

**STUDIES ON THE FISHERY AND BIOLOGY OF 'RIDGE-BACK SHRIMP'
SOLENOCERA CHOPRAI NATARAJ OCCURRING OFF MAHARASHTRA COAST***

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ABSTRACT

Penaeid prawns belonging to the genus *Solenocera* have been reported to have fishery value only off Northwest coast of India. The species exploited from the shallower regions of the coast has been identified as *Solenocera crassicornis* H. Milne Edwards, caught mainly in bag nets (Dol and Bhokshi).

Another species *S. choprai* Nataraj was recently reported to have considerable fishery value along Maharashtra coast, landed exclusively by mechanised trawlers, operating at 40-70 m depth zone. This was found to contribute about 5% of the total penaeid catches from the region. The fishing ground lies off Murud-Harnai coast.

S. choprai has been recorded only from the Northwest coasts of India. This species bears a very close resemblance to *S. alticarinata* Kubo. The salient features that help in its identity, along with notes on its fishery and biology are presented, covering a period of ten years from 1977-1986. The fishery for *S. choprai* was found to be highly seasonal from March to June for most of the years, sometimes extending upto September. The observations were carried out at Sassoon dock, an important landing centre for penaeid prawns in the state of Maharashtra. An export potential exists for this species as it grows to a fairly large size. It is comparable in size to *S. crassicornis* which is presently exported in good quantities to countries like Japan.

INTRODUCTION

PENAEID prawns belonging to the genus *Solenocera* constitute a fishery of considerable magnitude forming 10% of the total prawn landings of the Maharashtra State (Jones, 1967). Two species identified as *S. crassicornis* and *S. choprai* are the major contributors to the fishery. Other species that have been recorded mostly in numbers from Indian waters are *S. pectinata*, *S. hextii*, *S. keelbeli* and *S. melantho*, *S. crassicornis* is a shallow water species fished within a limit of 40 m and is caught mostly in bag nets and in a small

measure trawl nets also. *S. choprai* is a deep water form and is fished within a depth range of 40-70 m off Murud and Harnai coasts of Maharashtra. The resource value of this species was first reported by Aravindakshan and Karbhari (1983). Since very little is known about its biology and fishery apart from this preliminary report, a detailed study was undertaken to understand the trend of its fishery and important biological parameters from 1977-1986.

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MATERIAL AND METHODS

The data were collected from Sassoon dock. Biological studies were carried out on

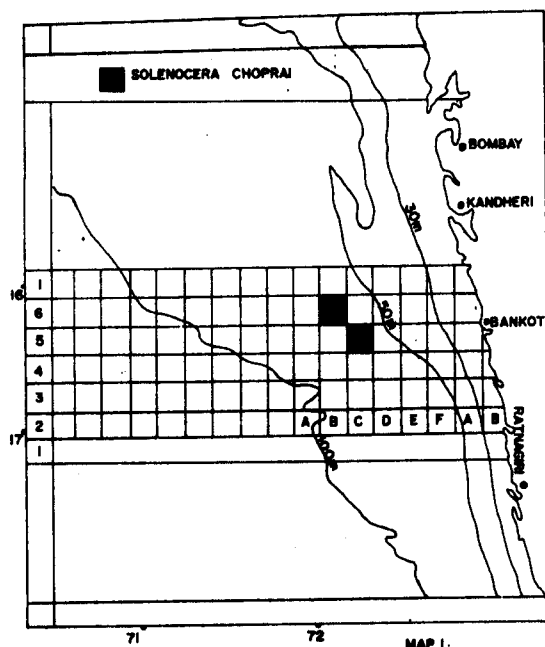


Fig. 1. Fishing grounds along the NW coast of India of *Solenocera choprai*.

samples collected from the centre and later analysed in the laboratory. Data collected by the field staff of the Fishery resources and assessment division of Central Marine Fisheries Research Institute and processed at Bombay Research Centre have been made use of in computing yearwise landings and C.P.U. **The species identity :** *S. choprai* can be easily identified from *S. crassicornis* by two salient characters. 1. The post rostral carina is markedly elevated forming a distinct ridge and is laminose. 2. Telson is trifurcate in *S. choprai* with a pair of distolateral fixed spines. Telson in *S. crassicornis* is simple and unarmed. In addition the antennae of *S. choprai* are banded dark red and white in fresh condition. The

antennae of *S. crassicornis* are pinkish. Though Nataraj (1945) has recorded this species from Arabian sea ($17^{\circ} 27' N, 71^{\circ} 41' E$) at 102 m, it enjoys a wider distribution extending upto Gujarath coast (Bapat *et al.* 1982) and off the coast of Pakistan (Tirmizi and Bashir., 1973). Bapat *et al.* (1982) recorded the species in the depth range of 126-360 m off Okha coast of Gujarath.

The Fishery : The fishery for this species is seasonal. It begins usually in March and ends in June as noticed by Aravindakshan and Karbhari (1983). The craft and gear employed in the fishery have been reported by Chakraborty *et al.* (1983). The area of fishing is off Murud-Harnai coasts of Maharashtra as shown in Fig. 1. This species was also caught by Research cum training vessel *R. V. Sarawathi* of Central Institute of Fisheries Education, Bombay on its 37th cruise.

The catch trend : The trend of landings from 1977-1986 is presented as histogram in Fig. 2. The landings show wide fluctuations. From 1978 the fishery showed a steady decline reaching the lowest catch in 1983 and then showed an upward trend during the next two years. During 1986 the fishery was found to be again on the decline. The reasons for these wide fluctuations are not known. The present depth limit of 70 m operated by country craft trawlers is not sufficient to tap the resource fully as this species inhabits in greater depths than that of the area fished at present. Holthuis (1980) and Bapat *et al.* (1982) recorded a depth range of more than 100m for this species. The trawling capacity of country craft trawlers is now limited to 70 m (Gokhale, 1982). Further detailed exploration into deeper area is necessary for assessment of total stock. The catch/unit during the different years is presented below.

| Year | No. of units | Catch (kg) | C.P.U. (kg) |
|------|--------------|------------|-------------|
| 1977 | 3215 | 40112 | 12.5 |
| 1978 | 4802 | 51125 | 10.6 |
| 1979 | 3828 | 36110 | 9.4 |
| 1980 | 3012 | 25115 | 8.3 |
| 1981 | 3444 | 25152 | 7.3 |
| 1982 | 3812 | 20125 | 5.2 |
| 1983 | 2452 | 10005 | 4.1 |
| 1984 | 4883 | 70801 | 14.4 |
| 1985 | 3132 | 46442 | 14.8 |
| 1986 | 4297 | 57717 | 13.12 |

1980 when larger groups were noticed. Tirmizi and Bashir (1979) noted only smaller size groups ranging from 70-90 mm occurring off the coast of Pakistan. The present study also reveals that size groups of less than 100 mm are major contributors to the fishery.

Food : The only information available on the food habits of this species is by Aravindakshan and Karbhari (1983) who reported a carnivorous diet for it. The major

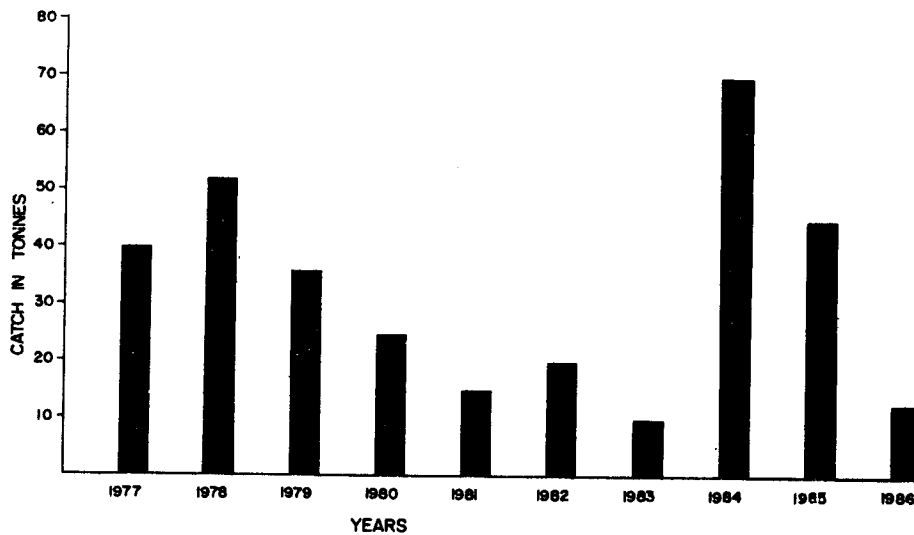


Fig. 2. Landings of *Solenocera choprai* at Sassoon Docks from trawlers.

As per the catch trend the C.P.U also showed a decline upto the year 1983. An improvement in C.P.U could be discerned from 1984 onwards.

Biological studies : Males as a rule were of smaller size not exceeding 100 mm. The largest female encountered measured 125 mm. Kurien and Sebastian (1976) recorded 130 mm as the maximum size attained by this species. In general the size range was below 100 mm during nine years and the exception was during

food items in percentage of 1012 specimens of size range 58-112 mm examined are given below.

| | |
|-------------------------|----|
| Crustaceans | 50 |
| Polychaetes | 15 |
| Foraminifera & mollusca | 10 |
| Sand grains and debris | 25 |

No difference in food items was noticed with regard to sex of the species. Hall (1962) observed a carnivorous habit for the related species *S. alticarinata* from Malaysian waters,

though the dominant item of food was polychaete remains. In the present case crustaceans mainly in the form of appendages of decapods formed the chief food item followed by polychaete remains.

Maturity : Fully mature and gravid females with large size groups of more than 100 mm were noticed only in September 1980. The species appears to spawn in this month as during other months gravid ones were not noticed. The fecundity was estimated to be 130850 ova for a fully mature female 107 mm

in total length. The fecundity was found to be very similar to that of *S. crassicornis* as reported by Chung (1963). The ova diameter was found to vary from 0.2 to 0.3 mm.

General considerations : This species is smaller than the major penaeids like *Metapenaeus affinis* and *M. monoceres*. But it is comparable in size to *S. crassicornis*. The large sized adults measuring over 110 mm are attractive to commerce and may fetch good price in foreign markets if exported. At present it is consumed locally and fetches a price varying from Rs. 10 to 15/kg in the market.

REFERENCES

- ARAVINDAKSHAN, M. AND J. P. KARBHARI, 1983. New penaeid prawn resources showing p along Maharashtra Coast. *Mar. Fish. Infor. Serv. T & E Ser.*, 4 : 9-12.
- BAPAT, S. V., V. M. DESHMUKH, B. KRISHAMURTHY, C. MUTHIAH, P. V. KAGWAD AND C. P. RAMAMIRTHAM, K. J. MATHEW, S. KRISHNA PILLAI AND C. MUKUNDAN, 1982. Fishery resources of Exclusive Economic Zone of Northwest coast of India. *Bull. Cent. Mar. Fish. Res. Inst.*, 33 : 1-83.
- CHAKRABORTY, S. K., V. D. DESHMUKH, KUBERVIDYASAGAR AND S. RAMAMURTHY, 1983. By catch of shrimp trawlers of greater Bombay. *Mar. Fish. Infor. Serv. T & E Ser.* : 54 : 7-15.
- CHUNG, T. S. 1963. The natural history of the commercial species of Hong Kong penaeidae (Crustacea, Decapoda) *Ann. Mag. Nat. Hist.*, (13) 6 : 401-433.
- GOKHALE, S. V. 1982. The Mania called deep sea fishing. *Science Today*, Aug. 5-8.
- HOLTHUIS, L. B. 1980, Shrimps and prawns of the world. *FAO Fisheries Synopsis*, 125 Vol. 1.
- Jones, S., 1967. The crustacean fishery resources of India. *Proc. Symp. Crustacea, MBI*, Pt. 4 : 1328-1340.
- KUNJU, M. M., 1967. Observations on the prawn fishery of Maharashtra coast. *Ibid.*, Pt. 4 : 1382-1397.
- KURIEN, C. V. and V. O. SEBASTIAN, 1976. *Prawns and prawn fisheries of India*. Hindustan Publishing Corporation, Delhi 280 p.
- MOHAMED, K. H., 1967. Penaeid prawns in the commercial shrimp fisheries of Bombay with notes on species and size fluctuations. *Proc. Symp. Crustacea, MBI*, pt. 4 : 1408-1418.
- NATARAJ, S., 1945. On two species of *Solenocera* (Crustacea, Decapoda : Penaeidae) with notes on *Solenocera pectinata* (Spence Bate). *J. Roy. Asiatic. Soc. Bengal*, 11 (1) : 91-98 pp.
- *TIRMIZI, N.M. AND Q. BASHIR, 1973, *Shore and offshore prawns of northern Arabian Sea*.

*Reference not consulted in original but reference taken from Holthuis (1980) cited above.