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Identification of the postlarval *Penaeus* (Crustacea, Decapoda, Penaeidae) appearing along shore waters

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Diagnostic characters for the identification of postlarval *Penaeus* appearing along the coastal waters of the Philippines are reviewed and categorized, basing on materials from the wild and laboratory.

The postlarvae of the four *Penaeus* species or groups viz. *P. monodon*, *P. semisulcatus*, *P. merguensis*-group and *P. japonicus*-group could be separated on the basis of the chromatophore pattern on the sixth abdominal segment and telson plus uropods especially when materials are still fresh. Morphological characters are shape of rostrum, number of rostral teeth, relative length of antennular flagella and presence of dorsal carinal spines of the sixth abdominal segment.

Presently there are seven adult known species belonging to the genus *Penaeus* around Panay Island and its adjacent waters, viz. *P. monodon*, *P. semisulcatus*, *P. merguensis*, *P. indicus*, *P. japonicus*, *P. canaliculatus* and *P. latisulcatus*.

I. *P. monodon*

The postlarval *P. monodon* is largest among those of other species/groups. In appearance, aside from its larger size, it is easy to identify due to its dark brownish streak extending from the tip of the antennular flagellum to the tip of the telson. The inner (lower) antennular flagellum consisting mainly of six or seven segments is twice the length of the outer (upper) flagellum which consists of four or five (or rarely six) segments, the former having dark-brown or reddish brown chromatophores, while the latter none. The sixth abdominal segment devoid of dorsal carinal spines is generally longer than the carapace. The telson and inner half of both inner uropods are fully occupied with the said chromatophores from proximal to distal portions near the abdominal surface. Number of chromatophores lined ventrally along the sixth abdominal segment is more than 13, they are often densely distributed, almost continuous or even countless. Rostrum is straight, slightly bent upward at the tip, and is 0.4 to 0.5 times the length of the carapace. Antennal spine is absent.

II. *P. semisulcatus*

Postlarval *P. semisulcatus* is relatively small and has up-tilted rostrum with six dorsal and two ventral spines. The inner antennular flagellum with 5 or rarely 6 segments is 1.7 to 2.0 times the length of outer flagellum. Rostrum length is 0.5 to 0.8 times the length of the carapace. Antennal spine is feeble or absent.

This postlarva is closely similar to *P. monodon* in general appearance. However, it can be differentiated by:

- 1) Carapace length is generally shorter than 2.1 mm; in *P. monodon*, mostly 2.5 mm.
- 2) Inner flagellum is less than (or rarely equal to) 2 times the length of outer flagellum in *P. semisulcatus*, and in *P. monodon* it is more than 2 times.
- 3) In *P. semisulcatus*, the rostrum is equipped with mostly one or two conspicuous ventral teeth but usually none or one in *P. monodon*.
- 4) The sixth abdominal segment is almost equal to carapace length in *P. semisulcatus* but generally longer in *P. monodon*.
- 5) Only proximal and distal portions of telson and uropods are pigmented in *P. semisulcatus* whereas in *P. monodon* these portions are well covered with dark brown chromatophores.
- 6) Number of chromatophores along the sixth abdominal segment is from 6 to 12 in *P. semisulcatus*, while in *P. monodon*, there are more than 13 or in form of densely continuous pattern.

III. *P. merguensis*-group

Well known as white shrimp or banana prawn in adults, these species of *P. merguensis* and *P. indicus* are poorly pigmented even since larval stage. The inner flagellum of the postlarva with 4 or 5 segments is 1.4 to 1.5 times the length of outer flagellum which has 4 (rarely 3 or 5) segments. Both flagella are relatively bulky often devoid of any chromatophores compared with those belonging to other groups. The rostrum is prominent at which two thirds of the distal portion is toothless dorsally and ventrally, sharply directed straight forward and is 1.4 to 1.5 times of the carapace length. The number of teeth on the rostrum is mostly 3 or 4 dorsally and none ventrally, and the anterior portion is usually very straight, toothless and longer than those of other groups especially in sizes above 1.1 mm carapace length. Antennal spine is absent.

In older individuals the rostrum becomes progressively more attenuated and slightly bent upward having a maximum of 6 to 7 dorsal and 3 to 6 ventral teeth as found also in adult specimen. This group might be dominated by a *P. merguensis* if related to catch composition in adult (Motoh, *et al.* unpublished data).

IV. *P. japonicus*-group

The postlarvae of this group, consists of *P. japonicus*, *P. latisulcatus* and *P. canaliculatus*; the first two are probably quite dominant in number based on adult catch composition. They are very easily identified through the following characteristics:

- 1) Rostrum is short 0.2 to 0.3 times of carapace length and does not exceed the tip of eye.
- 2) The intervals between each dorsal rostral teeth are narrow in distance.
- 3) There are rows of prominent dorsal carinal spines on the sixth abdominal segment.

Generally it looks like a small postlarval *P. monodon*, because of the longitudinal streak of dark brown or dirty green chromatophores similar to those in *P. monodon*. However, even local fry collectors can, with naked eyes, skillfully distinguish the postlarval *P. japonicus*-group from *P. monodon*, because of their small size and slightly bulky body aside from the distinguish-

ing criteria mentioned above. Rostrum is stout with 5 to 7 dorsal and without ventral teeth. The number of chromatophores on the sixth abdominal segment are more than 8 or countless.

The inner antennular flagellum is 1.4 to 1.8 times the length of the outer flagellum. Antennal spine is prominent.

Key to the genus *Penaeus* postlarvae appearing along the shore, based on structures

- 1) Rostrum stout and inferior to tip of eye, spines and setules on the 6th abdominal segment present*, antennal spine prominently present, carapace slightly longer than 6th abdominal segment *P. japonicus*-group

Rostrum slender and exceeding to tip of eye, spines and setules on the 6th abdominal segment absent, antennal spine absent or minute, carapace slightly or distinctly shorter than 6th abdominal segment 2

- 2) Inner (lower) antennular flagellum less than 1.6 times the outer (upper), exceeding the latter by its distal 1 segment *P. merguensis*-group

Inner antennular flagellum 1.6 to 2.0 times the outer, exceeding the latter by its distal 2 segments *P. semisulcatus*

Inner antennular flagellum more than 2.0 times as long as upper, exceeding the latter by its distal 3 segments *P. monodon*

Key to the genus *Penaeus* postlarvae appearing along the shore, based on chromatophore patterns

- 1) Number of chromatophores on the 6th abdominal segment less than 7. Anterolateral chromatophore of the 6th abdominal segment present *P. merguensis*-group

Number of chromatophore of the 6th abdominal segment present or absent 2

- 2) Number of chromatophores on the 6th abdominal segment less than 12, Chromatophores on the middle portion of telson and inner uropods absent. Anterolateral chromatophore of the 6th abdominal segment present *P. semisulcatus*

Number of chromatophores on the 6th abdominal segment more than 12, Chromatophores on the middle portion of the telson and inner uropods present. Anterolateral chromatophore of the 6th abdominal segment absent 3

- 3) Chromatophores on the 6th abdominal segment densely continuous *P. monodon*

Chromatophores on the 6th abdominal segment discontinuous *P. japonicus*-group

While specimens are alive or freshly preserved in 5% formalin, it is very useful to check chromatophore numbers of the 6th abdominal segment, and the patterns on telson and uropods. This method is applicable within at least three weeks after the said formalin preservation.

The keys presented might not be available for young materials from off shore waters and for older more advanced postlarvae or juveniles from brackishwaters and mangrove areas.

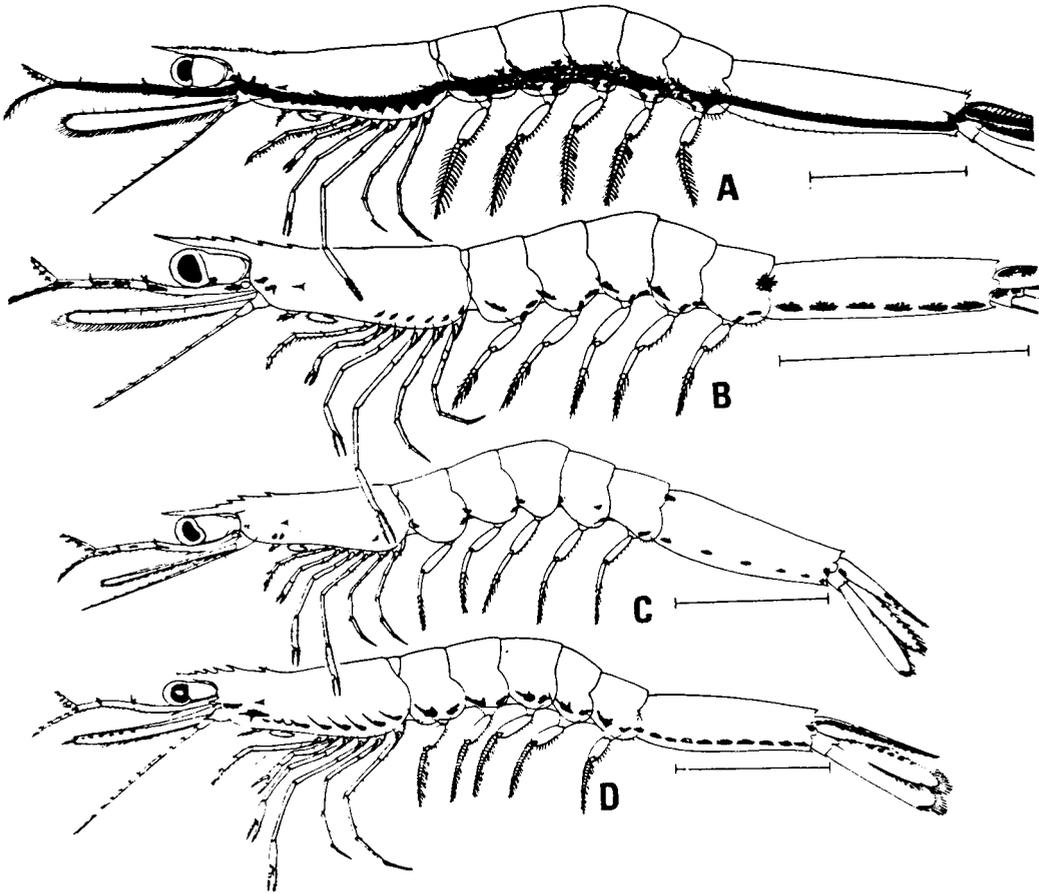


Fig. 1. Lateral view of *Penaeus* postlarvae showing chromatophore patterns. A, *P. monodon*; B, *P. semisulcatus*; C, *P. merguensis* group; D, *P. japonicus* group. Scale represents 2 mm.

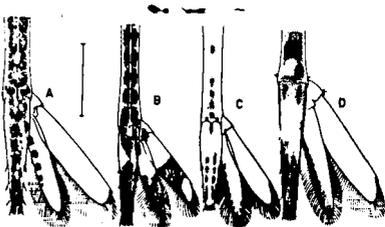


Fig. 2. Dorsal view of 6th abdominal segment, telson and uropods of *Penaeus* postlarvae showing chromatophore patterns. A, *P. monodon*; B, *P. semisulcatus*; C, *P. merguensis* group; D, *P. japonicus* group. Scale represents 1 mm.

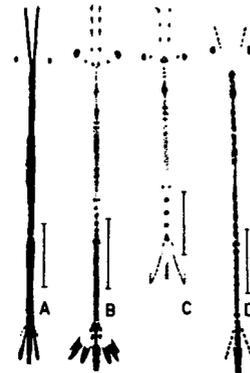


Fig. 3. Dorsal view of postlarval *Penaeus* showing chromatophore pattern for quick identification. Same order as Fig. 2. Scale represents 2.5 mm.

It was observed that the colour of chromatophores distributing on inner antennules, abdomen, telson and uropods quite varied from red, yellowish brown, greenish brown to dark brown regardless of the species or group. The colour might be the reflection of postlarvae to their environmental conditions.

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