ON THE IDENTIFICATION OF JUVENILES OF THREE SPECIES OF *METAPENAEUS* (DECAPODA, PENAEIDAE)

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ABSTRACT

Distinguishing characters of juveniles (10 to 27 mm body length) of three species of commercially important prawns, namely, *Metapenaeus dobsoni*, *M. monoceros* and *M. affinis* are described. Colouration of body, distribution pattern of chromatophores on carapace and abdominal segments, and length of rostrum of each of the species are compared. A key for their identification is provided based on these characters.

Among the commercially important penaeid prawns of India, *Metapenaeus dobsoni* (Miers), *M. monoceros* (Fabricius) and *M. affinis* (H. Milne-Edwards) are extensively fished from the marine and brackish water environments. It is well known that these prawns breed in the sea and their young ones enter the estuaries and backwaters, where they grow to a certain size before returning to the sea to complete their life cycle. Menon (1951) described the life-history of *M. dobsoni* through the post-larval stages, while Mohamed *et al.* (1968) compared the first post-larval stages of the five species of commercial penaeid prawns. Recently, Rao and Gopalakrishnan (1968) reported the differentiating characters of juveniles of the prawns, *Penaeus monodon* Fabricius and *P. indicus* H. M. Edwards. The exact identity of the juveniles of the three species of the genus *Metapenaeus* which co-exist in the estuarine areas remains undetermined, although this is of prime importance in the context of assessment of their rate of recruitment in the exploited areas. The identification of these juveniles, particularly those below 30 mm body length, is rendered difficult due to their close similarities in appearance and morphological features. The diagnostic characters of adult prawns (Alcock, 1906 and Menon, 1956) are not easily discernible at this stage. In order to overcome this difficulty, a large number of juvenile prawns obtained in try net collections made in connection with a detailed study of the population structure of these juveniles in the backwaters of Cochin were examined for characters that can accurately and easily be used for separating the juveniles in the field as well as in the fresh or recently preserved condition.

Various characters like the colouration of the body, size of eyes and eye stalks, rostral characters, nature of the grooves in the carapace, shape of antennal scale and lengths of pereopods are found useful in the identification of juvenile prawns belonging

to different species (William, 1953, 1959; Rao and Gopalakrishnan, 1968). Some of the features which could be used for the separation of the present species at these small sizes are described below. The distribution pattern of chromatophores and the colouration of the body were studied from fresh specimens.

Metapenaeus dobsoni

Rostrum short, with a conspicuous basal crest, extending to the base of eye in 10 mm and 18 mm sizes and almost reaching tip of eye in specimens measuring 27 mm body length. The number of teeth on the rostrum is variable (5 to 8), but the length is always short as compared to that of the corresponding sizes of *M. monoceros* and *M. affinis* (Fig. 1).

The ground colour of the body is cream white, with scattered small, dark bluish and brownish chromatophores. In the carapace, bluish chromatophores predominate, and are mainly concentrated near the antennal carina, tip of hepatic spine and below the anterior end of branchiocardiac sulcus (Fig. 1). A few chromatophores are also observed near the postero-lateral border of carapace.

In the abdomen, the median dorsal carina commences from the 4th segment. Both bluish and brownish chromatophores are present, the former being distributed on the postero-lateral margin of each segment and the latter on the mid-dorsal region. The uropods have only a few chromatophores which are predominantly reddish brown and are distributed at the distal region.

Metapenaeus monoceros

Rostrum long and reaches as far as or beyond the tip of eye in individuals 10 mm to 18 mm long, and extends almost to the tip of second segment of the antennular peduncle in specimens 27 mm long. Thus, the rostrum is always the longest at the comparative sizes of other two species.

The ground colour of the body is brownish or bluish brown with predominantly bluish or brownish chromatophores. In the carapace, the chromatophores are larger, highly dendritic and the majority of them bluish. They are most abundant at the dorsal and hepatic regions as well as near the postero-lateral border of carapace. A group of chromatophores on mid-lateral region of carapace forms a distinct dark bluish band which is characteristic of the species (Fig. 1).

The median dorsal carina of the abdominal segment starts from the 3rd segment. The chromatophores are more numerous, both on the dorsal and postero-lateral regions of each segment than in other species, those on the mid-dorsal region of the 4th segment being characteristic. There is a patch of densely distributed chromatophores on either side of the median carina in 2 or 3 rows and the whole region, when viewed dorsally, appears bluish black in the form of the letter 'M' (Fig. 1). In the uropods, brownish chromatophores are densely distributed at the distal region, giving a brownish appearance at the tip.

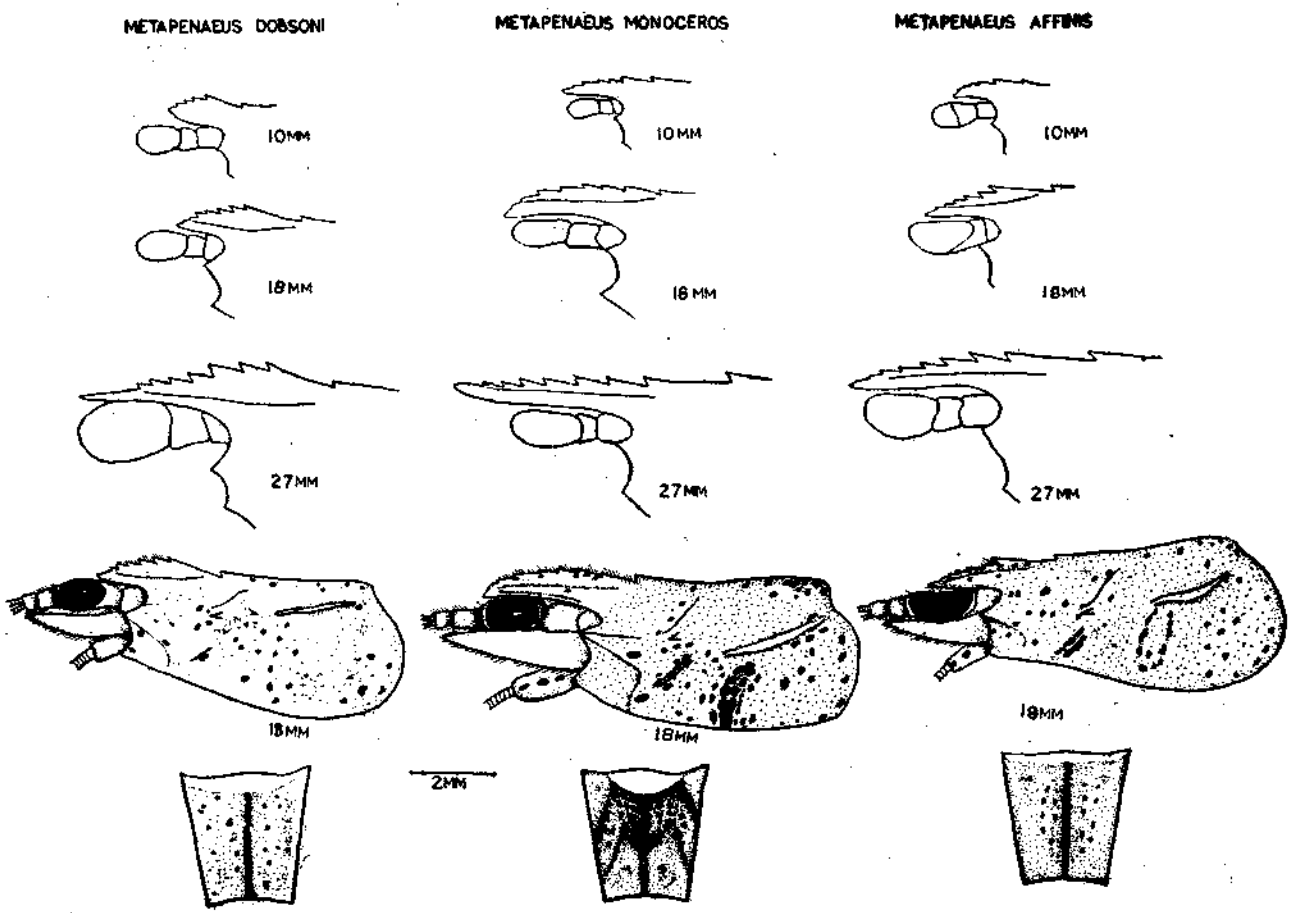

FIG. 1. Comparisons of rostral length, distribution pattern of chromatophores on carapace and fourth abdominal segment in the juveniles of three species of *Metapenaeus*. Sizes in mm indicate total body length.

Metapenaeus affinis

In specimens 10 mm long, the rostrum is short and extends to the middle of the eye. The ventral margin is slightly concave and the tip curves down, so that, when viewed laterally, the rostrum appears partially hidden in between the eyes. In older individuals, the rostrum, however, becomes straight and prominent, and reaches almost the tip of eye or slightly beyond it (Fig. 1).

The ground colour of the body varies from blue to bluish brown. The chromatophores of carapace are mostly bluish and distributed almost on the same pattern as that of *M. monoceros*. But those on the mid-lateral region, although they form a short band, are less conspicuous and lighter in colour than those of *M. monoceros*.

In the abdomen, the median dorsal carination is seen from the 3rd segment. The distribution of chromatophores is similar to that of *M. dobsoni*, but more numerous in number. The tip of uropod is coloured with brown chromatophores in specimens over 18 mm and in the larger juveniles it has a bluish brown border.

Based on these observations a key for their identification is provided below.

KEY FOR IDENTIFICATION OF JUVENILES OF THREE SPECIES OF *METAPENAEUS*

1. Rostrum long, without basal crest, extending to middle of eye in younger individuals and beyond eye in older forms; abdominal carination commences from 3rd segment; ground colour of body bluish brown to brownish; chromatophores closely spaced, forming short band on the lateral region of carpace —2

   Rostrum short, with basal crest, extending to base of eye in younger individuals and tip of eye in older forms; abdominal carination commences from 4th segment; ground colour of body cream white; chromatophores widely spaced, not forming bands —*Metapenaeus dobsoni*

2. Rostrum reaching middle of eye or a little beyond it; the short band on carapace less conspicuous; 'M'-like patch on mid-dorsal region of 4th abdominal tergum absent —*Metapenaeus affinis*

   Rostrum reaching tip of eye or beyond it; the short band on carapace conspicuous; a distinct 'M'-like patch on mid-dorsal region of 4th abdominal tergum present —*Metapenaeus monoceros*

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