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Report on the Occurrence of One Subspecies of *Scylla serrata* (Forskal) in Cochin Backwaters

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The taxonomy of the mud crab, *Scylla serrata* has become a topic of interest. Alcock (1899) described this species from Indian waters. It was considered that under the genus *Scylla,* only one species, namely, *Scylla serrata* was valid. But Estampador (1949) revised the genus and reported the occurrence of four sorts, *Scylla serrata, S. tranquebarica, S. oceanica* and a variety *S. serrata,* var *paramamosain* in Philippine waters. He established his claim based on the morphology such as colouration, relative length of chelae and also on the cytological events during gametogenesis. Serene (1952) pointed out that two distinct categories under this genus was demonstrable on the basis of colouration. But Stephenson & Campbell (1960) concluded them as only synonyms, but pointed out the need for further investigations.

In the present collection from Cochin backwaters two groups of this species with distinct morphological features were noticeable. Male and female animals of different size were collected in large numbers from different locations of the backwaters, the distribution was observed to be rather a mixed one in all parts of the backwaters. The structure of the carapace, the chelae, the first abdominal pleopod of male and colouration were studied. One group which agreed on the earlier description of *Scylla serrata* treated as *Scylla serrata* (Forskal) and the other one which differed is treated as sub-species, namely *Scylla serrata serrata.* A comparison of morphological characters of *S. serrata* and *S. serrata serrata* is presented in Table 1.

Table 1. *Comparison of the morphological characters of the Scylla serrata (Forskal) and Scylla serrata serrata*

Scylla serrata (Forskal)	*Scylla serrata serrata*
Carapace dark green, unsmooth and less convex	Dark green, smooth and more convex
Frontal lobe pointed and anteriorly projected	Not pointed and arranged in the same row
'H' shaped furrow deep	Less deep
Posterior border of the carapace broad and less convex	Comparatively narrow and more convex
Anterolateral teeth not anteriorly truncated	Anteriorly truncated
Ventral side of the carapace white or cream coloured	Bluish colour with reddish tinge, in the anterolateral portion of ventral side
Last pair of walking legs with numerous mosaic like yellow or white patches	Green or violet generally without patches
Chelate leg predominently green with numerous patches with yellow tinge in the lower margin	Orange with brownish green tinge patches are absent or very feeble
Two stout spines are present in the outer angle of the carpus	Only one spine is present
The abdomen of the fully mature females has numerous yellow or white patches	Dark brownish black thick bands are present

Scylla serrata (Forskal)

Carapace is convex, frontal teeth are slightly pointed and anteriorily projected. An 'H' shaped deep furrow is noticeable in the cardiac region of the carapace (Fig. 1 A). Anterolateral teeth are not much anteriorly truncated. The posterior border of the carapace adjoining the abdominal plate is broad, and less convex.

Chelate legs are massive; the merus bears three stout spines in the anterior border (inner angle) and two on the posterior border (outer angle) of which one is terminal and the other one is sub-median in position. The carpus has a strong spine at the inner angle; in the outer angle there exists two stout spines. Propodus is with one stout spine at the front of the apex of the wrist

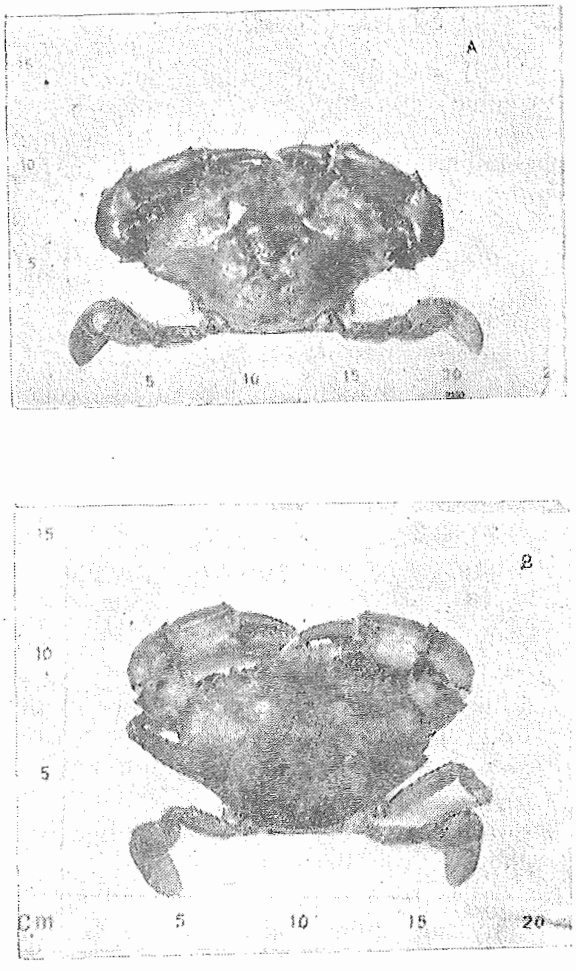

Fig. 1 A. *Scylla serrata* (Forskal)
B. *Scylla serrata serrata*

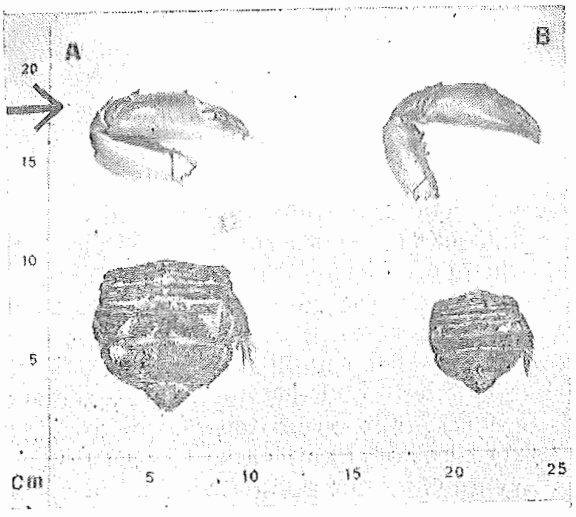

Fig. 2 The chelate legs and the abdominal plates of fully matured females
A. *Scylla serrata* (Forskal)
B. *Scylla serrata serrata*

joint and two small ones located side by side behind the finger joint. The colouration of the carapace is predominently green on the dorsal side and cream on the ventral side. Numerous mosaic–like yellow or white patches are seen on the swimming legs, upper portion of the chelate legs and also on the abdominal flap of the fully mature females (Fig. 2 A).

Scylla serrata serrata

Carapace is convex, frontal teeth are blunt and arranged in one row. The 'H' shaped furrow in the cardiac region is deep. Anterolateral teeth are compactly arranged and are anteriorly truncated (Fig. 1 B). The posterior border of the carapace adjoining the abdominal plate is narrow and convex. The mode of spinulation in the massive chelate leg does not differ from that of the former one except for the carpus, which has only one spine in the outer angle. In general, the spines of the carpus and the dactylus are vestigial in the adult with a broad base and less pointed end. One tubercle is present in the lateral region of the propodus.

The colour of the carapace is shiny green with a smooth surface, mosaic–like patches are sometimes visible on the carapace, but on such patches occur on the chelate leg, swimming legs and abdomen (Fig. 2B).

The ventral side of the carapace is bluish pink. Chelate legs are orange coloured with a brownish green tinge. The abdomen of the fully mature female has a brownish black colour.

Discussion

According to Estampador (1949) Philippine fishermen designate *S. serrata* and the variety paramamosain as belonging to the mamosain group. Vietnam fishermen (Serene, 1952) also recognise four groups, designating as rust red crabs, banana crabs or white crabs, green crabs and moving crabs. Though Serene (1952) does not fully agree with Estampodor in considering them as separate species, he regarded them as species with subdivisions of each varieties. But both agree only in the separation of two distinct groups based on colour. Estampador (1949) considered the relative length of the chelae, and the structure and degree of spinulation as important taxonomic characters. Serene (1952) suggested that the relative length of the chelae alone need not be considered as a diagnostic feature. Similarly Stephenson & Campbell (1960) doubted the diagnostic value of the structure of spines, because of the possibility of wear and tear of spines. In the present investigation the observed number of spines and its degree of sharpening in particular subspecies, irrespective of sex and age, based on an extensive material, may suggest to be of diagnostic value.

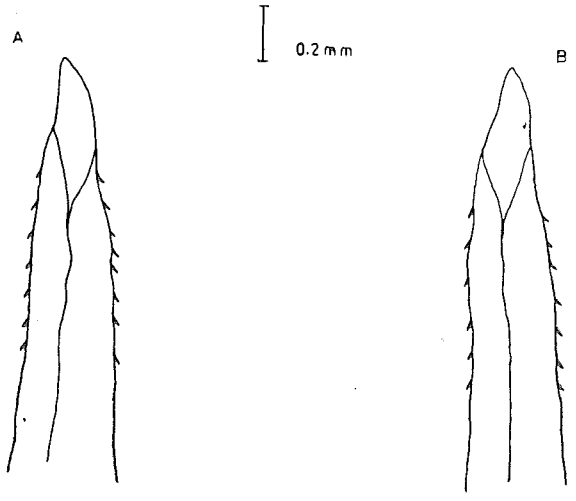

Fig. 3. The first male pleopod enlarged
A. *Scylla serrata* (Forskal)
B. *Scylla serrata serrata*

Taxonomists considered the structure of the first abdominal pleopod of male as a diagnostic feature. But the present study however did not demonstrate any contrasting features in the first abdominal pleopods in both groups suggesting that both groups may not be separate species (Fig. 3).

Gravid females of *S. serrata serrata* have been collected from the backwater near the bar mouth, while no gravid females of *S. serrata* could be noticeable in the backwater. It has been observed that in both forms the abdomen assumes a semicircular shape with well developed pleopods to hold the eggs, on sexual maturity. In *S. serrata* the abdominal flap develops a green colour, with full of yellow mosaic like patches while in *S. serrata serrata,* the colour of the abdomen at this stage is brownish black with dark bands across the flap. In this condition the ovary has a deep pink colour and almost fills the body cavity as observed by Radhakrishnan (1979) in other portunid species. Also, it is interesting to note that both forms differed in the size at maturity. Minimum carapace width observed at maturity in *S. serrata* was 140 mm and abdominal width 61 mm while it was 98 and 43 mm respectively in *S. serrata serrata.*

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