J. mar. biol. Ass. India, 1990, 32 (1 & 2) : 248-253 , 1991!

MACROBRACHIUM STRIATUS: A NEW SPECIES FROM THE SOUTHWEST COAST OF INDIA

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ABSTRACT

Macrobrachium striatus sp. nov. collected from Cochin Backwater along with *M. idella* and *M. equidens* by cast net during August-November is described in detail. The species closely resembles *M. equidens*, but it could be immediately distinguished from latter by the longitudinal stripes along the entire body length. A comparative study on the zoeal stages of the two species reared in the laboratory showed morphological differences. Separate studies carried out on the breeding of these two forms indicated that no inter-breeding between them takes place. All these distinct differences necessitated to describe the striped form as a new species.

INTRODUCTION

ABOUT 40 species of freshwater prawns of economic value under the genus *Macrobrachium* Bate 1868, have so far been recorded from India. Of these 15 species have been reported from Kerala (Jayachandran and Joseph, 1990). Our knowledge on the taxonomy and distribution of the species of *Macrobrachium* in South India is limited to a few works. Henderson and Matthai (1910) dealt with 9 species. Later, Nataraj (1942) and Kurian (1954) recorded *M. rosenbergii*, *M. idella*, *M. scabriculum*, *M. equidens* and *M. dayanus* from the erstwhile Travancore. During the survey of the Kayamkulam Lake, John (1958) listed 2 species, namely *M. idella* and *M. equidens*. Recently Jayachandran and Joseph (1986) described a new species *M. indicum* collected from Vellayani Lake near Trivandrum. A detailed survey on the distribution and abundance of freshwater prawns of the major rivers, estuaries and lakes of Kerala was recently undertaken by Jayachandran and Joseph (1989).

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M. equidens is one of the common palaemonid prawns found in the backwaters of Kerala. The cast net collections, made at Cochin Backwater around Thevara area during August-November represented two forms of *M. equidens*, one having longitudinal stripes along the entire length of the body and the other without stripes, but bearing blotches throughout the body. Jagadisha (1977) while studying the caridean prawns of Karwar area had also reported the occurrence of the striped and non-striped forms of *M. equidens*. The morphological characters of the two forms, their breeding and larval development have revealed that they are distinct from each other, the non-striped form closely agreeing to the discription of *M. equidens* given by Henderson and Matthai (1910), Holthuis (1950) and Tiwari and Pillai (1973). The striped form is now considered as new species.

The author is grateful to Dr. E. G. Silas for his constant guidance and encouragement and to Dr. P. S. B. R. James, Director, CMFRI for his kind permission to publish this work. He is also thankful to Dr. P. Vedavyasa Rao for critically going through the manuscript.

Macrobrachium striatus sp. nov.

Etymology : The specific name is derived from the striped nature of the body.

Holotype : Male (TL : 82.0 mm)

Paratypes : Three males (TL : 68.0, 78.5 and 79.0 mm). (The holotype and one of the paratypes measuring 79 mm in TL are being despatched to the Zoological Survey of India at Calcutta).

abdomen of which the dorsal one or two stripes are discontinuous (Fig. 1). Some of the stripes on the lateral sides of the carapace are also discontinuous and some times appears to be as patches. These patches and discontinuous stripes show some variations from individual to individual. All the pereiopods are striped. The second pereiopods of the adult male are striped and never exhibit the mottled appearance on carpus and palm, a character very distinct in the case of *M. equidens*.

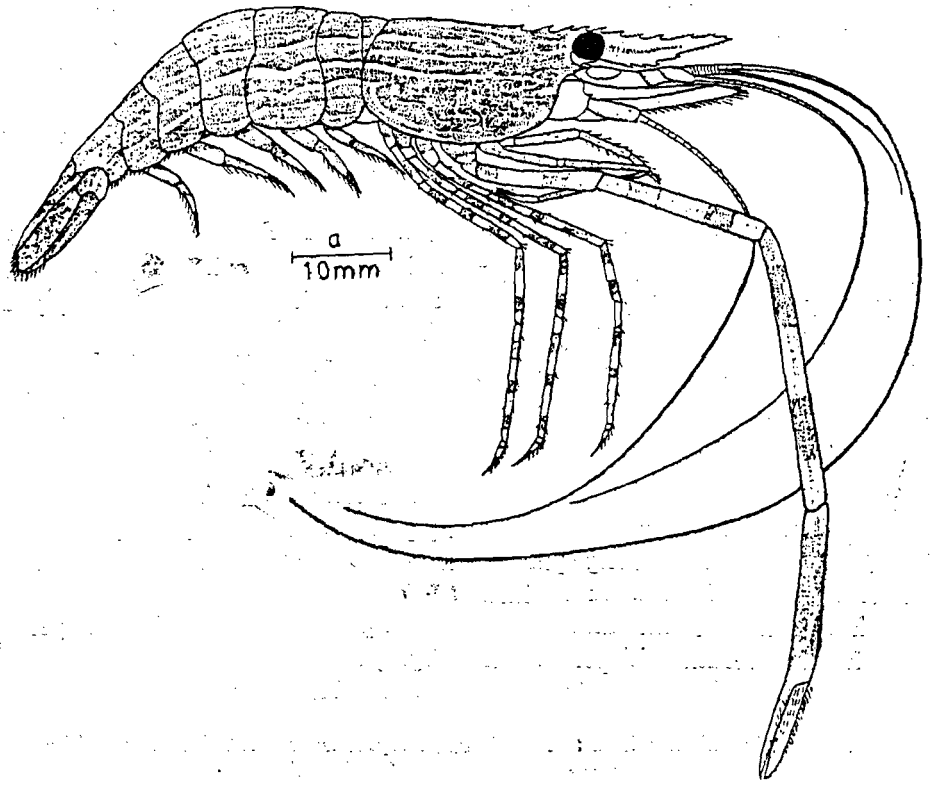

Fig. 1. An adult male *Macrobrachium striatus* sp. nov.

Type locality : Cochin Backwater around Thevara area, Kerala State, South India.

Description : Specimens possess greenish or greyish brown longitudinal stripes along the entire length of the body. In the adult 5 to 6 wavy stripes are seen along the sides of the

In *M. striatus* only the fingers are mottled. Movable finger and only the inner side of fixed finger are covered with velvety hairs. Pleopods and uropods are also striped. The striped nature which is very prominent in live materials, fade very fast when preserved in 10%

formaldehyde and almost disappear within 35 days of preservation.

Body is compressed and robust. Rostrum well developed, long, serrated and compressed. Hairs present between the teeth. Rostrum reaching upto the distal end of antennal scale, and basal crest not elevated (Fig. 1). In majority of the specimens the distal end of the rostrum slightly upturned. Dorsally it carries 11 to 13 teeth of which 3 are placed behind the orbit. Ventrally it carries 4 to 5 teeth. Carapace well developed. Antennal and hepatic spines are well developed and lie in one line. Antennal spine has a strong carina which continues posteriorly some distance towards hepatic spine (Fig. 1). Pleura of first to third abdominal segments typical, but 4th and 5th are backwardly directed and ends rather in an acute apex. Pleura of 6th segment ends in a spine. Telson slender, triangular and narrowing posteriorly. The distal end bears 2 pairs of spines of which the outer pair short. In between the longer spines, a number of plumose setae are present (Fig. 2 i). Dorsal surface of the telson carries 2 pairs of short movable spines of which the anterior pair placed in the middle of the telson.

Antennular peduncle 3 segmented, basal segment broadest and bears a strong spine at its anterolateral angle. Second and third segments are shorter than the first and almost of equal length and breadth. Upper antennular flagellum consists of 2 rami which are fused in the basal part, the first joint is largest. The lower flagellum is simple (Fig. 2 a). Antenna with a well developed scaphocerite which is 2.7 to 3.0 times as long as broad. Outer margin ends in a strong fine spine and falls short of the distal margin. The distal portion is produced anteriorly. The outer margin of the scaphocerite almost straight (Fig. 2 b). Oral parts are typical to this genera. The mandible distally cleft bearing 3 jointed palp (Fig. 2 c). Incisor with 3 blunt teeth and molar with blunt knobs and ridges distally. Maxillule (Fig. 2 d) palp well developed, bilobed, distal lobe bearing 8-12 setae, proximal lobe bearing one curved seta on its inner margin. Maxilla (Fig. 3 a) with endite which is deeply cleft and bearing a number of short setae at its distal margin. Scaphocerite large Maxilliped I (Fig. 2 e) well develcped. The caridean lobes of the exopod broad bearing setae along the outer margin. Epipod bilobed. The basis and coxa separated by a notch. In Maxilliped II (Fig. 3 b) the joint between the propodus and dactylus not very distinct. Exopod reaches beyond endopod. Maxilliped III (Fig. 3 c) is slender, exopod well developed and as long as the first segment of endopod. Epipod present. In pereiopod I (Fig. 2 f) fingers are shorter than palm. The carpus is 1.8 to 2.1 times as long as chela and 1.3 times as long as merus. Palm of pereiopod II (Fig. 1) 1.6 to 2 times as long as fingers (Table 1) and movable fingers velvety throughout. Fixed

TABLE 1. Macrobrachium striatus : *Total length, carapace length, rostral formula and length of segments of second pereiopod of adult males*

Total length (mm)	Carapace length (mm)	Rostral formula	Length of segments of IInd pereiopod (right side)				
			Ischium	Merus	Carpus	Propodus + dactylus	Dactylus
74.5	32.0	13/5	10.0	12.5	20.0	26.5	100
79.0	35.5	11/5	11.0	16.5	26.0	36.0	13.0
78.5	33.0	11/5	10.0	13.5	21.5	31.0	12.0
82.0	36.0	12/4	10.5	14.0	22.0	31.0	11.5
68.0	29.0	13/4	8.0	10.0	17.0	24.0	9.
79.0	35.0	12/5	..	..	..	..	..
86.0	37.0	12/5	..	..	..	..	.

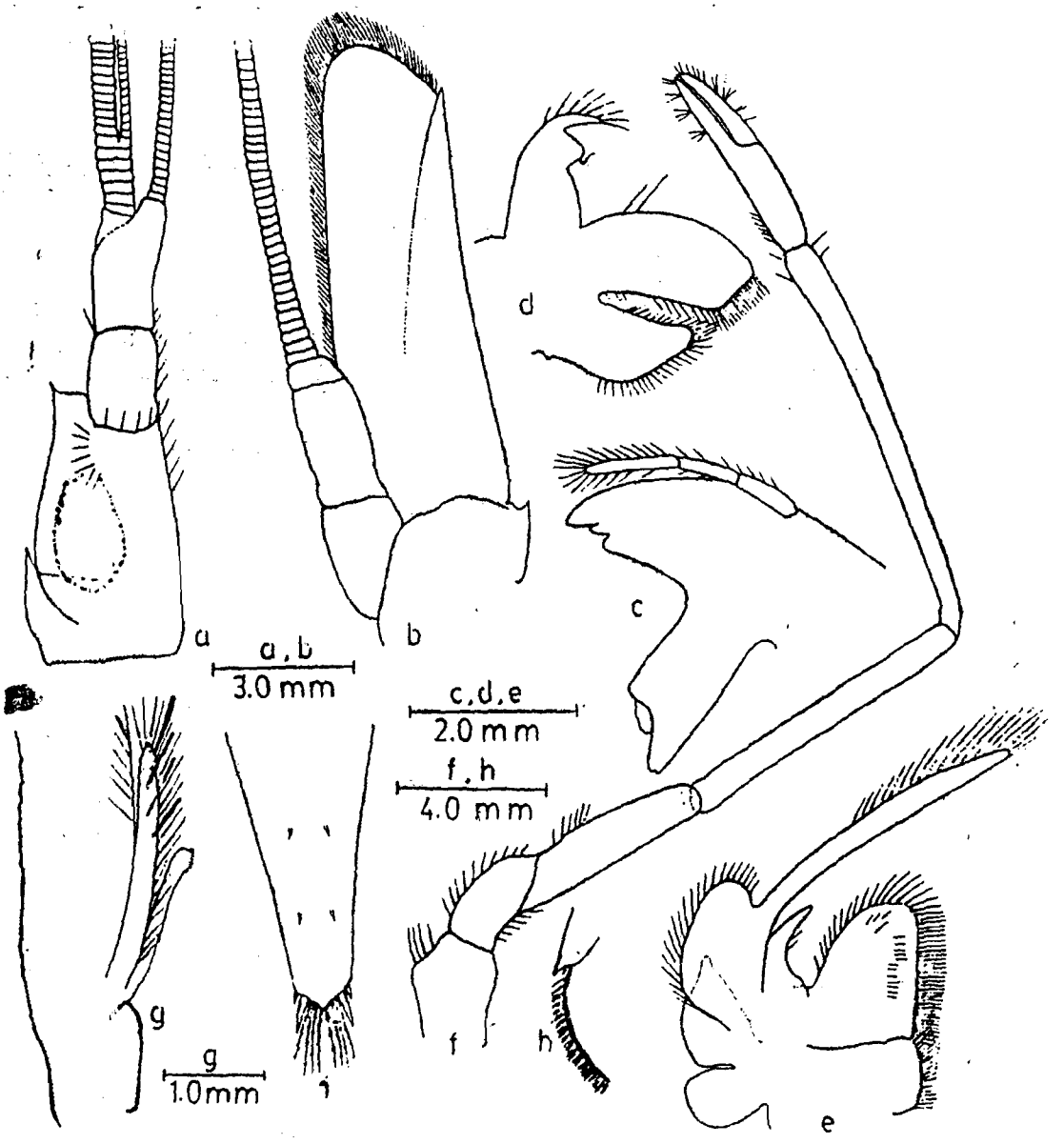

Fig. 2. *Macrobrachium striatus* sp. nov.: a, antennule; b, antenna; c, mandible; d, maxillule; e, first maxilliped; f, first pereiopod; g, appendix interna and appendix maxculina; h, distolateral outside margin of exopod of uropod and i, telson.

fingers not velvety on the outer margin. Fingers 1.3 to 1.7 times as long as carpus. Last three pereiopods (Fig. 3 d, e, f) almost identical, with their dactylus reaching beyond scaphocerite.

Remarks : The present species, as stated earlier is closely allied to *M. equidens* Dana, but can be distinguished from the latter by the following characters.

Characters	*M. equidens*	*M. striatus* sp. nov.
Body colouration	Bearing a number of greenish or greyish spots all along the body.	Bearing green/greyish brown longitudinal stripes along the entire length of body.
Inner side of second pereiopod of adult males	Dark brown/greyish yellow mottling on carpus and palm. Mottling prominent on the fingers.	No mottling on carpus or palm.
Second pereiopod of adult male	Carpus slightly shorter than chela. Chela/carpus ratio below 1.3.	Carpus much shorter than chela. Chela/carpus ratio above 1.3 (Table 1).
Velvety nature of fingers of second pereiopod of adult male	Both fingers velvety.	Fixed finger velvety only on the inner side.

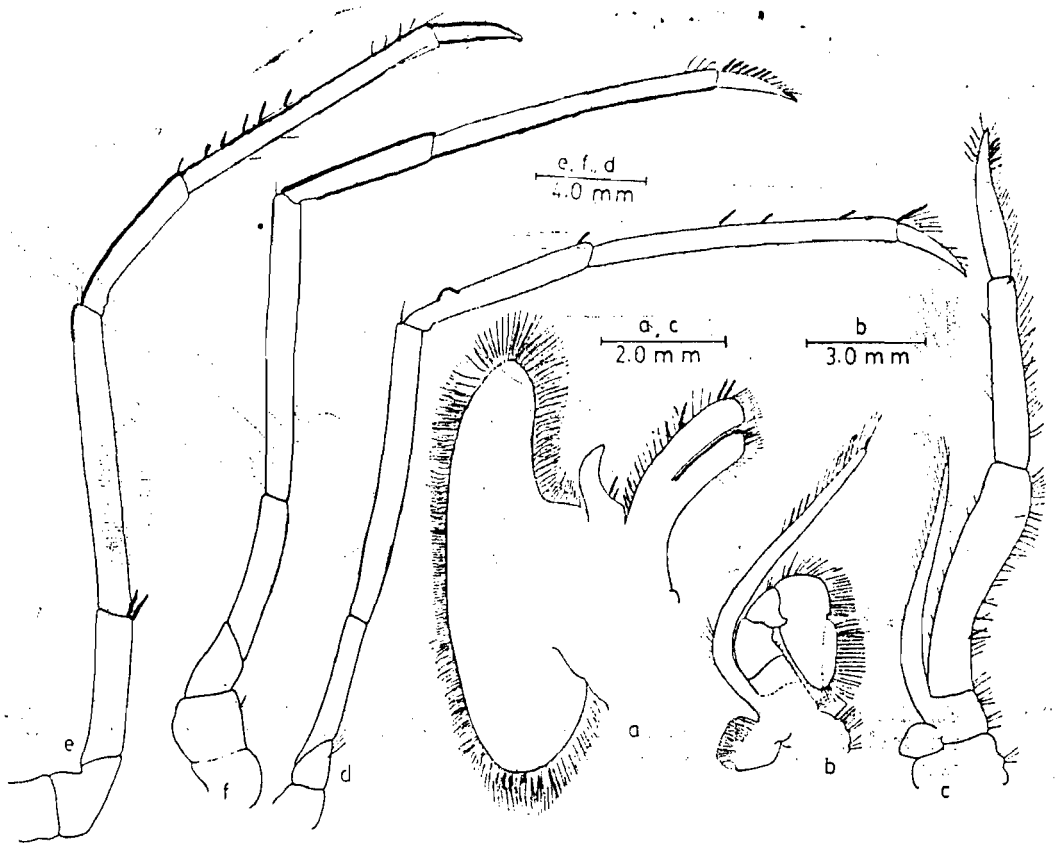

Fig. 3. *Macrobrachium striatus* sp. nov. : a. maxilla ; b. maxilliped II ; c. maxilliped III ; d. pereiopod III ; e. pereiopod IV and f. pereiopod V.

The results of the experiments carried out by Pillai (1990) has revealed that no interbreeding between the striped and non-striped forms is taking place and the distinct colour pattern characteristic of each of the forms becomes discernible as the postlarvae grow to a size of 20-25 mm. Complete larval development of both the striped and non-striped forms reared in the laboratory have been studied and the results are being published elsewhere. The major differences observed in the zoeal stages of both these forms are as follows :

First zoeal stages of both *M. equidens* and *M. striatus* are almost of the same size. As the larvae develop to zoea VII, the size difference between the forms becomes apparent, the zoea VII to postlarva I of *M. equidens* being longer than those of the same stages of *M. striatus*.

Major differences between the larvae of these two forms are noticed in the setation of telson. Zoea IV and V of both these forms bears 6+6 setae in the telson. In the case of zoeae of *M. striatus* this condition is retained until they metamorphose to postlarva I, except in the case of zoea X, where they carry 7+7 setae. But in the case of *M. equidens* it was 7+7 in zoea VI, 8+8 in zoea VII, 5+5 in zoea VIII and IX, and 4+4 in zoea X.

Endopod of maxillule of *M. equidens* and *M. striatus* has 2 distal setae. In *M. equidens* in zoea II these setae are of the same length until they metamorphose to zoea VI. From zoea VII to zoea X, one of the setae becomes twice the length of the other. But in the case of zoeae of *M. striatus*, these setae are of the same length in zoea V to X except in zoea VIII.

Thus the distinct differences in the colour pattern of both the adult and juvenile of *M. equidens* and *M. striatus*, along with the differences in morphological characters, observed in the advanced zoeal stages, and the inability of the adult to interbreed amply justify the elevation of the striped form to a new species.

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