

Fishery of Mud Crab, *Scylla serrata* (Forsk.) from Karwar Waters

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Catch data of *Scylla serrata* obtained in different gears from Karwar region during December 1983 – November 1984 indicated a sum of 9608 kg of landings of crabs. Majority of the crabs (89.57%) was found to be caught in backwaters by line fishing and cast nets. A considerable (10.43%) quantity of catch was also contributed by gill nets and shore-seines from inshore waters. A maximum of 1207 kg of crabs were landed in December, 1983. The size structure and sex-ratio of *S. serrata* varied with gear type and period.

The mud crab, *Scylla serrata* is known to occur abundantly all along the estuaries, mangrove swamps (Macnae, 1968) and tidal flats (Hill *et al.*, 1982) of Indo-pacific region. It is considered as the most important amongst the 6 species of the crabs in the world market (Alverson, 1971). Although *S. serrata* is the most preferred amongst the 8 species of Indian edible crabs (Rao *et al.*, 1973), its fishery aspects from Indian waters are less studied (Shanmugham & Bensam, 1980; Joel & Raj, 1980; Devasia & Balakrishnan, 1985).

In the present study, it is aimed to discuss the fishing methods, seasons and prospects of *S. serrata* fishery from Karwar region.

Materials and Methods

Data on catch statistics of *S. serrata* landed from inshore waters (from gill nets and shore seines) and backwaters (from line fishing and cast nets) of Karwar were collected once in fortnight during December 1983 to November 1984. The monthly landings were estimated by the formula $MY = \frac{oy}{od} \times nd$ as suggested by Shanmugam & Bensam, (1980) where 'MY' is monthly yield; 'oy' is the total weight of crabs landed in each gear on the days of observation 'od', and 'nd' is the number of fishing days in the month. The carapace width, across the carapace including ninth antero-lateral spine, measured with the help of vernier calipers was used for determining

the size. Size frequency was calculated by grouping the crabs in 10 mm intervals.

Results and Discussion

S. serrata is caught along with fin fishes, prawns, the other crabs etc. all along Karwar coast (14°46' 54" N and 74°03" E to 14°54' 25" N and 74°19' 30" E) in long lines, cast nets, gill nets and shore seines. As such it was possible to obtain a first hand assessment of the relative importance of various gears in annual landings of *S. serrata*.

The Kali estuarine system of Karwar offers a considerable extent of backwaters with richly vegetated mangroves and muddy areas. The crabs available in these areas are usually collected by long lines which are similar to those described by Hora (1935) and Chhapgar (1962). This gear is made up of coconut coir measuring in length between 75–100 m with baited hooks set a metre apart. It is operated with flesh of elasmobranchs, eel or puffer fish bait by placing it across the backwaters during incoming tide for about 45 min. With the help of canoe, the line is lifted slowly without much disturbance and the crabs hanging onto the bait are collected by a scoop net into a bamboo basket. As the quantity of crabs captured from backwaters by cast nets is small, it is clubbed with long line catch.

Similar to many areas of coastal Karnataka (Bal & Rao, 1984), some special crab nets

locally called as 'aedi bale' are also used for inshore fishing of crabs in Karwar region. These are modified versions of anchoring gill nets. In view the damage caused by the crabs, fishermen use old anchoring gill nets with minor repairs having stones weighing about 10 kg as anchors. These nets have a mesh size of 50–60 mm with a length and height ranging from 22 to 29 m and 1.2 to 1.5 m respectively. They are anchored generally in 4–5 m deep water column during evening and hauled in the early morning. The majority of the catch comprises of the crab species of *Portunus*, *Matuta*, *Charybdis* and *Scylla*.

In the inshore fishing, the shore seines locally called 'Kairampani' or 'Yendi' are operated in which the crabs mainly *Portunus pelagicus*, *P. sanguinolentus*, *Charybdis* spp. and *S. serrata* along with fin fishes are landed. These nets are made of 50–60 pieces each measuring 4.40 x 4.80 m with a total length of 180–215 m. The mesh size was 10 mm in the middle, 15 mm in the sides and 30 mm along the sides. The height varies from 9.5 m in the middle to 3.8 m along the extreme end. They are operated up to a depth of 5 m in near shore waters.

S. serrata is also encountered in the off shore trawl catches, but their incidence is comparatively very less. All the crabs caught by trawls are either berried or spent females (Prasad, 1987). Their contribution to the total catch was however negligible and hence trawl catch data is excluded in the discussion.

The estimated catch of *S. serrata* in Karwar waters during December 1983 to November 1984 was 9608 kg of which 8606 kg came from lines and cast nets. Inshore waters (both gill nets and shore seines) contributed only 10.42% of the total landings. Gear-wise landings of *S. serrata* presented in Fig. 1 indicate that most of the catch in line fishing is yielded during post-monsoon (October–January) and pre-monsoon period (February–May) while gill net and shore seine catches are mainly during monsoon period. Although, crab fishing in inshore waters was carried out throughout the year, the fishing efforts were found to be intensified in monsoon period during which other fishing activities, namely, trawling and purse

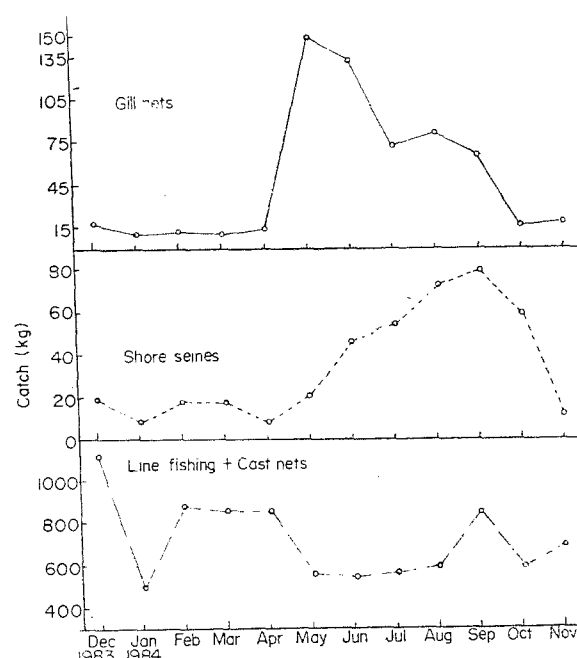


Fig. 1. Gear-wise landings of *S. serrata* from Karwar waters

Table 1. Gear-wise contribution (%) to the total catch of *S. serrata*

Period	Long lines + cast nets	Gill nets	Shore seines	Total catch kg
1983/84				
December	97.10	1.33	1.57	1207
January	96.49	1.75	1.75	513
February	96.90	1.10	1.99	905
March	96.97	1.01	2.02	891
April	97.70	1.38	2.06	872
May	77.15	20.08	2.77	722
June	75.38	18.29	6.33	727
July	81.66	10.62	7.71	687
August	79.27	11.04	9.69	743
September	84.95	6.96	8.09	977
October	88.50	2.45	9.06	632
November	96.06	2.39	1.54	712
Total catch kg	8606	590	412	9608
Percentage	89.57	6.14	4.28	

seining were abandoned. In all, the highest landings (1207 kg) of the crab were recorded during December 1983.

The annual combined frequency distribution of *S. serrata* exploited by different

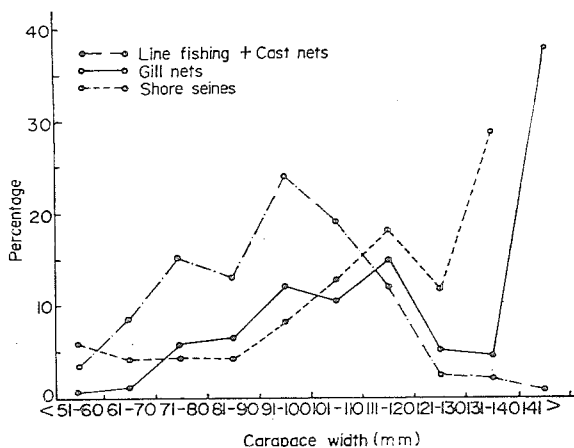


Fig. 2. Percentage contribution of different size groups of *S. serrata* to the total catch in different gears

gears is indicated in Fig. 2. It shows that the population available to different types of gear exhibited some differences from one another. In the catch from backwaters by lines and cast nets three distinct groups were present with dominant modes at 91–100, 101–110 and 71–80 mm which are designated as 'C', 'B' and 'A' respectively. Among these 'C' group (91–100 mm) contributed much to bulk of the catch, whereas in inshore water majority of the crabs belonged to 131–140 mm size group as evident from shore seine landings. The dominant size group in gill net catch was more than

141 mm contributing 38.30% of its total catch. The size frequency analysis of crabs in different gears indicated only the availability of these groups in such gear and period of operation.

The percentage contribution of each gear to the total catch varied with the period (Table 1). It ranged between 75.35 (June) and 97.70 (April) in line fishing and cast nets while it was 1.01 (March) and 20.08 (May) and 1.54 (November) and 9.69 (August) in gill net and shore seine catches respectively.

The proportion of males and females in the entire catch varied with the type of gear and also the period. The deviation of sex ratio from 1:1 was unusual and rare in inshore water crabs but too wide in backwaters catch (Table 2), particularly it was quite evident during October – November and through July–August. The disproportionality in sex ratio during this period may be attributed to the spawning migration of mature females into inshore waters during the same period (Prasad, 1987). A similar type of migration of *S. serrata* was reported earlier in Indian waters and elsewhere (Arriola, 1940; Naidu, 1955; Ong, 1966; Hill, 1975).

In Karwar region there is a great demand for *S. serrata* particularly during monsoon months when major fishing activities are

Table 2. Sex ratio* of *S. serrata* in different gears

Period 1983/84	Backwaters (Long lines + cast nets)		Inshore waters			
	n	Sex ratio	n	Sex ratio	n	Sex ratio
December	841	1.33	39	0.95	227	0.72
January	600	0.75	37	0.76	212	1.06
February	720	0.48	39	0.86	190	0.76
March	640	1.46	38	1.00	194	0.88
April	693	1.20	45	1.05	144	0.85
May	675	0.71	470	0.64	194	0.90
June	630	0.78	438	0.58	459	0.90
July	585	1.22	324	0.60	486	0.76
August	528	1.66	334	0.78	585	0.82
September	420	0.53	323	0.66	558	0.75
October	680	2.27	55	0.77	411	0.68
November	675	1.14	49	0.75	187	0.75

*Males to females

ceased. However, the *S. serrata* fishery in this region is not properly organised as indiscriminate fishing of berried females and juveniles has been often observed. Hence some immediate measures have to be adopted to safeguard the resources of *S. serrata*. An intensive culture of *S. serrata* in impounded water bodies along with some of the fast growing fish could be yet another area of undertaking which can augment the production of crab.

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