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Note

Fishery and biology of the Flamingo shrimp *Parapenaeus longipes* (Alcock, 1705) off Veraval

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Abstract

The Flamingo shrimp *Parapenaeus longipes* (Alcock, 1705) contributed to nearly 4 % and 6 % of penaeid shrimp landings at Veraval during 2004 and 2005 respectively. In both the years the females dominated the catch with a mean size = 80 mm in most of the cases. Relationship between length and weight was significantly different ($p < 0.05$) in the sexes. Spent females formed 51 % in 2004 while late maturing constituted 42% in 2005. Though the minimum size at maturity was 81-85 mm, majority of the females were found to be mature at 86-90 mm and above. Females dominated during both the years. Gradual increase in landings was observed from February to April, 2004, but it was reverse during the same period in 2005.

Extension of fishing to deeper areas has resulted in the exploitation of a variety of shellfishes in recent years. *Parapenaeus longipes* (Alcock, 1705) have been reported occur in the shrimp landings in stray numbers (unpublished data). But during 2004-2005 this species formed considerable fishery in February, March and April at Veraval. Three species viz., *P. longipes*, *P. fissures* and *P. investigatoris* have been reported to occur in Indian waters (Kurian and Sebastian, 1976). *P. longirostris* is a species that dominates the shrimp catch in the southern coast of Portuguese (Rosa and Nunes, 2002). *P. longipes* has recently been recorded in the near-shore waters off Karachi (Ayub and Ahmed, 2001). Though there are few records of *P. longipes*, commonly known as "Flamingo shrimp" (Mathew, 2000) and locally as "Bhoonsi", it is not known to occur exclusively as fishery in the seas around India or any other country. Though there are some scattered reports (Sukumaran, 1985) on this species, no serious work has been done on their biological aspects. But during 2004 and 2005 this formed an incidental catch in trawl nets. Major landings were by the long trip (LT) deep sea trawls (5-7 days) from a depth of 70-90m, fetching Rs. 17-20/kg. It was found to occur along with *Solenocera* spp. and *Metapenaeopsis stridulans* in the trawl net catches. The occurrence of *P. longipes* during certain months of the year probably indicates the changing nature of trawl fishery off Veraval. An attempt is, therefore, made to study the seasonal occurrence and biology of the species.

Materials and methods

Monthly catch and effort data were collected from trawlers landed at Old Light House (OLH) and Bhidya

landing centre at Veraval. Weekly pooled up data were used to derive monthly estimates. Sexwise size distribution of shrimps and maturity condition of females were studied based on the weekly random samples.

Results and discussion

Catch and effort data: The penaeid shrimp landings at Veraval remained stationary during 2004 and 2005 but the quantity of *P. longipes* showed an increasing trend forming 4 % and 6 % respectively. This is comparatively higher than that recorded earlier as 1 % (Joe, 2000). The estimated landings of this species during February, March and April 2004 and 2005 amounted to 3 t, 8 t, 16 t and 6 t, 4 t and 6 t respectively and the CPUE varied from 0.7 to 4 kg in total crustacean landings with an average of 1% in both the years (Table 1).

Size distribution: The catch was composed of comparatively bigger size shrimps than those reported earlier (Joe, 2000). As in most shrimps, the females were relatively bigger in size. The size distribution of males and females falls in the ranges of 61-90mm and 61-95mm, with 66-70mm and 81-95mm as dominant size group respectively. In contrast, Fischer (1984) reported comparatively much smaller size ranges for males (76mm) and females (79mm) caught from a depth of 10-90 m from Pakistan.

Length-weight relationship: The relationship between total length (TL) and weight (W) of a shrimp is described by the non linear allometric model, using the equation $W = aL^b$, where W = weight in gram, L = total length in mm and a, b are constants. The exponent values, 2.99 and 2.92 were significantly different, indicating differential

Table 1. Month-wise estimated catch (tonnes) and effort (Resource: *P.longipes* ; Gear: Trawl-net)

Month/Year	Feb		Mar		April		Total	
	2004	2005	2004	2005	2004	2005	2004	2005
No.of units	3451	2217	4610	3216	3793	2813	11854	8246
Total fish catch	3159	1818	5397	3562	4727	641	13283	6021
Total crustaceans catch	674.9	298.5	1900.6	682.6	1791	438.2	4366.5	1419.3
Total penaeids	85.6	60.6	214.9	108.5	453.2	80.6	7537.6	249.7
% Penaeids in crustaceans	12.6	20.3	11.3	16	25.3	18.4	17.3	17.6
<i>P.longipes</i>	2.7	6.1	7.8	4.0	15.7	5.7	26.2	26.2
CPUE/unit (kg)	1.0	3.0	2.0	1.1	4.1	2.0	2.0	3.2
% <i>P.longipes</i> in crustaceans	0.40	2.04	0.41	0.59	0.88	1.29	0.60	1.85
% <i>P.longipes</i> in penaeids	3.2	10.1	3.6	3.7	3.5	7.1	3.5	6.3

growth in the sexes. The following regression equations explain the length-weight relationship in females and males of *P.longipes*

For females:

$$W = 0.0003976 L^{2.99}$$

$$i.e., \log W = -3.40055 + 2.99 \log L$$

Where, $r = 0.75$ ($p < 0.05$), $R^2 = 0.5503$, Standard error = 0.0703

For males:

$$W = 0.0010026 L^{2.92}$$

$$i.e., \log W = -2.998872 + 2.92 \log L$$

Where, $r = 0.51$ ($p < 0.05$), $R^2 = 0.26$, Standard error = 0.11

The identity of these regression lines when tested

(ANOVA) indicated that they were significantly different.

Breeding: The ovary development revealed five successive stages, *i.e.*, immature, early maturing, late maturing, mature and spent. The percentage distribution of various maturity stages was recorded of which highest was contributed by the spent (51%) followed by late maturing (18%) in 2004 and 2005 respectively (Fig. 1).

Size at maturity and sex ratio: Though the size at maturity of females is at 81-85 mm, majority were found to be spent at 86-90 mm and above. The overall sex ratio (M:F) for all the population pooled was 1:4. Size wise distribution of sexes indicated that the proportion of males was generally high upto length range of 65-75 mm (86%) with a very few exception whereas females (80mm) dominated the population in most of the cases (91%). *P. longipes* landed at Veraval showed marked differences in size between sexes. The study revealed a higher range *i.e.*, 61 to 90 mm in males and 61 to 95 mm in females compared to earlier reports (Sukumaran *et al.*, 1998).

Consequent on the extension of fishing to deeper areas, a variety of fin-fishes and shellfishes have been found to occur in the landings all along the Indian coast. Species which occurred in stray numbers earlier are commercially exploited at present. *P.longiceps* occurred in the shrimp catch in stray numbers. However, this species shows prospects of increased exploitation as indicated by the higher percentage contribution in the total penaeid shrimp production off Veraval. It is evident that with the vast changes occurring in the marine fisheries sector, the shrimp fishery witnessed remarkable change in species composition with the addition of a number of new ones, which were hitherto, not known to support a fishery of

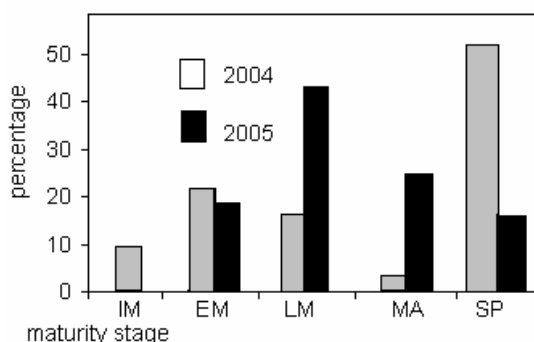


Fig. 1. Maturity stage distribution in percentage of *P.longipes*

any significance along the Veraval coast. The sudden appearance of *P. longipes* in the trawl fishery from February to April and then its complete disappearance during the rest of the season probably indicates the effect of environmental parameters, change in the fishing area or migration of the species to other areas.

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