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NOTE

Fecundity indices of the humpback nylon shrimp, *Heterocarpus gibbosus* Bate, 1888

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Abstract

Fecundity of the humpback nylon shrimp *Heterocarpus gibbosus* has been worked out based on 55 specimens, of total length varying from 94mm to 136 mm and having a weight range of 7.8g to 25.5g. The absolute fecundity was estimated as 20,672. The fecundity varied from 5,670 in the smallest prawn to 33,962 in the largest specimen. The fecundity showed a positive correlation with total length, carapace length and weight. Average fecundity per gram body weight was found to be 1,261.

Depth zones 200-400m along the south-west coast of India is well known for the deep sea prawn resources, among them *Heterocarpus gibbosus* is one of the most important species. Assessment of fecundity is of paramount importance in fisheries management as it provides knowledge about the number of offspring produced in a season and the reproductive capacity of the species (Qasim and Qayyum, 1963). Though preliminary studies on biology and fecundity of some of the deep sea prawns inhabiting south-west coast of India have been conducted notably by Suseelan (1985) and Suseelan and Mohammed (1968), practically no attempts have been made so far to workout the fecundity indices in *H. gibbosus*

Material and methods

Material for this study was collected at random from the commercial deep sea trawlers landed at three fisheries harbours in Kerala viz. Sakthikulangara, Cochin and Munambum during September 2000 to April 2002. Prawns were packed in ice-boxes and transported carefully to reduce the egg loss. The fecundity of 55 prawns ranging in total length from 94 to 136 mm and weight 7.8g to 26g was estimated. The specimens were sorted out to 5 size groups based on their total length. Length and weight were taken to the nearest millimetre and 0.1g respectively. Eggs were carefully removed from the brood pouch, weighed and the absolute fecundity was estimated by following standard procedures (Kurup and Binu, 1994; Suresh Kumar and Kurup, 1998). Relative fecundity was derived by estimating the number of eggs per gram body weight (Beganal, 1978). The absolute fecundity estimated

was regressed to the total length (tip of the rostrum to the tip of the telson), total weight (with berry) and carapace length (posterior border of the carapace to the posterior edge of the orbital cavity).

Results and discussion

The absolute fecundity varied from 5,670 to 33,962 in berried specimens of total length ranging from 94mm (7.8g) to 136mm (25.5g) and the details are presented in Table 1. Figures 1,2 and 3 depict the relationship of fecundity with total length, carapace length and weight in *H.gibbosus*. The total weight, total length and carapace length showed significant positive correlation with fecundity as manifested by the higher correlation coefficient values (Pauly, 1980). Mean total length, mean weight, carapace length, average absolute and relative fecundity for various length groups are presented in Table 2. Average absolute and relative fecundity showed a gradual increase with increasing size groups whereas the relative fecundity showed a gradual increase in the first four groups while a sharp decrease in the higher size group is worth noticing (Table 2).

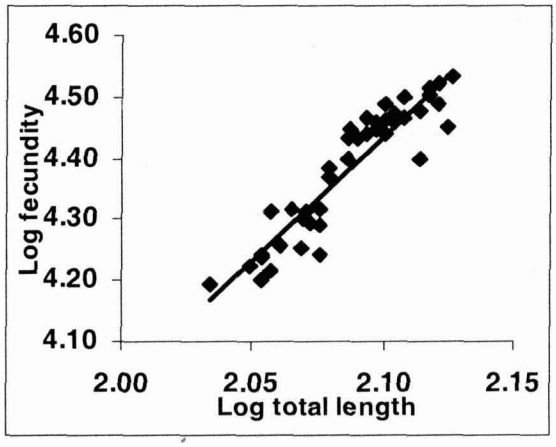

Fig.1. *Relationship between total length and fecundity*

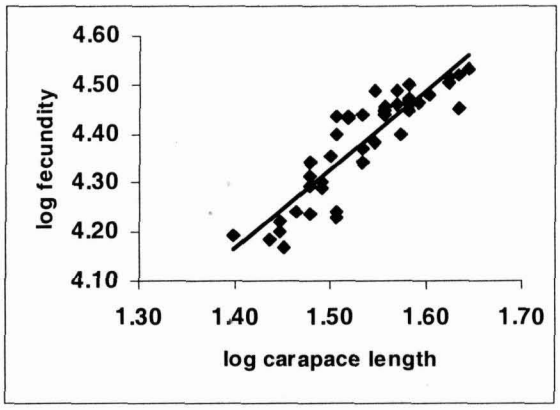

Fig.2. *Relationship between carapace length and fecundity*

Table 1. *Fecundity in relation to length and weight of* H. gibbosus

Measurements (mm)	Min.	Max.	Mean	SD	Regression analysis: Regr. Constant (a)	Regr. Coef (b).	Correl. coef. (r)	Fecundity per unit body dimension
Total length	94	136	119.7	9.28	-3.8194	4.0426	0.8790*	173
Total weight(g)	7.8	25.5	16.4	3.94	2.245	2.39	0.7419*	1260
Carapace length	23	44	33.4	5.23	0.7442	2.3254	0.7611*	618
Absolute fecundity	5,670	33,962						

* Significant at 1% level

Table 2. *Size group -wise variation in fecundity indices of* H.gibbosus

Size group mm	Sample size	Mean total length (mm)	Mean Wt.g	Mean carapace length (mm)	Av. absolute fecundity	Relative fecundity
90-100	6	96	9	25	6,555	724
100-110	5	106	12	27	9,477	781
110-120	18	115	14	31	15,919	1,126
120-130	18	124	18	36	29,460	6,566
130-140	8	132	22	41	572	1,325

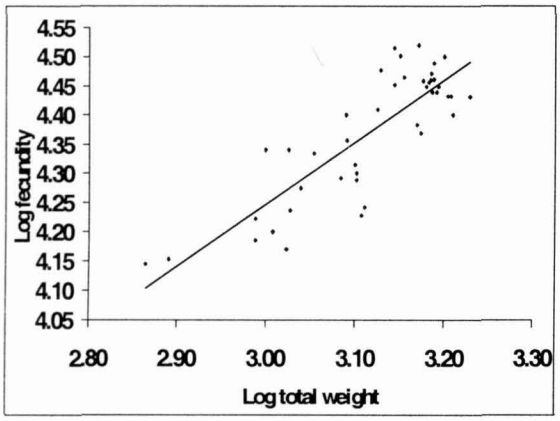

Fig.3. *Relationship between total weight and fecundity*

The estimated absolute fecundity of *H.gibbosus* is comparable with the fecundity of *H.woodmasonii*, another important deep-sea prawn from the same area (Suseelan, 1985). He reported the fecundity of other deep sea prawns off south west coast of India such as *Plesionika spinipes, P.martia* and *P.ensis* as 3,972, 2,733, and 2,655 respectively. The fecundity of *H.gibbosus* is relatively high when compared to other pandalid species coexisting in the same fishing ground.

The inverse relationship noticed between fecundity and total length in the size group 130-140mm might be due to loss in weight of female during advance incubation stages as a result of diminishing feeding activity. According to Sureshkumar and Kurup (1998), the ovarian development and subsequent reduction in feeding intensity contributed considerably to the decrease in body weight which in turn increased the relative fecundity in berried *Macrobrachium rosenbergii*. In palaemonids, a reduction in feeding rate is observed during the progression of maturity stages as the ovary occupies three fourth of cephalothorax (Ibrahim, 1969).

The results of the present study revealed that fecundity of *H.gibbosus* is perceptibly low when compared to shrimp species inhabiting the coastal waters off Kerala (Rao, 1968). Therefore, the exploitation of deep-sea prawn population needs to be scientifically regulated for the sustenance of the stock along the southwest coast of India.

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