

Maturity Size of the Female Population of Certain Commercial Prawns from Bombay*

P V KAGWADE

Bombay Research Centre of Central Marine Fisheries Research Institute, Bombay 400 023

Received 14 July 1980, revised received 25 August 1980

Size at which 50% of female prawn population attains maturity is determined in 8 species of commercial prawns, commonly available in the bag net catches of Bombay waters. The sizes (in mm) for different species determined were *Metapenaeus brevicornis* - 112.5, *Parapenaeopsis stylifera* - 105.5, *P. hardwickii* - 85.5, *P. sculptilis* - 122.0, *Solenocera indica* - 88.5, *Atypopenaeus stenodactylus* - 38.3, *Palaemon tenuipes* - 50.5 and *Hippolysmata ensirostris* - 60.5.

Determination of size at maturity is an important aspect of reproductive biology. However, most of the available literature¹⁻⁶ on the subject refer only to the minimum size at 1st maturity attained by stray individual prawns. What is more important is the maturation size of the population as such which can be the size at which at least 50% of the individuals from the population are matured. Such an information about all the commercially important species would prove very useful in throwing light on their fluctuations, breeding migrations and status of their fisheries. Therefore, an attempt has been made to determine the maturity size of the population by constructing maturity curves of 8 commercially important prawns, available around Bombay region.

Penaeid prawns *Metapenaeus brevicornis* (H.M. Edw.), *Parapenaeopsis stylifera* (H.M. Edw.), *P. hardwickii* (Miers), *P. sculptilis* (Heller), *Solenocera indica* Nataraj and *Atypopenaeus stenodactylus* (Stimpson) and non-penaeid prawns *Palaemon*

*Published with the permission of the Director, Central Marine Fisheries Research Institute, Cochin.

Table 1—Maturity Size of Population for Different Species of Commercial Prawns and Percentage of Mature Individuals in Population in Those Measuring below and above This Size

Species	Total No. of specimens examined	Size-range (mm)	Maturity size of the population (mm)	No. of specimens below maturity size	No. of mature individuals below maturity size	No. of specimens above maturity size	No. of mature individuals above maturity size	Minimum size of matured specimen (mm)
<i>M. brevicornis</i>	253	26-138	112.5	210	28(3.3)*	43	28(65.1)*	64
<i>P. stylifera</i>	384	18-127	105.5	274	21(7.7)	110	78(70.9)	76
<i>P. hardwickii</i>	173	24-115	85.5	86	18(20.9)	87	75(86.2)	71
<i>P. sculptilis</i>	488	29-155	122	390	78(20)	98	57(58.2)	71
<i>S. indica</i>	1327	11-107	85.5	1281	92(7.2)	46	29(63)	30
<i>A. stenodactylus</i>	142	18-43	38.5	127	13(10.2)	15	10(66.7)	29
<i>P. tenuipes</i>	2253	11-96	50.5	1798	195(10.8)	455	276(60.6)	30
<i>H. ensirostris</i>	738	18-99	60.5	307	43(14)	431	290(67.3)	45

*Per cent values

tenuipes Henderson and *Hippolysmata ensirostris* Kemp. landed at Madh and Mahul, the two important fishing centres in Bombay, during Jan 1972 to June 1973 were used. The fishing gear used was the bag net or 'dol' which operates on tidal currents up to a depth of 40 m.

Only the females were selected as their different maturity stages can easily be identified. Samples for different species were grouped in 10 mm class intervals except in the case of *A. stenodactylus* which being small in size, was grouped in 2 mm class interval.

Initially the data for Madh and Mahul were separately analysed for different species. As no significant difference between the sample means for the specimens from the 2 sampling sites was noticed the entire data were pooled for further analysis. Maturity curves for different species were drawn by plotting the percentage of matured individuals for different size groups. The term 'matured' included maturing, mature and spent individuals, all classified on the accepted convention based on the condition of the ovary and intra-ovarian eggs in prawns. In addition berried condition was also taken into consideration for this purpose in the case of non-penaeid prawns. The size at which the curve was intersected at 50% level, was considered as the size of maturity for the population.

The results are given in Table 1. Last column of the table gives the size of the smallest matured individual observed in different species. Incidentally, this size is comparable with the one recorded earlier for some of these species¹⁻⁴. It is evident that this size is much below the maturity size of the population.

Rajyalakshmi⁵ made an indirect effort of determining the maturity size of the population of *M. brevicornis* from Hooghly river. From the relative

condition factor for different length groups she maintained that this species attains maturity at 100 mm. However, she combined both the males and females. Ramamurthy⁶ while studying the prawn fishery of Kutch, also made a reference to the fact that majority of the impregnated prawns of *M. brevicornis* measured between 101 and 125 mm. Both these findings are in close agreement with the maturity size of the population of this species recorded here.

The present study reveals some striking facts about the inshore prawn fishery in Bombay. A large number of specimens encountered in the catch are juveniles. This is an indirect indication of the fact that the inshore area, fertile as it is, serves as the nursery grounds for all these species of prawns, accounting for their rich and sustained inshore yield along the Bombay coast. The matured specimens encountered in the catch must be those that enter the inshore waters along with currents during their breeding season. The active spawning grounds of these prawns must be lying in the offshore areas, outside the area of operation of the 'dol'. A thorough analysis of the trawl catches of these prawns would help throwing further light on this aspect.

The author thanks Dr M.S. Rege, Prof. of Zoology, Institute of Science, Bombay for suggestions and Shri A.S. Alawni, Statistical Officer, Department of Fisheries for statistical analysis.

References

- 1 Bhimachar B S, *Fish Tech*, 2 (1965) 1.
- 2 Kunju M M, *FAO Fish Rep*, 57 (1968) 467.
- 3 Menon M K, *J Zool Soc India*, 5 (1953) 153.
- 4 Rao P Vedavyasa, *Bull Cent mar Fish Res Inst*, 14 (1969) 127.
- 5 Rajyalakshmi T, *Indian J Fish*, 8 (1961) 383.
- 6 Ramamurthy S, in *Proceedings symposium on Crustacea* (Marine Biological Association of India, Cochin) (1967) 1424.