as possibly *sp. nov.*

PROTO: 'On trees, Mt Gower n. 382, 525.'

ISOSYNTYPE: NSW (*Watts* 382)

SYNTYPE: H-BR (*Watts* 382, 525) [annotated by I.G. Stone (1988) in pencil = *F. asplenoides*, but the combination is not yet published]

Fissidens subtenellus Broth. & Watts (1915a: 366)

LABEL:

1. By well at back of G. Wilson's, LHI, *W.W. Watts* 60 (=56) 4.vii.1911 det. Broth.
2. Track above sugar cane, back of Paton's, LHI, 1 *W.W. Watts* 56 4.vii.1911 det. Broth.

PROTO: 'Track above sugarcane back of Paton's (n. 56); back of Gower Wilson's (n. 60 ex p.).'

ISOSYNTYPE: NSW (*Watts* 56, 60)

SYNTYPE: H-BR (*Watts* 56, 60)

REC: [Lectotype needs to be chosen]

Fissidens tenelliformis Broth. & Watts (1915a: 367)

LABEL:

1. Northern Hills, LHI, *W.W. Watts* 221 21.vii.1911 det. Broth.
2. Northern Hills, LHI, *W.W. Watts* 223 21.vii.1911
3. Northern Hills, near top, *W.W. Watts* 209 20.vii.1911

PROTO: 'On earth, Northern Hills (n. 209, 221, 223).'

ISOSYNTYPE: NSW (*Watts* 209, 221, 223)

SYNTYPE: H-BR (*Watts* 209, 221, 223)

REC: [Lectotype needs to be chosen]

Fissidens watsii Broth. (1915a: 368)

LABEL:

1. Northern Hills, I, *W.W. Watts* 224 21.vii.1911 det. Broth. 1913
2. Stone, Intermediate Hill, LHI *W.W. Watts* 136 (=515) 10.vii.1911 det. Broth. 1913
3. Run, scaly bark, LHI, *W.W. Watts* 518.viii.1911 det. Broth. 1913
4. Run, scaly bark, LHI, *W.W. Watts* 515.viii.1911 det. Broth. 1913
5. Dinner Run, LHI, *W.W. Watts* 337 (=209) 29.vii.1911 det. Broth. 1913

PROTO: 'Northern Hill (n. 224); Dinner Run (n.337); 'Run', Scaly Bark (n.515, 518); Stone, Intermediate Hill (n. 136).'

ISOSYNTYPE: NSW (*Watts* 136, 224, 337, 515, 518)

SYNTYPE: H-BR (*Watts* 136, 224, 337, 515, 518)

REC: [Lectotype needs to be chosen]

Holomitrium perichaetiale (Hook.) Brid. var. **robustum** Broth. & Watts (1915a: 364-5)

LABEL:

1. Saddle Back, LHI, *W.W. Watts* 449 5.vii.1911

PROTO: 'Saddle Back (no. 449)'

HOLOTYPE: NSW

? : H-BR (no specimen located)

REC: [see comments in Ramsay, (1986: 311)]

***Isopterygium howeanum* Broth. & Watts (1915a: 380-1)**

LABEL:

1. Hillside back of Johnson's, LHI, *W.W. Watts* 112 8.vii.1911

PROTO: 'on rotten log, back of Johnson's (n 112)'

HOLOTYPE: NSW

ISOTYPE: H-BR

REC: [no additional information]

***Macromitrium peraristatum* Broth. (1893: 45)**

LABEL:

1. Mt Gower LHI, *T. Whitelegge* ix.1887 Type [Hb. NSW M12734]2. LHI, *T. Whitelegge* 2 viii.18873. On branches of trees, Mt Gower, LHI, viii-ix 1887 *T. Whitelegge* 2B (2 specimens)[in Whitelegge's handwriting]4. LHI *T. Whitelegge* Sept 1887 [Watts' handwriting, thus data transferred from original when duplicate made]

PROTO: 'Lord Howe Island, Mt Gower, ubi ad ramulos arborum m. Sept. 1887. legit T. Whitelegge (n 2)'

ISOTYPE: NSW (*Whitelegge* 2, Sept 1887); PARATYPE: (*Whitelegge* 2B)HOLOTYPE: H-BR (*Whitelegge* 2)

REC: [Name confirmed Vitt & Ramsay, (1985: 425). Whitelegge collected a series of specimens in August-September, 1887. According to the protologue *Whitelegge* n2 was collected on Mt Gower in September, but the specimen held at NSW (n.2) gives only Lord Howe Island as the locality and the date as *August*. but is listed here as an isotype. The specimen annotated type at NSW is not numbered but fits the date and locality (=isotype) as does specimen 4 above. Only two specimens, *Whitelegge* 2B, are annotated as in the protologue, but the date on these is viii-ix 1887. These are named here as paratypes. The single specimen held at H-BR is the holotype.]

***Macromitrium subbrevicaule* Broth. & Watts (1915a: 371)**

LABEL:

1. Rocks, cliff, North Head, LHI, *W.W. Watts* 478 viii.19112. North Head, LHI, *W.W. Watts* 507 viii.19113. Sea cliff, Northern Hills, LHI, *W.W. Watts* 239 21.vii.19114. North Head, LHI, *W.W. Watts* 504 viii.19115. Seacliff, Top of Northern Hills, LHI, *W.W. Watts* 236 21.vii.19116. Seacliff, top of Northern Hills, LHI, *W.W. Watts* 21.vii.1911

PROTO: 'Growing mostly on cliffs at North Head and on the Northern Hills (n 236, 239, 478, 504, 507).'

ISOLECTOTYPE: NSW (*Watts* 239); SYNTYPE: NSW (*Watts* 236, 478, 504, 507); PARATYPE: NSW (*Watts* no number)LECTOTYPE: H-BR (*Watts* 239) Vitt & Ramsay, 1985; SYNTYPE: H-BR (147d, 207, 360, 408)REC: [= *M. brevicaule* (Besch.) Broth. Vitt & Ramsay, (1985: 381-2) Specimen 6 above without collection number is selected here as a paratype since data match protologue]***Rhaphidostegium subfalcatulum* Broth. & Watts (1915a: 381-2)**

LABEL:

1. Back of Henderson's, LHI, *W.W. Watts* 131 10.vii.19112. Intermediate Hill, LHI, *W.W. Watts* 134 10.vii.1911

3. Above Johnson's, LHI, *W.W. Watts* 122 8.vii.1911
4. Mt. Gower, LHI, *W.W. Watts* 364a viii.1911
5. Intermediate Hill, LHI, *W.W. Watts* 135 10.vii.1911
6. Mt. Gower, LHI, *W.W. Watts* 370 1-4.vii.1911 (2 specimens)
7. Mt. Gower, LHI, *W.W. Watts* 400 viii.1911

PROTO: 'on rotten log, Intermediate Hill (n 134, 135); creek above Johnson's (n 122); gully at back of Henderson's (n 131); Mt. Gower (n 370, 400); top of Mt. Gower (n 364a).'

ISOSYNTYPE: NSW (122, 131, 134, 135, 364a, 370, 400)

SYNTYPE: H-BR (122, 131, 134, 135, 364a, 370, 400)

REC: [=? *Rhaphidorrhynchium subfalcatulum* (Broth. & Watts) Broth.- listed as *Pungentella subfalcatulum* (Broth. & Watts) C.Muell. in Ramsay (1984: 556). Lectotype not yet chosen]

***Rhynchostegiella campylioides* Broth. & Watts (1915a: 383)**

LABEL:

1. Second open gully, south of King's, LHI, *W.W. Watts* 201 15.vii.1911

PROTO: 'swampy ground, open gully, south of King's (n 201)'

ISOTYPE: NSW

HOLOTYPE: H-BR

REC: [no additional information]

***Rhynchostegium tenuifolium* (Hedwig) Reichardt. var. *howeanum* Broth. & Watts (1915a: 383)**

LABEL:

1. Back of G. Wilson's, LHI, *W.W. Watts* 50 4.vii.1911

PROTO: 'very plentiful at back of Gower Wilson's; also found in Robin's swamp.'

LECTOTYPE: NSW (*Watts* 50)

ISOLECTOTYPE: H-BR

REC: [No number was cited in the protologue. As the NSW specimen *Watts* No. 50 has var. *howeanum* written on it but those in H-BR do not, the specimen at NSW has been chosen here as the lectotype]

***Thuidium trachypodioides* Broth. & Watts (1915a: 379)**

LABEL:

1. 'The Pines' LHI, *W.W. Watts* 293 19.vii.1911
2. Gully, back of 'The Pines', LHI *W.W. Watts* 287 (=438) 19.vii.1911 det. Broth. 1913. Lectotype (duplicate), Haak (1983).
3. Gully at back of 'The Pines' LHI, *W.W. Watts* 537 20.vii.1911 det. Broth. Syntypetype Haak (1983).
4. Gully, back of 'The Pines', LHI, *W.W. Watts* 289 19.vii.1911. det. Broth. Syntypetype, Haak (1983).

PROTO: 'On coral rocks, gully behind 'The Pines' (n 287, 289, 293, 537); south of King's, open gully (n 164) and creek (n 171) top of Mt. Gower (n 389)'

ISOLECTOTYPE: NSW (*Watts* 287); ISOSYNTYPE: NSW (*Watts* 289, 293, 537)

LECTOTYPE: H-BR (*Watts* 287, Touw & Haak (in press)); SYNTYPE: H-BR (*Watts* 289, 293, 537)

REC: [Wijk et al 1959-1969 cite this as *hom. illeg.* In recent studies Touw & Haak (in press) have checked specimens *Watts* 164, 171, 389 and identified them as *T. sparsum*.

The lectotype chosen for *T. trachypodioides* as Watts 287, Only the collections from the gully behind 'The Pines' belong to this taxon. The species is known only from these type collections.]

***Tortella subflavovirens* Broth. & Watts (1915a: 369–370)**

LABEL:

1. Ground above beach near Flagstaff, LHI, *W.W. Watts* 300 24.vii.1911
2. Rocks, beach near Wilson's, LHI, *W.W. Watts* 84 5.vii.1911
3. Middle beach, LHI, *W.W. Watts* 106 7.vii.1911
4. Rocks by sea, west side, near Johnson's, LHI, *W.W. Watts* 108 8.vii.1911
5. Sea cliff near landing place, LHI, *W.W. Watts* 174 14.vii.1911
6. LHI, ex. p. *W.W. Watts* 502 (In literature, location is 'stone-border, Wilson's garden').
7. Blenkenthorp's Beach, LHI, *W.W. Watts* 524 viii.1911
8. Rocks by Wilson's boatshed, LHI, *W.W. Watts* 83 5.vii.1911
9. North Head, LHI *W.W. Watts* 488 viii.1911

PROTO: 'Sandy cliff by Flagstaff (n 300, 174); rocks near Wilson's (n 84, 83); Blenkenthorp's Beach (n 524); rocks by sea, Johnson's (n 108); stone-border, Wilson's garden (n 502 ex.p.); on rocks, Middle Beach (n 106) etc.'

ISOSYNTYPE: NSW (*Watts* 83, 84, 106, 108, 174, 300, 502, 524)

SYNTYPE: H-BR (*Watts* 83, 84, 106, 108, 174, 300, 502, 524)

REC: [Lectotype not yet chosen]

***Trachyloma wattsii* Broth. (Broth. & Watts 1915a: 377)**

LABEL:

1. Mt Gower, LHI, *W.W. Watts* 357 1–4.vii.1911

PROTO: 'Mt Gower (n 357)'

ISOTYPE: NSW

HOLOTYPE: H-BR

REC: [Specimen in H-BR is annotated as holotype by G. Scott 17.5.1976, conf. N. Miller & M. Manuel 1982]

Invalid Names

***Bryum whiteleggei* Broth. (1892: 277)**

LABEL:

1. LHI, *T. Whitelegge* 14.ix.1887
2. LHI 5

REC: [Specimen cited without valid description — *nom. nud.* see Brotherus & Watts 1915a: 384]

***Fissidens howeanus* Broth. ex Whitelegge (1892: 277)**

LABEL:

1. Near Capt. Nicholl's farm, LHI, *T. Whitelegge* 19B viii.1887

REC: [Accepted as valid species in Index Muscorum. *B. howeanus* was listed in Whitelegge & Brotherus (1892: 277) but without description -*nom. nud.*: see Brotherus & Watts (1915a: 384)]

Register of Type Specimens at NSW: Vanuatu (New Hebrides)

(Relevant latitudes and longitudes are Aneityum Is. 20°14'S 169°51'E ; Futuna Is. 19°32'S 170°12'E; Epi Is. 16°50'S 168°20'E; Paama Is. 16° 25'S 168°15'E; Espiritu Santo Is. 15°31'S 167°E.)

***Barbula aneitensis* Broth. & Watts (1915b: 136-7)**

LABEL:

1. S.W. side Aneityum Island c. Gunn v-vi. 1913, *Watts* 416 Aneityum Island 19°32'S 170°32'E.

PROTO: 'Aneityum: Gunn May-June 1913 (Hb Watts 416)'.

ISOTYPE: NSW

HOLOTYPE: H-BR

REC: [=*B. subcomosa* Broth. det. D.H. Norris. Annotated lectotype on packet at H-BR by D.H. Norris ix.1985 but this is neither validly published nor necessary]

***Callicostella frateri* Broth. & Watts (1915b: 145-6)**

LABEL:

1. Paama Island. Dr. Gunn and Rev. Frater 1912. Hb. *Watts* 259

PROTO: 'Paama: Gunn & Frater 1912 (Hb. Watts 259)'

ISOTYPE: NSW

HOLOTYPE: H-BR

REC: [Annotated as lectotype by D.H.Norris Nov. 1982 and det. as =*C. papillata* (Mont.) Mitt. xii.1986). This has not been published and lectotypification is not necessary]

***Camptochaete prolongata* Broth. & Watts (1915b: 144)**

LABEL:

1. Aneityum Island, Dr. Gunn 1912 ex Herb. Rev. D. Lillie

PROTO: 'Aneityum: Gunn 1912 (Hb. Lillie 749)'

PARATYPE: NSW

HOLOTYPE: H-BR

REC: [NSW specimen fits protologue but no number is given hence this is named here as paratype.]

***Chaetomitrium aneitense* Broth. & Watts (1915b: 146)**

LABEL:

1. Aneityum Island per Dr. Gunn vii-viii.1913. *Watts* 474

PROTO: 'Aneityum: Gunn 1913 (Hb Watts 474)'

ISOTYPE: NSW

HOLOTYPE: H-BR

REC: [Annotated on packet as lectotype by D.H. Norris ix.1986. This was not published nor is it necessary]

***Clastobryum hebridense* Broth. & Watts (1915b: 144-5)**

LABEL:

1. Aneityum Island Dr. Gunn ii.1913 *Watts* 387

PROTO: 'Aneityum: Gunn Feb. 1913 (Hb Watts 387)'

ISOTYPE: NSW

HOLOTYPE: H

REC: [This number occurs in the main Herbarium (H) Brotherus No. R11468 and not in the Brotherus Herbarium (H-BR). As he must have seen this specimen it is most likely the holotype]

***Ectropothecium aneitense* Broth. & Watts (1915b: 149)**

LABEL:

1. Aneityum Island, Gunn ii.1913 Hb. *Watts* 379
2. Aneityum Island Gunn ii.1913 Hb. *Watts* 382
3. Aneityum Island, Dr Gunn 1912 ex Hb. Rev. D. Lillie.

PROTO: 'Aneityum: Gunn 1912 (Hb. Lillie 760, 761) Feb. 1913 (Hb. *Watts* 379, 382b).'

ISOSYNTYPE: NSW (*Watts* 379, 382)

PARATYPE: NSW (Hb Lillie)

SYNTYPE: H-BR (*Watts* 379, 382; Hb. Lillie 760, 761)

REC: [Specimen 3 above does not have a number but as the rest of the data fit it is named here as a paratype. Lectotype needs to be chosen]

***Ectropothecium bowiei* Broth. & Watts (1915b: 149)**

LABEL:

1. Santo, F.G.Bowie xi.1909 Hb. *Watts* 53.
2. F.G.Bowie 1909 Hb. *Watts* 106.

PROTO: 'Santo: Bowie 1909 (Hb. *Watts* 53, 106)'

ISOSYNTYPE: NSW (*Watts* 53, 106)

SYNTYPE: H-BR (*Watts* 53, 106)

REC: [Needs to be lectotypified]

***Ectropothecium brachyphyllum* Broth. & Watts (1915b: 150)**

LABEL:

1. SW side of Aneityum Island Dr Gunn v-vi.1913 Hb. *Watts* 425 (3 specimens)
2. Aneityum Island, Dr. Gunn v-vi.1913 Hb. *Watts* 458 (2 specimens)

PROTO: 'Aneityum: Gunn May-June 1913 (Hb *Watts* 425, 458)'

ISOSYNTYPE: NSW (*Watts* 425, 428)

SYNTYPE: H-BR (*Watts* 425, 428)

REC: [A lectotype needs to be chosen]

***Ectropothecium gunnii* Broth. & Watts (1915b: 150)**

LABEL:

1. Aneityum Island comm. natives Dr. Gunn ii. 1913 Hb. *Watts* 383
2. Aneityum Island comm. natives, Dr. Gunn ii. 1913 Hb. *Watts* 393
3. Aneityum Island Dr Gunn v-vi 1913 Hb. *Watts* 404
4. Aneityum Island Dr. Gunn v-vi 1913 Hb. *Watts* 459

PROTO: 'Aneityum: Gunn (Hb. *Watts* 383, 393, 404, 459)'

ISOSYNTYPE: NSW (*Watts* 383, 393, 404, 459)

SYNTYPE: H-BR (*Watts* 383, 393, 404, 459)

REC: [Needs to be lectotypified]

Epipterygium vanuatuicum H.A. Miller (1988: 133–7)

LABEL:

1. Vanuatu: Ambrym Island, east fork of Woala River, in narrow gulch, 1700–1900 ft. alt.
H.A. Miller 19389, 23 September 1985, ex Hb. Harvey A. Miller

PROTO: 'Vanuatu, Ambrym Island, East fork of Woala River, 550m, in deep gulch, 23 Sep 1985, H.A. Miller 19389'

ISOTYPE: NSW

HOLOTYPE: MU

REC: [recently described — Miller (1988: 133–137)]

Euptychium assimile Broth. & Watts (1915b: 140)

LABEL:

1. Futuna Island Dr. Gunn x.1910 Hb. Watts 208

PROTO: 'Futuna: Gunn 1910 (Hb Watts 208, Hb Lillie 530) Aneityum: Gunn 1611 (Hb Watts 181)'

ISOLECTOTYPE: NSW (Watts 208)

LECTOTYPE: H (?Hb Watts 208 or ? Hb. Lillie 530) During (1977: 69), [not clear which was chosen]; ISOLECTOTYPE: BM (specimen not cited); FH (specimen not cited); JE (specimen not cited); ISOLECTOTYPE: H-BR (?Watts 208 or Hb. Lillie 530); SYNTYPE: H-BR (Watts 181)

REC: [Specimens in H-BR annotated = *E. setigerum* (Sull.) Broth. subspecies *setigerum* (det. During 1976). Lectotypified by During (1977: 69) but not clear which of two specimens *Watts 208* or *Hb. Lillie 530* was chosen hence clarification needed to confirm validity of lectotype. During did not examine the collections from NSW]

Euptychium gunnii Broth. & Watts (1915b: 140–1)

LABEL:

1. Aneityum Island Dr. Gunn 1911 Hb. Watts 145 Det. Broth. (2 specimens)
2. Aneityum Island Dr. Gunn ii.1913 Hb. Watts 358 conf. Broth.
3. Aneityum Island, Dr. Gunn ii.1913 Hb. Watts 366 confd. Broth.
4. S.W. side Aneityum Island Dr. Gunn v-vi.1913 Hb. Watts 422 (3 specimens)
5. S.W. side Aneityum Island Dr. Gunn v-vi.1913 Hb Watts 462. Confd. Broth.
6. Aneityum Island Dr. Gunn iii.1911 Hb. Watts 225 (3 specimens)
7. S.W. side Aneityum Island, comm. Gunn v-vi 1913 Hb. Watts 424 Det. Broth.
8. S.W. side Aneityum Island comm. Gunn v-vi.1913 Hb. Watts 435 Det. Broth.
9. Aneityum Island, Natives comm. Dr. Gunn ii.1913 Hb. Watts 358 Det. Broth.

PROTO: 'Aneityum: Gunn 1911 (Hb. Watts 145, 225 cfr 'Hb. Lillie 536') Feb. 1913 (Hb. Watts 358, 366) May-June 1913 (Hb. Watts 422, 424, 435, 462)'

ISOLECTOTYPE: NSW (Watts 145); ISOSYNTYPE: NSW (Watts 225, 358, 366, 422, 424, 435, 462)

LECTOTYPE: H-BR (Watts 145) During (1977:69); ISOLECTOTYPE: BM (Watts 145); SYNTYPE: H-BR (Watts 225cfr, 358, 366, 422, 424, 435, 462; Hb. Lillie 536)

ISOSYNTYPE: BM (Watts 225); JE (Watts 225)

REC: [All specimens at H-BR were determined as = *E. setigerum* subspecies *setigerum* by During 1976. Lectotypified by During (1977: 69). None of the specimens in NSW were examined by During.]

Fissidens scabrisetus Broth. & Watts (1915b: 132)

LABEL:

1. Paama: Dr Gunn & Frater vi.1912 Hb. Watts 255

PROTO: 'Paama: Gunn & Frater, June 1912 (Hb. Watts, 215)'

ISOTYPE: NSW

HOLOTYPE: H-BR

Hyophila microphylla *Broth. & Watts* (1915b: 136)

LABEL:

1. Aneityum Island Dr. Gunn Hb. *Watts* 192. Det. Broth.
2. Aneityum Island, comm. Gunn, ii.1913 Hb. *Watts* 353. (3 specimens).
3. Aneityum Island, W, Gunn 1912 ex. Hb. Lillie.

PROTO: 'Aneityum Island: Gunn Oct. 1911 (Hb. Watts 192, Hb. Lillie 699) 1912 (Hb. Lillie 741) Feb. 1913 (Hb. Watts 353)'

ISOSYNTYPE: NSW (Hb. Watts 192, 353); PARATYPE: NSW (ex Hb. Lillie)

SYNTYPE: H-BR (Hb. Watts 192, 353; Hb. Lillie 699, 741)

REC: [On specimen 3 above the data fits although number missing and the specimen is named here as a paratype. Lectotype needs to be chosen]

Hypnodendron flagelliferum *Broth. & Watts* (1915b: 156)

LABEL :

1. Aneityum Island, Gunn 1911. Hb. *Watts* 144, Det. Broth.
2. N. side Aneityum Island, Dr. Gunn v-vi.1913 Hb. *Watts* 402, Hb. NSW M36
3. S.W. side Aneityum Island, Gunn. v-vi.1913 Hb. *Watts* 417.

PROTO: 'Aneityum: Gunn 1911(Hb. Watts 144, Hb. Lillie 689) 1912 (Hb Lillie 746); May-June 1913 (Hb. Watts 402, north side & 417 south-west side).'

ISOSYNTYPE: NSW (Gunn 144=689, Watts 402, 417); LECTOTYPE: H-BR (Hb. Lillie 746, Touw 1971:152);

ISOLECTOTYPE: BM (Hb. Lillie 746); L (Hb. Lillie 746); SYNTYPE: H-BR (Watts 402, 417, Hb. Lillie 689)

ISOSYNTYPE: H-BR (Hb. Watts 144)

REC: [No additional information]

Hypopterygium bowiei *Broth. & Watts* (1915b: 147)

LABEL:

1. Tangoa, Santo F.G. Bowie 1906 comm. Murdoch x.1911 Hb. *Watts*

PROTO: 'Santo: Bowie (Hb Watts 73 Comm. Murdoch)'

PARATYPE: NSW

HOLOTYPE: H-BR

REC: [Specimens at H-BR on loan for revision elsewhere, no details available. Specimen at NSW is missing its number although other data are correct and is named here as a paratype]

Isopterygium gunnii *Broth. & Watts* (1915b: 151)

LABEL :

1. Futuna Island, Dr Gunn, x.1910. Hb. *Watts* 209.
2. Futuna Island.

PROTO: 'Futuna: Gunn, Dec. 1910 (Hb Watts 209, Hb Lillie 519)'

ISOSYNTYPE: NSW (Watts 209)

SYNTYPE: H-BR (Watts 209, Lillie 519)

REC: [Specimen 2. above only gives Futuna Is. but fits locality, possibly a syntype or paratype. Species not yet lectotypified]

Leucobryum aneitense Broth. & Watts (1915b: 130-1)

LABEL :

1. Aneityum Island Dr Gunn, iii.1911 Hb. *Watts* 241 Det. Broth. (2 specimens)
2. Aneityum Island, Dr. Gunn, ii.1911 Hb. *Watts* 230.
3. Aneityum Island. Natives, Dr. Gunn 1913. Hb. *Watts* 357a Det. Broth. (3 specimens).

PROTO: 'Aneityum: Gunn, 1911 (Hb Watts, 241, 230, ex p.), 1912 (Hb Lillie, 736), 1913 (Hb Watts, 357a). Det. Broth. Hb Watts 241'

ISOSYNTYPE: NSW (Watts 241, 357a); SYNTYPE: NSW (Watts 230)

SYNTYPE: H-BR (Watts 241, 357a, Lillie 736)

REC: [Not yet lectotypified]

Leucobryum gunnii Broth. & Watts (1915b: 130)

LABEL :

1. Aneityum Island, Gunn v-vi.1913 Hb. *Watts* 454a (3 specimens)
2. Aneityum Island, comm. Gunn, ii.1913 (2 specimens) Hb. *Watts* 357c.
3. Futuna Island, Natives, Gunn. x.1912, Hb. *Watts* 303.

PROTO: 'Futuna: Gunn Oct. 1913. (Hb Watts, 303); Aneityum: Gunn, 1913 (Hb Watts 357c, 454a).'

ISOSYNTYPE: NSW (Watts 303, 357c, 454a)

SYNTYPE: H-BR (Watts 303, 357c, 454a)

REC: [Not yet lectotypified]

Leucoloma subtenuifolium Broth. & Watts (1915b: 128-9)

LABEL:

1. Aneityum Island, Gunn, viii. 1912. Hb. *Watts* 271, det. Broth.
2. Aneityum Island, natives, comm Gunn ii.1913 Hb. *Watts* 344 Det. Broth. (2 specimens).
3. North side Aneityum Island, comm. Gunn v-vi.1913 Hb. *Watts* 407 det. Broth.
4. Aneityum Island, S.W. side, comm. Gunn, v-vi. 1913 Hb. *Watts* 421 (3 specimens).

PROTO: 'Futuna: Gunn, March-April, 1910 (Hb. Lillie, 523).; Aneityum: Gunn, 1911 (Hb. Lillie, 544, 694), Aug. 1912 (Hb. Watts, 271, Hb. Lillie, 728), Feb 1913 (Hb. Watts, 344), May-June, 1913 (Hb. Watts, 407, 421).'

ISOSYNTYPE: NSW (Watts 271, 344, 407, 421)

SYNTYPE: H-BR (Hb. Lillie 523, 544, 694, 728, Hb. Watts 271, 344, 407, 421)

REC: [not yet lectotypified]

Papillaria pellucida Broth. & Watts (1915b: 141-2)

LABEL:

1. Futuna Island. Dr Gunn, 28.xii.1910 Hb *Watts* 212
2. Aneityum Island, Dr. Gunn, iii.1911. Hb. *Watts* 236
3. Aneityum Island, Dr. Gunn, iii.1911. Hb. *Watts* 239-240 Det. Broth.
4. Futuna Island, Comm. Gunn. x.1912 Hb. *Watts* 295 .

PROTO: 'Futuna: Gunn, Dec., 1910 (Hb Watts, 212, 236, 239); 1911 (295); Aneityum: GUNN, MARCH, 1911 (240).'

ISOSYNTYPE: NSW (212, 236, 239-240, 295)

SYNTYPE: H-BR (specimens on loan)

REC: [*Watts* 295 has correct number but year in protologue is 1912 not 1911— may be an error in protologue; *Watts* 236 has correct number but year is 1911 whereas in protologue it is 1910— may be an error in protologue; not yet lectotypified]

Rhynchostegium oblongifolium Broth. & Watts (1915b: 156)

LABEL :

1. Santo, F.G. Bowie, 1909. Hb *Watts* 116
2. Futuna Island. Comm. Dr. Gunn x.1912 Hb. *Watts* 302. Det. Broth.

PROTO: 'Santo: Bowie 1909 (Hb *Watts*, 116). Futuna: Gunn, Oct., 1912 (302).'

SYNTYPE: NSW (*Watts* 116, 302)

REC: [No specimens located in H-BR. Needs to be lectotypified]

Sematophyllum glabrifolium Broth. & Watts (1915b: 154)

LABEL: S-W side Aneityum Island. Gunn v-vi.1913. *Watts* 436a

PROTO: 'Aneityum, south-west side; Gunn, May-June, 1913 (Hb *Watts* 436a)'

ISOTYPE: NSW (*Watts* 436a)

HOLOTYPE: H-BR (*Watts* 436a)

REC: [Specimen at H-BR must be the Holotype; =*Aptychella glabrifolia* on folder in H-BR]

Sematophyllum serricalyx Broth. & Watts (1915b: 154-5)

LABEL:

1. Aneityum Island. Comm. Dr Gunn, v-vi. 1913. *Watts* 457.
2. Santo, F.G. Bowie xi.1909 Hb. *Watts* 63 Det. Broth.
3. Aneityum, Gunn v-vi.1913

PROTO: 'Santo: Bowie, 1909 (Hb *Watts*, 56 e.p., 63 c.fr.). Epi: Riddle, Jan., 1911 (135); Aneityum: Gunn, 444, 447, 457); Futuna: Gunn, Oct., 192 (329) [192=1912].'

ISOSYNTYPE: NSW (*Watts* 63, 457)

SYNTYPE: H-BR (*Watts* 63cfr, 135, 282, 444, 447, 457)

REC: [Needs lectotypification; Location of *Watts* 56 e.p., 329 unknown]

Symphysodon gunnii Broth. & Watts (1915b: 140)

LABEL:

1. Aneityum Island, Dr. Gunn iii.1911, Hb. *Watts* 221
2. Futuna Island. Natives comm. Dr. Gunn x.1912. Hb. *Watts* 296 Det. Broth. (3 specimens)
3. Futuna Island, Dr. Gunn x.1910, Hb. *Watts* 202
4. Futuna Island, Dr. Gunn, seen by *Watts* 28.x.1910. Hb. *Watts* 202.
5. Epi Island, T.E. Riddle, i.1911, Hb. *Watts* 131 Det. Broth. (2 specimens).
6. Epi Island, T. E. Riddle, i.1911 Hb. *Watts* 142

PROTO: 'Futuna: Gunn, 1910 (Hb *Watts*, 202), Oct. 1912 (296, forma *viridis*); Aneityum 1911, Gunn, (221); Epi: Riddle, Jan., 1911 (Hb. *Watts*, 131, c.fr. and 142)'

ISOSYNTYPE: NSW (*Watts* 131, 202, 296); SYNTYPE: NSW (*Watts* 142, 221)

SYNTYPE: H-BR (*Watts* 131 c.f.r., 202, 296)

REC: [Specimen 5. above may be part of type, but data incomplete and number differs, *Watts* 296 det. as *S.gunnii* f. *viridis* by V.F. Brotherus. Location of *Watts* 142 unknown. Not yet lectotypified]

Synodontia aneitensis Broth. & Watts (1915b: 129–130)

LABEL:

1. Aneityum Island (5 specimens) Comm. Gunn ii.1913. Hb. *Watts* 375.
2. Aneityum Island, Comm. Gunn ii.1913 Hb. *Watts* 377a.

PROTO: 'Aneityum: Gunn, 1911 (Hb. Lillie 701), Feb. 1913 (Hb. Watts, 375, 377a).'

ISOSYNTYPE: NSW (Watts 377a); SYNTYPE: NSW (Watts 375)

SYNTYPE: H-BR (Watts 377a)

REC: [Not yet lectotypified]

Syrrhopodon diversiretis Broth. & Watts (1915b: 134)

LABEL:

1. Aneityum Island, natives, comm. Gunn ii.1913. Hb. *Watts* 352a.
2. Aneityum Island, SW side. Comm. Gunn v-vi.1913, *Watts* 434. (4 specimens).

PROTO: 'Aneityum: Gunn, Feb., 1913 (Hb. Watts, 352a); S.W. side, May-June, 1913 (Hb. Watts, 434).'

ISOTYPE: NSW (Watts 352a); SYNTYPE: NSW (Watts 434)

LECTOTYPE: H-BR (352a)

REC: [*Watts* 352a at H-BR labelled syntype by W.D. Reese; =*S. japonicus* (Besch.) Broth. W.D. Reese (1984); cited as lectotype and *syn. nov.* under *S. japonicus* Reese & Mohamed, (1985: 227). Specimens at NSW were not cited in publication but have been seen by W. D. Reese and determined by him in 1987 — *Watts* 434 and *Watts* 352a are syntypes = *S. japonicus*]

Syrrhopodon lilliei Broth. & Watts (1915b: 133)

LABEL:

1. Aneityum Island, Comm. Gunn ii. 1913, Hb. *Watts* 350 (4 specimens)

PROTO: 'Aneityum: Gunn, 1912 (Hb. Lillie, 740), Feb. 1913 (Hb. Watts, 350)'

ISOSYNTYPE: NSW (Watts 350)

SYNTYPE: H-BR (Watts 350)

REC: [Location of specimen *Lillie* 740 not known; =*S. trachyphyllus* Mont. as *syn. nov.* Mohamed & Reese, (1985: 243) who do not specify the precise nature of the type; they examined a specimen from NY which would be a syntype, the specimen at H-BR should be chosen as the lectotype. Specimens at NSW were not seen by W. D. Reese until 1987 when he confirmed *Watts* 350 as syntype =*S. trachyphyllus*]

Syrrhopodon perarmatus Broth. & Watts (1915b: 133–4)

LABEL:

1. Santo, F.G. Bowie 1909. Hb *Watts* 89 (2 specimens).
2. Aneityum Island, Dr. Gunn x.1911, Hb. *Watts* 193 Det. Broth. (2 specimens)
3. Aneityum Island, N. side. Comm. Gunn iii.1913. Hb. *Watts* 410 (3 specimens)
4. Futuna Island, Natives, comm. Gunn x.1912. Hb. *Watts* 292 Det. Broth. 1912

PROTO: 'Santo: Bowie, 1909 (Hb. Watts, 89); Aneityum: Gunn, Oct., 1911 (Hb. Watts 193, Hb. Lillie, 697), May-June, 1913 (Hb. Watts, 410); Futuna: Gunn, Oct. 1912 (Hb. Watts, 292).'

SYNTYPE: NSW (Watts 89, 193, 410);

ISOTYPE: NSW (Watts 292)

SYNTYPE: H-BR (Watts 292, Hb. Lillie 697).

REC: [Not yet lectotypified. *Watts* 292 in H-BR designated syntype by W. D. Reese 1984; specimen Hb. Lillie, H-BR labelled syntype in pencil but no specimen in NSW has

this number. H. Mohamed & W. D. Reese (1985) retain *S. perarmatus* Broth. & Watts as a species closely allied to *S. spiculosus*; specimens at NSW not examined by W. D. Reese until 1987 when the following were confirmed as syntypes, *Watts* 89, 193, 292, 410]

***Syrrhopodon tenuinervis* Broth. & Watts (1915b: 135)**

LABEL: Futuna Island, Natives, Comm. Dr. Gunn x.1912, Hb. *Watts* 318 'Futuna: Gunn, Oct., 1912 (Hb Watts 318)'

ISOTYPE: NSW (Watts 318)

HOLOTYPE: ?

REC: [no specimen located at H-BR, this species not mentioned in H. Mohamed & W. D. Reese (1985); specimens seen by W.D. Reese in 1987 designated as isotype = *S. japonicus* (Besch.) Broth.; location of the holotype is not known]

***Taxithelium annandii* Broth. & Watts (1915b: 152)**

LABEL:

1. Tangoa, Santo Dr. Annand xiii.1903. Hb. *Watts* 10.

2. Tangoa, Santo Dr. Annand xiii.1903 Hb. *Watts* 17

3. Tangoa, Santo Dr. Annand xiii.1903 Hb. *Watts* 21.

PROTO: 'Tangoa, Santo: Annand, Dec, 1903 (Hb. Watts 10, 17, 21 e.p.)'

ISOSYNTYPE: NSW (Watts 10, 21e.p.); SYNTYPE: NSW (Watts 17)

SYNTYPE: H-BR (Watts 10, 21)

REC: [Not yet lectotypified]

***Trichosteleum gunnii* Broth. & Watts (1915b: 153)**

LABEL:

1. Aneityum Island Comm. Gunn ii.1913 Hb. *Watts* 384 (4 specimens)

2. Aneityum Island, Comm. Gunn ii.1913 Hb. *Watts* 382c

3. Aneityum Island, W. Gunn 1912, ex. Hb. D. Lillie. (2 specimens)

PROTO: 'Gunn, 1912 (Hb. Lillie, 755), Feb., 1913 (Hb Watts, 384, 382c).'

ISOLECTOTYPE: NSW (Watts 382c, 384)

SYNTYPE: H-BR(Watts 382c, 384, Hb. Lillie 755)

REC: [Not yet lectotypified. Specimens 3 above ex Hb. Lillie but without number, but must represent isosyntypes, or paratypes]

***Trichosteleum subtile* Broth & Watts (1915b: 153)**

LABEL: Paama: Dr. Gunn & Rev. Frater vi. 1912. *Watts* 256 (2 specimens)

PROTO: 'Paama: Gunn & Frater, June, 1912 (Hb. Watts, 256, 258)'

ISOSYNTYPE: NSW (Watts 256)

SYNTYPE: H-BR (Watts 256, 258)

REC: [Not yet lectotypified]

Missing Type Specimens

No type specimens were located at NSW for the following species described in Brotherus & Watts (1915a,b):

***Syrrhopodon anietensis* (Hb. Lillie 688)**

Invalid Names

Barbula crispatula C. Muell. (1897: 104)

LABEL: Santo, New Hebrides, F.G. Bowie, 1909. Hb. *Watts* 88.

REC: [nom. inval. in synonym. err. pro. *Syntypetrichia crispatula* C. Muell. Listed only for AM2 in Wijk et al. 1959) = *Calyptopogon mnioides* (Schwaegr.) Broth. *fid.* Salm. *J. Bot.* 41: 3 (1903)]

Floribundaria pseudo-floribunda Fleisch. var. *tenuiramea* Broth. & Watts (1915b: 143)

LABEL: Futuna Island Dr Gunn iii-iv.1911 Com. D. Lillie

PROTO: 'Futuna: Gunn 1911 (Hb Lillie)'

REC: [This is the specimen referred to but without valid description — *nom. nud.*]

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