

FLORISTICS AND ECOLOGY OF WESTERN INDIAN OCEAN ISLANDS

1. INTRODUCTION

by D. R. Stoddart

At the time that the Royal Society of London and the Smithsonian Institution began studies of the marine and terrestrial ecology of western Indian Ocean coral reefs and islands, in 1966, this was one of the least known sectors of the world's reef seas. Only the sketchiest information was available for most of the islands between Madagascar and Seychelles (Stoddart 1967), and much of that dated from the early years of the century.

Since then, research has been concentrated at the Research Station built by the Royal Society at Aldabra Atoll in 1968-70, and operated since 1980 by the Seychelles Islands Foundation. The early summary accounts of Aldabra ecology (Stoddart, ed. 1967; Westoll and Stoddart, eds. 1971) have been greatly expanded, particularly with regard to the terrestrial fauna and flora (Stoddart and Westoll, eds. 1979). The *Flora of Aldabra and neighbouring islands* (Fosberg and Renvoize 1980) provides a critical account of the plants found on many of the western Indian Ocean coral islands as well as on the raised-reef islands of the Aldabra group itself, and replaces the earlier *Field Guide* of Wickens (1975). The origins and distributions of the western Indian Ocean island floras have been examined by Renvoize (1971, 1975, 1979), while on a smaller scale S. H. Hnatiuk (1979b) has applied island-biogeographic theory to the floras of small islets within the Aldabra lagoon. The role of dispersal mechanisms, germination and fertilisation has been studied at Aldabra by S. H. Hnatiuk (1978, 1979a), Wickens (1979a, 1979b) and Woodell (1979), though so far there have been few studies of other aspects of the land plants, such as genetics and physiology (Lewis 1975, R. J. Hnatiuk 1980).

Much attention has also been given to vegetation studies at Aldabra. Fosberg's (1971) original classification of the vegetation has been examined by Hnatiuk and Merton (1979a, 1979b), and numerical techniques applied to the Mixed Scrub community by Newbery and Hill (1981). The mangroves have been studied by Macnae (1971), and the intertidal communities by Potts and Whitton (1980). Gillham (1977a, 1977b) has studied the effects of seabirds on vegetation, both at Aldabra and at Cosmoledo. Aldabra is, of course, the only remaining island in the western Indian Ocean to have retained its native population of Giant Tortoises, though many other islands had similar populations until about 150 years ago (Stoddart and Peake 1979). The effects of tortoise grazing on vegetation has been studied by R. H. Hnatiuk *et al.* (1976) and Merton *et al.* (1976). More recently Gibson and Phillipson (1983a, 1983b) have investigated primary productivity, with particular reference to tortoise grazing, while Gibson *et al.* (1983) have examined the response of vegetation to exclusion of tortoises in experimental plots.

Parallel with the Aldabra studies, every opportunity has been seized to expand our knowledge of other western Indian Ocean islands, both within and outside the Republic of Seychelles. In addition to data on land birds and seabirds, particular attention has been given to the flora, with the aim of establishing a basic knowledge of the distribution and composition of insular floras of vascular plants. In an earlier issue of the Bulletin, *Coral islands of the western Indian Ocean* (Stoddart, ed. 1970), floristic lists and much other information were presented for Assumption, Astove and Cosmoledo (elevated islands in the Aldabra group) (this information was revised in the *Flora of Aldabra*); Remire, Desroches and African Banks (coral islands in the Amirantes); and for Farquhar Atoll and Tromelin. Subsequently similar data have been provided for D'Arros and St Joseph in the northern Amirantes (Stoddart, Coe and Fosberg 1979), and for Bird and Denis Islands on the Seychelles Bank (Stoddart and Fosberg 1981).

In the present Bulletin, new information is presented on several more western Indian Ocean islands. These include the small granitic islands of Cousin and Frégate in the central Seychelles; the coral islands of Poivre, Marie-Louise, Desnoeufs and Alphonse in the southern Amirantes; the coral islands of Platte and Coetivy on the Seychelles Bank; and the two large isolated coral islands of Agelega. Figure 1 shows the location of these islands, and also of those previously examined in this series of island reports associated with the Royal Society, Smithsonian Institution, and Seychelles Islands Foundation research programme.

The final paper presents new information on rainfall variability on Aldabra itself, extending the analyses provided by Stoddart (1971), Stoddart and Mole (1977), Stoddart and Walsh (1979), Farrow (1971), and R. J. Hnatiuk (1979).

A substantial amount of floristic information is now available on the raised-reef and coral islands of the western Indian Ocean. A

preliminary analysis of it has been made by Stoddart and Fosberg (in press), and a more substantial review, including the central and eastern Indian Ocean coral islands, is in preparation. It is, however, appropriate to note that information is still required on the flora and vegetation, as well as on other aspects of the terrestrial ecology, for islands such as St Pierre, Providence, Cerf, St Francois, Bijoutier, and the islands in the Mozambique Channel.

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