Occurrence of ghost crabs *Ocypode* spp., in the eastern Cape

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Although ocypodid crabs have been recorded down the east coast of South Africa as far as Mossel Bay (Day 1969), adult specimens become rare south of East London. In Algoa Bay and St. Francis Bay near Port Elizabeth (25°30'E 34°0'S) juvenile crabs are often encountered in low numbers, but adults are almost never found. Biomass values of intertidal beach macrofauna in this area have been quantified (McLachlan 1977) but biomass values of these supralittoral crabs have not been included. The three species found on the east coast, *Ocypode ryderi, O. ceratopthalma* and *O. madagascariensis,* are difficult to distinguish as juveniles (Berry *pers. comm.*). Of the two dominant species, *O. ceratopthalma* occurs mainly in more sheltered localities while *O. ryderi* dominates the supralittoral on all open beaches (Jones 1972) including the sandy beaches in the eastern Cape Province.

A study was undertaken over 15 months to estimate ghost crab biomass and establish the reason for the absence of adults. On two beaches, Maitlands and Sundays River beach (see McLachlan 1977), the total number of burrows along 100 m shoreline was counted. Internal diameters of 30 burrows were measured, the crabs excavated and burrow depth measured. Crab size was measured as greatest carapace width and the animals were then weighed both live and after drying at 90 °C for 24 h for calculation of width/mass regressions. Four powdered samples of dried whole crabs were oxidized in an adiabatic bomb calorimeter for determination of energy contents, an endothermy correction (Paine 1966) being applied.

Crab holes occurred between the high tide swash line and the primary dunes. They were moved up and down the shore in response to spring and neap tides and were often plugged at midday. Burrows averaged 35 cm deep (range 21 − 55 cm) but depth was not related to crab size. There was, however, a significant relationship between burrow diameter and crab width as follows:

Burrow diameter (mm) = 1,11 carapace width (mm) + 0,73 ($r = 0{,}96, p < 0{,}01$).

Burrow diameter is thus slightly greater than carapace width.

In both 1978 and 1979 (Fig. 1) there appeared to be a main settlement around late summer to March after which numbers dropped off. During March 1979 a single late megalops larva was collected at the high tide swash line on Sundays River beach. Mean numbers (all juveniles) were 0,235/m shoreline at Maitlands and 0,188/m shoreline at Sundays River. Crabs collected were 6,1 − 30,7 mm carapace width with most 8 − 14 mm. The largest specimens were found in January 1979 (mean carapace width

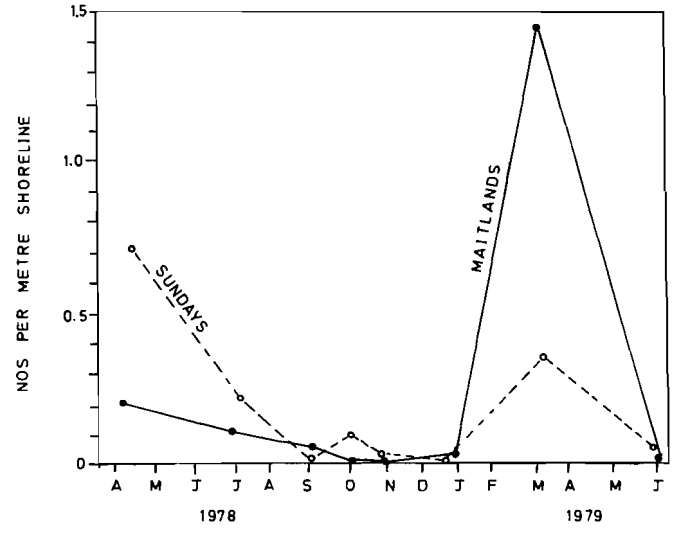

Fig. 1 Seasonal abundance of juvenile *O. ryderi* on two East Cape beaches.

16,6 mm) and the smallest in March 1979 (mean carapace width 8,9 mm). This further suggests one main settlement towards March with almost complete mortality by the following March. The width/mass regressions obtained for the size range 6,1 − 30,7 mm were as follows:

log wet mass (mg) = 2,78 log carapace width (mm) − 0,07 ($r = 0{,}99, p < 0{,}01$)

log dry mass (mg) = 2,84 log carapace width (mm) − 0,66 ($r = 0{,}98, p < 0{,}01$)

Dry mass averaged 28% of wet mass and the mean energy value was 12,10 $kJ.g^{-1}$ dry mass. As the average numbers of *Ocypode* were 0,212/m shoreline with a mean carapace width of 12,7 mm (= 0,298 g dry mass) the average dry biomass was 0,063 g/m shoreline or 0,762 kJ/m shoreline.

O. ryderi feeds largely on stranded *Physalia* (Berry *pers. comm.*) the remains of which have been found pulled deep into their burrows. Their main predators in the study area seem to be mongooses (Viverridae, probably *Myonax pulverulentius* the Cape Grey mongoose and *Cynictis penicillata* the yellow mongoose) which dig them out of their relatively shallow burrows. They share the supralittoral with the large air breathing isopod, *Tylos capensis,* occupying the zone up to the primary dunes while the latter occurs mainly in the primary dunes. A few talitrid amphipods may sometimes also be found near the primary dunes.

In conclusion it appears that small numbers of *O. ryderi* settle on open sandy beaches in the eastern Cape Province mainly around March, coming probably from adult stocks higher up the east coast and travelling south as larvae in the Agulhas current. Few survive more than a year on these beaches and there are virtually no adults. A combination of low temperature and poor supply may be responsible for this. From an energetics point of view these crabs are of negligible importance on these beaches where total dry macrofauna biomass averages about 1 500 g/m shoreline. The eastern Cape Province represents a transition region between the subtropical east coast of South Africa where *O. ryderi* dominates the supralittoral and the south and west coasts where talitrid amphipods and *Tylos* spp. dominate this zone (Brown & Jarman 1978). This corresponds to the boundary between Dahl's (1952) warm and cold water regions.

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Prevalence of pentastomids in *Mabuya striata* (Scincidae) from Dar es Salaam, Tanzania

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The occurrence of pentastomid parasites in the respiratory system of vertebrates has been extensively reviewed by Self (1969). Pentastomids occur widely in Africa as parasites of reptiles and mammals including humans (Self, Hoops & Williams 1974).

In order to determine the prevalence of pentastomids in the skink *Mabuya striata* from Dar es Salaam, skinks from three sites namely, the main campus of the University of Dar es Salaam (established 1964), Pugu School (established 1948) and Mbezi Housing Estate (established 1977) were examined during the months of November and December 1978. Captured *M. striata* were chloroformed and their thoracic and abdominal cavities were opened and the animals immersed in Bouin's fluid for 24 h and finally transferred to 70% alcohol. The lungs and trachea were opened and examined with a stereoscopic microscope. Some pentastomids were removed and processed for histological examination and identification. They were identified by Riley (*pers. comm.*) as *Raillietiella hemidactyli*. However, *R. hemidactyli*, *R. gehyrae* and *R. hebitihamata* form a natural group according to Self (1969), and the name *R. gehyrae* is recommended for both. Table 1 summarizes the results of the investigation. From the table, it seems that *M. striata* from old human habitations have parasites whilst those from a new residential area are free from parasites. The significance, if any, of this observation is not yet clear.

R. gehyrae, which ranged from 3 – 10 mm in body length, were either found freely in the pulmonary passages or loosely attached by their anterior chitinous hooks to the inner lining of these passages. The number of *R. gehyrae* recovered from individual *M. striata* ranged from two to 25. In one individual, 15 parasites were collected from one lung. In some animals, the parasites were found in one lung only.

Histological examination of *R. gehyrae* showed the presence of blood in their digestive tracts. A careful study of the lungs, however, showed that even in the cases of heavy infection, there was no visible damage to the lung tissue. Self and Kuntz (1967) observed that pentastomids are capable of living in the tissues of their hosts with little or no damage to the latter.

Table 1 Prevalence of *R. gehyrae* in *M. striata* from Dar es Salaam

	Pugu School	University campus	Mbezi Estate
No. of *M. striata* examined	36	68	18
No. of *M. striata* infected	13	17	–
No. of *M. striata* infected	36	25	–

Adult female *R. gehyrae* contained numerous eggs with developing embryos. Some of the eggs were also seen in the trachea and alveolar sacs of the lungs. Microscopic examination of the gut contents of each infected *M. striata* showed that no eggs of *R. gehyrae* were being passed in the faeces. According to Fain (1961), some species of *Raillietiella* complete their life cycles in one host. It is possible that *R. gehyrae* completes its life cycle in the lungs of *M. striata*. However, it is also likely that the developing eggs of *R. gehyrae* escape through the mouth of *M. striata* and complete their life cycle in intermediate hosts. Lavoipierre and Lavoipierre (1966) have shown that the cockroach *Periplaneta americana* can act as an intermediate host for species of *Raillietiella*. Since the gut contents of *M. striata* show that the animals feed mainly on grasshoppers and cockroaches, the possibility of these insects acting as intermediate hosts for *R. gehyrae* and other species of *Raillietiella* needs to be investigated.

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