Superfamily PENAEOIDEA

Penaeoid shrimps

Diagnostic characters: Small to large sized, with a body length from 2.5 to about 35 cm. All 5 pairs of legs well developed, with first 3 pairs of legs forming a pincer, none of the pincers particularly large. Abdomen with posterior part of pleura (lateral plates) covering anterior part of succeeding pleura. With large copulatory organ, on first pair of pleopods in males (petasma), and on posterior thoracic sternites in females (thelycum). Eggs are released directly into the water and not retained by the females on the abdomen.

Habitat, biology, and fisheries: Members of this superfamily are all marine, although the juveniles of some species of Penaeidae inhabit brackish water and occasionally are even found in almost fresh water. The 4 families of penaeoids can all be found in the Western Central Pacific, with the family Penaeidae being of great economic importance in capture fisheries and aquaculture. Members of the 2 families Aristeidae and Solenoceridae mainly occur in deep water and are presently not exploited in the area. As some of them can reach a large size and are often taken on the basis of exploratory deep-water trawling, they may eventually prove to be of commercial interest. In contrast, species of the family Sicyoniidae are usually small and nowhere abundant. They are caught incidentally in prawn fisheries but do not have any economic importance.

Other major groups of shrimps and prawns occurring in the area

Sergestoidea: usually small sized to microscopic; body strongly compressed laterally; shell rather soft; rostrum as well as last 2 pairs of legs reduced or absent; branchiae few, not more than 8 on each side.

Stenopodidea: third pincer very large and massive; males and females without large copulatory organ on first pair of pleopods or posterior thoracic sternites, respectively; females carry the eggs on the abdomen until hatching.
Caridea: third leg always without pincer; pleuron of second abdominal segment greatly expanded and overlapping those of first and third segments; males and females without large copulatory organ on first pair of pleopods or posterior thoracic sternites, respectively; females carry the eggs on the abdomen until hatching.

Key to the families of Penaeoidea occurring in the area

1a. Either rostrum very short and armed with 1 or 2 upper teeth only, or upper antennular flagellum very short and attached to the base of distal antennular segment (Fig. 1) ........................................... Aristeidae (p. 868)

1b. Rostrum always armed with more than 3 upper teeth, and both upper and lower antennular flagella of similar length and attached to the tip of antennular peduncle .................... → 2

2a. Pleopods (abdominal appendages) with 1 branch only; abdomen often with many distinct furrows and grooves (Fig. 2) .......................................................................................................................... Sicyoniidae (p. 952)

2b. Pleopods (abdominal appendages) with 2 branches; abdomen without or with very few distinct grooves .................................................................................................................. → 3

3a. Cervical groove prominent and extending to about dorsal carapace; either postorbital or postantennal spine present (Fig. 3) ............................................................................... Solenoceridae (p. 875)

3b. Distinct part of cervical groove far from dorsal carapace; postorbital and postantennal spine absent (Fig. 4) ...................................................................................................................... Penaeidae (p. 889)

Fig. 1 Aristeidae

Fig. 2 Sicyoniidae

Fig. 3 Solenoceridae

Fig. 4 Penaeidae

(after Hayashi, 1992)
**ARISTEIDAE**

Aristeid shrimps

**Diagnostic characters:** Animals either a) with rostrum very long in females and young males, but becoming rather short in adult males, and **always bearing more than 2 upper teeth** (subfamily Aristeinae); or b) rostrum short, not extending beyond eyes and armed with 1 or 2 upper teeth (subfamily Benthesicyminae). No styliform projection at base of eyestalk, but a tubercle present on its inner border (very small in *Aristaeomorpha*). In the subfamily Aristeinae, upper antennular flagellum very short and attached to the base of distal antennular segment. Carapace lacks both postorbital and post antennal spines; cervical groove either long, extending almost to dorsal carapace, or very short. All 5 pairs of legs well developed, **fourth leg bearing 2 well-developed arthrobranchs (hidden beneath carapace).** In males, endopod of second pair of pleopods (abdominal appendages) with appendix masculina and appendix interna, but without lateral projection. Third and fourth pleopods divided into 2 branches. Telson with 1 to 4 pairs of movable lateral spines. **Colour:** typical coloration of deep-sea crustaceans: body reddish or scarlet, sometimes pale white and with red cross bands on abdomen.

**Habitat, biology, and fisheries:** All representatives of this family are marine and occur in very deep waters (generally deeper than 300 m), with the members of the subfamily Benthesicyminae being exclusively bathypelagic (to depths of at least 5 413 m), whereas those of the Aristeinae are benthic and prefer soft bottom. Aristeid shrimps are generally of large size and can reach a body length of 33 cm. The sexes are easily distinguished by the presence of a large copulatory organ (petasma) on the first pair of pleopods (abdominal appendages) of males, while the females have the posterior thoracic sternites modified into a large sperm receptacle process (thelycum) which holds the spermatophores or sperm sacs (usually whitish or yellowish in colour) after mating. The shape of the petasma and thelycum is often specific and very useful for species identification. The eggs are small and numerous, and are released directly into the water and not retained on the female abdomen. The larvae are planktonic and have the nauplius stage. At present, 11 genera and 29 species of aristeid shrimps are known from the Western Central Pacific, but none of them are fished commercially because there is virtually no deep-sea fishery in the area. Nevertheless, the fact that some species reach a large size and are commonly taken on the basis of exploratory deep-water trawling, suggests they may have future commercial potential once that suitable deep-sea fishing gear is used in the area. In view of the present non-commercial status of the whole family in the area, no identification key to all species is provided here. Instead, a simplified key and species accounts are given for 3 species that have high potential interest.
**Similar families occurring in the area**

Penaeidae: rostrum always armed with more than 3 upper teeth; both upper and lower antennular flagella of similar length, attached to tip of antennular peduncle; eyestalk without tubercle on inner border; in males, endopod of second pair of pleopods with appendix masculina only; a single well-developed arthrobranch on fourth leg (hidden beneath carapace).

Sicyoniidae: shell generally hard and body “stony” in appearance; abdomen often with deep grooves and numerous tubercles; rostrum always armed with more than 3 upper teeth; both upper and lower antennular flagella of similar length, attached to tip of antennular peduncle; third and fourth pleopods single-branched.

Solenoceridae: either postorbital or postantennal spine present on carapace; rostrum always armed with more than 3 upper teeth; both upper and lower antennular flagella long, of similar length and attached to tip of antennular peduncle; telson usually armed with fixed lateral spines; in males, endopod of second pair of pleopods with appendix masculina, appendix interna, and lateral projection.

Sergestidae: generally small sized; rostrum very short; body strongly compressed laterally, shell soft; last 2 pairs of legs reduced or absent.

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**Penaeidae**

- Tubercle
- Eyes

**Aristeidae**

- Various types of appendices masculinae on endopods of 2nd pair of pleopods

**Penaeidae**

- Appendices masculina
- Appendices interna

**Sicyoniidae**

- Appendices masculina
- Appendices interna

**Solenoceridae**

- Appendices masculina
- Appendices interna

**Sergestidae**

- 3rd maxilliped
- 3rd maxilliped
Stenopodidae: third pincer very large and massive; males and females without large copulatory organ on first pair of pleopods or posterior thoracic sternites, respectively; females carry the eggs on the abdomen until hatching.

Shrimps of the infraorder Caridea: third leg without pincer; second abdominal pleuron (lateral plate) greatly expanded, overlapping posterior part of first pleuron as well as anterior part of third pleuron; males and females without large copulatory organ on first pair of pleopods or posterior thoracic sternites, respectively; females carry the eggs on the abdomen until hatching.

Key to species with commercial potential in the area

1a. Rostrum armed with more than 5 upper teeth; hepatic spine present (Fig. 1) (*Aristaeomorpha*) ........................................... *Aristaeomorpha foliacea*
1b. Rostrum armed with 3 upper teeth only; hepatic spine absent (Fig. 2) ........................................... → 2

2a. Crests on carapace without sharp edges (*Aristeus*) ........................................... *Aristeus virilis*
2b. Crests on carapace very prominent and sharply edged (*Plesiopenaeus*) ........................................... *Plesiopenaeus edwardsianus*
List of species occurring in the area
The symbol ☑ is given when species accounts are included.

☒Aristaemorpha foliacea (Risso, 1827)
  Aristaeus mabahissae Ramadan, 1938
  Aristaeus semidentatus Bate, 1881
☒Aristaeus virilis (Bate, 1881)
  Benthonectes filipes Smith, 1885
  Betheogennema pasithea (De Man, 1907)
  Bethesicymus altus Bate, 1881
  Bethesicymus bartletti Smith, 1882
  Bethesicymus investigatoris Alcock and Anderson, 1889
  Bethesicymus iridescens Bate, 1881
  Bethesicymus tirmiziae Crosnier, 1978
  Bethesicymus urinator Burkenroad, 1936
  Gennadas bouvieri Kemp, 1909
  Gennadas capensis Calman, 1925
  Gennadas gilchristi Calman, 1925
  Gennadas incertus (Balss, 1927)
  Gennadas kempi Stebbing, 1914
  Gennadas propinquus Rathbun, 1906
  Gennadas scutatus Bouvier, 1906
  Hemipenaeus carpenteri Wood-Mason, 1891
  Hemipenaeus spinidoralis Bate, 1881
  Hepomadus tener Smith, 1884
  Parahepomadus vaubani Crosnier, 1978
☒Plesiopenaeus armatus (Bate, 1881)
  Plesiopenaeus edwardsianus (Johnson, 1867)
  Pseudaristeus crassipes (Wood-Mason, 1891)
  Pseudaristeus gracilis (Bate, 1888)
  Pseudaristeus kathleenae Pérez Farfante, 1987
  Pseudaristeus sibogae (De Man, 1911)

References
Aristaeomorpha foliacea (Risso, 1827)

Frequent synonyms / misidentifications: Aristaeomorpha rostridentata (Risso, 1827) / None.

FAO names: En - Giant red shrimp; Fr - Gambon rouge; Sp - Gamba española.

Diagnostic characters: A large shrimp. Rostrum with 6 to 12 upper teeth (including 2 teeth on carapace); very long in females and extending far beyond antennal scale, but short in males and not exceeding tip of antennular peduncle. Carapace with antennal, hepatic, and branchiostegal spines. Upper antennal flagella very short. Third to sixth abdominal segments each bearing a strong posteromedian spine. Telson with 4 pairs of small movable lateral spines. Colour: body uniformly vermilion; eyes black.

Size: Maximum body length 22.5 cm in females (carapace length 5.9 cm) and 17 cm in males (carapace length 4.5 cm); commonly between 12 and 16 cm.

Habitat, biology, and fisheries: Found from depths of 61 to 1 300 m, but more often between 300 and 750 m; prefers mud bottoms. Moves to midwater at night. One of the common larger shrimps caught during deep-water exploratory trawling operations, often encountered in large quantities. Not yet fished commercially in the area, but with high potential for deep-sea fisheries.

Distribution: Cosmopolitan, reported to be widely distributed in the Western Atlantic, Mediterranean, and Indo-West Pacific.
**Aristeus virilis** (Bate, 1881)

Frequent synonyms / misidentifications: None / None.

FAO names: **En** - Stout red shrimp; **Fr** - Gambon gaillard; **Sp** - Gambón colorado.

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**Diagnostic characters:** A large shrimp; body covered with pubescence. Rostrum armed with 3 upper teeth only (including 1 tooth on carapace); very long in females and extending far beyond antennal scale, but short in males and not exceeding tip of antennal scale. Carapace with antennal and branchiostegal spines but lacking hepatic spine. Crests on carapace without sharp edges. Upper antennal flagella very short. Legs with photophores; first to third legs armed with a movable spine on merus. Fourth to sixth abdominal segments each bearing a strong posteromedian spine. Telson with 4 pairs of small movable lateral spines. **Colour:** body pale white, with red bands on posterior margin of abdominal segments; eyes black; tip of rostrum, antennal scale, distal half of uropods, antennular and antennal flagellum reddish; upper and lateral carapace, as well as legs and pleopods somewhat reddish; photophores on legs purple-red; some young individuals with body rather uniformly reddish.

**Size:** Maximum body length about 22.2 cm in females (carapace length 6.1 cm) and 14.6 cm in males (carapace length 4.6 cm); commonly between 9 and 12 cm.

**Habitat, biology, and fisheries:** Found on sand and mud bottom, at depths from 188 to 936 m, usually between 350 and 700 m, apparently not migrating into midwater at night. Not yet fished commercially in the area. However, the size of this species and the fact that it is commonly taken during experimental trawling operations in the Philippines, Indonesia, and New Caledonia suggest it has high potential with the development of a deep-sea fishery in these countries.

**Distribution:** Indo-West Pacific from eastern coast of Africa to India, western Australia, the Philippines, Japan, Indonesia, New Caledonia, and Vanuatu.
**Plesiopenaeus edwardsianus** (Johnson, 1867)

**Frequent synonyms / misidentifications:** *Aristaeopsis edwardsiana* (Johnson, 1867) / None.

**FAO names:** En - Scarlet shrimp; Fr - Gambon écarlat; Sp - Gamba carabinero.

**Diagnostic characters:** Size very large. Rostrum armed with 3 upper teeth only (including 1 tooth on carapace); very long in females, reaching far beyond antennal scale, but short in males and not exceeding tip of antennal scale. Carapace with antennal and branchiostegal spines but lacking hepatic spine. Crests on carapace very sharp and prominent. Upper antennal flagella very short. Exopod of second maxilliped about 2 times as large as endopod. Legs without exopods. Third to sixth abdominal segments each bearing a sharp posteromedian spine. Telson with 4 pairs of small movable lateral spines. **Colour:** uniformly scarlet; eyes black.

**Size:** Maximum body length 33.4 cm in females (carapace length 10.4 cm) and 19.3 cm in males (carapace length 6.3 cm); commonly between 15 and 19.5 cm.

**Habitat, biology, and fisheries:** Found on sandy or muddy bottom, at depths of 200 to 1850 m, usually between 400 and 900 m. A very large species, often trawled at depths of more than 500 m. With very high potential for deep-sea fisheries in the area, although so far only encountered during exploratory trawling operations off the Philippines, Willis and Fortuna islands.

**Distribution:** Cosmopolitan, widely distributed in the Atlantic and the Indo-West Pacific.
Solenoceridae

Solenocerid shrimps

**Diagnostic characters:** Rostrum well developed (extending at least to middle of eye), always bearing more than 3 upper teeth (including those on carapace); no styliform projection at base of eyestalk, but a tubercle present on its inner border. Both upper and lower antennular flagella long (additionally strongly compressed laterally and tube-like in *Solenocera*), of the same length, and attached to tip of antennular peduncle. Carapace either with postorbital or postantennal spine; cervical groove long, extending to about dorsal carapace. All 5 pairs of legs well developed, fourth leg bearing 2 well-developed arthrobranches (hidden beneath carapace). In males, endopod of second pair of pleopods (abdominal appendages) with appendix masculina, appendix interna, and lateral projection. Third and fourth pleopods divided into 2 branches. Telson generally armed with at least 1 pair of fixed lateral spines. **Colour:** generally pink to red; sometimes with pale markings on antennular flagella and tips of uropods.

**Habitat, biology, and fisheries:** Found in deeper marine waters offshore from depths of 2 to over 5700 m (usually deeper than 20 m). Generally benthic animals with preference for soft bottoms. Species of the genus *Solenocera* often burrow in mud during the daytime, with only the tube-like antennular flagella sticking out for respiration. Their size range from 2.5 to 21.5 cm body length but most species are of moderate size. The sexes are easily distinguished by the presence of a large copulatory organ (petasma) on the first pair of pleopods (abdominal appendages) of males, while the females have the posterior thoracic sternites modified into a large sperm receptacle process (thelycum) which holds the spermatophores or sperm sacs (usually whitish or yellowish in colour) after mating. The shape of the petasma and thelycum is often specific and very useful for species identification. The eggs are small and numerous, and are released directly into the water and not retained on the female abdomen. The larvae are planktonic and have the nauplius stage. In the Western Central Pacific, about 8 genera and 36 species of solenocerid shrimps have been recorded. Since they are generally found in deeper waters, at present only a few of them are taken as bycatch in commercial trawl fisheries. Nevertheless, results of many exploratory deep-water trawling operations have shown that several species are abundant and have fishery potential. Nevertheless, no key to all species of Solenoceridae occurring in the area is given here as most of them are not yet commercially caught and the taxonomic status of some species is still unclear. Species accounts and a key are included below for 2 genera and 11 species which are either more commonly found in commercial catches or that can be easily confused with those commercial species.
Similar families occurring in the area

Aristeidae: either rostrum very short and armed with 1 or 2 upper teeth only, or upper antennular flagellum very short and not attached to tip of antennular peduncle; no postorbital or postantennal spine present on carapace; telson armed only with movable lateral spines; in males, endopod of second pair of pleopods with appendix masculina, appendix interna, but without lateral projection.

Penaeidae: no postorbital or postantennal spine present on carapace; cervical groove short, with distinct part always far from dorsal carapace; eyestalk without tubercle on inner border; in males, endopod of second pair of pleopods with appendix masculina only; a single well-developed arthrobranch on fourth leg (hidden beneath carapace).

Sicyoniidae: shell generally hard and body "stony" in appearance; abdomen often with deep grooves and numerous tubercles; no postorbital or postantennal spine present on carapace, cervical groove generally indistinct or absent; third and fourth pleopods single-branched.

Sergestidae: generally small sized; rostrum very short; body strongly compressed laterally, shell soft; last 2 pairs of legs reduced or absent.

Solenoceridae Penaeidae

tubercle

Penaeidae

appendix interna

Penaeidae

appendix masculina

Aristeidae

lateral projection

Solenoceridae
cervical groove

endopods of 2nd pleopod in males

Penaeidae

Aristeidae

Penaeidae

eyes

Sicyoniidae

grooves

3rd and 4th pleopods single-branched

Sicyoniidae

rostrum short or absent

Sergestidae

3rd maxilliped

3rd maxilliped
Stenopodidae: third pincer very large and massive; males and females without large copulatory organ on first pair of pleopods or posterior thoracic sternites, respectively; females carry the eggs on the abdomen until hatching.

Shrimps of the infraorder Caridea: third leg without pincer; second abdominal pleuron (lateral plate) greatly expanded, overlapping posterior part of first pleuron and anterior part of third pleuron; males and females without large copulatory organ on first pair of pleopods or posterior thoracic sternites, respectively; females carry the eggs on the abdomen until hatching.

Key to species of interest to fisheries occurring in the area

1a. Antennular flagella subcylindrical and thread-like (Fig. 1a); rostrum strongly convex (Fig. 2a); exopod of uropod armed with a distolateral spine (*Haliporoides*) → *Haliporoides sibogae*

1b. Antennular flagella flattened and tube-like (Fig. 1b); rostrum nearly horizontal (Fig. 2b); exopod of uropod without distolateral spine

1

2a. Telson without lateral spine (Fig. 3a)

2b. Telson armed with lateral spines (Fig. 3b) → 3

3a. Postrostral crest elevated → 4

3b. Postrostral crest weak and low → 10
4a. Postrostral crest very high and plate-like (Figs 4 and 5) → 5
4b. Postrostral crest distinct but not plate-like (Figs 6 and 7) → 6

5a. Rostrum extending to 2/3 of eye; postrostral crest behind cervical notch with anterior part distinctly higher than posterior part (Fig. 4) → Solenocera choprai
5b. Rostrum extending to 1/2 of eye; postrostral crest behind cervical notch with posterior part distinctly higher than anterior part (Fig. 5) → Solenocera alticarinata

6a. Postrostral crest well separated from postrostral teeth by a distinct notch above cervical groove (Fig. 6) → Solenocera koelbeli
6b. No distinct notch present between postrostral teeth and postrostral crest (Fig. 7) → 7

7a. Posterior part of hepatic groove and anterior part of brachiocardiac groove both very distinct and strongly curving downward; postrostral crest behind cervical groove sometimes with an upper tooth; median part of first abdominal segment very narrow and dorsal crest of second abdominal segment distinct (Fig. 8a) → Solenocera alfonso
7b. Never both posterior part of hepatic groove and anterior part of brachiocardiac groove distinct and curving downward together; postrostral crest behind cervical groove without any teeth; median part of first abdominal segment moderately wide and dorsal crest of second abdominal segment indistinct (Fig. 8b) → 8

8a. Rostrum with lower border nearly convex (Fig. 9a); male petasma with distal margin armed with many well-defined long spinules (Fig. 10a); female thelycum with posterior thoracic ridge almost straight (Fig. 11a) → Solenocera australiana
8b. Rostrum with lower border razor-shaped, very straight or slightly concave (Figs 9b, c); male petasma with spinules on distal margin short and not very well defined; female thelycum with posterior thoracic ridge strongly bilobed (Fig. 11b, c) → 9
9a. Anterior end of hepatic crest very strongly convex (Fig. 12a); male petasma with dorsolateral lobule bearing 0 to 13 terminal spinules (Fig. 10a); female thelycum bearing 2 or 3 pairs of protuberances in the middle, with submedian pair larger than lateral ones (Fig. 11b). \textbf{Solenocera melanthe}.

9b. Anterior end of hepatic crest only slightly convex or nearly straight (Fig. 12b); male petasma with dorsolateral lobule bearing 18 to 40 terminal spinules (Fig. 10c); female thelycum always bearing 2 pairs of protuberances in the middle, with submedian pair smaller than lateral pair (Fig. 11c). \textbf{Solenocera halli}.

10a. Rostrum with 6 or 7 large and well-separated upper teeth (Fig. 13); antennular flagella 0.8 to 1.2 times as long as carapace and generally composed of less than 60 articles. \textbf{Solenocera pectinulata}.

10b. Rostrum generally with 8 or 9 densely packed small upper teeth (Fig. 14); antennular flagella 1.3 to 1.9 times as long as carapace and composed of more than 60 articles. \textbf{Solenocera pectinata}.
### List of species occurring in the area

The symbol ☕️ is given when species accounts are included.

<table>
<thead>
<tr>
<th>Species</th>
<th>Reference</th>
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<tbody>
<tr>
<td>Hadropenaeus lucassii (Bate, 1881)</td>
<td></td>
</tr>
<tr>
<td>Haliporoides cristatus 1987</td>
<td></td>
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<tr>
<td>Haliporoides sibogae (De Man, 1907)</td>
<td></td>
</tr>
<tr>
<td>Haliporus curvirostris Bate, 1881</td>
<td></td>
</tr>
<tr>
<td>Haliporus taprobanensis Alcock and Anderson, 1899</td>
<td></td>
</tr>
<tr>
<td>Hymenopenaeus equalis (Bate, 1881)</td>
<td></td>
</tr>
<tr>
<td>Hymenopenaeus halli Bruce, 1966</td>
<td></td>
</tr>
<tr>
<td>Hymenopenaeus laevis (Bate, 1881)</td>
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<tr>
<td>Hymenopenaeus neptunus (Bate, 1881)</td>
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<tr>
<td>Hymenopenaeus propinquus (De Man, 1907)</td>
<td></td>
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<tr>
<td>Mesopenaeus brucei 1986</td>
<td></td>
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<tr>
<td>Mesopenaeus mariae Pérez Farfante and Ivanov, 1982</td>
<td></td>
</tr>
<tr>
<td>Solenocera alfonso 1981</td>
<td></td>
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<tr>
<td>Solenocera alticarinata 1949</td>
<td></td>
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<td>Solenocera annectens 1891</td>
<td></td>
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<tr>
<td>Solenocera australiana 1980</td>
<td></td>
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<td>Solenocera barunajaya 1994</td>
<td></td>
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<tr>
<td>Solenocera bedokensis 1962</td>
<td></td>
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<tr>
<td>Solenocera choprai 1945</td>
<td></td>
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<tr>
<td>Solenocera comata 1915</td>
<td></td>
</tr>
<tr>
<td>Solenocera crassicornis (H. Milne Edwards, 1837)</td>
<td></td>
</tr>
<tr>
<td>Solenocera faxoni 1907</td>
<td></td>
</tr>
<tr>
<td>Solenocera halli 1972</td>
<td></td>
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<tr>
<td>Solenocera koelbeli 1911</td>
<td></td>
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<td>Solenocera melanthe 1907</td>
<td></td>
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<td>Solenocera moosai 1985</td>
<td></td>
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<tr>
<td>Solenocera pectinata (Bate, 1888)</td>
<td></td>
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<tr>
<td>Solenocera pectinulata 1949</td>
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<tr>
<td>? Solenocera phuongi 1972</td>
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<td>Solenocera rathbunae 1938</td>
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<td>Solenocera spinajugo 1961</td>
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<td>Solenocera waltairessi 1970</td>
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Haliporoides sibogae (De Man, 1907)

Frequent synonyms / misidentifications: Haliporoides sibogae australiensis Kensley, Tranter, and Griffin, 1987; H. sibogae madagascariensis Crosnier, 1987; Hymenopenaeus sibogae (De Man, 1907) / None.

FAO names: En - Jack-knife shrimp; Fr - Salicoque canif; Sp - Camarón cortapluma.

Diagnostic characters:
- Body somewhat hairy. Both upper and lower antennular flagella very long, thread-like.
- Rostrum strongly convex and short, extending just beyond eyes; upper border armed with 4 to 7 teeth; lower border concave, armed with 1 to 3 teeth.
- Carapace with 1 postrostral and 1 epigastric tooth, as well as antennal, postantennal, branchiostegal, hepatic, and suprahepatic spines. Cervical groove distinct, extending to dorsal carapace. Legs progressively longer posteriorly.
- Telson with a pair of fixed lateral spines.
- Colour: body orange to pink; antennal flagella whitish; eyes dark brown; uropods reddish with white tips.

Size:
- Maximum body length 16.5 cm in males (carapace length 3.3 cm) and 20 cm in females (carapace length 4.9 cm), commonly between 7 and 10 cm.

Habitat, biology, and fisheries:
- Deep sea from depths of 100 to 1463 m, usually between 300 and 600 m, on soft bottom. Taken in large quantities on the basis of experimental deep-water trawling in the Philippines and Indonesia. Generally considered as a species with high potential for commercial deep-sea fisheries. In the area, so far only fished on a small scale off the northeastern coast of Australia (about 50 t in the annual period of 1989/1990). Marketed mainly frozen, consumed locally, sometimes exported.

Distribution:
- Widely distributed in the Indo-West Pacific from Madagascar to Japan, Australia, and New Zealand (populations from Madagascar and eastern Australia are sometimes considered as 2 different subspecies).
Solenocera choprai Nataraj, 1945

Frequent synonyms / misidentifications: None / Solenocera alticarinata Kubo, 1949.
FAO names: En - Ridgeback shrimp; Fr - Salicoque balafrée; Sp - Camarón costurón.

Diagnostic characters: Rostrum short, extending to about 2/3 of eyes; upper border with 8 to 10 teeth (including 4 teeth on carapace); lower border moderately convex. Postrostral crest markedly elevated and plate-like, slightly interrupted by a small notch above cervical groove; height of posterior part progressively decreasing posteriorly. Carapace with orbital, postorbital, antennal and hepatic spines, but without pterygostomian spines. Antennular flagella moderately long and tube-like. Telson with a pair of lateral spines. Colour: body and legs reddish; antennae banded with dark red and white; uropods dark red, except for some white areas.

Size: Maximum body length 13 cm (females) and 9.5 cm (males).

Habitat, biology, and fisheries: Found on soft bottoms at depths between 50 and 175 m. Probably burrows in mud during the daytime, with only the tube-like antennular flagella sticking out for respiration. A bycatch of trawling operations in slightly deeper waters. Nowhere abundant, but of some commercial value because of its moderately large size. In the Philippines, this shrimp is occasionally marked together with other Solenocera species. Marketed mainly fresh for local consumption. Often confused with Solenocera alticarinata, which has a more northeastern distribution (from Japan to the Philippines), but they are both sometimes considered as a single species.

Distribution: Widely distributed in the Indo-West Pacific from the eastern coast of Africa to the Philippines and Australia.
Solenocera crassicornis (H. Milne Edwards, 1837)

Frequent synonyms / misidentifications: Solenocera indicus Nataraj, 1945; S. kuboi Hall, 1956; S. sinensis Yu, 1937; S. subnuda Kubo, 1949 / None.

FAO names: En - Coastal mud shrimp; Fr - Salicoque des vases côtières; Sp - Camarón fanguero de orilla.

Diagnostic characters: Rostrum short and nearly straight, about as long as eyes; upper border armed with 4 to 7 (mostly 5) teeth; lower border unarmed and somewhat convex. Carapace with 3 postrostral teeth and 1 epigastric tooth, and orbital, postorbital, antennal and hepatic spines, but without pterygostomian spines; postrostral crest low and rounded. Antennular flagella moderately long and tube-like. Telson unarmed, without lateral spines. Colour: body pink to pinkish orange; posterior border of each abdominal segment covered with a red cross band; eyes dark brown; antennular flagella and distal part of tail fan reddish.

Size: Maximum body length 9 cm (males) and 14 cm (females), commonly between 6 and 8 cm.

Habitat, biology, and fisheries: Inhabits muddy bottoms close to shore, at depths from 20 to 85 m. Probably burrows in mud during the daytime, with only the tube-like antennular flagella sticking out for respiration. Mainly forms a bycatch of trawlers. In the area, this shrimp seems to be more common around Thailand and is of minor commercial importance.

Distribution: Widely distributed in the Indo-West Pacific from the Persian Gulf to Japan and Indonesia.
**Solenocera melantho** De Man, 1907

**Frequent synonyms / misidentifications:** *Solenocera prominentis* Kubo, 1949 / *Solenocera alfonso* Pérez Farfante, 1981; *S. australiana* Pérez Farfante and Grey, 1980; *S. halli* Starobogatov, 1972; *S. koelbeli* De Man, 1911.

**FAO names:** En - Razor mud shrimp.

**Diagnostic characters:** Rostrum short, not extending beyond eyes; upper border with 6 to 10 teeth (including 3 teeth on carapace); lower border straight or slightly concave, razor-shaped. Postrostral crest distinct but not very high and plate-like, without a distinct notch above cervical groove. Carapace with orbital, postorbital, antennal and hepatic spines, but without pterygostomian spines. Anterior end of hepatic crest strongly concave and curving upward. Antennular flagellum moderately long and tube-like. Telson with a pair of lateral spines. Colours: body pink to red and somewhat semi-transparent; some irregular red markings on abdomen; eyes black-brown; antennular flagella reddish with a white (or pale yellowish) band at midlength; distal part of uropods slightly yellowish.

**Size:** Maximum body length 15 cm, commonly between 7 and 12 cm.

**Habitat, biology, and fisheries:** Inhabits the upper slopes of continental shelves at depths from 78 to 400 m, on sandy mud bottom. Mainly forms a bycatch of trawling operations in slightly deeper waters. Probably the most common species of the genus in the Philippines, but still not very abundant and only occasionally sold in local fish markets. Marketed mainly fresh for local consumption. This species, *Solenocera alfonso*, *S. australiana*, and *S. halli* are probably often confused with each other.

**Distribution:** Western Pacific and definitely known from Japan, Korea, Taiwan Province of China, coasts of China, the Philippines, and Indonesia.
Solenocera alfonso Pérez Farfante, 1981

En - Deep-water mud shrimp.

Maximum body length about 12 cm (at a maximum carapace length of 4 cm). Inhabits the upper slopes of island shelves at depths from 176 to 547 m, on bottoms of green mud or fine sandy mud. So far only taken on the basis of experimental deep-water trawling. However, the size of this species and the fact that it is sometimes found in large quantities suggest it may have commercial potential with the development of a deep-sea fishery in the area. Indo-West Pacific and so far only known with certainty from the Philippines, Indonesia, and Northwestern Australia.

Solenocera alticarinata Kubo, 1949

En - High ridge mud shrimp.

Maximum body length 11 cm (females) and 9 cm (males), commonly between 7 and 9 cm. On sandy mud bottom, at depths from 50 to 180 m. Taken by trawls. Apparently restricted to the Western Pacific from Japan to Taiwan Province of China, the South China Sea, and the Philippines. Often confused with the closely related Solenocera choprai. In the area, so far only recorded from the Philippines where it is probably less common than S. choprai.
**Solenocera australiana** Pérez Farfante and Grey, 1980

En - Australia mud shrimp.

Maximum body length 12 cm (females) and 9 cm (males). In shallow water at depths from 15 to 40 m, over mud bottom with or without coral debris, rock, shell, or vegetation. Taken by commercial trawlers fishing for large penaeids in northern Australia, but so far without significant economic importance. Restricted to northern Australia.

![Image of Solenocera australiana](image)

(after Pérez Farfante and Grey, 1980)

**Solenocera halli** Starobogatov, 1972

En - Malayan mud shrimp.

Maximum body length about 10 cm (at a maximum carapace length of 2.75 cm). Found in shallow waters at depths from 48 and 75 m. So far mainly caught by experimental trawlers but probably more common around Malaysia and Singapore. Indo-West Pacific; thus far known from Bay of Bengal, Strait of Malacca, Singapore, and the South China Sea. Often confused with *Solenocera melanha*.

![Image of Solenocera halli](image)

(after Hall, 1962)
**Solenocera koelbeli** De Man, 1911

**En** - Chinese mud shrimp; **Fr** - Salicoque chinoise de vase; **Sp** - Camarón fanguero chino.

Maximum body length 15 cm, commonly between 5 and 10 cm. On soft bottom at depths from 21 to 241 m, usually between 60 and 90 m. A bycatch in trawl fisheries. Western Pacific from Japan to Taiwan Province of China, the South China Sea, Viet Nam, the Philippines, and Indonesia. Apparently not abundant in the area. Sometimes confused with *Solenocera alticarinata*, *S. choprai*, or *S. melantho*.

![Solenocera koelbeli](image)

(after Lee and Yu, 1977)

**Solenocera pectinata** (Bate, 1888)

**En** - Comb shrimp; **Fr** - Salicoque peigne; **Sp** - Camarón peine.

Maximum body length 6 cm. On soft bottom at depths from 4 to 205 m. A common bycatch of commercial trawlers but of no economic importance, due to its small size. Widely distributed in the Indo-West Pacific, from the eastern coast of Africa to Japan and Wallis Island in the South Pacific. Often confused with *Solenocera pectinulata* but generally found at shallower depths.

![Solenocera pectinata](image)

(after Hall, 1962)
Solenocera pectinulata Kubo, 1949

**En** - False comb shrimp.

Maximum body length 6.5 cm (carapace length to 2.2 cm), commonly between 3 and 5.5 cm. On bottoms of sand and/or mud, at depths from 75 to 350 m, usually deeper than 175 m. A common bycatch of commercial trawlers but without economic importance, due to its small size. Widely distributed in the Indo-West Pacific from the eastern coast of Africa to Japan and Indonesia. Often confused with Solenocera pectinata but generally has a deeper distribution.

(after Motoh and Buri, 1984)