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## PRELIMINARY OBSERVATION ON THE ISOPOD CRUSTACEAN FAUNA OF ALDABRA ATOLL

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*Abstract.*—A brief review of crustacean research on Aldabra is presented, with the few isopod studies being listed. Two major divisions are emphasized when dealing with crustacean biogeography—those groups having a planktonic stage allowing for dispersal (e.g. caridean shrimps), and those that lack any planktonic stage (e.g. the peracaridans such as the isopods). The summarized results of microhabitat surveys on Aldabra are presented, including a faunal list of 34 species, of which about 20 are probably undescribed. Divided into ecological categories, the highest species-diversity is seen in coral rubble sediments in the 6–25 m depth-range (20 species), with 15 species occurring in the shallow (0–6 m) rubble sediments. Shallow algal turfs (12 species) appear to harbor a higher diversity than deeper-occurring turfs (4 species). The understory in *Thalassodendron* seagrass beds yielded 13 species while a similar habitat in *Thalassia* seagrass yielded only four species. The genus *Carpias* (probably represented by a single species) occurred in almost all samples from all habitats, frequently in very high numbers. Species of this genus are undoubtedly ecologically important as a food source, especially for reef-dwelling fish. Comparison with the few localities that have been at all intensively studied seem to indicate that the Aldabran fauna (34 species) is depauperate. Carrie Bow Cay, Belize, and S.W. Madagascar, having all the same overall ecological microhabitats associated with coral reefs, seagrass beds, and mangroves, have each yielded between 80 and 90 species of isopods. Isolation by deep water, and the lack of a planktonic stage for dispersal may to some degree explain this relatively poor Aldabran isopod fauna.

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Published studies on Crustacea from Aldabra have been sparse, and may be summarized as follows:

- Freshwater Entomostraca: McKenzie 1971, Wells & McKenzie 1973.
- Mysidacea: Ingle 1972.
- Decapod shrimps: Bruce 1972, 1978, 1984; Polunin & Lubbock 1977; Fricke & Fricke 1979.
- Terrestrial and freshwater decapods: Alexander 1979, Grubb 1971, Hnatiuk 1980, Haig 1984.
- Burrowing Crustacea: Farrow 1970, 1971.

For the Isopoda, other than papers dealing with the general Seychelles area (Stebbing 1910, Barnard 1925, Pires 1982), only

three papers deal with material from Aldabra itself: Jones (1976) recorded four species of *Cirolana*; Spaul (1979) mentions terrestrial isopods occurring in soil and litter, but did not mention any taxa; Ferrara & Taiti (1985) recorded 13 species of terrestrial isopods, of which six were new. Thus, although a certain affinity with the tropical East African, Red Sea, and Madagascan fauna is to be expected, very few actual records exist.

### Material and Methods

Isopod material covered in this paper comes from collecting stations of the author as well as several members of the various Smithsonian Institution teams that visited

Table 1.—Tentative species list for Aldabran isopods, with distribution by habitat.

	Shallow coral rubble	Deep coral rubble	Shallow algal turf	Deep algal turf	Shallow Halimeda	Deep Halimeda	Live coral	Thalassodendron understorey	Thylassia understorey	Lagoonal macroalgae	Lagoonal decayed wood
<i>Accalathura sladeni</i>	X	X	X		X						
Anthuridean sp. 1					X						
<i>Apanthura</i> sp.	X	X	X		X		X				
<i>Apanthuroides</i> n. sp.		X					X				
<i>Carpias</i> cf. <i>brucei</i>	X	X	X	X	X	X		X	X	X	
<i>Cirolana</i> cf. <i>capitella</i>				X				X			
<i>Cirolana</i> cf. <i>parva</i>	X	X	X						X		
<i>Cirolana</i> sp. 1		X		X							
<i>Colanthura pigmentata</i>		X				X					
<i>Cymodoce</i> cf. <i>alia</i>					X						
<i>Eisothistos</i> n. sp.			X								
<i>Gnathia</i> sp.	X	X		X			X	X	X		
Janirid sp.		X					X	X			
<i>Joeropsis</i> n. sp. 1	X	X						X			
<i>Joeropsis</i> n. sp. 2	X	X	X					X			
<i>Joeropsis</i> n. sp. 3								X			
<i>Joeropsis</i> n. sp. 4								X			
<i>Kupellonura</i> n. sp.	X	X			X	X					
<i>Leptanthura</i> sp.								X			
<i>Limnoria pfefferi</i>											X
<i>Limnoria platycauda</i>											X
<i>Mesanthura</i> n. sp.		X									
<i>Metacirolana</i> sp.	X						X				
<i>Munna</i> n. sp.	X	X	X					X			
<i>Neohyssura</i> n. sp.		X									
<i>Panathura macronesia</i>	X	X	X				X	X			
<i>Paracilicæa mossambica</i>	X	X	X			X		X	X	X	
<i>Paranthura</i> sp.	X	X	X		X			X			
<i>Pendanthura</i> n. sp.								X			
<i>Pleurocope</i> n. sp.							X				
<i>Prethura</i> n. sp.	X										
<i>Santia</i> n. sp.		X	X				X				
<i>Stenetrium</i> sp. 1								X			
<i>Stenetrium</i> sp. 2	X	X	X				X				
34	15	20	12	4	7	4	9	13	4	2	2

Aldabra in 1983, 1985, and 1986 (see Acknowledgments). In all, 87 stations yielded isopods. Many of these were collected with the aid of SCUBA. The majority of the stations were sampled in discrete microhabitats, giving valuable ecological information. While a range of quantitative samples from several habitats were taken, these have not

been fully analyzed, and are not included here.

### Results

A total of 33 isopod species are recorded in the present study. Table 1 summarizes the occurrence of these species in 11 habitats.

*Faunal composition and biogeography.*—Of the 34 isopod species, ten have been described, while between 15 and 20 species are probably undescribed.

Several of the species are small (less than 5 mm in length) and therefore rarely collected. Biogeographical conclusions thus cannot be drawn with any great validity, neither can endemism be usefully discussed. Five species have been recorded from other Indian Ocean localities and may well have widespread distributions: *Accalathura sladeni*, *Carpias* cf. *brucei*, *Cirolana* 'parva', *Colanthurus pigmentata* and *Panathura macronesia*.

Only two genera in the present collection have not been recorded from the Caribbean: *Neohyssura* and *Prethura*. The latter has previously only been recorded from the Great Barrier Reef, from a very similar habitat, i.e. shallow coral rubble sediment.

*Comparison with the fauna of other tropical areas.*—Only two tropical areas at all similar to Aldabra in variety of habitats are available for comparison, viz. Carrie Bow Cay, Belize, (see Kensley 1982, 1984a) and south-west Madagascar (see Roman 1979). The Aldabran isopod fauna would seem to be poorer both in number and diversity of species than either of these other localities, both of which have yielded between 80 and 90 species. (Almost certainly, further collecting at Aldabra will reveal more species, but the rate of increase compared to collecting effort is bound to be small, given the scope of collecting already done.)

One further aspect of comparison that also indicates an impoverished fauna is the percentage of the anthurideans in the total fauna: these often highly specialized and slender-elongate forms are the best represented of all the isopod suborders in tropical shallow-water habitats, being between 40–50% of the fauna at both Carrie Bow Cay and Madagascar. Twelve anthuridean species have been recorded from Aldabra, representing about 36% of the total fauna.

*Ecological observations* (see Table 1).—Earlier ecological studies of the intertidal (Taylor 1971, Brander et al. 1971) and the shallow infratidal (Price 1971) at Aldabra deal only with macro-invertebrates like crabs, molluscs, and corals. Rarely are organisms like the small crustaceans and worms dealt with in such studies, yet these can be major elements of the fauna and vitally important as energy-converters and sources of food. An example of such an organism is the species of *Carpias* at Aldabra, which occurred in almost all the samples, and from all the habitats sampled, often in large numbers. A congener at Carrie Bow Cay, Belize, *C. algicola*, occurred in numbers up to 4000 in an area of 50 cm<sup>2</sup> (Kensley 1984b). Other abundant species which occurred in almost all the habitats sampled include *Paracilicsea mossambica*, *Stenetrium* sp. 2, and *Gnathia* sp.

In terms of habitat, the highest diversity was seen in the coral rubble-coarse sediments in the 6–25 m depth range (20 species), and somewhat fewer (15 species) in the shallow 0–6 m coral-rubble sediments. The shallow algal turfs sheltered more species (12) than the deeper algal turfs (4). The understory in *Thalassodendron* seagrass beds (being rich in microhabitats composed of corals, sponges, attached algae, and coarse sediments) sheltered 13 species, while the more exposed and less habitat-diverse understory in *Thalassia* seagrass beds yielded only four species.

The impoverished nature of the Aldabran isopod fauna may be explained by invoking a combination of factors including the geographic isolation of Aldabra and its further isolation by surrounding deep water ( $\pm 4000$  m), the geological history of the atoll, and the lack of planktonic dispersal stages.

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