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Bryophytes and Lichens of Aldabra

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Abstract. Collections of bryophytes and lichens made during expeditions to Aldabra in 1981 and 1983 are reported: in all, two hepatics, three mosses and eleven lichens, of which thirteen are new to Aldabra, have been determined from a variety of substrata.

Introduction

Aldabra Atoll, in the Republic of Seychelles, lies 450 km to the north of Madagascar and 650 km to the east of the Tanzanian coast of Africa (9°24'S, 46°20'E). It is one of the largest atolls in the world, with four main islands and numerous islets, totalling 97 km^2. The underlying limestone is slightly raised, but is generally less than 8 m in elevation, and varies substantially in texture due to erosion. The atoll has been elevated above sea level for at least 80,000 years. Soils are generally shallow and alkaline (Trudgill 1979). The geology and ecology are outlined in Westoll and Stoddart (1971), Stoddart and Westoll (1979), and Stoddart (1984).

There is a southeast trade winds period from April to November and a wet northwest monsoon season for the remainder. Humidity is high. The coastlines are subjected to substantial sea-spray, particularly in the south. Rainfall is relatively high in the north and west of the atoll (Stoddart 1983).

The vascular plant communities are relatively well known and are rich for an atoll, including several endemics (Fosberg & Renvoize 1980). As with the fauna, there are affinities with Africa, Madagascar and the Comoros, and the granitic Seychelles (Stoddart 1984). Terrestrial vegetation includes very open grassland, several scrub types and low forest (Gibson & Phillipson 1983). The central

lagoon is fringed by mangrove of several species.

The dominant herbivore is the Aldabran giant tortoise (*Geochelone gigantea*) with a population numbering some 150,000. It is predominantly a grazer with a wide diet, browsing to a height of about 1 m. The dead remains of these animals are widespread, the most persistent being the major bones, the bone of the carapace and plastron, and the keratinous plates (scutes) of the shell. The latter may remain on or near a carapace for some years.

This paper reports on material collected in 1981 and 1983 by one of the authors (CH) on zoological expeditions to Aldabra. Collections and observations were superficial, attention being focused on species which were common, conspicuous or which appeared different from others. Relatively unusual habitats, such as tortoise remains, and other selected habitats, such as mangroves, received disproportionate attention.

Material, sun-dried for preservation (since salt from sea-spray and high humidity tended to encourage fungal degredation), was collected predominantly from Île Malabar, the second largest island, with very small collections from Île Polymie and Île aux Cedres. Attention focused on the "Malabar Mixed Scrub" vegetation type (Gibson & Phillipson 1983), within 100 m of the outer (northern) coast; mangrove on the lagoonward coast of Ile Malabar was also examined very locally.

Although much of Aldabra was visited, lichens were most in evidence on Ile Malabar and Ile Polymie, where foliose species are attached to both living and dead branches of shrubs which are relatively sheltered and which receive relatively little sea-spray. Mosses and lichens appeared more common and diverse in mixed scrubland habitats of various types, and in the small areas of low forest, than in the *Pemphis acidula* scrub which covers much of the island. Shrubs with abundant epiphytic lichens were relatively rare, and there is less moss coverage in general than is evident on soils and woody plants in the granitic Seychelles.

Substrata on which lichens were noted included bare limestone (both exposed and sheltered), living and dead tree trunks, branches and twigs, fallen woody debris, and tortoise remains; lichens were not evident on living tortoises, as is the case with Galapagos giant tortoises (Hendrickson & Weber 1964). Mosses were mostly evident at or near ground level, in rock crevices, on bark, and on tortoise remains in sheltered locations.

The distribution and abundances given in this paper are very provisional: given the general similarity in topography and vegetation structure around the atoll, many species will doubtless prove widespread, as are many of the vascular plants. Undoubtedly the lichen and bryophyte floras of Aldabra are much richer than indicated by the lists below.

Little has so far been published on the lichen and bryophyte floras of Aldabra: The few exiting records (see Buck 1979, Dodge 1959, Ellis 1988, 1992, Gradstein 1975, O'Shea 1995, Townsend 1980) have been incorporated into the list below. It is hoped that the additional records provided will make a contribution to our limited knowledge of the nature and distribution of these organisms over wide areas of the Indian Ocean.

Species List

Distribution and habitat data for Aldabra are derived solely from the 1981 and 1983; distributions on neighbouring Indian Ocean islands are also provided. Previously published records are given in squared brackets [ ]. Voucher speciemns of all species collected in 1981 and 1983 have been incorporated into the herbarium of M.R.D.Seaward (MRDS), currently housed at the University of Bradford but ultimately destined for a national collection, and a few duplicate lichen specimens are in the herbarium of A.Aptroot.

Hepatics:
Acrolejeunea emergens(Mitt.)Steph.
[Gradstein (1975)]
Widespread and frequent, on *Apodytes dimidia-*

ta, Erythroxylum acranthum and *Rhizophora mucronata*
Île Malabar: Middle Camp and Anse Petit Grabeau areas, (Herb.MRDS 107144, 107153, 107235, 107236, 107237)
Île Polymie, near eastern end (Herb.MRDS 107147, 107148, 107152)
Known also from Comoros, Madagascar, Mauritius, Rodriguez Island, Seychelles and Sri Lanka (Gradstein 1975, Gradstein & Inoue 1980, Grolle 1995)

Frullania ericoides(Nees)Mont.
Rare, on *Erythroxylum acranthum*
Île Malabar: Anse Petit Grabeau area (Herb.MRDS 107237)
New to Aldabra
Known also from Chagos, Comoros, Madagascar, Mauritius, Rodriguez Island and Seychelles (Grolle 1995)

Mosses:

[*Bryum* sp. - Townsend (1980)]

[*Calymperes graeffeanum* C.Müll. - Ellis (1988, 1992)]

Calymperes motleyi Mitt.ex Dozy & Molk.
Locally frequent, on *Rhizophora mucronata*
Île Malabar: Anse Malabar area (Herb.MRDS 107142, 107216)
Île Polymie, near eastern end (Herb.MRDS 107147, 107152, 107215)
New to Aldabra
Known also from Maldives and the granitic Seychelles (Ellis 1988a, 1989, O'Shea 1995)

Calymperes tenerum C.Müll.

[Townsend (1980), Ellis (1988, 1992)]; also unpublished record: Grand Terre island, 1968, Renvoize 1080, Herb. Townsend (O´Shea in litt.)
Widespread and frequent, on *Cordia subcordata, Mystroxylon aethiopicum, Maytenus senegalensis, Pemphis acidula, Sideroxylon inerme* and *Terminalia boivinii*
Île Malabar: Anse Malabar, Middle Camp and Anse Petit Grabeau areas (Herb.MRDS 107141, 107143, 107145, 107146, 107150, 107217)
Île aux Cedres, northern end (Herb.MRDS 107149)
Known also from Chagos, Comoros, Madagascar, Maldives and Sri Lanka (Townsend 1971, Ellis 1989, O'Shea 1995)

[*Fissidens* sp. - Townsend (1980)]

Hyophila involuta(Hook.)Jaeg.
Rare, on rock surfaces in shaded grove, tortoise nest site
Île Malabar: Anse Petit Grabeau area (Herb.MRDS 107214)
Known also from Maldives (Ellis 1988a, O'Shea 1995)

[*Hyophila potieri* Besch - Townsend (1980); possibly a synonym of *H.involuta* (O´Shea in litt.)]

[*Luisierella barbula* (Schwaegr.) Steere - unpublished record: Grand Terre, 1973, Hnatiuk 731465, Herb. Townsend; the only collection from Africa (O´Shea in litt.)

[*Thuidium* sp. - Townsend (1980)]

[*Trachyphyllum inflexum*(Harv.)Gepp - Buck (1979), Townsend (1980), O'Shea (1995)]

Lichens:

With the exception of *Collema rugosum,* all the following species are new to Aldabra:

Buellia efflorescens Müll.Arg.
Occasional, on twigs and branches of unknown hosts
Île Malabar (107189, 107191)
Known also from Maldives (Aptroot 1991)

Caloplaca bassiae(Ach.)Zahlbr.
Uncommon, on tortoise skeleton (carapace) and on bark of unknown host
Île Malabar, eastern (Herb.MRDS 107183, 107184, 107186)

Known also from Mauritius (David & Hawksworth 1995) and Rodriguez Island (Herb.BM, Herb.Aptroot)

Coccocarpia erythroxyli(Sprengel)Swinscow & Krog
Uncommon, on mosses over bark of unknown host
Île Malabar: Anse Petit Grabeau area (Herb.MRDS 107190)
Known also from Chagos, Comoros, Madagascar and Maldives (Arvidsson 1982, Aptroot 1990, 1991)

[*Collema rugosum* Krempelh. - Degelius (1974)]

Dirinaria picta(Sw.)Clem.& Shear
Frequent, on twigs, branches and bark of a variety of hosts
Île Malabar (Herb.MRDS 107185, 107189, 107191, 107193)
Known also from Chagos, Madagascar, Maldives and Sri Lanka (Awasthi 1975, Aptroot 1988, 1991)

Parmotrema aldabrense(Dodge)Hale
[Dodge (1959), as *Parmelia aldabrense* Dodge]
Uncommon, on branches of unknown host
Île Malabar (Herb.MRDS 107191)
Known also from Madagascar (Swinscow & Krog 1988)

Physcia cf. *atrostriata* Moberg
Rare, on bark of unknown host
Île Malabar (Herb.MRDS 107188)
Known also from Madagascar (Aptroot 1988)

Physcia sorediosa(Vainio)Lynge
Uncommon, on twigs of unknown host
Île Malabar (Herb.MRDS 107193)
Known also from Chagos

Pyrenula confinis (Nyl.) R.C. Harris [syn. *corticata*(Nyl.)R.C.Harris]
Uncommon, on bark of unknown host
Île Malabar (Herb.MRDS 107186)
Known also from Chagos

Pyxine berteriana(Fée)Imshaug
Rare, on tortoise skeleton (carapace)
Île Malabar (Herb.MRDS 107183)
Known also from Madagascar (Aptroot 1988)

Pyxine cocoes(Sw.)Nyl.
Uncommon, on twigs of unknown host
Île Malabar (Herb.MRDS 107193)
Known also from Chagos, Madagascar and Sri Lanka (Awasthi 1965, Aptroot 1988)

Roccella montagnei Bel.
Occasional, as epiphyte on unknown hosts
Île Malabar (Herb.MRDS 104770, 107204)
Widely distributed in Indian Ocean islands (Darbishire 1928)

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