OBSERVATIONS ON THE REPRODUCTIVE CYCLES OF SOME CRABS FROM THE SOUTH-WEST COAST OF INDIA

INFORMATION on the breeding of crabs stems mostly from investigations upon those with economic value (Menon, 1952 ; Prasad and Tampi, 1953 ; George and Nayak, 1961). Yet there are still conspicuous gaps in our knowledge of the reproductive cycles of several species of Indian crabs.

The reproductive cycles of *Uca annulipes* (*Latreille*), *Uca marionis nitidus* (Dana), *Sesarma quadrata* (Fabricius), *Ilyoplax gangetica* (Kemp), *Metopograpsus messor* (Forskål), *Matuta lunaris* (Forskål), *Scylla serrata* (Forskål), *Portunus pelagicus* (Linnaeus), *Portunus sanguinolentus* (Herbst), *Charybdis cruciata* (Herbst), *Charybdis hoplites pusilla* Alcock and *Dorippe astuta* Fabricius, have been studied. The period of investigation extended from 1963 to 1965. At least ten females of each species were examined every month to represent a sample following the procedure adopted by Boolootian *et al.* (1959). In all cases the abdomen of the female was examined for the presence of eggs and the percentage of females carrying eggs in each month was calculated. The size, colour and the number of eggs in the ' sponge ' (berry) are noted.

In Table 1 the percentage of ovigerous females of the different species of crabs is presented. *Uca annulipes* breeds from September to April along the Cochin backwaters. The peak season of breeding activity is in December. *Uca marionis nitidus* breeds from September to March with a peak in January. In *Sesarma quadrata* the season extends from August to February with a peak in October. *Ilyoplax gangetica* breeds from September to April with peak activity in October. In

Metopograpsus messor the breeding season extends from September to February and here the peak is in December. Thus in general the breeding period of these shore crabs extends from August to April and there is practically no breeding activity during May to July.

TABLE I

The incidence of ovigerous females (percentage) in the samples of different species of crabs collected during 1963-1965

Name of species	Months S	O	N	D	J	F	M	A	M	J	J	A
1. *U. annulipes*	13	25	32	36	33	16	10	8				
2. *U. marionis nitidus*	20	27	25	40	82	25	20					10
3. *S. quadrata*	30	54	50	30	31	20						
4. *I. gangetica*	25	70	65	31	50	30	23	8				
5. *M. messor*	20	66	50	75	27	18						
6. *M. lunaris*	10	40	58	35	28	30	13					
7. *S. serrata*	25	30	28	40	46	33	20	10	20	10	10	30
8. *P. pelagicus*	18	23	23	48	56	46	31	20				10
9. *P. sanguinolentus*	12	10	19	25	54	65	40	53	27	8		10
10. *C. cruciata*	33	40	35	41	57	52	30	12	16	10	7	20
11. *C. hoplites pusilla*	31	45	27	53	75	50	58	30	33	10	14	20
12. *D. astuta*	28	46	33	58	53	80	66	20	10			

Some of the swimming crabs such as *Scylla serrata*, *Charybdis cruciata* and *C. hoplites pusilla* show a tendency to breed continuously throughout the year with low activity between May and August. In *Matuta lunaris* breeding extends from September to March with a peak in November, in *Portunus pelagicus* from August to April with peak in the month of January and in *P. sanguinolentus* breeding is almost continuous throughout the year (with the exception of July) with peak activity in February. *Dorippe astuta*, the bottom species, breeds from September to May with peak activity in February.

Thus, these crabs of the west coast apparently have a breeding season extending for several months and in a few species a tendency for almost continuous breeding may be noted. But a well marked peak of reproductive activity is unmistakably discernible. One among the many factors influencing this peak breeding activity along the south-west coast of India seems to be the abundance of rich planktonic food produced as a result of the formation of the 'mud banks' at the close of the south-west monsoon (Panikkar and Jayaraman, 1966) and also by the upwelling of bottom water during the post-monsoon period (Panikkar and Jayaraman, 1966; Banse, 1959). It is, therefore, quite probable that the breeding of these species of crabs is effectively attuned to the availability of food for the young during their planktotrophic life as was suggested in regard to some crabs of the west coast of America (Boolootian *et al.* 1959).

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A CASE OF ABNORMAL PETASMA IN THE PENAEID PRAWN, *METAPENAEUS AFFINIS* (H. MILNE-EDWARDS)

INSTANCES of anomalies in the structure of the external genital organs of crustaceans are on record. Recently, George (1963) and Susseelan (1968) have described partly developed petasma in the female specimen of *Metapenaeus monoceros* (Fabricius) and *M. affinis* (H. Milne-Edwards) respectively. While examining a boat seine

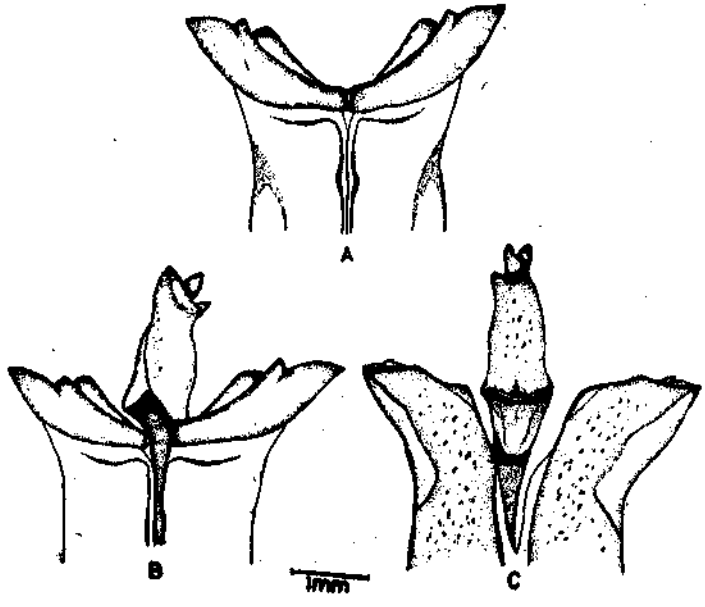

FIG. A. Normal petasma.
FIG. B. Abnormal petasma (dorsal view).
FIG. C. Abnormal petasma (ventral view).

catches made on 27-1-1967 from 11 metres depth off Calicut, a male specimen of *M. affinis* (141 mm. in total length and 34 mm. in carapace length) with abnormally developed petasma was observed. The anomaly was in the distal end, where a conspicuous additional lobe was noticed (Fig. B). This lobe was medially placed and originated from the distolateral portion of the left half of the petasma.

A closer examination of the comparative size and structure revealed that it was a fully developed andricum. The usual distal lobes are normally developed as described by Alcock (1906) and George and Rao (1968). The structure and size of the additional lobe were found to be similar to the normal distal lobes of the petasma on either side. From its position, it would appear that the tip of the left endopodite, at the time of differentiation of the distal lobes (42 mm. size, George and Rao, *op. cit.*) got bifurcated into 2, each one undergoing the normal development. As the endopodite gradually attained the adult petasmal characters, the outer lobe occupied the usual transverse position and the inner one developed straight giving a trilobed appearance at the tip. The abnormality being confined to the petasma, its teratological nature is of interest in view of the importance given to the characters of external genitalia in taxonomic studies in prawns.

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