

## THE EXTRA-EUROPEAN LICHEN COLLECTIONS OF ARCHIBALD MENZIES MD, FLS (1754–1842)

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Two hundred years after their gathering, the pioneering lichen collections made by Archibald Menzies between 1784 and 1802 during his career as a naval surgeon are recorded and discussed. The bulk of Menzies's lichens come from three major collection periods: the Halifax Station (Nova Scotia) of 1784–1786; his time as surgeon to James Colnett on the circumnavigation of the *Prince of Wales* (1786–1789); and his extensive tour as naturalist to Vancouver's *Discovery* expedition (1791–1795).

Menzies's extra-European lichen collections were the most extensive ever made during the 18th century and contain many first discoveries and type collections: (1) Nova Scotia, 16 taxa in 11 genera, 1 type; (2) Staten Island, 32 taxa in 19 genera, 5 types; (3) west coast of North America, 83 taxa in 45 genera, 11 types; (4) Sumatra, 10 taxa in 7 genera; (5) Cape of Good Hope, 30 taxa in 23 genera; (6) New Zealand, 14 taxa in 6 genera; (7) Tahiti, 5 taxa in 4 genera; (8) Hawaii, 25 taxa in 13 genera; (9) St Helena, 10 taxa in 8 genera. Major repositories of Menzies lichens are the Royal Botanic Garden Edinburgh, the Linnean Society of London (James Edward Smith herbarium) and the Natural History Museum, London.

### INTRODUCTION

Archibald Menzies, the Scottish surgeon-botanist (Fig. 1), was born in 1754 at Styx House in the parish of Weem near Aberfeldy, Perthshire, and died at his house at 2 Ladbrooke Terrace, Notting Hill, London on 15 February 1842. Although today widely remembered as the great pioneer of botanical collecting on the north-west coast of America, Menzies also botanized in many other regions during periods of overseas service as a surgeon between 1784 and 1806, both in the navy and on private merchantmen (Galloway & Groves, 1987). As surgeon on the *Prince of Wales*, Menzies collected lichens from Staten Island, the west coast of North America, Hawaii, and the south end of Sumatra (Fig. 2a); and as Vancouver's naturalist on the *Discovery* voyage of 1791–1795 he collected from the Cape of Good Hope, Dusky Sound, New Zealand, Tahiti, Hawaii, the west coast of North America, and St Helena (Fig. 2b).

Menzies was a complete botanist, being interested in, and collecting, all plant groups. The cryptogams, especially mosses and lichens, were among his favourite plants and those that he kept in his personal herbarium until his death. He was obviously keenly interested in the names of lichens, and many of his specimens (especially those in E) have pencil annotations of names (Fig. 3) from either Swartz's *Prodromus* (Swartz, 1788) or Acharius's works (Acharius, 1803, 1810, 1814).

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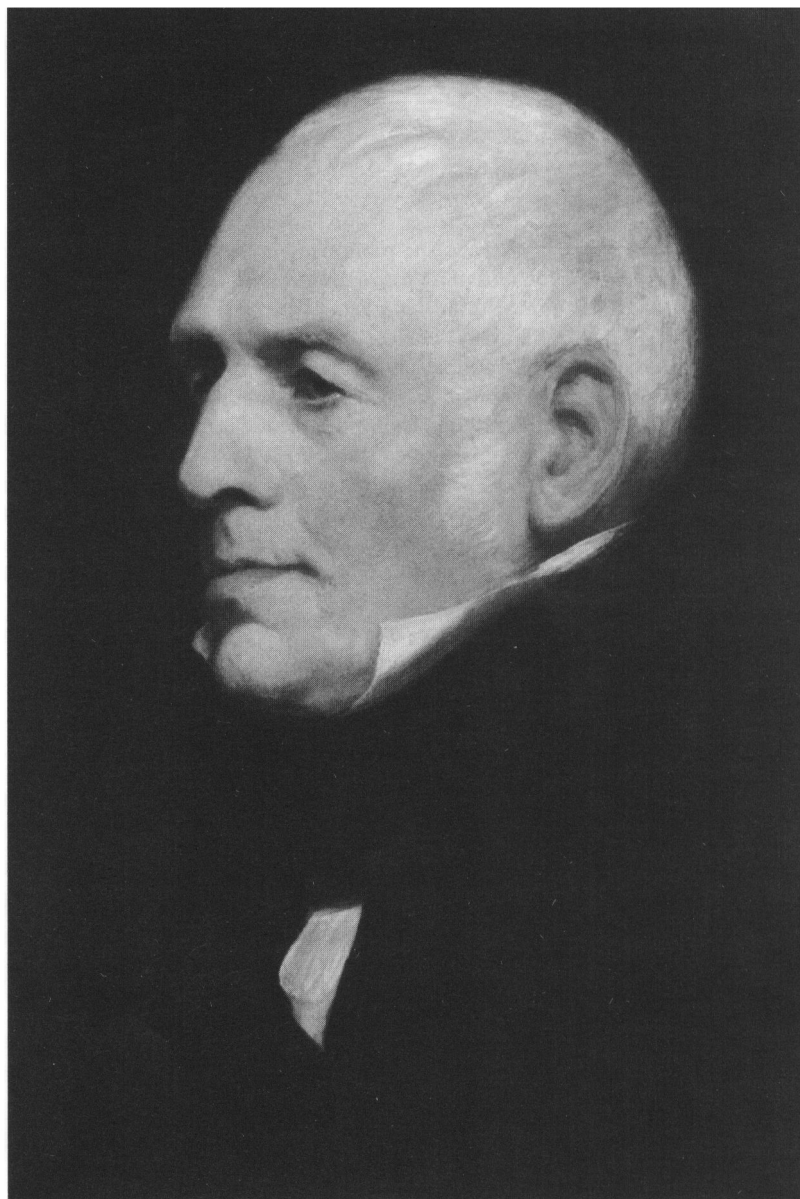


FIG. 1. The Eddis portrait of 'Archibald Menzies Esq. F.L.S. Presented by subscription Nov. 14, 1836' in the Meeting Room of the Linnean Society of London. (Published with permission of the President and Council of the Linnean Society of London).

Menzies was a friend and correspondent of Swartz (Galloway & Groves, 1987) and it was through Swartz, and James Edward Smith, that he came to know of the work of Acharius (Galloway, 1988b). His collections of bryophytes and flowering plants

- (a) Nova Scotia 1704. BM.  
 Nova Scotia 1705 BM.  
 Antislund - Feb. 1707. A. Menzies  
 Antislund near Santa del Fuogo - Feb. 1707 BM.  
 West-coast of North America Sept. 1707 BM.  
 West-coast of N. America Oct. 1707 BM.  
 West-coast of N. America 1700. BM.  
 Lichen pictus Swartz  
 South end of Sumatra  
 Feb. 09
- (b) Cape of Good Hope 1791. BM.  
 Dusky Bay N. Zealand 1791. BM.  
 Otaheite 1791. BM.  
 Burylee Sandwich Islands BM.  
 Monterey, California 1792. BM.  
 Port Trinidad California 1792. BM.  
 Otaheite 1792. BM.  
 California 1793. BM.  
 Monterey California 1793. BM.  
 St. Helena BM.

FIG. 2. (a) Menzies's collecting localities from Nova Scotia (1784-5) and the Prince of Wales expedition (1787-1789). (b) Menzies's collecting localities from Vancouver's Discovery expedition (1791-1795).

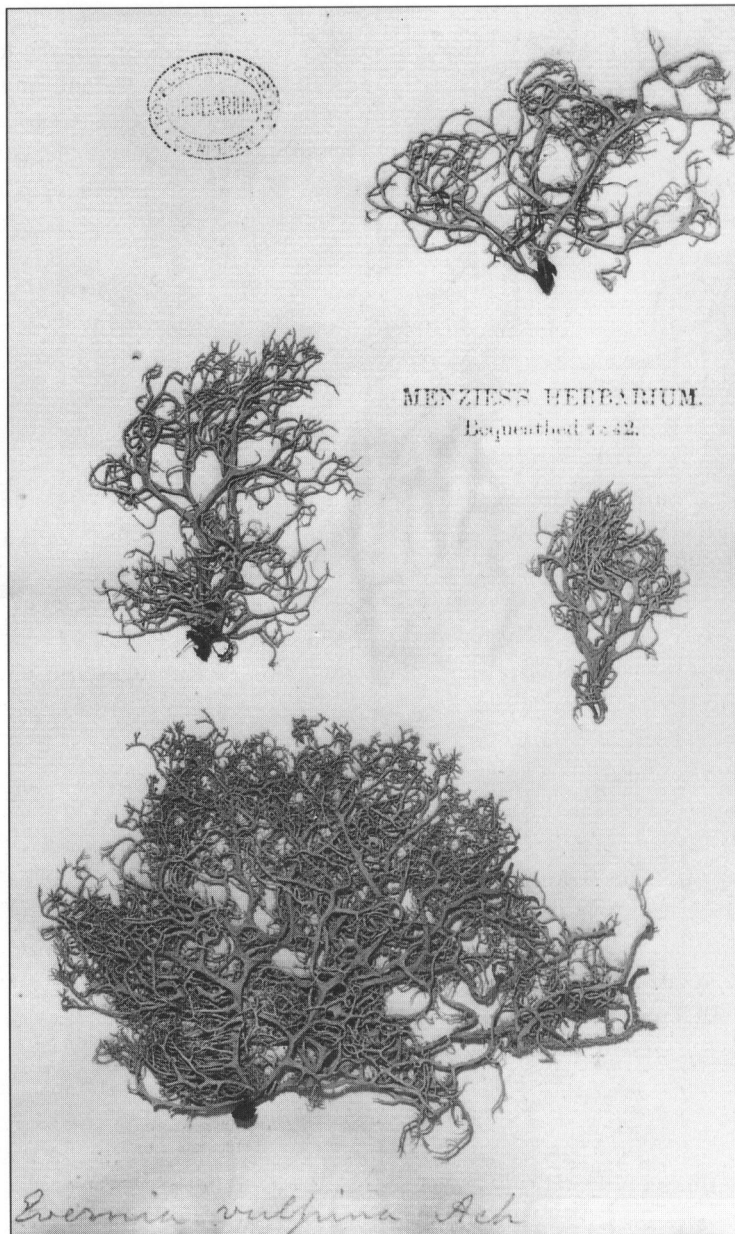


FIG. 3. Menzie's pencil annotation of a sheet of *Letharia vulpina* (E).

made during his participation in overseas expeditions (see Galloway & Groves, 1987; Groves, 1992) were studied by several botanists, both during his lifetime and later, from Olof Swartz, William Jackson Hooker and James Edward Smith onwards. His lichen collections, which are undoubtedly the most diverse and extensive assemblage

of extra-European taxa made in the 18th century, have, however, remained unjustly neglected for 200 years. At the time of his death Menzies was one of the most long-standing Fellows of the Linnean Society, but he was never President, and certainly not in 1790 as stated in a recent dictionary of Scottish biography (Goring, 1992).

Lichens collected by Menzies are preserved in several herbaria (see below) and contain specimens from the following localities: Nova Scotia; Staten Island (near Cape Horn); the west coast of North America from California to Alaska; Tahiti; Hawaii; Sumatra; New Zealand (Dusky Sound); the Cape of Good Hope; St Helena; and the West Indian islands of St Vincente and Martinique. Many of his early lichen collections from the Scottish Highlands are also extant (especially in E), as are a few others from elsewhere in the British Isles, for example, from Kew Gardens and from near Caernarvon.

Menzies was generous in distributing duplicates of his lichen collections to contemporary botanists and his specimens are to be found in the herbaria of William Aiton (BM), Joseph Banks (BM), William Borrer (BM, US), Erik Acharius (BM-ACH, H-ACH, UPS-ACH), William Jackson Hooker (BM), James Edward Smith (LINN-SM), Olof Swartz (S), Dawson Turner (BM), J. G. Baker (US) and Edward Tuckerman (FH-TUCK). Aylmer Bourke Lambert also received many Menzies plant specimens, and it is recorded that in December 1798 he wrote to Dr Pulteney . . . 'Mr. Menzies has given me all the remainder of his Herbarium of his first Voyage. Plants chiefly from Staten Land and Owhyhee . . . seven or 8 duplicates of each species . . .' (Miller, 1970). In turn, he received lichens from Acharius, Schleicher, Swartz, Zier (Britten, 1886) and his colleagues and friends in Britain. James Edward Smith was instrumental in sending many of Menzies's lichens to Acharius, the foremost lichenologist of the day (Galloway, 1981, 1988b), who also received them from Swartz in Stockholm; Swartz was a close friend and correspondent of Menzies. Fifteen of Menzies's lichens sent to Acharius were new to science, 12 being described in the *Methodus* (Acharius, 1803) and three in *Lichenographia Universalis* (Acharius, 1810), with Smith providing names and preliminary descriptions for Acharius to use (Galloway, 1988b). A Menzies specimen from William Jackson Hooker's herbarium was named *Ramalina menziesii* by Thomas Taylor (1847), and Edward Tuckerman (1859) described *Cetraria californica* from material collected by Menzies. Tuckerman was later to write ' . . . Menzies who visited the North West Coast of America in 1787-8, and somewhat later with Vancouver's expedition, was the first to observe, principally, if not entirely at Monterey, the remarkable coast-lichens of California. Some of his specimens reached Acharius; but others, among them *Ramalina menziesii* Tayl., remained undescribed for more than half a century. Having the good fortune to meet this venerable botanist in 1842, I was favoured by him with a considerable set of his duplicates' (Tuckerman, 1866).

Recognizing the considerable interest now being shown in the lichens of Southern Hemisphere islands and continents, the Pacific Basin and North America, all places visited by Archibald Menzies, and the bicentenary of Vancouver's *Discovery* voyage, it is particularly apt that Menzies's lichen collections should be given the prominence

and recognition that they deserve. It is not yet fully appreciated just how diverse and important Menzies's lichen collections really are, especially his North American collections. Of the 194 species mentioned in this account, 17 are types, 5 described by Acharius (1803) from Staten Island, and 12 from North America described by Acharius (1803, 1810), Taylor (1847) and Tuckerman (1859). The present account sets out to remedy this two hundred years of neglect.

## MATERIALS AND METHODS

Lichens collected by Menzies, many annotated by him in his own hand, are located in the following herbaria: BM, E, FH, LINN-SM, LIV, H-ACH, S, UPS-ACH, US (nomenclature follows Holmgren et al. (1990)). In the Edinburgh herbarium, where the largest numbers of Menzies's lichens are preserved, lightly pressed lichens are neatly arranged on octavo sheets with, in most cases, both upper and lower surfaces of the lichens adequately displayed. Systematic or herbarium names (in a few cases Menzies appended his own MS names; however, most names are from the works of Acharius, which Menzies knew well) are written in pencil above the lower front edge of each sheet (Fig. 3), and the localities of the specimens in ink on the upper edge of the reverse (Fig. 2).

Thin-layer chromatography (TLC) was carried out according to standard procedures (Culberson, 1972; Culberson et al., 1981; White & James, 1985).

## SPECIES LIST

Lichens are arranged in alphabetical order within genera. A chronological listing is made of the various major geographical localities in which Menzies collected lichens, and, within these, information given is from Menzies's own handwritten annotations to the individual sheets. Additional information on particular species is appended where available.

### *1. Nova Scotia*

These collections were made during Menzies's time of service on HMS *Assistance* on the Halifax Station from 1784 to 1786 (see Allen, 1977; Galloway & Groves, 1987). This is the second major lichen collection made from the eastern seaboard of North America and comprises 16 taxa in 11 genera. Earlier lichen collections were made from the United States by several botanists and are to be found scattered through the bound volumes in the Sloane Herbarium (BM), but the first important collection of Canadian lichens was that of Joseph Banks, who collected 16 taxa from 11 genera during his Newfoundland and Labrador travels in 1766 (Lysaght, 1971). Menzies's material of *Usnea trichodea* (Acharius, 1803) is the first type described from eastern North America. Lichen nomenclature for North American lichens, both here and below, follows Egan (1987, 1989, 1990, 1991).

1. *Cladonia cervicornis* subsp. *verticillata* (Hoffm.) Ahti (E).
2. *C. cristatella* Tuck. (E). Both of these taxa are mounted on the same sheet which is labelled by Menzies 'Cenomyce digitata Ach.'. Collected in 1785.
3. *C. maxima* (Asah.) Ahti (BM, E). The ecology and distribution of this species in North America is discussed by Ahti (1980: 222–225).
4. *Dermatocarpon luridum* (With.) Laundon (E). Sheet annotated by Menzies 'Endocarpon Weberi. Ach.'. Collected in 1784.
5. *Diploicia canescens* (Dickson) Massal. (E). Sheet annotated by Menzies 'L. canescens. Dicks: (in ink); Lecidea canescens Ach.; Placodium canescens E.fl.p. 197.'. Collected in 1784.
6. *Graphis scripta* (L.) Ach. (E, LINN-SM 1690.36). E material annotated by Menzies 'Opegrapha parallela'. Collected in 1784.
7. *Icmadophila ericetorum* (L.) Zahlbr. (E). Annotated by Menzies 'L. ericetorum; L. icmadophila With. 5 Ed.; L. elucloides Weber'. Collected in 1785.
8. *Lobaria quercizans* Michaux (E). Sheet annotated by Menzies 'L. laetevirens ? Lightf.'. Collected in 1784. The specimen contains gyrophoric acid. The species and its distribution in North America is discussed by Jordan (1973: 245–247).
9. *Loxospora ochrophaea* (Tuck.) R. C. Harris (E). Labelled by Menzies 'Nova Scotia 1785'; it had not previously been determined. This species has a North American–East Asian distribution (Culberson, 1963).
10. *Parmelia fertilis* Müll. Arg. (E). Labelled by Menzies 'Parmelia scortea?: Ach. Nova Scotia 1784 A:M'. Hale (1987: 24–25) discusses this taxon reporting it as rare from New Brunswick and Nova Scotia.
11. *P. saxatilis* (L.) Ach. (BM, E). BM material annotated by Menzies 'L. saxatilis. Nova Scotia – July 1784'. E material is intermixed with *P. fertilis* above. The species is discussed by Hale (1987: 37–40).
12. *P. sulcata* Taylor (E). Collected in 1784.
13. *Parmelina galbina* (Ach.) Hale (E, LINN-SM 1700.9). The E material is annotated by Menzies 'P. tiliacea Ach.'. Collected in 1784. It comprises three specimens from Nova Scotia and an additional specimen labelled 'Ab Herbar: Smith:'. The typification of this species and its distribution in eastern North America is discussed in Hale (1976b: 30–31). See also Hale & Kurokawa (1962).
14. *Usnea strigosa* (Ach.) A. Eaton (E). Collected in August 1784. This taxon is discussed in Tavares (1987).
15. *U. trichodea* Ach., Meth. Lich.: 312 (1803). *Parmelia trichodea* (Ach.) Sprengel, Syst. Veg. 4(1): 277 (1827). *U. barbata* var. *trichodea* (Ach.) J. D. Hook., Handb. N.Z. fl. 2: 563 (1867). Type: Nova Scotia, Menzies (holo. H-ACH 1881 n.v., syn. E, LINN-SM 1715.3). E material is annotated by Menzies 'Usnea trichodea Ach: Nova Scotia near Halifax July 1784 A: Menzies'. The E material comprises three good fertile specimens, and the LINN-SM material has two specimens, only one of which is fertile. The E material represents two different chemical strains, two of the three specimens having barbatic acid and the other containing salazinic acid (see also Brodo, 1984a). Until the chemistry of the H-ACH material is checked, all the other cited specimens must be regarded as syntypes.
16. *Xanthoria elegans* (Link) Th. Fr. (BM). Annotated by Menzies 'L. flavescens. Nova Scotia – June 1784'.

A specimen of *Cladonia maxima* (Asah.) Ahti in E is labelled by Menzies 'Newfoundland', and undoubtedly was collected during Menzies's time on the Halifax Station.

## 2. Staten Island

Menzies was surgeon to the merchant ship *Prince of Wales* captained by James Colnett. The vessel anchored in New Year's Harbour, Staten Island from 26 January

until 12 February 1787 in order to land stores and men for a sea lion fishery (Galloway & Groves, 1987). During that time Menzies made a plant collection which included 32 lichens from 19 genera, the first collection of any size from so southerly a latitude. However, Menzies's lichens were not the first seen in Europe from southern South America: George Forster late in December 1774 gathered a lichen from shrubs of *Berberis ilicifolia* from a site in Christmas Sound, Tierra del Fuego, naming it *Lichen berberinus* (Forster, 1787) and now recognized as *Pseudocyphellaria berberina* (Galloway & James, 1977). Earlier still, Philibert Commerson, naturalist on *La Boudeuse* commanded by Louis Antonie de Bougainville, collected lichens from several localities in the Straits of Magellan between December 1767 and January 1768. On 17 December 1767, *La Boudeuse* anchored in Bougainville Bay and two weeks were spent there during which time '... M. de Commerson accompanied by the Prince of Nassau, profited of such days for botanizing. He had obstacles of every kind to surmount, yet this wild soil had the merit of being new to him, and the Straits of Magalhaens have filled his herbals with a great number of unknown and interesting plants' (Godley, 1965). Although Commerson's lichens have never been subsequently worked on in detail, Müller Argoviensis (1889a) recorded 11 Commerson lichens from Freshwater Cove, Bougainville Bay and Port Gallant from specimens in PC, and Jacquin described *Lichen aurantiaco-atra* and *L. antarcticus* (Jacquin, 1781) from Commerson material (Walker, 1985; White & James, 1988).

Menzies's lichens from Staten Island created considerable interest in England and Sweden, and James Edward Smith made manuscript diagnoses of four of them (Galloway, 1988b) and sent both specimens and Latin diagnoses to Acharius who incorporated them into his new system of classification in *Methodus Lichenum* (Acharius, 1803) as *Parmelia cincinnata* Ach., *P. menziesii* Ach., *P. obvoluta* Ach., and *Peltidea cellulosa* Ach. A specimen sent to Swartz by Menzies was described by Acharius (1803) as *Sticta orygmaea* Ach. (Galloway & James, 1977; Galloway, 1988b, 1992).

Sixty years after Menzies botanized in Staten Island, Joseph Hooker wrote '... The successive labours of Commerson, Banks and Solander and of Menzies, early called the attention of botanists to the singular aspect of the Fuegian Flora, apparently incompatible in its luxuriance with the rigour of the climate (p. 213) ... the materials for a Fuegian Flora would still be incomplete without the plants discovered by Menzies during Vancouver's expedition ... (p. 222)' (Hooker, 1847). Although Menzies's collections were made during the voyage of the *Prince of Wales* (1787–1789) and not during that of the *Discovery* (1791–1795), they occupy a major place in the history of Fuegian botany in general (see Moore, 1983; Tuhkanen et al., 1992) and of lichenology in particular.

1. **Bunodophoron australe** (Laurer) A. Massal. (BM, LINN-SM 1712.6). BM material is labelled by Menzies 'Staten Land near Cape Horn – Feb: 1787'.
2. **B. patagonicum** (Dodge) Wedin (E, LINN-SM 1712.6 pr.p.). E material is annotated by Menzies 'Sphaerophoron compressum var: Staten Land – Feb: 1787 A:M'.
3. **Chaenotheca brunneola** (Ach.) Müll. Arg. (E). Sheet annotated by Menzies 'Calicium.



Staten Land near Cape Horn 1787, A:M'. The material is on decorticated wood, has a dark brown hypothecium, a chlorococcoid photobiont and brown, globose spores, 3.5–4 (–4.5)µm.

**4. *Chrysothrix candelaris*** (L.) Laundon (E). Sheet annotated by Menzies 'Lepraria chlorina Ach. Staten land near Cape Horn. A:M'.

**5. *Cladia aggregata*** (Sw.) Nyl. (BM, E). The BM material is annotated by Menzies 'Lichen. Staten Land. Jany: 1787', while the E material comprises two sheets both annotated by Menzies 'L. aggregatus Swartz. Staten Land near Cape Horn. Feb: 1787 A:M'.

**6. *Cladina pycnoclada*** (Pers.) Leighton (E). The sheet is annotated by Menzies 'L. rangiferinus. Staten Land near Cape Horn Feb: 1787 A:M'. This species is discussed by Ahti & Kashiwadani (1984: 131–132).

**7. *Cladonia bacillaris*** Nyl. (BM, E, LINN-SM 1709.25). BM material annotated by Menzies 'Lichen cornutus Dill.: T.15.f.14.D.E. Staten Land near Cape Horn – Feb: 1787'. E material annotated by Menzies 'L. lumbricalis M. Staten Land near Cape Horn Feb: 1787'.

**8. *C. gracilis*** subsp. ***elongata*** (Jacq.) Vainio (BM, E, LINN-SM 1709.20). The E material is annotated by Menzies 'L. ecmocyna Ach. L. gracilis? Staten Land & N. America 1787 A:M'. The species is discussed by Ahti & Kashiwadani (1984: 139) and Stenroos & Ahti (1990: 321–322).

**9. *Lecidella elaeochroma*** (Ach.) M. Choisy (LINN-SM 1694.12 pr.p.).

**10. *Leptogium menziesii*** (Ach.) Mont. in *Annlis Sci. Nat. Bot. ser. 3*, 18: 313 (1852). *Parmelia menziesii* Ach., *Meth. Lich.*: 221 (1803). *Lichen menziesii* Sm. in Ach., *Meth. Lich.*: 212 (1803) nom. inval. (Art. 63.1). *Collema menziesii* (Ach.) Ach., *Lich. Univ.*: 645 (1810). Type: Ad Fretum Magellanicum, *Menzies* (E, LINN-SM 1701.1). The E material is annotated by Menzies 'Collema Menziesii. Staten Land near Cape Horn Feb: 1787 A:M', and was chosen as neotype by Jørgensen (1975: 446) who gives a good discussion of the species and its distribution. No authentic Menzies material of this species was found in any of the known Acharian herbaria (BM-ACH, H-ACH, UPS-ACH). Acharius's designation of the type locality as 'Fretum Magellanicum' is an error commonly made in the 18th century when any locality remotely near the southern tip of South America was referred to by the designation 'Fretum Magellanicum'. The *Prince of Wales* anchored only at Staten Island and never visited any part of the Straits of Magellan, so Staten Island must be the correct type locality for *Leptogium menziesii*.

**11. *Menegazzia cincinnata*** (Ach.) Bitter in *Hedwigia* 40: 172 (1901). *Parmelia cincinnata* Ach., *Meth. Lich.*: 252 (1803). *Lichen cincinnatus* Sm. in Ach., *Meth. Lich.*: 252 (1803) nom. inval. (Art. 63.1). *Lichen bullatus* Menzies in Ach., *Lich. Univ.*: 495 (1810) nom. inval. (Art. 63.1). Type: Ad Fretum Magellanicum, *D. Menzies* (E, lecto. selected here. Labelled by Menzies 'Parmelia cincinnata Ach. Staten Land near Cape Horn – Feb: 1787 A:M'). Additional Menzies material (BM, E, LINN-SM 1700.53). BM material is annotated by Menzies 'Parmelia cincinnata Ach: Staten Land'. This species is discussed in Santesson (1942).

**12. *Nephroma antarcticum*** (Jacq.) Nyl. (BM, E).

The E material comprises three specimens on a sheet annotated by Menzies 'Nephroma polaris Ach., L. antarcticus. Staten Land Terra del Fuego Feb: 1787 A:Menzies'. This species is discussed in White & James (1988: 117–121).

**13. *N. cellulorum*** (Ach.) Ach., *Lich. Univ.*: 523 (1810). *Peltidea cellulosa* Ach., *Meth. Lich.*: 289 (1803). *Nephromium cellulorum* (Ach.) Nyl., *Mém. Soc. Sci. Nat. Cherbourg* 5: 101 (1857). *Opisteria cellulosa* (Ach.) Vainio, *Ark. Bot.* 8(4): 93 (1909). Type: Staten Island near Cape Horn, February 1787, *A. Menzies* (lecto. LINN-SM 1706.13; isolecto. BM, E, US: fide White & James, 1988: 128). E material is annotated by Menzies 'Nephroma cellulosa. Staten Land near Terra del Fuego – Feb: 1787 A:M'. This species is discussed by White & James (1988: 128–131).

**14. *Neuropogon aurantiaco-ater*** (Jacq.) Lamb (BM, E, LINN-SM 1715.19). BM material is

annotated by Menzies 'Lichen Species nova? On rocks about the Sea shore & on the top of the Mountains Staten Land Feb: 1787' and Edinburgh material is annotated by Menzies 'Usnea melaxantha Ach., L. aurantiaco-ater. Staten Land - Feb: 1787 A:Menzies'. This species is discussed in Walker (1985: 62-74).

**15. *Pannaria pezizoides*** (G. H. Weber) Trevisan (E). The sheet comprises six specimens from South America and two from Herb. Dickson. Menzies has annotated the South American material 'Lecanora brunnea Ach; Staten Land - Feb: 1787 A:M'. This species is discussed in detail by Jørgensen (1978: 52-54).

**16. *Pertusaria*** sp. (E). Menzies has annotated the collection of three small specimens from bark 'Porina. Staten Land on the bark of *Wintera aromatica*'. The specimens are fertile; spores 8 per ascus, thin-walled, 70-80 × 35-40 μm, and approximate to *P. cretacea* Müll. Arg. from New Zealand (Galloway, 1985a).

**17. *Pseudocyphellaria berberina*** (G. Forster) D. Galloway & P. James. *Sticta orygmæa* Ach., Meth. Lich.: 278 (1803). *Lobaria orygmæa* (Ach.) Hellbom in Bih. Svenska Vetensk.-Akad. Handl. 21(3/13): 36 (1896). *Pseudocyphellaria orygmæa* (Ach.) Malme in Bih. Svenska Vetensk.-Akad. Handl. 25(3/6): 28 (1899). Type: Staten Land, New Year's Harbour, February 1787, A. Menzies (holo. H-ACH 1535; iso. E, LINN-SM 1705.5, UPS-ACH). Additional Menzies material in BM, US. BM material of this species is found on four separate sheets; one from Dawson Turner's herbarium is labelled 'Mr Menzies L. ochraceus MSS' in Dawson Turner's hand and contains another large specimen labelled 'St. d'Urvillei Del.' by Nylander; one comprising four specimens of the lichen is labelled by Menzies 'Lichen epidendros Banks Herb. Staten Land Feb: 1787'; one comprising a mixed collection (together with *P. endochrysa*) is labelled by Menzies 'Lichen Sp: nov: On trees at New Year's Harbour. Staten land near Cape Horn Feb:y 87' (Fig. 4); a single specimen is labelled by Robert Brown 'Staten land A. Menzies'. A specimen from US is labelled 'L. epidendros Commerson. Staten Land 1787. Menzies', though not in Menzies's hand. The E material is discussed and illustrated in Galloway & James (1977) and Galloway (1992).

**18. *P. dubia*** Du Rietz (BM). A mixed collection together with two specimens of *P. hirsuta*. Labelled by Menzies 'Lichen Sp: nov: This plant was found grow:g on the Berberis ilicifolia at New Year's Harbour Statenland near Cape Horn. Feb:ry 1787'. The species is discussed in Galloway (1986, 1992).

**19. *P. freycinetii*** (Delise) Malme (BM, E). BM material is mixed with *Sticta gaudichaldia* and is annotated by Menzies 'L. filix. Staten Land, Jan:ry 1787'. The E material comprises three fertile specimens annotated by Menzies 'Sticta cinnamomea? Staten Land. 1787 A:M'. The species is discussed in Galloway (1992).

**20. *P. hirsuta*** (Mont.) Malme (BM). BM material comprises three collections: one is mixed with *P. dubia* (see No. 16 above); one is labelled by Menzies 'Lichen Berberinus Sp:nov: found growing on the Berberis ilicifolia at Staten Land near Cape Horn Feb: 1787' (Fig. 5); one from Aiton's herbarium (ex Herb. Churchill Babington) is labelled by Babington 'This is *Sticta obvoluta* Ach. wh: grows on Berberis ilicifolia at Staten land. See Ach. Syn. A spec. in Hb. Hooker named *S. obvoluta* from Menzies in his hand agrees exactly. The apothecia are very large. Lichen Berberinus Menz'. The species is discussed in Galloway (1986, 1992).

**21. *P. obvoluta*** (Ach.) Malme in Bih. Svenska Vetensk.-Akad. Handl. 25(3/6): 17 (1899). *Parmelia obvoluta* Ach., Meth. Lich.: 218 (1803). *Lichen obvolutus* Sm. in Ach., Meth. Lich.: 218 (1803) nom. inval. (Art. 63.1). *Sticta obvoluta* (Ach.) Ach., Lich. Univ.: 452 (1810). *Crocodia obvoluta* (Ach.) Trevisan, Lichenotheca veneta No. 75 (1869). *Cyanisticta obvoluta* (Ach.) Dodge, Trans. Amer. Microscop. Soc. 84: 506 (1965). Type: Staten Island, A. Menzies (lecto. BM). Additional Menzies material in E, LINN-SM 1707.4. The collections of this taxon are typified and discussed in Galloway (1986: 139-144).

**22. *Psoroma hypnorum*** (Vahl) S. F. Gray (BM, LINN-SM 1698.5). BM material is labelled

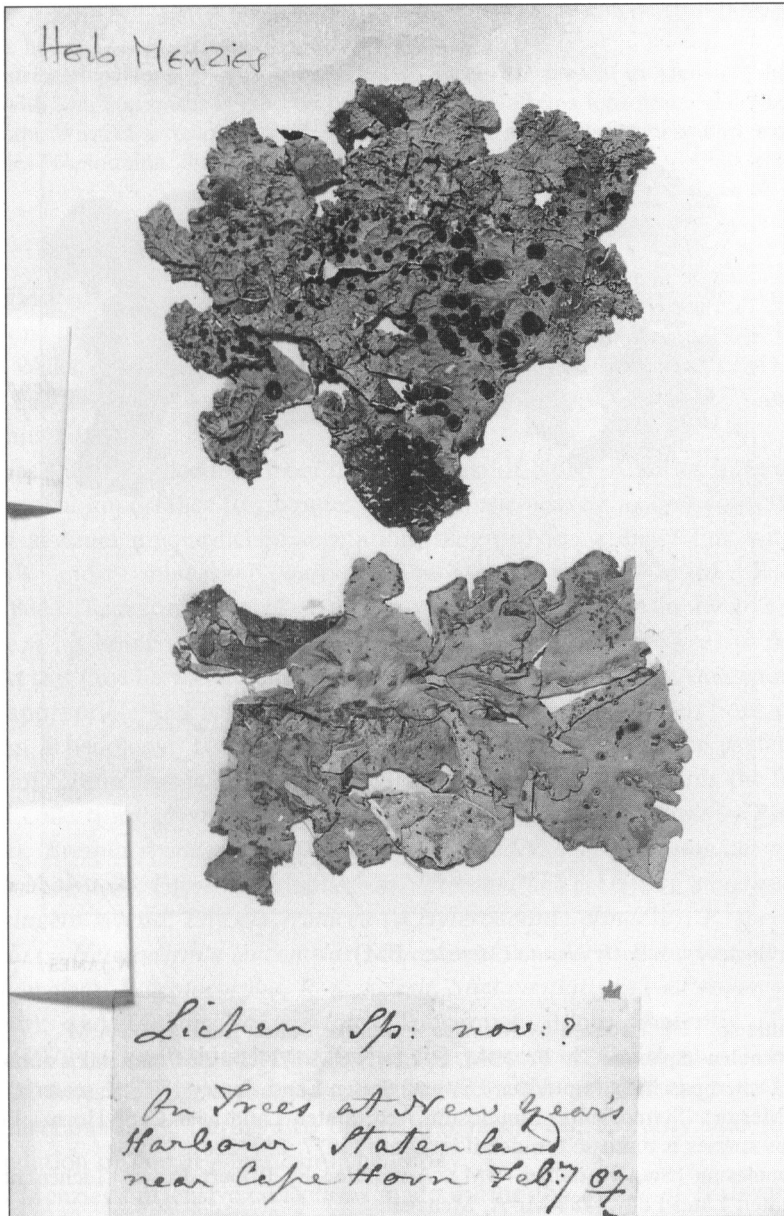


FIG. 4. *Pseudocyphellaria berberina* and *P. endochrysa* (Menzies, BM).

by Menzies 'Lichen. Staten Land near Cape Horn Feb: 1787'. This species is discussed in Jørgensen (1978: 26–31).

23. *P. leprolomum* (Nyl.) Räsänen (E). Labelled by Menzies 'Staten Land – Feb: 1787'. This species is discussed in Galloway (1985a: 476–477).

24. *P. pholidotoides* (Nyl.) Trevisan (BM). Labelled by Menzies 'Staten Land – Feb: 1787'. This species is discussed in Galloway (1985a: 479–480).

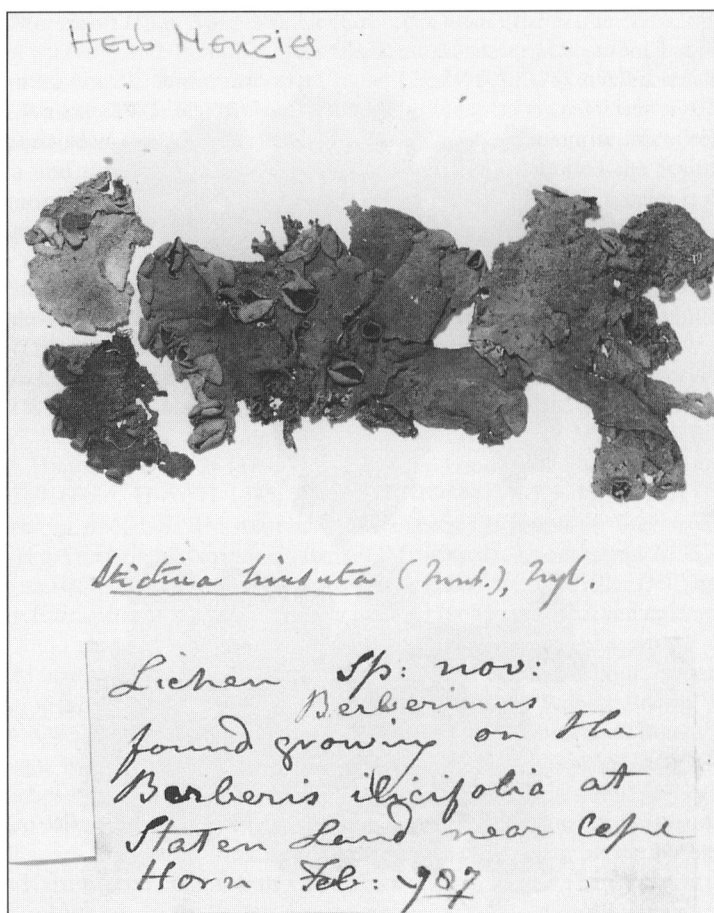


FIG. 5. *Pseudocyphellaria hirsuta* (Menzies, BM).

25. *Pyrenula* sp. (E). Labelled by Menzies 'Pyrenula. Staten Land 1787. A:M'.
26. *Stereocaulon implexum* Th. Fr. (BM, E, LINN-SM 1711.1). BM material is annotated by Menzies 'Lichen paschalis ramulosus ? Swartz Staten Land. Jan:ry 1787'; E material is annotated by Menzies 'Stereocaulon ramulosum Ach: Staten Land near Cape Horn - Feb: 1787 A:M'. This species is discussed in detail in Lamb (1977: 294-296).
27. *S. ramulosum* (Sw.) Rauschel (BM). Annotated by Robert Brown 'Lichen ramulosus Swartz Staten Land Feby 1787 Mr A. Menzies'.
28. *S. vesuvianum* Pers. (BM). Labelled by Menzies 'L. paschalis Staten Land Feb: 87'.
29. *Sticta caulescens* de Not. (BM). A mixed collection with *S. gaudichaldia* from Dawson Turner's herbarium labelled by him 'Sticta filicina Ach. Meth. p.275. Staten Land Mr Menzies'. This species is discussed in Galloway (1994).
30. *S. fuliginosa* (Hoffm.) Ach. (LINN-SM 1705.19). This species is discussed in Galloway (1994).
31. *S. gaudichaldia* Delise (BM, E, LINN-SM 1705.13 pr.p., US). BM material is mixed with *S. caulescens* (see No. 29 above), and another specimen is labelled by Robert Brown 'Staten Land. A. Menzies'. E material is annotated by Menzies 'Sticta sylvatica Ach: 2. Staten Land.

Feb: 1787 A:M'. US material is labelled 'L. Staten Land 1787. A. Menzies' although not in Menzies's hand. This species is discussed in Galloway (1994).

**32. *Thelotrema lepadinum*** (Ach.) Ach. (E). Two sheets are present in Menzies's herbarium; the first with four specimens is labelled by Menzies 'Thelotrema lepadinum E.fl:No:1. Staten Land on the Wintera aromatica 1787'; the second sheet has five specimens and is annotated by Menzies 'Thelotrema. Staten Land 1787. A:M'.

### 3. *West Coast of North America*

Menzies visited the west coast of North America many times during his two circum-navigations of 1787–1789 and 1791–1795. Localities visited are discussed by Pursh (1814), Wilks & Hutchinson (1914), Newcombe (1923), Balfour (1924), Britten (1924), Eastwood (1924), Hultén (1940), Groves (1992), Olson (1992) and Olson & Thilenius (1993).

Menzies's lichen collections from the west coast of North America have considerable historical importance for, besides their intrinsic interest as first collections of a new and at times unique lichen vegetation, they provide a direct link with North America's most important early lichen taxonomist, Edward Tuckerman (1817–1886). Tuckerman travelled to Europe as a young man in 1841–2 and met Menzies at his home in Notting Hill Gate, London in 1842, the year of Menzies's death. At this time he was able to receive a set of Menzies's North American lichens, a most appropriate and fortuitous link between the first two generations of North American lichenology. Tuckerman (1866) acknowledged this in the preface to his account of Californian lichens (see above). In this account he records the following Menzies collections: *Cetraria californica*; *C. juniperina*; *C. lacunosa* (= *Platismatia lacunosa*); *Evernia prunastri*; *E. vulpina* (= *Letharia vulpina*); *Leptogium palmatum* (= *L. corniculatum*); *Parmelia physodes* var. *enteromorpha* (= *Hypogymnia enteromorpha*); *Peltigera venosa*; *Physcia erinacea* (= *Heterodermia erinacea*); *P. speciosa* var. *leucomela* (= *Heterodermia leucomelos*); *Pilophorus acicularis*; *Ramalina homalea* (= *Niebla homalea*); *R. leptocarpha*, *R. menziesii*; *Sticta anthraspis* (= *Pseudocyphellaria anthraspis*); and *Umbilicaria angulata* (Tuckerman, 1866). Recently, Tucker & Jordan (1979) acknowledged Menzies as the pioneer of Californian lichenology. Indeed, Menzies's earlier east coast specimens from Nova Scotia, and the later west coast collections made during two different voyages, can be fairly said to provide the foundation of North American lichenology.

From Menzies's extensive collections made during the *Prince of Wales* voyage of 1787–1789, Acharius (1803) described *Cetraria lacunosa*, *Sticta anthraspis* and *Parmelia duplicata*, and Taylor (1847) described *Ramalina menziesii*.

From the later *Discovery* voyage of 1791–1795, the following new taxa were described: *Baeomyces acicularis*, *Parmelia enteromorpha* (Acharius, 1803); *Borreria ceruchis*, *B. erinacea*, *Parmelia lophyrea*, *Ramalina homalea* (Acharius, 1810) and *Cetraria californica* (Tuckerman, 1859). Later lichenologists to mention Menzies's west coast collections in their work include: Tuckerman (1845, 1848a, 1848b, 1858, 1859, 1860, 1866, 1872a, 1872b, 1882); Müller Argoviensis (1889); Herre (1910,

1945); Howe (1910, 1911, 1913, 1914a, 1914b, 1914c, 1914d); Hasse (1913); Merrill (1923); Fink (1935); Wheeler (1938); Howard (1950); Hale (1969); Tucker & Jordan (1979); Lai (1980a); Hale & Cole (1988). The following list shows the impressive range of material collected and indicates the depth of interest that Menzies obviously had for lichens.

1. *Alectoria nigricans* (Ach.) Nyl. (BM). Labelled by Menzies 'West-coast of N. America 1788'. The species is discussed in Brodo & Hawksworth (1977). Circumpolar, (oro)arctic to rarely northern boreal (Goward & Ahti, 1992).

2. *A. sarmentosa* (Ach.) Ach. subsp. *sarmentosa* (E). Labelled by Menzies 'Alectoria sarmentosa Ach: West coast of N. America 1787 A:M'. The ecology and distribution of this species is discussed in Brodo & Hawksworth (1977). Western North American eastern North America-western Eurasia, (oro)arctic to temperate (but chiefly oroboreal), with oceanic tendencies (Goward & Ahti, 1992).

3. *A. vancouverensis* (Gyelnik) Gyelnik ex Brodo & D. Hawksw. (E). Labelled by Menzies 'L. jubatus. West coast of N. America Oct. 1787'. This species is a North American endemic, from lowland localities in British Columbia and northern California (Brodo & Hawksworth, 1977). Menzies's specimen is probably the earliest collection of it.

4. *Arthothelium ilicinum* (Taylor) P. James (E). Labelled by Menzies 'Opegrapha epipasta. West-coast of N. America 1787 A:M'. This is the earliest record of this species from North America.

5. *Bacidia* sp. (LINN-SM 1693.40).

6. *Bryoria bicolor* (Ehrh.) Brodo & D. Hawksw. (BM, E). BM material is labelled by Menzies 'Lichen lanatus (chalybeiformis scored out), Banks' Isles Sept. 1787' — misquoted in Brodo & Hawksworth (1977: 100) as 1785! E material labelled by Menzies 'Cornicularia bicolor. West-coast of N. America — Sep: 1787'. The species is discussed in Brodo & Hawksworth (1977).

7. *B. capillaris* (Ach.) Brodo & D. Hawksw. (E). Labelled by Menzies 'West coast of N. America Oct. 1787 A:M'. This species is discussed in Brodo & Hawksworth (1977). Probably incompletely circumpolar, predominantly middle (oro)boreal to northern temperate, with oceanic tendencies (Goward & Ahti, 1992).

8. *Caloplaca* cf. *flavorubescens* (Huds.) Laundon (E). Labelled by Menzies 'Lecidea aurantiaca Ach: West coast of N. America Sept. 1787 A:M'.

9. *Catillaria* sp. (LINN-SM 1694.11).

10. *Cavernularia lophyrea* (Ach.) Degel. in Acta Horti Gothoburg 12: 132 (1937). *Parmelia lophyrea* Ach., Meth. Lich.: 198 (1803), *Hypogymnia lophyrea* (Ach.) Krog in Nyt. Mag. Naturvidensk. 88: 76 (1951). Type: Americae boreali, Menzies (lecto. selected here BM; isolecto. LINN-SM 1700.13, FH n.v.). BM material is labelled by Menzies 'Parmelia, W. Coast of N. America'. It is also annotated by Thomas Taylor as 'Parmelia cribellata Tayl.'.

Syn.: *Parmelia cribellata* Taylor in Lond. J. Bot. 6: 164 (1847). Type: W. Coast of N. America, Menzies (iso. BM, FH n.v.).

Nylander (1861: 104) reported *Parmelia lophyrea* and *P. cribellata* as the same taxon, and it was combined into *Cavernularia* by Degelius (1937: 132) who, however, did not discuss type collections. This species is discussed in Tuckerman (1882), Riddle (1911), Fink (1935), Degelius (1937), Howard (1950), Krog (1968), Hale (1969) and Hale & Cole (1988).

11. *Cetraria californica* Tuck. in Am. J. Arts Sci. 2, 28: 203 (1859). *Coelocaulon californicum* (Tuck.) Howe, Classif. Fam. Usneac.: 20 (1912). *Alectoria californica* (Tuck.) Merrill in Bryologist 13: 104 (1913). *Cornicularia californica* (Tuck.) Du Rietz in Ark. f. Bot. 20A(11): 32 (1926). Type: USA, California, Monterey, 1787, Menzies (holo. FH-TUCK n.v.; iso. BM, E, LINN-SM 1713.10). BM material annotated by Menzies 'Lichen hispidus Lightf: Banks's

Isles Oct: 1787' consists of two specimens of this species together with one of *C. islandica* subsp. *crispiformis* and three of *Coelocaulon aculeatum*. This taxon is discussed in Kärnefelt (1986: 39–46) and Kärnefelt et al. (1992).

12. *C. islandica* subsp. *crispiformis* (Räsänen) Kärnefelt (BM, E). For Menzies's annotation see No. 11 above. This species is discussed in Kärnefelt (1979, 1986).

13. *C. orbata* (Nyl.) Fink (E). Labelled by Menzies 'Cetraria sepincola, California 1793. A:M'. This taxon is discussed in Hale (1969), Lai (1980b), Hale & Cole (1988) and Kärnefelt et al. (1992). Western North American–eastern North America, essentially orohemiarctic to temperate (Goward & Ahti, 1992).

14. *Cladonia portentosa* subsp. *pacifica* (Ahti) Ahti (E). Labelled by Menzies 'L. rangiferina, West-coast of N. America A:M'. This species is discussed in Ahti (1961, 1984).

15. *C. rangiferina* (L.) Nyl. (BM, E, LINN-SM 1710.7). BM material labelled by Menzies 'Lichen rangiferinus Banks's Isles 1787', and E material is labelled 'L. rangiferinus, West-coast of N. America Sepr: 1787 A:M'. This species is discussed in Ahti (1961, 1977, 1984), Thomson (1968, 1984) and Ahti & Lai (1979). Circumpolar, arctic to temperate (Goward & Ahti, 1992).

16. *Cladonia amaurocraea* (Flörke) Schaerer (E). Labelled by Menzies 'Arctic Isles of N. America'. This species is discussed in Thomson (1968, 1984). Circumpolar, arctic to hemiboreal, with continental tendencies (Goward & Ahti, 1992).

17. *C. bellidiflora* (Ach.) Schaerer (BM, E, LINN-SM 1711.4). E material labelled by Menzies 'C. cervicornis ?? West-coast of N. America 1788. A:M'. This species is discussed in Thomson (1968, 1984). Incompletely circumpolar, (oro)arctic to northern temperate, with oceanic tendencies (Goward & Ahti, 1992).

18. *C. cervicornis* subsp. *verticillata* (Hoffm.) Ahti (E, LINN-SM 1709.6 pr.p.). Labelled by Menzies 'West-coast of N. America 1787 A:M'. This species is discussed in Thomson (1968, 1984).

19. *C. crispata* (Ach.) Flotow (E pr.p.). Labelled by Menzies 'C. pungens, West-coast of N. America Sepr: 1787 A:M'. This species is discussed in Thomson (1968, 1984). Circumpolar, arctic to northern temperate with oceanic tendencies (Goward & Ahti, 1992).

20. *C. furcata* (Huds.) Schrader (E). Two sheets labelled by Menzies 'L. subulatus ?, West-coast of N. America Oct: 1787 A:M.; West-coast of North America Sepr. 1787 A:M.'. Another E specimen labelled by Menzies 'L. subulatus? Dill. Musc. T. 16. f. 21 West-coast of N. America 1788. A:M'. This species is discussed in Thomson (1968).

21. *C. maxima* (Asah.) Ahti (BM, E, LINN-SM 1709.19). BM material labelled by Menzies 'Lichen gracilis Banks's Isles Oct: 1787'. Two E collections, both labelled by Menzies, one as 'C. uncialis, Banks's isles on the west coast of N. America 1787 – A:M.', and the other 'N.W. Coast of America. A:M'. This species is discussed in Ahti (1980).

22. *C. subfurcata* (Nyl.) Arnold (BM, E pr.p.). BM material is labelled by Menzies 'Lichen rangiferinus var. sylvat: Banks's Isles Oct: 1787', and E material is labelled 'C. pungens, West-coast of N. America Sepr: 1787 A:M'. This species is discussed in Thomson (1968, 1984).

23. *C. transcendens* (Vainio) Vainio (BM). Labelled by Menzies 'West coast of North America 1787'. This is an endemic species of western North America ranging from Alaska to California close to the coast (Thomson, 1968).

24. *C. uncialis* (L.) Weber ex Wiggers (BM). Labelled by Menzies 'L. uncialis, West-coast of N. America'. This species is discussed in Thomson (1968, 1984). Circumpolar, (oro)arctic to temperate (Goward & Ahti, 1992).

25. *C. verruculosa* (Vainio) Ahti (E). This species is discussed in Ahti (1978), Brodo & Wong (1993). Western North American, lower oroboreal to northern temperate, with oceanic tendencies (Goward & Ahti, 1992).

26. *Coccotrema pocillarium* (Cummings) Brodo (LINN-SM 1692.10). This coastal species occurs from Oregon to Alaska (Brodo, 1973).

- 27. *Coelocaulon aculeatum*** (Schreber) Link, see No. 11 above. This species is discussed in Kärnefelt (1986). Circumpolar, (oro)arctic to temperate, with slight oceanic tendencies (Goward & Ahti, 1992).
- 28. *Dimerella lutea*** (Dickson) Trevisan (E). Labelled by Menzies 'L. lutea Dicks: En:fl: 60, *Lecidea melizea* Ach.; West-coast of N. America – Sept. 1787 – A:M.'. This species is discussed in Fink (1935), Howard (1950) and Hale & Cole (1988).
- 29. *Graphis* sp.** (LINN-SM 1690.37).
- 30. *Heterodermia erinacea*** (Ach.) W. Weber in Bryologist 90: 163 (1987). *Borrera erinacea* Ach., Lich. Univ.: 499 (1810). *Lichen erinaceus* Sm. in Ach., Lich. Univ.: 499 (1810) nom. inval. (Art. 63.1). *Physcia leucomela* var. *erinacea* (Ach.) Nyl. in Mém. Soc. Sci. Nat. Cherbourg 5: 106 (1859). *Physcia erinacea* (Ach.) Tuck. in Proc. Amer. Acad. Arts Sci. 4: 388 (1860). *Anaptychia erinacea* (Ach.) Trevisan in Flora 44: 52 (1861). *Physcia leucomela* var. *erinacea* (Ach.) Nyl. in Mém. Soc. Sci. Nat. Cherbourg 5: 106 (1857). *Physcia ciliaris* var. *erinacea* (Ach.) Nyl., Syn. Meth. Lich. 1: 414 (1860). Type: California, Menzies H-ACH 1445 (holo. H-ACH 1445 n.v.; iso. BM, E, LINN-SM 1708.35). E material labelled by Menzies 'Borrera erinacea Ach: Monterrey California A:M' (Fig. 6). This species is restricted to coastal regions of California and Baja California, on twigs of shrubs, cacti and on rocks (Tuckerman, 1848a, 1866, 1882; Herre, 1910, 1945; Hasse, 1913; Fink, 1935; Wheeler, 1938; Kurokawa, 1962, 1973; Hale, 1969; Hale & Cole, 1988).
- 31. *Hypogymnia duplicata*** (Ach.) Rasm. in Nov. Sist. Niz. Rast. 1965: 200 (1965). *Parmelia duplicata* Ach., Meth. Lich.: 252 (1803). *Lichen duplicatus* Sm. in Ach., Meth. Lich.: 252 (1803) nom. inval. (Art. 63.1). Type: Ad oras occid. Americae borealis, Menzies (holo. H-ACH n.v., fide Krog (1968: 94); iso. BM, E, LINN-SM 1700.55). BM material is labelled by Menzies 'Parmelia physodes var. vittata. W. coast of N. America', and E material is labelled 'P. physodes v. vittata. West-coast of N. America Sept: 1787 A:M' (Fig. 7). This species is discussed in Krog (1968), Ohlsson (1973) and Pike & Hale (1982).
- 32. *H. enteromorpha*** (Ach.) Nyl. in Acta Soc. Sci. Fenn. 26(10): 7 (1900). *Parmelia enteromorpha* Ach., Meth. Lich.: 252 (1803). *Lichen intestinalis* Sm. in Ach., Meth. Lich.: 252 (1803) nom. inval. (Art. 63.1). *Parmelia physodes* var. *enteromorpha* (Ach.) Tuck. in Proc. Amer. Acad. Arts Sci. 1: 228 (1848). *Imbricaria enteromorpha* (Ach.) Jatta in Nuov. Giorn. Bot. Ital. nov. ser. 9: 471 (1902). Type: Americae borealis oras occid., Menzies (lecto. LINN-SM 1700.51 pr.min.p., fide Pike & Hale (1982) (Fig. 8)). Additional Menzies material in BM, E. Lectotype material is PD + containing atranorin, physodic, physodalic and protocetraric acids. BM material is labelled by Menzies 'Parmelia enteromorpha Ach: West-coast of N. America A. Menzies' and E material is labelled 'P. enteromorpha Ach: West coast of N. America – Sept: 1787 A:M'. PD- material with atranorin only is found in E, LINN-SM 1700.54 pr.max.p., LINN-SM 1700.51. This species is discussed in Hooker (1829), Tuckerman (1848a, 1882), Bitter (1901), Herre (1910, 1945), Merrill (1923), Fink (1935), Wheeler (1938), Howard (1950), Imshaug (1957), Krog (1968), Hale (1969), Ohlsson (1973), Elix (1979), Lai (1980a), Pike & Hale (1982) and Hale & Cole (1988). Western North America, upper oroboreal to temperate, distinctly oceanic (Goward & Ahti, 1992).
- 33. *Icmadophila ericetorum*** (L.) Zahlbr. (E, LINN-SM 1694.36). E material labelled by Menzies 'L. aeruginosus, West-coast of N. America 1787 A:M'. This material is obviously of the same provenance as loose specimens found in E still in Menzies's original drying papers and labelled by Menzies 'Lichen aeruginosus, Nootka July 1787, West-coast of N. America – Sept. 1787'.
- 34. *Lecanora pacifica*** Tuck. (E, LINN-SM 1693.39). E material labelled by Menzies '1788'. The species is discussed in Brodo (1984b).
- 35. *Lecidea* sp.** (LINN-SM 1694.11).
- 36. *Lepraria nivalis*** Laundon (E). Labelled by Menzies 'Byssus candida, West-coast of



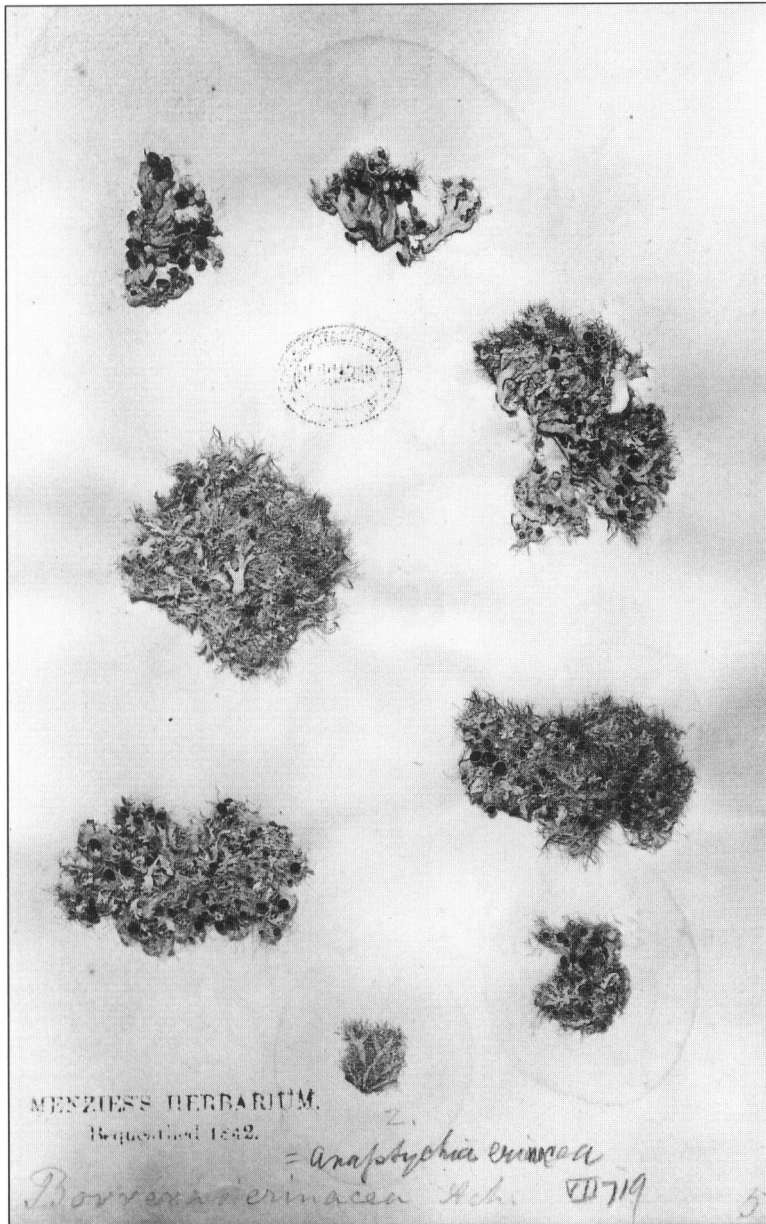


FIG. 6. Isotype of *Borreria erinacea* [= *Heterodermia erinacea*] (Menzies, E).

N. America 1787 A:M'. Another specimen (E) is labelled by Menzies 'Lepraria alba E. flor., Lecidea alba Ach: West-coast of N. America 1787 A:M'. This protocetraric acid-containing species is discussed in Laundon (1992).

37. *Leptogium corniculatum* (Hoffm.) Minks (E). Labelled by Menzies 'Collema palmatum

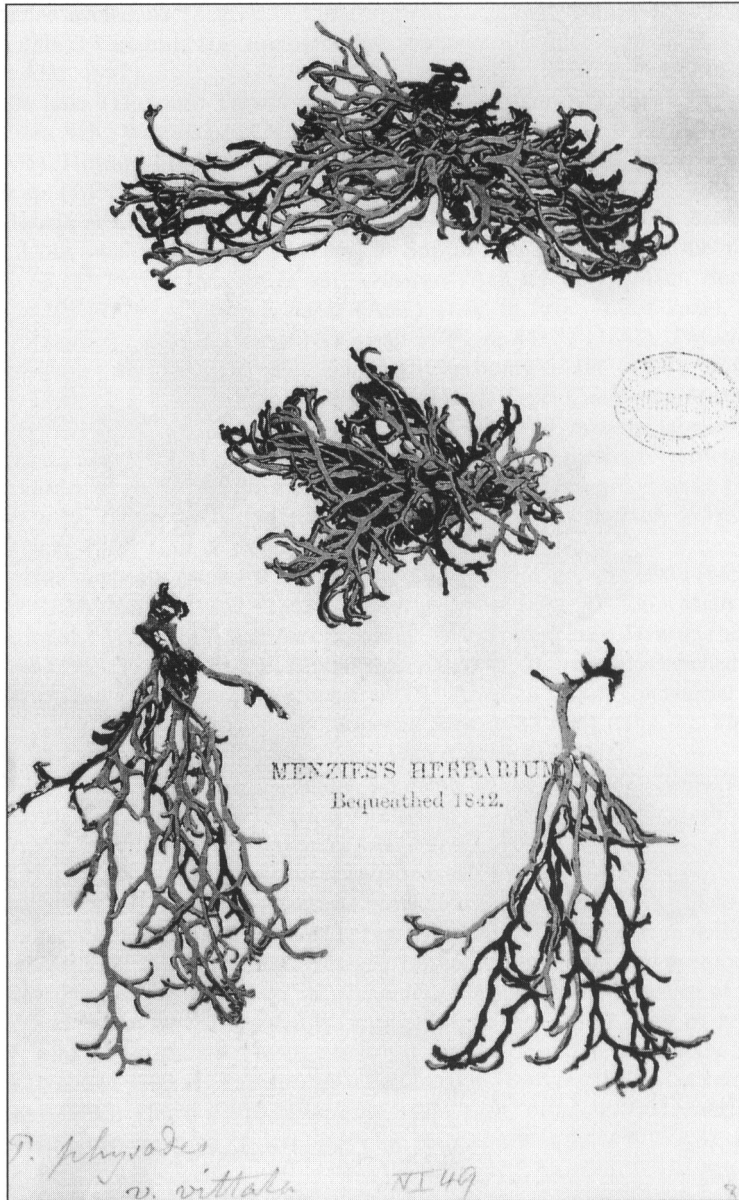


FIG. 7. Isotype of *Parmelia duplicata* [= *Hypogymnia duplicata*] (Menzies, E).

Ach: Port Trinidad California 1792. A:M'. This species is discussed in Thomson (1984). Coastal, oceanic, western North America from Alaska to California, also in Europe and Japan.

38. *Letharia vulpina* (L.) Hue (E). Labelled by Menzies 'Evernia vulpina Ach, California 1793. A:M'. Western North American-western Eurasia, oroarcctic to northern temperate (Goward & Ahti, 1992).

39. *Lobaria pulmonaria* (L.) Hoffm. (BM). Labelled by Menzies 'Lichen pulmonarius Banks

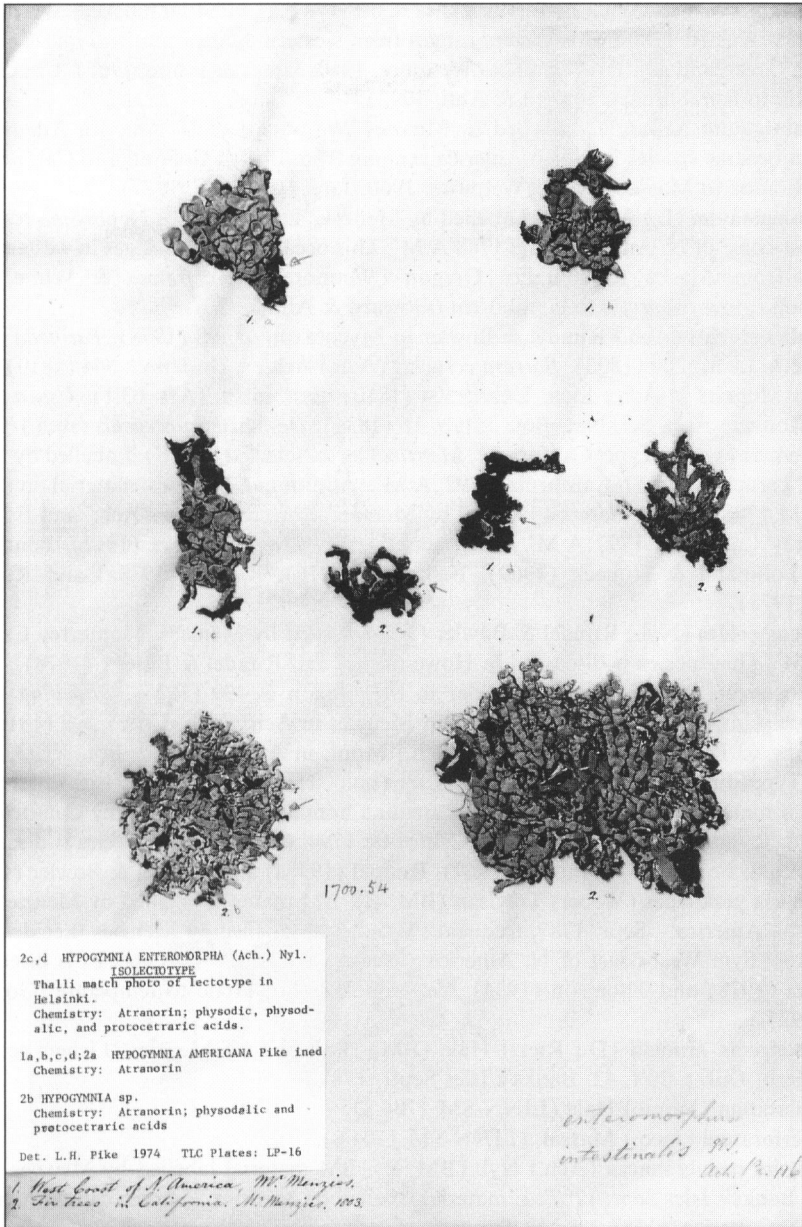


FIG. 8. Lectotype of *Parmelia enteromorpha* [= *Hypogymnia enteromorpha*] (Menzies, LINN-SM 1700.54).

Isles & other places Sepr. 1787'. This species is discussed in Thomson (1984) and Hale & Cole (1988). Incompletely circumpolar, low (oro)boreal to temperate, with oceanic tendencies (Goward & Ahti, 1992).

40. *Nephroma bellum* (Sprenzel) Tuck. (BM, E, LINN-SM 1706.20). BM material labelled

by Menzies 'Lichen resupinatus, Banks's Isles Sepr. 1787', E material labelled 'West-coast of N. America August 1788'. This species ranges from western Alaska south to mid-California, and from Greenland south to Virginia (Wetmore, 1960; James & White, 1987). Circumpolar, (oro)arctic to hemiboreal (Goward & Ahti, 1992).

**41. *N. laevigatum*** Ach. (E). Labelled by Menzies 'West-coast of N. America August 1788'. This is an oceanic species in North America ranging from British Columbia to California and from Labrador to Massachusetts (Wetmore, 1960; James & White, 1987).

**42. *N. resupinatum*** (L.) Ach. (E). Labelled by Menzies 'L. resupinatus Nephroma resupinata Ach: West-coast of N. America Aug: 1788 A:M'. This oceanic species ranges in western North America from Alaska to southern Oregon (Wetmore, 1960; James & White, 1987). Circumpolar, low oroarctic to hemiboreal (Goward & Ahti, 1992).

**43. *Niebla ceruchis*** (Ach.) Rundel & Bowler in Mycotaxon 6: 498 (1978). *Parmelia ceruchis* Ach., Meth. Lich.: 260 (1803). *Borrera ceruchis* (Ach.) Ach., Lich. Univ.: 504 (1810). *Lichen lacunosus* Menzies in Ach., Lich. Univ.: 504 (1810) nom. inval. (Art. 63.1). *Usnea ceruchis* (Ach.) Mont. in Ann. Sci. Nat. Bot. 2: tab. 16 (1834). *Desmazieria ceruchis* (Ach.) Trevisan in Flora 54: 51 (1861). Type: Californiae, Menzies (lecto. selected here E). Labelled by Menzies 'Borrera ceruchis Ach.?? California 1792 A:M'. Additional Menzies material in BM, E, LINN-SM 1708.24. BM material labelled by Menzies 'Borrera ceruchis Ach:' and E material 'Monterrey California 1792 A:M'. This species is discussed in Howe (1913), Bendz et al. (1965), Follmann & Huneck (1969), Follmann (1976), Rundel (1978a) and Rundel & Bowler (1978).

**44. *N. combeoides*** (Nyl.) Rundel & Bowler (E). Labelled by Menzies 'Monterrey California 1792 A:M'. This species is discussed in Howe (1913) and Rundel & Bowler (1978).

**45. *N. homalea*** (Ach.) Rundel & Bowler in Mycotaxon 6: 499 (1978). *Ramalina homalea* Ach., Lich. Univ.: 598 (1810). *Lichen planus* Menzies in Ach., Lich. Univ.: 598 (1810) nom. inval. (Art. 63.1). *Desmazieria homalea* (Ach.) Mont. in Ann. Sci. Nat. Bot. sér. 3, 18: 304 (1852). Type: In rupibus Californiae, Menzies (holo. H-ACH 1820 n.v.; iso. E, LINN-SM 1708.4). E material labelled by Menzies 'Ramalina homalea Ach: Monterrey California 1792 A:M' and 'R. homalea Ach: Monterrey California 1794' (Fig. 9). This species is discussed in Howe (1913), Follmann & Huneck (1969), Rundel (1978a) and Rundel & Bowler (1978).

**46. *Pannaria pezizoides*** (Weber) Trevisan (BM, E). BM material labelled by Menzies 'West-coast of N. America - Sepr: 1787, frequent'. E material labelled by Menzies 'Lecidea microphylla Ach: Syn: West-coast of N. America - Sepr. 1787 A:M'. This species is discussed in Jørgensen (1978) and Thomson (1984). Circumpolar, (oro)arctic to temperate (Goward & Ahti, 1992).

**47. *Parmotrema arnoldii*** (Du Rietz) Hale (BM). Labelled by Menzies 'Lichen perforatus Banks Herb. Dill. t. 20 f. 42. Banks's Isles Sepr. 1787'.

**48. *P. dilatatum*** (Vainio) Hale (LINN-SM 1704.8).

**49. *P. perforatum*** (Jacq.) Massal. (LINN-SM 1704.8).

**50. *Peltigera membranacea*** (Ach.) Nyl. (BM, E). BM material labelled by Menzies 'Lichen caninus, Banks's Isles Sepr: 1787'. E material labelled by Menzies 'Peltidea canina Ach: West-coast of N. America - 1788 - A:M'. This species is discussed in Thomson (1984). Incompletely circumpolar, (oro)boreal to temperate with oceanic tendencies (Goward & Ahti, 1992).

**51. *P. venosa*** (L.) Hoffm. (BM, E). BM material labelled by Robert Brown 'NW coast America A. Menzies'. Another specimen labelled by Menzies 'West-coast of N. America - 1787'. E material labelled by Menzies 'L. venosus, Peltidea venosa Ach: E. fl., N.W. Coast of America A:M'. This species is discussed in Thomson (1984). Circumpolar, (oro)arctic to northern temperate (Goward & Ahti, 1992).

**52. *Phyllopsora*** sp. (LINN-SM 1694.54).

**53. *Pilophorus acicularis*** (Ach.) Th. Fr., Steroc. Piloph. Comm.: 41 (1857). *Baeomyces acicu-*

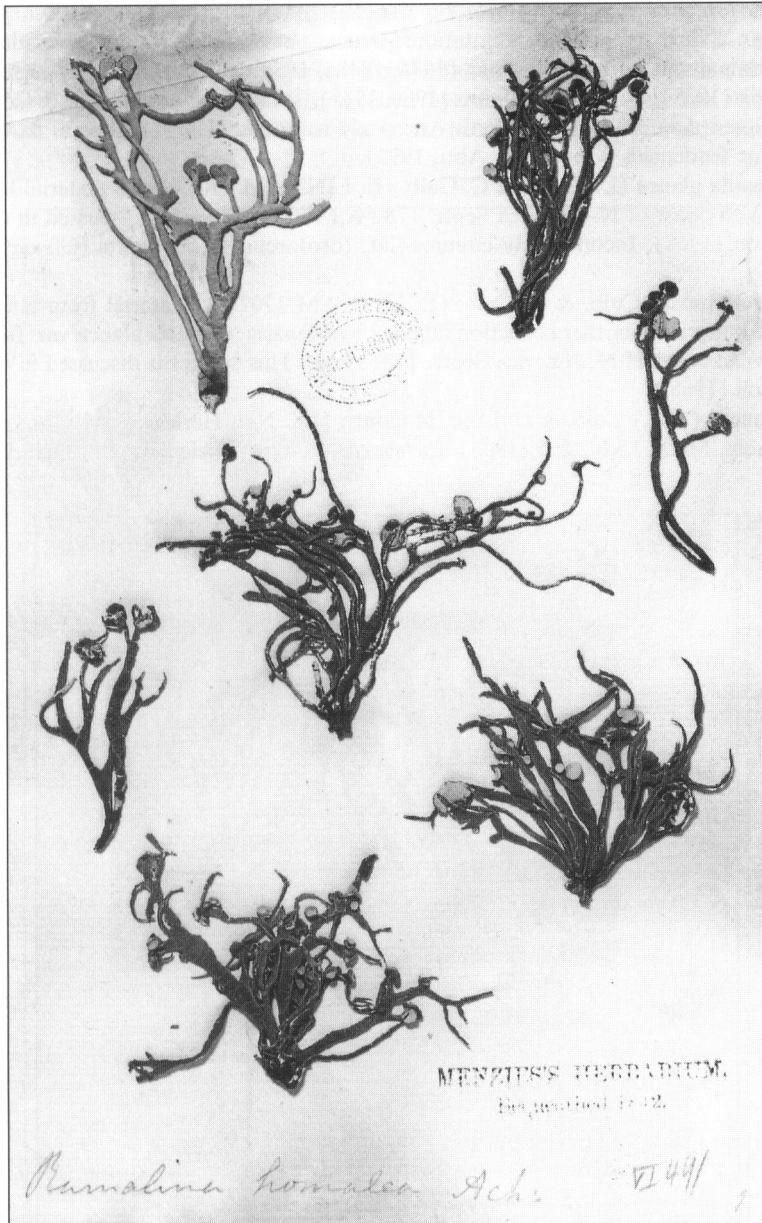


FIG. 9. Isotype of *Ramalina homalea* [= *Niebla homalea*] (Menzies, E).

*laris* Ach., Meth. Lich.: 328 (1803). *Cenomyce acicularis* (Ach.) Ach., Lich. Univ.: 567 (1810). *Cladonia acicularis* (Ach.) Fr., Lichenogr. Eur. Reform.: 242 (1831). *Stereocaulon aciculare* (Ach.) Tuck., Enum. N. Am. Lich.: 52 (1845). *Pilophorus cereolus* var. *acicularis* (Ach.) Tuck., Syn. N. Am. Lich. 1: 235 (1882). Type: In Americae septentrionali, Menzies (holo. H-ACH 1582 n.v.; iso. BM, LINN-SM 1711.6). BM material labelled by Menzies 'Sp nov This plant

grows often on Stones & dead Trees on the West coast of North America July 1787-8' (Fig. 10). In a further pencilled annotation Menzies has added 'Cenomyce acicularis Ach.'. This species is discussed in Tuckerman (1845, 1848a, 1858, 1872a, 1882), Müller Argoviensis (1889), Fink (1935), Hale (1969), Jahns (1970, 1981), Tucker (1973) and Hale & Cole (1988). Western North America-eastern North America-eastern Eurasia, (oro)boreal to temperate, with oceanic tendencies (Goward & Ahti, 1992).

54. *Platismatia glauca* (L.) Culb. & C. Culb. (E, LINN-SM 1707.10). E material labelled by Menzies 'West-coast of N. America Sepr. 1787 A:M'. This species is discussed in Culberson & Culberson (1968). Incompletely circumpolar, (oro)arctic to temperate (Goward & Ahti, 1992).

55. *P. herrei* (Imsh.) Culb. & C. Culb. (E, LINN-SM 1707.9). Material from E intermixed with above material. Another collection labelled by Menzies 'Cetraria glauca var. fallax Ach., L. fallax, West-coast of N. America Sepr. 1787 A:M'. This species is discussed in Culberson & Culberson (1968).

56. *P. lacunosa* (Ach.) Culb. & C. Culb. in Contr. U.S. Nat. Herb. 34: 541 (1968). *Cetraria lacunosa* Ach., Meth. Lich.: 295 (1803). *Lichen cavernosus* Menzies in Ach., Lich. Univ.: 508

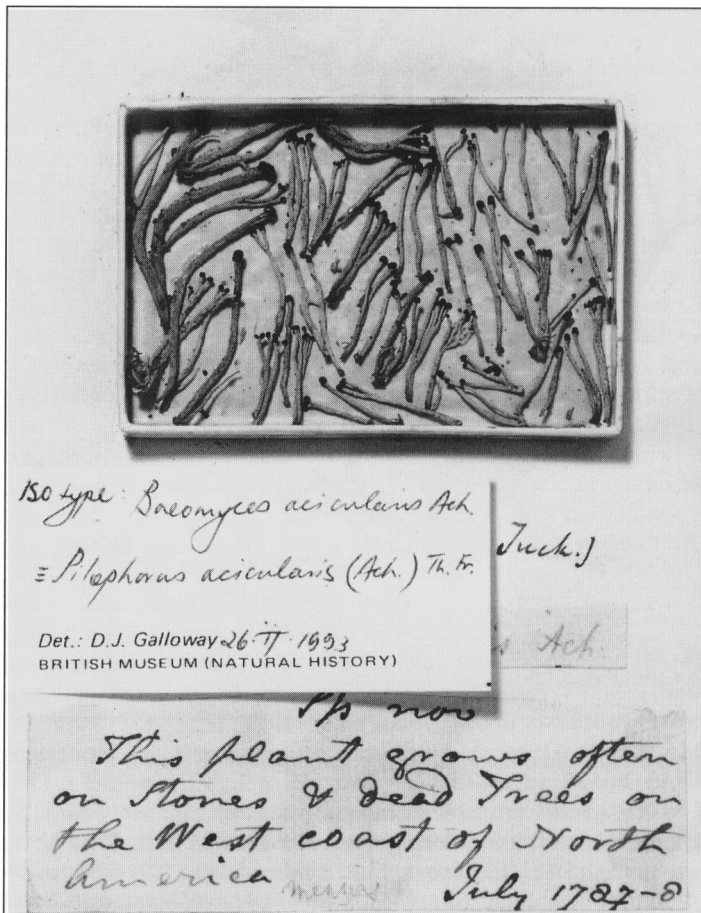


FIG. 10. Isotype of *Baeomyces acicularis* [= *Pilophorus acicularis*] (Menzies, BM).

(1810) nom. inval. (Art. 63.1). *Cetraria lacunosa* f. *cavernosus* (Menzies in Ach.) Merrill in Bryologist 13: 26 (1910). *Platysma lacunosum* (Ach.) Nyl. in Bot. Not. 1855: 137 (1856) ('1855'). *Cetraria lacunosa* f. *cavernosa* (Menzies) Merrill in Bryologist 13: 26 (1910). Type: In Americae boreali, Menzies (lecto. E, labelled by Menzies 'L. cavernosus Msc. Cetraria lacunosa Ach: West-coast of N. America 1787 - A: Menzies' (Fig. 11)). Additional Menzies

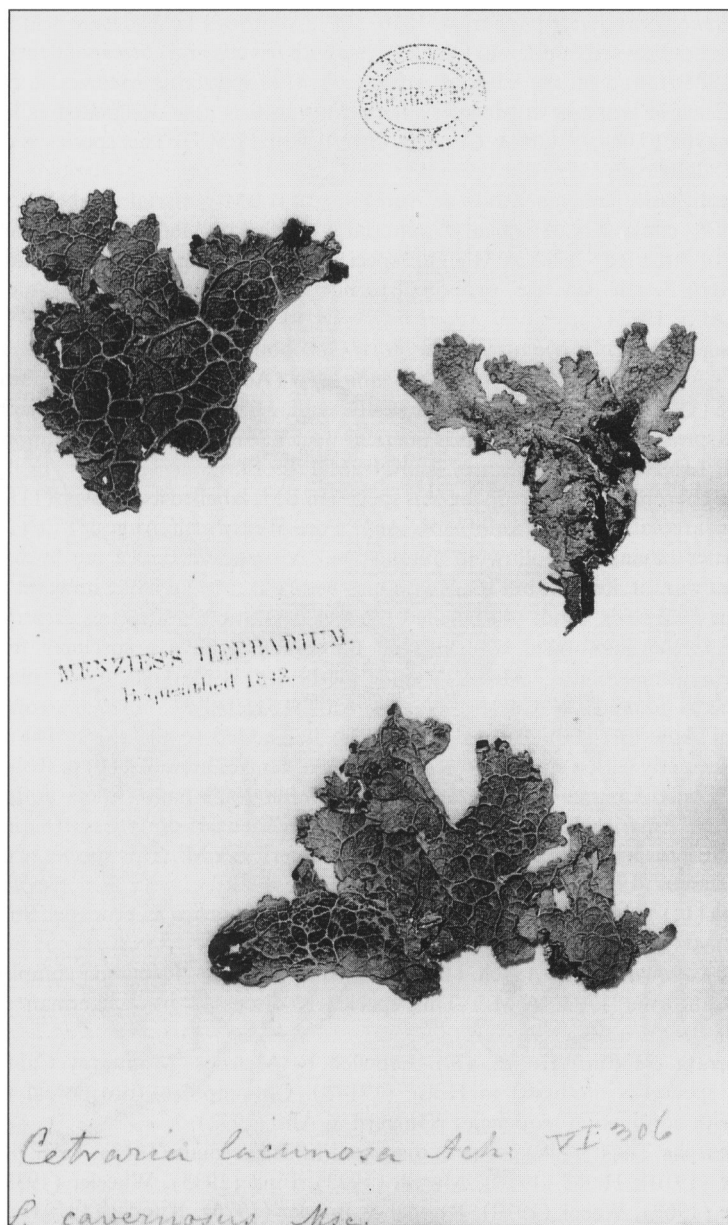


FIG. 11. Lectotype of *Cetraria lacunosa* [= *Platismatia lacunosa*] (Menzies, E).

material: BM (labelled by Robert Brown 'Banks's Isles A, Menzies'); E (labelled by Menzies 'West-coast of N. America - 1787 - A:M'); LINN-SM 1707.10. This species is discussed in Tuckerman (1848a, 1866, 1882), Herre (1910), Hasse (1913), Fink (1935), Howard (1950), Culberson & Culberson (1968), Hale (1969) and Hale & Cole (1988). As there is no authentic Menzies material of *Cetraria lacunosa* in H-ACH, Culberson & Culberson (1968: 543) neotypified *C. lacunosa* on a specimen in Swartz's herbarium in Stockholm (S). Although Menzies was not cited as collector in the protologue (Acharius, 1803: 295), he was mentioned by name in *Lichenographia Universalis* (Acharius, 1810: 508). Menzies's lichens were sent to Acharius by both Sir James Edward Smith and Olof Swartz, both friends and correspondents of Menzies (Galloway, 1988b), and on the basis of Acharius (1810) specifying Menzies as collector the material of *Cetraria lacunosa* in Menzies's herbarium in E is here designated as lectotype.

**57. *P. stenophylla*** (Tuck.) Culb. & C. Culb. (LINN-SM 1709.9). This species is discussed in Culberson & Culberson (1968).

**58. *Pseudocyphellaria anomala*** Brodo & Ahti (BM, E). BM material is labelled by Menzies 'Banks's Isles W. coast of N. America'. E material is labelled by Menzies 'Sticta near Scrobicul: ? West-coast of America - 1788 A:M'. This species is discussed in Ahti (1977) and Ahti et al. (1987). Western North America, oroboreal to northern temperate, with oceanic tendencies (Goward & Ahti, 1992).

**59. *P. anthraspis*** (Ach.) H. Magn. in Acta Horti Gothoburg. 13: 248 (1939). *Sticta anthraspis* Ach., Meth. Lich.: 280 (1803). *Cyanisticta anthraspis* (Ach.) Gyelnik., Lichenotheca parva. Fasc. 1, No. 8 (1937). Type: In Americae septentrionali, Menzies (lecto. E, labelled by Menzies 'Sticta anthraspis Ach: West-coast of N. America - Oct: 1787 A:Menzies'). Additional Menzies material BM, LINN-SM 1705.14 pr.p., LINN-SM 1705.15.

There are eight separate collections of this species in BM, labelled as follows: (1) in Menzies's hand 'Lichen areolatus, Sticta anthraspis Ach: Port Wentworth Aug: 1787'; (2) ex Herb. Dawson Turner having the following annotation: 'A foreigner, given me by Mr. Menzies No. 57. If you want it, keep it; but if not you may return it. I beg a name however'; (3) 'Sticta anthraspis' in Menzies's hand; (4) labelled by Menzies 'Sticta anthraspis Ach: W. coast of N. America' further annotated by Churchill Babington 'I have a specimen from Aiton's herbarium "Lichen areolatus" Menz. A sp in Herb. Sm. is marked "California - Menzies 1803", another is marked "W. Coast of N. America"'; (5) labelled "Lichen areolatus Menz." (W. Coast of America) (Hb. Aiton). Babington has added to the sheet 'The spec in Hb Hook. agrees exactly with a sp. named & localized by Menzies himself'; (6) in Robert Brown's hand 'N.W. Coast America A. Menzies'; (7) in Babington's hand 'Sticta anthraspis Ach. W. Coast of N. America Hb. Hook. another sp from Menzies doubtless'; (8) in Menzies's hand 'Sticta anthraspis Ach: North West Coast of America A:M'. This species is discussed in Galloway & James (1977) and Ahti et al. (1987).

**60. *P. crocata*** (L.) Vainio (BM, E). E material labelled by Menzies 'L. crocatus, Sticta crocata, California A:M'.

**61. *Ramalina complanata*** (Sw.) Ach. (E). Labelled by Menzies 'Ramalina complanata Ach.: Monterrey California 1793. A:M.'. This species is discussed in Tuckerman (1882) and Rundel (1978a).

**62. *R. dilacerata*** (Hoffm.) Hoffm. (E). Labelled by Menzies 'Monterrey California 1792 A:M.'. This species is discussed in Howe (1914b). Circumpolar, (oro)boreal to northern temperate, with continental tendencies (Goward & Ahti, 1992).

**63. *R. leptocarpha*** Tuck. This species is discussed in Tuckerman (1848a, 1858, 1866, 1872a, 1882), Herre (1910), Hasse (1913), Merrill (1923), Fink (1935), Wheeler (1938), Howard (1950), Hale (1969), Weber (1970), Rundel & Bowler (1976), Rundel (1978a) and Hale & Cole (1988).

**64. *R. menziesii*** Taylor in Lond. J. Bot. 6: 189 (1847). Type: California, Monterey, Archibald



*Menzies* (iso. BM, material labelled in ink in Taylor's hand 'Ramalina Menziesii Tayl MSS California. Menzies'). Fig. 12.

Syn.: *Ramalina reticulata* Krempelh. in Geschichte und Litt. Lich. 1: 86 (1867). Type: As for *Ramalina menziesii* Taylor.

*Lichen reticulatus* Noehden in Schrad. J. Bot. 1800, I(2): 238 (1801), non *L. reticulatus* Ach. (Lich. Suec. Prodr.: 144 (1799)) nec Wulfen in Jacq. (Collectanea II: 187 (1789)). Type:

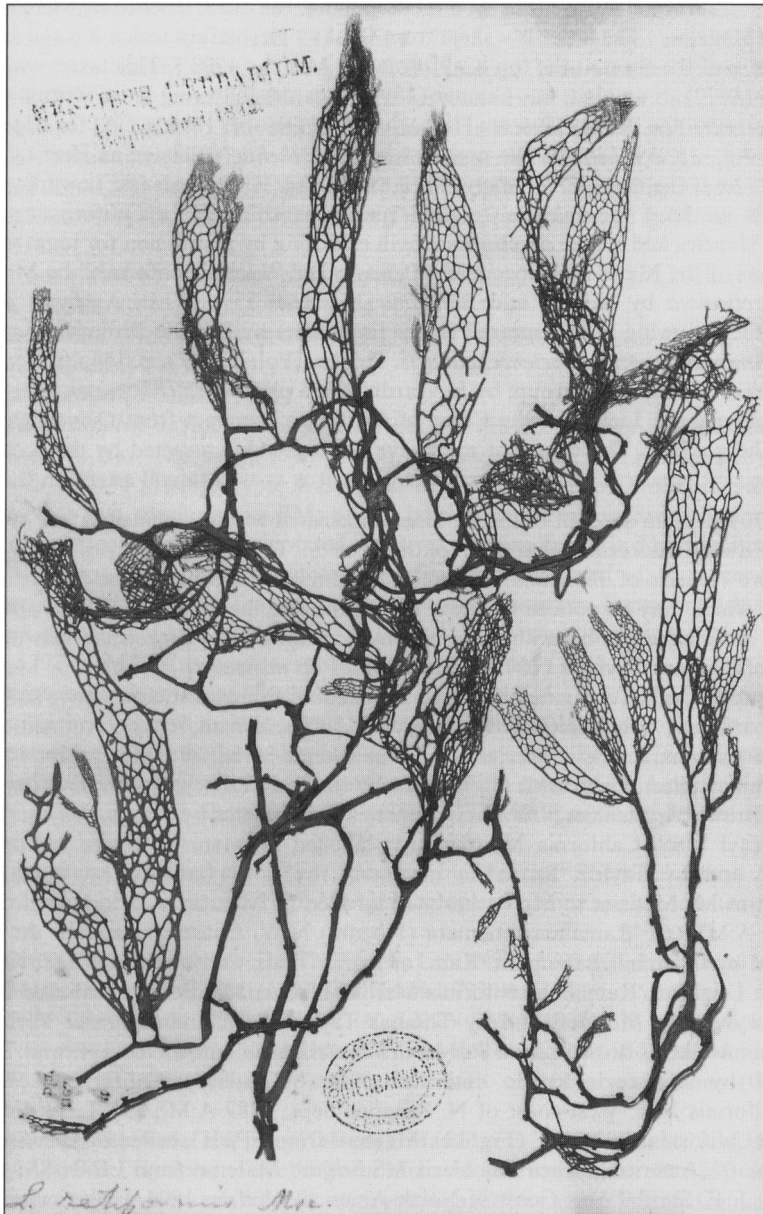


FIG. 12. *Ramalina menziesii* (Menzies, E).

Westkuste von Amerika, Menzies ex Herb. Banks (? n.v.). A sheet in BM labelled in Robert Brown's hand 'from Mr Menzies' has the pencil annotation in a modern hand 'Chlorodictyon foliosum J. Ag. Ramalina reticulata Noehd.' and may represent isotype material.

*Ramalina retiformis* Menzies ex Tuck. in Proc. Amer. Acad. Arts Sci. 1(2): 204 (1848). Type: Monterey, *Menzies* (FH, n.v.).

*Chlorodictyon foliosum* J. Agardh in Ofvers. K. Vetensk. Akad. Förh. Stockh. 27: 434 (1870). Type: Hb. J. E. Gray, sine ulla de origine et loco natali adnotatione (syn., BM. Two sheets, one labelled 'California Mr Menzies' in a modern hand, the other labelled by Menzies 'Lichen retiformis (Menzies)'. The latter is a sheet from Banks's Herbarium which has the annotation on the reverse of the sheet at the top 'California Mr Menzies 1793'). This taxon was regarded by Agardh (1870) as an alga, but Cramer (1891) cites the following letter written to him by George Murray of the British Museum Herbarium on 2 October 1890 '... As for *Chlorodictyon foliosum* J. Ag. – it is a Lichen!. We possess here an authentic specimen ex Herb. J. E. Gray, which bears on it the name *Chlorodictyon foliosum* J. Ag. in Agardh's (sic.) own handwriting. Besides this we have the splendid original specimens collected in California in 1793 by Archibald Menzies and I have much pleasure in enclosing by permission for your (sic.) collection portions of the Menziesian specimens. It was called "Lichen retiformis" by Menzies and *Ramalina reticulata* by Noehd. and *Ramalina Menziesii* Tayl. When Agardh's paper was published the following note appeared (some time later) by the late Professor Asa Gray in Silliman's *American journal of science and arts*, 3rd ser., Vol. V, 1873, p. 144, "Chlorodictyon, a new genus of the Caulerpa group; by J. Agardh with a plate, – which represents the *Ramalina retiformis* Menzies, a Lichen of the Coast of California"; extract from Oefversigt of K.V. Akad. Förhdlg., 1870. The oversight may have been already corrected by the accomplished author; but as it concerns a North American plant it is as well to call attention to it. A.G.'.

Weber (1970) gives an account of the problems associated with the nomenclature of *Ramalina menziesii*. Edward Tuckerman first wrote of this species: 'The late Mr Menzies kindly presented me with two (species of *Ramalina*), collected by him on the coast of the Mexican State of California, which may be noticed briefly ... It is probable the first, at least, has already been described, but I have not been able to find any account of it. [Tuckerman was unaware at that time of Thomas Taylor's (1847) description of *R. menziesii*] *R. retiformis* Menz. herb.; subcartilagineous, much elongated, the irregular flexuous branches dilated above and regularly reticulate-perforate; apoth. lateral. Monterey! ...' (Tuckerman, 1848). Authentic Menzies material of this characteristic species is held in several herbaria: BM, E, LINN-SM, LIV. There are nine collections in BM: (1) labelled by Menzies 'Lichen retiformis (Menzies)' and by Robert Brown 'A. Menzies N.W. Coast America'; (2) labelled by Thomas Taylor 'Ramalina menziesii Tayl MSS, California Menzies'; (3) labelled by Menzies 'Usnea retiformis Msc: California' and by Taylor 'Ramalina menziesii Tayl.'; (4) labelled by William Borrer 'L. reticulatus Mr Menzies to Mr Turner'; (5) labelled by Menzies 'Alectoria retiformis Msc: California A:M'; (6) 'Ramalina reticulata (Noehd.) N.W. Coast of America. A. Menzies'; (7) labelled by Churchill Babington 'Ram. menziesii Tayl., California Menzies'; (8) labelled by William Leighton 'Ramalina retiformis Msc. California Menzies'; (9) labelled by Robert Brown 'Owyhee Mr Menzies' and by Thomas Taylor 'Ramalina menziesii Tayl.'. This is obviously a mistake of Brown's since *Ramalina menziesii* is not known from Hawaii. E material is labelled by Menzies: (1) 'L. retiformis Msc: Monterey California 1792. AM.'; (2) 'L. retiformis Msc: West-coast of N. America Sepr: 1787 A:M'; (3) 'L. retiformis Msc: Monterey California 1792 A:M' (Fig. 12). Material from LIV is labelled by J. E. Smith 'West Coast of North America. Lichen reticularis MS Smith'. Material from LINN-SM 1715.23 is labelled by J. E. Smith 'West Coast of North America. Menzies 1803. L. (reticularis)'.

The characteristic netted thallus of *Ramalina menziesii* has attracted considerable interest from lichenologists over the years, in terms of both the development of this particular mor-

phology and its special physiological adaptation in condensing liquid water from sea fogs which are characteristic of the habitats in which the lichen grows (Noedhen, 1801; Taylor, 1847; Tuckerman, 1848a, 1866, 1882; Müller Argoviensis, 1889; Cramer, 1891; Lutz, 1894; Pierce, 1898; Herre, 1904, 1910, 1945; Hasse, 1913; Howe, 1914a; Merrill, 1923; Fink, 1935; Wheeler, 1938; Howard, 1950; Hale, 1969; Rundel, 1974, 1978a; Nash et al., 1983; Larson, 1983; Larson et al., 1985, 1986; Matthes-Sears & Nash, 1986; Matthes-Sears et al., 1986a, 1986b, 1987; Hale & Cole, 1988; Boonpragob et al., 1989; Boonpragob & Nash, 1990, 1991; Nash et al., 1990; Sanders, 1989, 1992).

**65. *R. thrausta*** (Ach.) Nyl. (BM, E, LINN-SM 1708.21, 1710.19). BM material labelled by Menzies '*Alectoria crinalis* Ach.:? W. Coast of N. America', and another specimen 'Banks's Isles Oct: 1787'. E material labelled by Menzies '*Alectoria thrausta* Ach., West-coast of N. America Sepr. 1787 A.M.'. This species is discussed in Bowler (1977) and Thomson (1984). Circumpolar, arctic to essentially (oro)boreal and temperate (Goward & Ahti, 1992).

**66. *R. usnea*** (L.) R. Howe (E, LINN-SM 1715.21). E material labelled by Menzies '*Alectoria Usneoides*, Monterrey California 1792. A:M'. This species is discussed in Howe (1914d) and Rundel (1978b).

**67. *R.* sp.** (annotated by Magnusson *R. tropica* H. Magn., 1955) (E). Labelled by Menzies '*Ramalina*, Monterrey, California 1792. A:M'.

**68. *Rimelia cetrata*** (Ach.) Hale & Fletcher (BM). Labelled in pencil 'Banks's Isles Sept. 1787', not by Menzies but in a later hand.

**69. *Siphula ceratites*** (Wahlenb.) Fr.

Syn.: *Dufourea simplex* Taylor in Lond. J. Bot. 6: 185 (1847). *Siphula simplex* (Taylor) Nyl. in Mém. Soc. Sci. Nat. Cherbourg 5: 97 (1857). *Siphula ceratites* var. *simplex* (Taylor) Müll. Arg. in Flora 71: 130 (1888). Type: West coast of North America, *Archibald Menzies* (iso. BM). There are two specimens in BM; one is labelled by Menzies '*Stereocaulon* sp. Nov: W. Coast of N. America' — it is annotated '*Dufourea simplex* Tayl.', in Thomas Taylor's hand (Fig. 13); the second specimen is annotated by Menzies 'West-coast of N. America – Sepr. 1787'. It has no annotation by Taylor. This species is discussed in Thomson (1984).

**70. *Solorina spongiosa*** (Ach.) Anzi (E). Labelled by Menzies '*Solorina orbiculata* Nost., California 1792. A:M'. This species is discussed in Thomson (1984).

**71. *Sphaerophorus melanocarpus*** (Sw.) DC. (BM, E, LINN-SM 1712.6). BM material labelled by Menzies 'Lichen Sp: nov: *melanocarpus* Swartz *fruticulosus* dichotomous, ramulis distichis ramosisimis, scutellis terminalibus despicentibus, Banks's Isles Sepr. 1787'. E material labelled by Menzies '*Sphaerophoron compressum* Ach., West-coast of N. America – Sepr. 1787 A: Menzies'. This species is discussed in Ohlsson (1974) who records a Menzies specimen as being present in US.

**72. *Sticta fuliginosa*** (Hoffm.) Ach. (E). Labelled by Menzies '*Sticta fuliginosa* Ach: E. fl: p. 206, West-coast of N. America 1787 A:M.'. Incompletely circumpolar, low (oro)boreal to tropical, with oceanic tendencies.

**73. *Teloschistes chrysophthalmus*** (L.) Th. Fr. (E, LINN-SM 1708.10). E material labelled by Menzies '*Borrera chrysophthalma* Ach., California 1793, A:M'.

**74. *Thamnomia subuliformis*** (Ehrh.) Culb. (E, LINN-SM 1710.14). E material labelled by Menzies 'West-coast of N. America – Oct: 1787 A:M'. This species is discussed in Thomson (1984). Circumpolar, essentially (oro)arctic, but with oroboreal extensions (Goward & Ahti, 1992).

**75. *Thelomma mammosum*** (Hepp in Hartung) Massal. (E, LINN-SM 1692.3). E material labelled by Menzies '*Gyalecta Thunbergiana* Ach: Monterrey California 1793 A:M'. This species occurs on the American West Coast from Baja California to British Columbia (Hale & Cole, 1988), and it is also known from Portugal and the Canary Islands (Tibell, 1976).

**76. *Umbilicaria vellea*** (L.) Ach. (BM, E). BM material labelled by Menzies '*Gyrophora*,

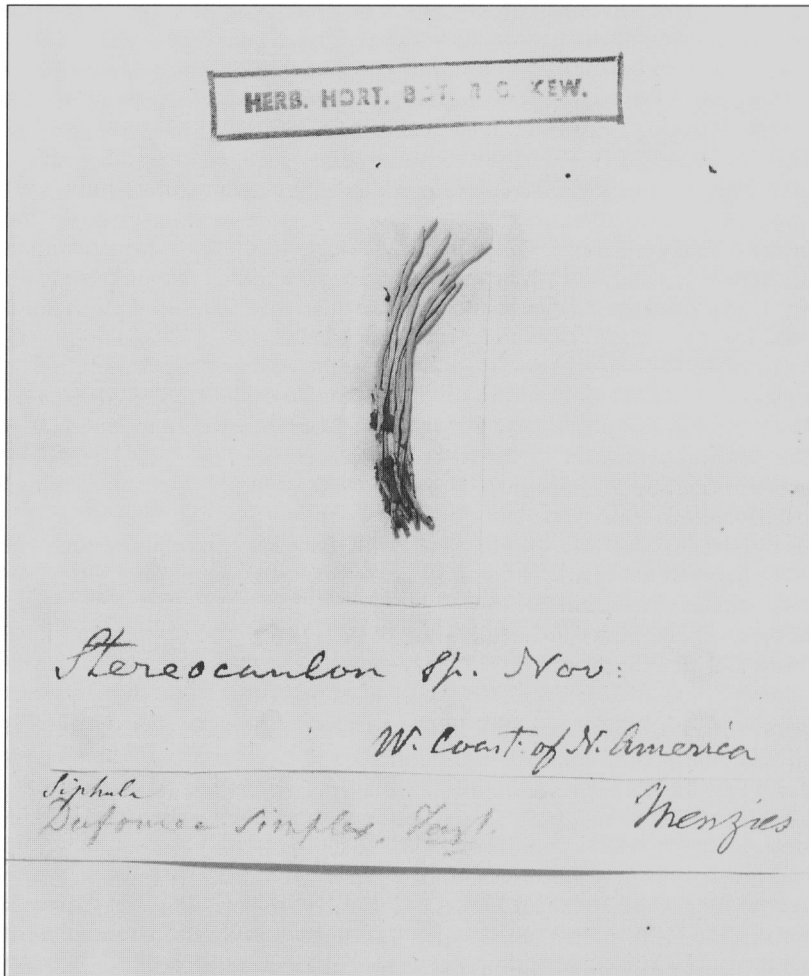


FIG. 13. Isotype of *Dufourea simplex* [= *Siphula ceratites*] (Menzies, BM).

California', and E material labelled 'California 1793. A:M'. This species is discussed in Thomson (1984). Circumpolar, (oro)arctic to northern temperate (Goward & Ahti, 1992).

**77. *Usnea cavernosa*** Tuck. (E, LINN-SM 1715.7). E material labelled by Menzies 'L. plicatus ? West-coast of N. America Sepr: 1787 A.M.'.

**78. *U. ceratina*** Ach. (BM, LINN-SM 1715.16). BM material labelled by Menzies 'L. barbatus West-coast of N. America Sepr: 1787' and 'Lichen barbatus, Banks's Isles Octr: 1787'.

**79. *U. fulvorenans*** (Räsänen) Räsänen. (E). Labelled by Menzies 'L. hirtus ?? U. barbata, West-coast of N. America 1787'.

**80. *U. longissima*** Ach. (BM, LINN-SM 1715.6). BM material labelled by Menzies 'Lichen plicatus fructificationib. Banks's Isles Octr: 1787'.

**81. *U. subfloridana*** Stirton. (E). Labelled by Menzies 'L. hirtus ?? Usnea barbata Ach: West-coast of N. America Oct: 1787 A:M'. This species is discussed in Brodo (1984a).

**82. *Vulpicida canadensis*** (Räsänen) Mattson & Lai (E). Labelled by Menzies 'California 1794.

A:M'. This species is discussed in Brodo (1984a), Kärnefelt et al. (1992) and Mattson & Lai (1993). Western North American, oroboreal to temperate (Goward & Ahti, 1992).

**83. *Xanthoria candelaria*** (L.) Th. Fr. (BM, E). BM material labelled by Menzies 'Lichen on the Cupressus Thuyoides on the West coast of N. America 1787'. E material labelled by Menzies 'L. concolor, West-coast of N. America - 1787 A:M'. This species is discussed in Thomson (1984). Circumpolar, (oro)arctic to temperate (Goward & Ahti, 1992).

#### 4. *Sumatra*

Menzies collected a small number of lichens from Sumatra in 1789 on the return voyage of the *Prince of Wales* from China to Britain. In both Menzies's letter to Professor Rutherford in Edinburgh (Galloway & Groves, 1987), and specimens from the Edinburgh herbarium annotated by Menzies as 'South end of Sumatra February 1789' (Fig. 2a), no information is given as to the exact localities of the collections. These are the earliest known lichen collections from Sumatra.

**1. *Bacidia*** sp. Spores narrowly fusiform, 3–6-septate, 25–30 × 5 μm. Labelled by Menzies 'Lecidea vernalis Ach: Sumatra - Feb. 1789 A:M'.

**2. *Collema rugosum*** Krempelh. (E, LINN-SM 1701-38). E material labelled by Menzies 'Collema flaccidum Ach: L. rupestris, Sumatra - Feb: 1789 A:Menzies'.

**3. *Dirinaria picta*** (Sw.) Clem. & Shear (E, LINN-SM 1699.16). E material labelled by Menzies 'P. picta Ach: L. pictus Swartz, Sumatra - Feb: 1789 A:M'. Another specimen is labelled by Menzies 'Lichen pictus Swartz South end of Sumatra Feb: 89'.

**4. *Graphina*** sp. (Spores muriform, 1 per ascus, 100–130 × 35–40 μm. Thallus with norstictic acid). (E). Labelled by Menzies 'Sumatra Feb: 1789. A:M'.

**5. *Lecanactis concordans*** (Nyl.) Zahlbr. (E, LINN-SM 1694.12 (1)). E material labelled by Menzies 'Sumatra. Feb: 1789 A:M'. Known formerly only from the Andaman Islands (Awasthi, 1991).

**6. *Leptogium* cf. *corticola*** (Taylor) Tuck. (E). Labelled by Menzies 'Collema diaphanum Ach: South end of Sumatra - Feb: 1789 A:M'.

**7. *L.* cf. *cyanescens*** (Rabenh.) Körber (E). Labelled by Menzies 'Collema diaphanum Ach: Sumatra - Feb: 1789 A:M'.

**8. *Leptogium*** sp. (E). With specimens of two above taxa.

**9. *Parmeliella* cf. *brisbanensis*** (C. Knight) P. M. Jørg. & D. J. Galloway (E). Labelled by Menzies 'L. pannosus Swartz, Sumatra - Feb: 1789'. (With *P. mariana*).

**10. *P. mariana*** (Fries) P. M. Jørg. & D. J. Galloway (E). Labelled by Menzies 'P. pannosa Ach: L. Pannosus Swartz Sumatra - Feb: 1789 A:M'. Another specimen labelled by Menzies 'Lichen Sp: nov: pannosus Swartz Prodrum. South end of Sumatra Feb: 1789'.

#### 5. *Cape of Good Hope*

Although Menzies called at the Cape first in 1789 on his way back from Macao during the voyage home of the *Prince of Wales* (Galloway & Groves, 1987), his lichen collections from there were made during Vancouver's expedition when the *Discovery* anchored at Simonstown for six weeks during July–August 1791 (Gunn & Codd, 1981; Lamb, 1984). A period from 10 July to 17 August was spent at Simons Bay ... 'which gave Menzies the opportunity to do some collecting. Harvey (W. H. Harvey 1811–1866) records that "It was at Paradise (an estate near

Kirstenbosch) that old Menzies got many of his beautiful mosses" ... He also met Col. R. J. Gordon (1743–1795) who gave his mercury barometer to Menzies ...' (Gunn & Codd, 1981: 250).

The 30 lichens which comprise Menzies's Cape collection represent one of the earliest lichen collections made from this region, predating those of Wawra (Massalongo, 1861) by 61 years, and Eaton's (Crombie, 1877) by 83 years. Only Koenig's discovery of *Teloschistes chrysophthalmus*, the first lichen recorded from South Africa as (*Lichen chrysophthalmus* L., Linnaeus, 1771), and of Thunberg's collections (see Thunberg, 1823) made between 1772–1775 when he lived at the Cape (Almborn, 1966, 1988) were earlier than Menzies's lichen gatherings.

Menzies's Cape lichens are presently known from the following herbaria: BM (3 specimens), E (17 specimens), LINN-SM (15 specimens). The Edinburgh specimens are on standard Menzies octavo sheets, all bearing the locality data 'Cape of Good Hope 1791 A:M' on the reverse (Fig. 2b), while the Smith Herbarium sheets have Smith's annotation 'Cape of Good Hope, Mr Menzies 1803', referring to the date when Menzies actually presented his lichen collections to Smith.

1. *Anaptychia ciliaris* Ach. (LINN-SM 1708.36).
2. *Collema subconveniens* Nyl. (BM, E). E material is annotated by Menzies 'C. limosum Ach.'. (Spores are colourless, muriform,  $18-30 \times 9-11 \mu\text{m}$ ). The species is discussed in Degelius (1974: 137–139).
3. *Heterodermia leucomelos* (L.) Poelt (BM).
4. *H. magellanica* (Zahlbr.) Swinscow & Krog (E).
5. *H. lepidota* Swinscow & Krog (BM, LINN-SM 1700.27). This species is discussed in Swinscow & Krog (1976: 122; 1988: 95).
6. *H. speciosa* (Wulfen) Trevisan (E). This material is host to an undescribed lichenicolous species of *Opegrapha* (Coppins, pers. comm.).
7. *Lasallia papulosa* var. *rubiginosa* (Pers.) Llano (BM, E, LINN-SM 1703.13). E material is annotated by Menzies 'Umbilicaria rubiginosa Pers'. Turner & Borrer (1839: 234) state of Menzies's collection '... Some specimens of this Lichen, brought by Mr. Menzies from the Cape of Good Hope, have the upper surface tinged with an ochrey red, perhaps the effect of an accident. These specimens bear abundance of patelliform tricae, and are almost entirely destitute of the black tufted fibres mentioned above, in the description of the upper surface, which also appear somewhat less numerous than usual in the other specimens which we have seen ...'. Leighton (1856: 296) wrote of this same collection: 'Mr Menzies' specimen from the Cape of Good Hope! in herb Borrer, mentioned in Lich. Brit. 234, is smoother and less granulated on both surfaces, tinged of an ochrey-red; the apothecia very numerous, much more sessile, their margins entire or irregularly waved and undulated, but not at all fibrous. Sporidia similar to those of British specimens. A specimen in my own herbarium received from Prof De Notaris, collected by Zeher at the Cape of Good Hope and labelled "Lasallia (Gyrophora Eschw.) porphyrea De Not." appears identical with Mr Menzies' in structure and sporidia. The thallus when wetted becomes a vivid scarlet hue'. The species is discussed in Llano (1950: 47), Krog & Swinscow (1986: 78) and Swinscow & Krog (1988: 125–126). Chemistry of this taxon is discussed in Posner (1990) and Posner et al. (1991).
8. *Leptogium austroamericanum* (Malme) Dodge (E).
9. *L. azureum* (Sw.) Mont. (E).
10. *L. coralloideum* (Meyen & Flotow) Vainio (BM, E, LINN-SM 1701.7). This species is discussed in Swinscow & Krog (1988: 136).

11. *L. corniculatum* (Syn. *L. palmatum* (Hudson) Mont.) (LINN-SM 1710.16).
12. *Lethariella canariensis* (Ach.) Krog. (BM). Material is labelled 'St Helens Bay Caffraria', but not in Menzies's hand. This taxon is not known from South Africa, nor is there any evidence that Menzies travelled as far north as the coast of Caffraria. It is possible that this is a mislabelled specimen.
13. *Megalospora sulphurata* Meyen (LINN-SM 1694.15). This species is discussed in Sipman (1983: 125–132).
14. *Opegrapha atra* Pers. (E). Annotated by Menzies 'Opegrapha hapalea v. pedonta' following Acharius (1814: 79–80).
15. *Pannaria brisbanensis* C. Knight (BM).
16. *P. lurida* (Mont.) Nyl. (BM, LINN-SM 1700.29). Discussed as *P. rubiginosa* in Dodge (1964: 136–137).
17. *Parmeliella mariana* (Fr.) P. M. Jørg. & D. J. Galloway (BM, LINN-SM 1694.84).
18. *Phaeophyscia ? endococcina* (Körber) Moberg (E).
19. *Phyllopsora corallina* (Eschw.) Müll. Arg. (E). Annotated by Menzies 'Lecidea microphylla Ach:Syn.'. (Spores simple, 6–7 × 2–3µm).
20. *Physma byrsaeum* (Ach.) Tuck. (BM, LINN-SM 1701.40). This species is discussed in Swinscow & Krog (1988: 235).
21. *Pseudocyphellaria gilva* (Ach.) Malme (B). FH material (not seen) discussed in Dodge (1964: 174–175) as *Cyanisticta gilva* var. *angustilobata*. A detailed account of this species is given in Galloway (1992).
22. *Ramalina celastri* (Sprengel) Krog & Swinscow (E). This species is discussed in Krog & Swinscow (1976: 159).
23. *Rimelia reticulata* (Taylor) Hale & A. Fletcher (LINN-SM 1694.15).
24. *Roccella arnoldii* Vainio (E).
25. *Siphula verrucigera* (J. F. Gmelin) R. Sant. (E). Annotated by Menzies 'Stereocaulon tabulare Ach:'.
26. *Squamarina cartilaginea* (With.) P. James (E, LINN-SM 1698.15). E material annotated by Menzies 'Lecanora crassa'.
27. *Teloschistes exilis* (Michaux) Vanio (E). Annotated by Menzies 'Borrera exilis?'.
28. *Usnea* cf. *subflorida* (Zahlbr.) Mot. (E). Annotated by Menzies 'Usnea florida?'. This species is discussed in Swinscow & Krog (1979: 246–247).
29. *Xanthomaculina hottentota* (Ach.) Hale (LINN-SM 1698.13). This species is discussed in Hale (1985).
30. *Xanthoria parietina* (L.) Th. Fr. (BM, LINN-SM 1708.36 pr.p.).

Specimens of *Anaptychia obesa* (Pers.) Zahlbr., (E, LINN-SM 1700.28) annotated as being from the Cape of Good Hope are obviously in error since this taxon is known only from Hawaii. Dodge (1959: 101–102) described *Parmelia menziesii* Dodge, from a specimen in the Tuckerman Herbarium (FH) collected by Menzies at the Cape of Good Hope, but I have not seen this type.

## 6. New Zealand

Joseph Hooker wrote of Menzies's New Zealand and Southern Hemisphere collections '... The exertions of the late Mr. Menzies during Vancouver's voyage, brought to light so many new and interesting species of Cryptogamic Plants from the southern extreme of the American Continent, and from the New Zealand islands in the opposite hemisphere, that the attention of Botanists has always been directed to these countries as probably affording a richer harvest, especially of *Mosses* and

*Jungermannia*, than any other part of the world. Before leaving England, when paying my farewell visit to that lamented and then venerable naturalist, he particularly advised should our expedition touch at his favourite botanical ground, Dusky Bay, New Zealand, or any adjacent part, that I should diligently search for such plants, and requested me to send him at once a few specimens, adding that no collector had visited that spot since himself, then nearly half a century ago, and that if I did not rediscover some of his favourites, he was too near his ninetieth year to expect to receive them from any one else. Unfortunately, it was out of our Commander's power to visit Dusky Bay; but during the stay of our ships at Lord Auckland's Islands, four degrees further south, and in the Bay of Islands, ten degrees to the northward of where Mr. Menzies had collected, most of his specimens were found. A few specimens were sent at different times in the hopes that the admirable health in which I had left him might have been continued, through Providence, until those of *Hypnum Menziesii* amongst others, should have reached him. It was, however, ordered otherwise; and the, to me, peculiarly melancholy account of his decease found our expedition at the Falkland Islands, on our return from Tierra del Fuego, where I had been again endeavouring, "*longo post intervallo*", to follow his footsteps.' (Hooker & Wilson, 1844).

Menzies's botanizing in New Zealand is discussed in Godley (1960) and Galloway (1985a, 1991c). His New Zealand lichens are preserved in the following herbaria: BM, E, LINN-SM.

1. *Coenogonium implexum* Nyl. (E). Sheet labelled by Menzies 'Coenogonium linkii Nees ?? Hook: in Humb. Syn.'
2. *Collema subconveniens* Nyl. (E).
3. *Leigidium tenerum* (Laurer) Wedin (E). Sheet labelled by Menzies 'Sphaerophoron clavigerum Menz.'
4. *Leptogium brebissonii* Mont. (E).
5. *Pseudocyphellaria billardierei* (Delise) Räsänen (BM, LINN-SM 1705.17). BM sheet labelled by Menzies in ink 'Sticta Sp. Nov: N. Zealand'. Thomas Taylor has annotated the specimen 'Sticta impressa Tayl', and Churchill Babington has added 'Sticta foveolata accedit var.  $\beta$  cellulifera Bab.'. The species is discussed in Galloway (1988a, 1988c).
6. *P. cinnamomea* (A. Rich.) Vainio (E). Sheet labelled by Menzies 'Sticta cinnamomea D'Urville Pl.8.f.3'. This species is discussed in Galloway (1988a).
7. *P. coronata* (Müll. Arg.) Malme (BM, E). The E sheet is annotated by Menzies 'Sticta orygmæa' and has five specimens attached, three of which are *P. coronata*, the other two being *P. billardierei*. The BM material comprises two collections both annotated by Menzies 'Sticta orygmæa Ach: N:Zealand', one of which has attached also a specimen of *P. berberina*, this latter being annotated by Churchill Babington 'This is L. ochraceus Menzies=Sticta D'Urvillei Del. Is it from N.Z.? C.B.'. This species is discussed in Galloway (1988a).
8. *P. faveolata* (Delise) Malme (E). This species is discussed in Galloway (1988a).
9. *P. lividofusca* (Krempelh.) D. Galloway & P. James (E). This species is discussed in Galloway (1988a).
10. *P. multifida* (Nyl.) D. Galloway & P. James (BM, E). This species is discussed in Galloway (1988a).
11. *Stereocaulon ramulosum* (Sw.) Rauschel (BM, LINN-SM 1711.2). BM material is labelled



in ink by Menzies 'Stereocaulon ramulosum Ach: N. Zealand'. This species is discussed in Galloway (1980).

12. *Sticta filix* (Sw.) Nyl. (BM, E, LINN-SM 1705.12). E sheet labelled by Menzies 'Sticta filicina Ach.' (Fig. 14). This species is discussed in Galloway (1979, 1985a, 1985b, 1991a, 1991c).

13. *S. latifrons* A. Rich. (BM, E, LINN-SM 1705.13). The E material consists of two sheets

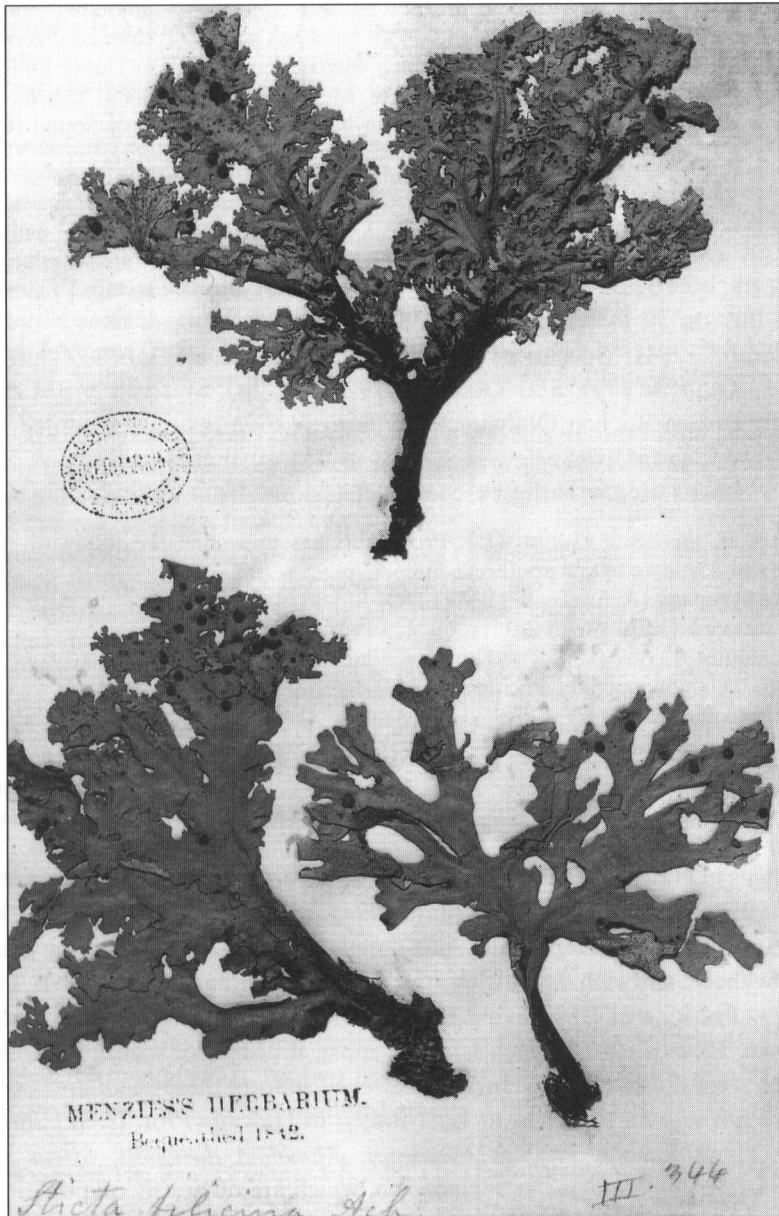


FIG. 14. *Sticta filix* (Menzies, E).

each with three specimens attached on each sheet of which is annotated by Menzies 'Sticta latifrons Flor. Zealand: D'Urville pl.8.f.2'. This species is discussed in Babington (1855) and Galloway (1985a: 557–558).

**14. *S. subcaperata*** (Nyl.) Nyl. (E). The sheet is annotated by Menzies 'Sticta tomentosa Ach.', and contains three specimens: the upper one has a cyanobacterial photobiont and does not appear to be from New Zealand, while the two lower specimens have green photobionts and are the species mentioned. A specimen in E containing *Pseudocyphellaria aurata*, *P. episticta*, *Collema subconveniens*, *Leptogium* sp. and *Usnea* sp. is annotated 'Sticta aurata Ach' by Menzies in a failing hand. An additional hand has added '(A. Menzies) New Zealand Fl.N.Z. II.273', but since the locality at which Menzies collected, i.e. Dusky Sound, is not mentioned, these records cannot be added to Menzies's New Zealand lichens. Further, *P. aurata* is not known to occur as far south in New Zealand as Dusky Sound (Galloway, 1988a: 71).

### 7. Tahiti

Menzies, on board the *Discovery*, was in Tahiti for almost a month, arriving at Matavai Bay on 30 December 1791 and departing for Hawaii late on 1 February 1792 (Lamb, 1984). Specimens in the E Herbarium are labelled variously as 'Otaheite', 'Otaheite 1791' and 'Otaheite 1792' (Fig. 2b). Material in BM is labelled by Robert Brown 'Lichen Otaheite Mr Menzies'. Five taxa are recorded from his stay there and, apart from a few specimens in BM attributed to Banks & Solander, Menzies's lichens are the earliest recorded collections from Tahiti.

1. *Cladonia* cf. *macilenta* Hoffm. (E). Prof. Ahti has appended the following note: 'too branched and corticate below apothecia to be *C. mac.* s. str.'
2. *Physma byrsaeum* (Ach.) Tuck. (BM, LINN-SM 1715.1).
3. *Sticta samoana* (Müll. Arg.) Zahlbr. (BM, LINN-SM 1705.18).
4. *Usnea nidifica* Taylor (BM, E). E material labelled by Menzies 'Usnea filaris. Otaheite 1791 A:M'. This polymorphic, Pacific species is discussed in Stevens (1991).
5. *U. trichodeoides* Mot. (E). Labelled by Menzies 'Usnea longissima Ach.:? Otaheite 1792. A:M'.

### 8. Hawaii

Menzies was in Hawaii on several occasions, twice on the *Prince of Wales* overwintering, and three times (1792, 1793 and 1794) with Vancouver on the *Discovery* (Galloway, 1991b). Neither locality nor date is given by Menzies on the plants held in E, 'Owyhee Sandwich Islands' being the only annotation (Fig. 2b). There are some 30 collections in BM having the typewritten annotation 'Herb. A. Menzies. Rec'd 1886. Hawaii Is, Sandwich Islands', most, if not all of which, it is reasonable to assume were collected by Menzies. However, among these there are several taxa which are not known to occur, at least today, in Hawaii (Prof. C. W. Smith, pers. comm.). These include *Physma byrsaeum*, *Ramalina menziesii*, *Sticta samoana*, *Teloschistes chrysophthalmus* and *Xanthoria*, which are obviously of a different provenance, most likely California and Tahiti, the labels having become mixed. Significantly, none of the specimens with typed labels which are attributed to Menzies

have Menzies holograph annotations. Menzies's Hawaiian lichens are of considerable historical interest since they are among the earliest known collections from these islands. For recent information on the Hawaiian lichen flora see Smith (1991).

1. *Erioderma pulchrum* Müll. Arg. (BM).
2. *Heterodermia comosa* (Eschw.) Follm. & Redon (E). Labelled by Menzies 'Owyhee Sandwich Islands A:M'.
3. *H. leucomelos* (L.) Poelt (BM).
4. *H. podocarpa* (Bel.) Awasthi (E). Labelled by Menzies 'Owyhee Sandwich Islands A:M'.
5. *Leptogium austroamericanum* (Malme) Dodge (BM). Labelled by Menzies 'Collema lacerum'.
6. *L. azureum* (Sw.) Mont. (BM). Labelled by Menzies 'Collema lacerum, Owhyhee'.
7. *L. cyanescens* (Rabenh.) Körber (LINN-SM 1701.39)
8. *L. moluccanum* (Pers.) Vainio (BM). Labelled by Menzies 'Collema rivulare Ach:'.
9. *Leptogium* sp. (LINN-SM 1701.37).
10. *Lobaria crenulata* (Hook.) Trevisan (BM). Labelled by Menzies 'Parmelia, Owhyhee'.
11. *Pannaria rubiginosa* (Thunb.) Delise (BM).
12. *Parmeliella mariana* (Fr.) P. M. Jørg. & D. J. Galloway (BM).
13. *Physma byrsaeum* (Ach.) Tuck. (BM). Labelled by Menzies 'Owhyhee'. Not known from Hawaii (C. W. Smith, pers. comm.), but phytogeographically not impossible there.
14. *Pseudocyphellaria aurata* (Ach.) Vainio (BM).
15. *P.* cf. *punctillaris* (Müll. Arg.) D. J. Galloway (BM). Not recorded from Hawaii; to date known only from eastern Australia and the Philippines (Galloway & Kemp, 1993).
16. *Pyxine petricola* Nyl. in Crombie (E, LINN-SM 1699.14). E material labelled by Menzies 'P.Picta ?? Owyhee Sandwich Islands A:M'.
17. *Ramalina celastri* (Sprengel) Swinscow & Krog (BM). Labelled by Menzies 'Owhyhee'.
18. *R. celastri* subsp. *ovalis* (J. D. Hook. & Taylor) Stevens (BM).
19. *R.* cf. *tayloriana* Zahlbr. (BM). Labelled by Menzies 'Owhyhee'.
20. *Ramalina* sp. (BM).
21. *Ramalinopsis manni* (Tuck.) Follmann & Huneck (E). Labelled by Menzies 'Owhyhee, Sandwich Isles 1794 A:M'. This endemic monospecific genus is discussed in Follmann & Huneck (1969, 1970), Follmann (1974), and Smith (1991) who states (p. 37), '... this rare endemic is now apparently confined to the Polynesian introduction *Aleurites moluccana*'.
22. *Teloschistes flavicans* (Sw.) Ach. (BM).
23. *Usnea intercalaris* Krempelh. (BM).
24. *U.* cf. *lutea* Motyka (BM).
25. *U. pruinosa* Motyka (BM). Labelled by Menzies 'Owhyhee'.

### 9. West Indies

Although Menzies visited the West Indies while on the Halifax Station of 1784–1785 (Galloway & Groves, 1987), the two lichens that are listed below appear to come from his service on the Jamaica Station between 1795 and 1801.

1. *Cladina confusa* (R. Sant.) Follmann & Ahti (E). Labelled by Menzies 'St Vincent West Indies'.
2. *Sticta damaecornis* (Sw.) Ach. (E). Labelled by Menzies 'Sticta damaecornis Ach: Martinique A:M 1800'.

### 10. *St Helena*

The *Discovery* reached St Helena on 1 July 1795, and sailed from there for England on 16 July 1795. Ten lichens are recorded from that time. The sheets in the Edinburgh herbarium are marked by Menzies on the verso 'St: Helena A:M'. These are the earliest lichen collections known from this remote island, and were neither examined nor referred to by William Leighton (1871) in his notes on the lichens of St Helena collected by W. Burchell, and J. C. Melliss. Menzies's collections must all have come from inland sites since there are no collections of species of *Roccella* which are characteristic of coastal cliffs on the island.

1. ***Collema conglomeratum*** var. ***crassiusculum*** (Malme) Degelius (E). Annotated by Menzies '*Collema melaenum* var. *marginale*'. This small, subfruticose species has colourless 1-septate spores,  $7-10 \times 3-4.5 \mu\text{m}$ . It is discussed in Degelius (1974: 4-6).
2. ***Dictyonema glabratum*** (Sprengel) D. Hawksw. (BM).
3. ***Heterodermia leucomelos*** (L.) Poelt (BM, LINN-SM 1708.11). BM material annotated by Menzies '*Borrera leucomela* Ach: in fruit St. Helena' and another specimen 'St: Helena July 1795'.
4. ***H. speciosa*** (Wulfen) Trevisan (LINN-SM 1700.26).
5. ***Pannaria pezizoides*** (G. H. Weber) Trevisan (BM, E). E material annotated by Menzies '*P. aleurites*'. The species is discussed in Jørgensen (1978: 52-54). This record is an extension southwards of its range in the Atlantic Ocean, being recorded formerly from only as far south as Macaronesia (Jørgensen, 1978: 53).
6. ***Pseudocyphellaria aurata*** (Ach.) Vainio (BM, E). Material annotated by Menzies '*Sticta aurata* Ach: E.fl.p.205'. The material is mixed with *P. clathrata*.
7. ***P. clathrata*** (De Not.) Malme (BM, E). Annotated by Menzies '*Sticta aurata* Ach:'. The species is discussed in Galloway & Arvidsson (1990: 119-126).
8. ***Ramalina arabum*** (Dill. ex Ach.) Meyen & Flotow (E). Annotated by Menzies '*Alectoria arabum*'. This species is discussed briefly in Krog & Østhagen (1978: 58-59).
9. ***Rimelia reticulata*** (Taylor) Hale & Fletcher (B, LINN-SM 1704.6).
10. ***Teloschistes flavicans*** (Sw.) Norman (BM, E). E material annotated by Menzies '*Cornicularia crocea* Ach: St: Helena 1795 A:M'.

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