

POLYCHAETE STUDIES ON ALDABRA AND ASSOCIATED ISLANDS

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Abstract.—The polychaetes reported from Aldabra are either characteristic Indian Ocean coralreef forms, or widely dispersed, “cosmopolitan” species. The fauna is apparently quite rich, but published records indicate that the collecting of polychaetes was an incidental part of ecological investigations. The Smithsonian collections, which have only partially been analyzed, show the presence of several new taxa. The fauna of the *bassins* is interesting in terms of new taxa, but also in overall composition, and are the focus of intensive studies. Among the coral-dwelling forms, a good representation of some of the larger species, such as *Eunice aphroditois* makes it possible to study morphometric changes with increasing size. These studies will resolve some very vexing taxonomic problems and at the same time add valuable information to the study of the relation between body-size and morphology among polychaetes.

Studies of polychaetes in the western Indian Ocean go back to the beginning of systematic zoology: some of the earliest scientific travellers collected along the African coastlines and on Madagascar, and especially the French and German collections (e.g. Peters 1854) are rich in specimens from early expeditions. A long list of species, especially those associated with exotic environments, such as the coralreefs and mangroves, had been accumulated from the area, and the French ecological studies associated with the stations at Tulear and Nosy Bé on Madagascar have yielded very good results (e.g. Clausade 1969, Thomassin 1972). Among the early British explorers of the polychaetes in the area can be mentioned Cyril Crossland who travelled along the African coast and accumulated a rather impressive collection, published in part (e.g. Crossland 1903, 1924).

The impression from these studies is that of a rich fauna, a great number of species associated with the coral reefs, and most characteristically, with the vast number of species widespread in coral environments in the whole Indo-Pacific region. The soft-bottom species mentioned tend also to be

those that are widespread in the Indo-Pacific or virtually world-wide in distribution.

Relatively few reliable records of polychaetes have been published from Aldabra proper. The survey of species diversity and ecology published by Brander, McLeod, & Humphreys (1971) makes use of information about errant polychaetes, but does not even give a listing of which polychaetes were found, nor does it indicate what literature was used in the identificatory work, or where the specimens might now be located; as a documentation of the fauna, this publication is useless. Hughes & Gamble (1977) surveyed the benthic organisms associated with soft substrates in Aldabra. These authors gave a species list as an appendix; the list contains mainly extremely widespread species of the type that have recently been demonstrated to consist of series of closely similar vicariant species in various parts of the world (see Hartley 1984, Williams 1984). There is no indication in the publication of who identified the polychaetes, nor is there any reference to the literature used in identification. It is probable that Day's (1967) fauna of southern Africa was the main source of information. One addition to the study

of polychaetes from the area was the publication of a new species of *Eunice* from deep water off Cosmoledo Island by Longbottom (1971); the general results of the expedition, financed by the Royal Society were reported in Forster et al. (1970); apparently the remainder of the collection has never been published.

Thus, there are collections in the British Museum and elsewhere, but they all have to be carefully re-examined and compared to material from other areas, before any of the names currently listed from Aldabra can be accepted. I had initially planned to append a list of species known from Aldabra, but in view of the above considerations, I believe such a list would do more harm than good.

Our own studies consist of several distinct sampling programs. We have collected polychaetes from reef-crest rubble; so far we have listed 12 species of eunicid and about 20 species of syllid polychaetes from these pieces of worn, overgrown, coral rubble. Other taxa are less well represented, but 50 of the 80+ families of polychaetes are present on Aldabra in reef and reef-related environments.

We have also collected a series of quantitative samples in the form of 3-inch diameter cores in the seagrass-beds both in front of the lab and in the lagoon. In these samples an average of 15 families are represented in each core. The numbers and the familial representation is similar to what is present in grass-flats elsewhere (Belize, David E. Russell, pers. comm.). In the samples taken in the *Thalassodendron* beds we have segregated the samples into canopy, stem, and base-samples, since the complex structure of these plants furnish a strong physical differentiation; the richest fraction of the samples come from the bases, where an average of 20 families are represented; relatively few taxa are associated with the stem, and the canopy samples have on the average 15 families of polychaetes in a sample.

A series of samples have also been taken in the *bassins* on Île Picard; each series of

connected *bassins* shows the presence of a different set of organisms and some forms, such as the small fabriciian sabellid polychaetes are far better represented in that environment than in any other environment we have sampled on the atoll. In fact, one or two species have yet to be found elsewhere; however, the sampling has not been adequate to declare these forms endemic to any of the *bassins*. It is however an interesting problem, and we will continue to sample these sinkholes in the future. Most of the species present in the *bassins* appear to have short life-spans; we will study the consistency of the observed differences among the *bassins* from one year to the next and attempt to determine recruitment patterns.

In the mangrove environment, we have taken a series of very small, 2-inch cores, in and around the roots of *Rhizophora* trees. At the family level, the fauna of these cores is rather similar to cores taken in the Western Atlantic Ocean in a similar environment (Kensley & Fauchald, in preparation). However, the number of specimens is higher and the relative proportions of the different families appear to differ. At this point, we have yet to get the specimens identified to species.

The study of the detailed composition of the eunicid polychaetes will continue. The Indian Ocean has a large number of described species, most of which are known only from the type material, often collected 100 or more years ago and from localities that are now hopelessly polluted, such as harbors and highly populated coastlines. We have already collected, carefully, large sets of eunicid polychaetes from old coral rubble, both from the outside of the island and from the lagoon. In the future we will concentrate our collecting in the lagoon in similar kinds of environments.

We plan to detail the polychaete fauna from soft bottoms in the lagoon using cores, so that the material can be used for quantitative benthic studies; several samples of the material Hughes & Gamble (1977) collected were from the lagoon and their re-

ports are intriguing. We plan to examine their material if it is available. If all or most material from previous investigations is available, it would be possible to get three 'snapshots' of the polychaete fauna taken at roughly ten-year intervals, and thus a very crude idea of changes in faunal composition with time.

We intend to follow the short-term faunal changes in the *bassins* on Île Picard. Because of the peculiar isolation of these *bassins*, they may be seen as islands in the island; a situation that is rarely found without excessive pollution, making the sampling of dubious value.

We can predict that most polychaete families will be represented on Aldabra and surrounding islands, simply because nearly all polychaete families are found in all oceans and at all locations (Fauchald 1977). Thus, a review of the polychaete fauna to family-level will add very little information. We wish to document carefully the composition of selected families. Dr. Patricia Hutchings of the Australian Museum is working on some additional families. Together we will be able to work up several morphologically and ecologically very different families, to furnish an image of the polychaete fauna of Aldabra and how it is related to the fauna of the remainder of the Western Indian Ocean.

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