

Author: R.N. Burukovsky
Date: 1 9 7 4
Ref.: Library Division of Crustaceans
Food Industry, Moscow, pages 96-111

DETERMINATION OF SHRIMPS, SPINY LOBSTERS AND LOBSTERS

SCYLLARIDEA BORRADAILE TRIBE, 1870 Key to determination of families

1. The carapace is almost cylindrical in shape. The antennae are long, articulated flagella ... Palinuridae Gray, 1847.
Carapace is more or less flat. Antennae are short and flattened. Their flagella are not articulated, but flat, lobe-like organs ... Scyllaridae White, 1847.

PALINURIDAE GRAY FAMILY, 1847 Key to determination of genera

1. Above the eye-stalks, there are supraorbital spines or prickles (offshoots), directed forward. The carapace is with spines and protuberances ... 2.
There are no supraorbital spines or prickles and the carapace is covered evenly, without spines ... *Palinurellus* van Martens* (George and Main, 1967, identify this genus as a separate Synaxidae family).
2. The supraorbital spine is not serrated dorsally. The abdominal somites never have more than one dorsal, transverse furrow. Their surface is sometimes covered by a scale-like sculpture ... 3.
The supraorbital spine is serrated dorsally. Each abdominal somite has 4-5 transverse furrows. Their surface lacks a scale-like sculp-

ture ... *Justitia* Holthuis.

3. The carapace is almost prismatic in shape. The pleopods II of females have well developed stilamblias of the same size as on following pleopods ... 4.

The carapace is cylindrical. The pleopods II in females have stilamblias smaller (or they are absent), when compared with other pleopods...6.

4. The antennules are short. Only the third segment reaches the last segment. The female pleopods I are absent. The peraeopods are naked or are covered by short hair ... 5.

The antennules are very long. The first segment reaches beyond the last segment. The peraeopods are covered by a dense wool-like cover of hard bristles. The supraorbital spines resemble widened prominences, serrated in the front ... *Palinustus* A. Milne-Edwards.

5. The supraorbital spines are joined at the middle line of the carapace ... *Linuparus* White (the only species - *L. trigonus* (Von Siebold, 1824)).

The supraorbital spines are widely apart ... *Puerulus* Ortman.

6. The antennule flagella are short, less than half in ^{the} length of the segment. The peraeopod II endopodites have well expressed stilamblias in females ... 7.

The antennule flagella are longer than the segments. The supraorbital spines are not ventrically serrated. The stilamblias are absent from the pleopods II in females ... *Panulirus* White.

7. The stridulant organ is absent at the base of antennae. The anteroventral edge of supraorbital spines is not serrated. ... 8.

The stridulant organ is present. The anteroventral edge of supraorbital spines is serrated ... *Palinurus Fabricius*.

8. The carapace has rounded sides and is covered by numerous, approximately identical spines. The abdomen is smooth or is covered by a scale-like sculpture ... *Jasus Parker*.

The carapace has angular sides and longitudinal ridges which are covered by spines. The abdomen has a median carina ... *Projasus George and Grindley, 1964* (the only species - *P. parkery*) (*Stebbing, 1902*).

JASUS PARKER GENUS, 1884
Key to determine species

1. Transverse furrows are found on the dorsal side of the abdominal somites ... 2.

The transverse furrows are absent on the abdominal somites. This species is found in Australia ... *J. verreauxi* (*H. Milne-Edwards, 1851*).

2. The first somite of the abdomen is covered by a sculptured pattern, either all over or partially ... 3.

The first abdominal somite is smooth. The species lives near Juan Fernandez Island (Chile) ... *J. frontalis* (*H. Milne-Edwards, 1937*).

3. A sculptured pattern covers only the rear side of the first somite, behind the transverse furrow ... 4.

The sculptured pattern is found in front of and behind the furrow. This species lives near South Africa ... *J. lalandii* (*H. Milne-Edwards, 1937*).

4. A sculptured pattern is behind the transverse furrow of the first somite as a wide band, covering almost the entire rear section of the somite ... 5.

The sculptured pattern on the first somite is a narrow band immediately behind the transverse furrow ... 6.

5. A sculptured pattern of convex scales is found on 2-6 somites of the abdomen and covers their entire surfaces. The scales are small and numerous and are organized in 4-5 transverse rows. The only section of the somites which is smooth is covered by the tergite of the preceding somite. The species lives near Southeast Australia and Tasmania ...
J. novaehollandiae Holthuis, 1963.

The sculptured pattern is on 2-6 abdominal somites and represents somewhat larger scales, in 2-3 rows on each somite. The species lives near New Zealand ... *J. edwardsii* (Hutton, 1875).

6. A sculptured pattern is on 2-6 abdominal somites and represents a ribbon in the middle of the abdomen, leaving the frontal and rear edges smooth. The species lives near Tristan-da-Cunya Island ... *J. tristani* Holthuis, 1963.

There are no smooth bands on the abdominal somites II-VI. The species lives near San Paulo and Amsterdam Islands ... *J. paulensis* (Heller, 1863).

PALINURELLUS VON MARTENS GENUS, 1878
Key to determine species

1. The species is encountered near West India ... *P. gundlachi* v. Martens, 1878.

The species is encountered near Mauritius Island (the Indian Ocean)...
P. wieneckii (de Man, 1881).

PALINURUS FABRICIUS GENUS, 1798
Key to determine species

1. These spiny lobsters are encountered in the Eastern Atlantic and Mediterranean Sea ... 2.

They live in the Indian Ocean near the southeastern coast of Africa, from the Agulhas Bank to the Mozambique Channel ... *P. gilchristi* Stebbing, 1898.

2. They are encountered along the African Coast, also in the Mediterranean Sea ... 3.

They live near the islands of Green Cape. The coloring of their bodies is red; a ring-like pattern is on the bodies, especially on the peraeopods ... *P. charlestoni* Forest et Postel, 1964.

3. Peraeopods I have an appearance of a pseudo claw because a deep recess is on the distal end of the propodus, opposite the dactylus. The body coloring is wine-red. The species lives mostly in the Mediterranean Sea and along the African Coast, not further south than Bojador Cape ... *P. elephas* (Fabricius, 1787).

Peraeopods I practically do not show a pseudo claw because the recess on the distal end of the propodus is only a small tooth. The body coloring is pink and creates an appearance of marble-design, especially on the walking legs. The species lives mostly by the African Coast in the region from the Canary Islands to the islands of Green Cape. In the Mediterranean Sea, the species is encountered only near the African Coast to Tunis ... *P. mauritanicus* Gruvel, 1911.

PALINUSTUS A. MILNE-EDWARDS GENUS, 1881
Key to determine species

1. A central tooth is on the frontal edge of the carapace ... *P. truncatus* A. Milne-Edwards, 1880.

There is no central tooth on the frontal edge of the carapace ... *P. mosambicus* Barnard, 1926.

JUSTITIAN HOLTHUIS GENUS, 1946
Key to determine species

1. Peraeopods I are somewhat shorter than peraeopods II, with a straight finger ... *J. japonica* (Kubo), 1955 .

Peraeopods I are considerably longer than peraeopods II, with a highly bent finger ... *J. longimana* (H. Milne-Edwards), 1837.

PUERULUS ORTMANN GENUS, 1897
Key to determine genera (Berry, 1969)

1. The post-orbital spines are absent. The protuberances of the carapace are well expressed and are not camouflaged by fuzziness of its surface. The eyes are small and their length is larger than the width...2. The post-orbital spines are present. The uneven surface of the carapace is low and is camouflaged by fuzziness. The eyes are large and their width is larger than the length ... *P. velutinus* Holthuis, 1963.

2. There are two teeth between the supra-orbital horns and the cervical furrow ... 3.

There are three or more teeth between the supra-orbital horns and the cervical furrow. The finger of the peraeopods V does not form a claw ... *P. angulatus* (Bate, 1888).

3. The median carina of the carapace with three post-cervical spines. The peraeopod V has a claw in the males ... *P. carinatus* Borradaile, 1910.

The median carina of the carapace has five post-cervical spines. The peraeopods V have no claws in the males ... *P. seweli* Ramadan, 1938.

PANULIRUS WHITE GENUS, 1847
Key to determine species

1. The exopodites are present on the maxillipeds III ... 2.

The exopodites are absent on the maxillipeds III ... 11.

2. The exopodites of maxillipeds III have a flagellum ... 8.

The exopodites of maxillipeds III have no flagellum ... 9.

3. Spiny lobsters live in the Indian and Pacific Oceans ... 4.

They live in the Atalantic Ocean (the Eastern Coast of America from Florida to Rio de Janeiro; also near the Bermuda, Bahama and Antilles Islands) ... *P. argus* (Latreille, 1804).

4. Spiny lobsters live in the Indo-Pacifica but are not encountered near the Pacific Coast of America. The transverse furrows on the abdomen are not interrupted ... 5.

They live near the Pacific Coast of America. Their transverse furrows on the abdomen are interrupted ... *P. interruptus* (Randall, 1839).

5. The transverse furrows on the abdominal somites III and IV are joined with the corresponding furrows on the pleuras. The pleopods on the abdominal somite II have no endopodites in the males ... 6.

The transverse furrows on the abdominal somites III and IV are not joined with the corresponding furrows on the pleuras. The pleopods on the abdominal somite II have exopodite and endopodite ... *P. japonicus* (Von Siebold, 1924) (FIGURE 180).

6. The transverse furrows on abdominal somite II are joined with the furrows on the pleuras ... 7.

The transverse furrows on abdominal somite II are not joined with the furrows on the pleuras ... *P. pascuensis* Reed, 1954.

7. The frontal edge of the pleuras of abdominal somite II has no teeth; the abdomen is with dorsal patches ... 8.

The frontal edge of the pleuras of abdominal somite II has a series of clearly defined teeth; there are transverse bands on the abdomen ... *P. marginatus* (Quoy and Gaimard, 1825) (FIGURE 182).

8. The rear edge of the thoracic sternite has two well defined teeth in adult females; the rear half of abdominal somite II has no fuzzy area ... *P. longipes* (A. Milne-Edwards, 1868).

The rear edge of the thoracic sternite has no teeth in adult females; behind the transverse furrow on abdominal somite II, there is a fuzzy area as a transverse band ... *P. cygnus* George, 1962 (FIGURE 183).

9.. The area with antennules has one pair of spines. The species lives in the Atlantic Ocean ... 10.

The area with antennules has two pairs of spines, joined at the base. The species lives in the Indo-Pacifica ... *P. penicillatus* (Olivier, 1791).

10. Transverse furrows on the abdominal somites II-V are interrupted. One or more clearly expressed and sharp teeth are found on the frontal edge of the pleuras of abdominal somites ... *P. echinatus* Smith, 1869.

Transverse furrows on abdominal somites II-V are not interrupted. On the frontal edge of pleuras of the abdominal somites I-V, at best, one finds small protuberances, but extremely rarely these are sharp ... *P. guttatus* (Latreille, 1804).

11. Exopodite of maxilliped II has a fully developed flagellum ... 12.
Exopodite of maxilliped II has no flagellum, or it is smaller ... 14.

12. Spiny lobsters live in the Atlantic Ocean ... 13.

They live in the Indo-Pacifica ... *P. polyphagus* (Herbst, 1793).

13. There are no transverse furrows on the back of the abdominal somites. Species lives in Western Atlantic ... *P. laevicauda* (Latreille, 1817).

There are interrupted transverse furrows on the back of the abdominal somites. Species lives in the East Atlantic ... *P. rissonii* (Desmarest, 1825).

14. The maxilliped II exopodites have no flagella ... 15.

The maxilliped II exopodites have smaller flagella... *P. homarus* (L., 1758) (*P. burgeri* de Haan, 1841 - *P. dasypus* Latreille, 1804).

15. Spiny lobsters live near the Pacific Coast of America ... 16.

They live in the Indo-Pacifica and are not encountered near the Pacific Coast of America ... 17.

16. A small number of scattered spines are found on the carapace, which do not protrude much. In the hepatic section of the carapace, there are three large spines; also, there is one more small spine above the rear one ... *P. gracilis* Streets, 1871.

There are numerous highly protruding spines on the carapace. In the hepatic area, apart from the three large, there are also 3-4 small spines ... *P. inflatus* (Bouvier, 1895).

17. The furrow in front of the rear edge of the carapace is at least as wide as the marginal crest, and it is wider in the center. The abdomen has narrow, dull, transverse bands, or these may be absent ... 18.

The furrow in front of the rear edge of the carapace is narrower than the marginal crest behind it and is approximately of the same width throughout. The abdomen is smooth and without the transverse, narrow and dull bands ... *P. ornatus* (Fabricius, 1798).

18. The abdominal somites have well-expressed, lowered, fuzzy areas. In the males, the length of pleopods/V is approximately twice as large as the width. Small spots are scattered over the abdomen, without the transverse, dull bands ... *P. stimpsoni* Holthuis, 1963.

The lowered, fuzzy areas on the abdomen are usually absent, or are not well-expressed. The length of pleopods V in the males is approximately three times bigger than the width. The abdomen has narrow transverse and dull bands ... *P. versicolor* Latreille, 1804.

SCYLLARIDAE WHITE FAMILY, 1847
Key to determine genera

1. The body is moderately pressed in the dorso-ventral direction. The carapace width is not larger than its length ... 2.

The body is highly squashed, plate-like. The carapace width is greater than its length ... 4.

2. The maxilliped III exopodite has a flagellum; 21 gills ... 3.

The maxilliped III exopodite has no flagellum; 19 gills ... *Scyllarus*.

3. The abdominal somite I has a transverse, uninterrupted furrow. The distal segment of antennae has numerous well-expressed teeth ... *Arctides*

The abdominal somite I has no transverse furrow. There are no numerous well-expressed teeth on the distal segment of antennae ... Scyllarides.

4. The eye cavities are between the central line of the body and the outer corner of the carapace ... 5.

The eye cavities^{are}/near the outer corner of the carapace ... Thenus (the only species is *T. orientalis* (Lund)).

5. The eyes are closer to the central line than to the outer carapace corner ... *Ibacus*.

The eyes are in the center between the central line and the outer carapace corners ... *Parribacus*.

IBACUS LEACH GENUS, 1815
Key to determine species

1. Species is not encountered near New Zealand ... 2.

Species lives around New Zealand and Chatham Island ... *I. alticrenatus* Bate 1888.

2. The inner side of the maxilliped III merus is septal, being subdivided by incomplete furrows ... 3.

The inner side of the maxilliped III merus is not septal ... *I. ciliatus* (von Siebold, 1824).

3. The septal nature of the merus distal end of maxillipeds III is not blown in appearance ... 4.

The septal nature of the merus distal end of maxillipeds III is spherical cone in appearance ... *I. verdi* Bate, 1888.

4. All three frontal teeth on the epistome are ventrally directed. The branchial carinas are behind the cervical furrow and are highly

convex ... *I. peronii* Leach, 1815.

Only the rear tooth of the teeth mentioned on the epistome is ventrally directed; whereas, the two frontal teeth are directed forward. The branchial carinas are behind the cervical furrow and are straight ...
I. novemdentatus Gibbes, 1850.

ARCTIDES HOLTHUIS GENUS, 1960

Key to determine species

1. Species lives in the Indo-Pacific ... 2.

Species lives in the Atlantic Ocean ... *A. guineensis* (Spengler, 1799).

2. Species lives near the Hawaiian Islands ... *A. regalis* Holthuis, 1963

Species lives near New Zealand and East Australia ... *A. antipodarum*
Holthuis, 1960.

PARRIBACUS DANA GENUS, 1852

Key to determine species

1. A well-expressed tooth is present on the rostrum ... 2.

There is no tooth on the rostrum ... 4.

2. The fourth segment of antennae is armed usually by six teeth over the outer edge (not counting the top of the segment) ... 3.

The fourth segment of antennae is armed, as a rule, with seven teeth over the outer edge (not counting the top of the segment) ... *P. calendonius* Holthuis, 1960.

3. Five red spots are on the abdominal somite I, along its rear edge.

There are no spots in the front ... *P. scarlatinus* Holthuis, 1960.

8-10 red spots are in the frontal section of the abdominal somite I ...
P. perlatus Holthuis, 1967.

4. The frontal half of the abdominal somites II-V is almost smooth, with a small number of net-like small furrows ... 5.

The frontal half of the abdominal somites II-V is covered by numerous small protuberances, placed close to each other ... *P. antarcticus* (Lund, 1793).

5. 8-10 brightly colored spots are irregularly scattered over the abdominal somite I. Species lives near the Haiti and Tuamotu Islands ... *P. holthuisi* Forest, 1954.

Five brightly colored spots are on the abdominal somite I. One of these is small and is in the center and there are two larger spots on each side of it. Species lives near the shores of Japan ... *P. japonicus* Holthuis, 1960.

SCYLLARIDES GILL GENUS, 1898
Key to determine species

1. Spiny lobsters live in the Atlantic Ocean ... 2.

Spiny lobsters live in the Indo-Pacific ... 8.

2. Spiny lobsters live in the East Atlantic Ocean and Mediterranean Sea ... 3.

Spiny lobsters live in the West Atlantic ... 4.

3. The fuzziness of the carapace is sparse and the body is comparatively smooth. Three large red spots of approximately the same shape are found on the frontal half of the abdominal somite I ... *S. herklotsi* (Herklots, 1851).

The fuzziness of the carapace is dense and the body surface is highly granulated. On the frontal half of the abdominal somite I, in the middle

of its back, there is a dark-red spot, surrounded by a light ring of yellowish color; on its sides, there are two more spots, half-moon in shape and with their concave sides towards the central spot ... *S. latus* (Latreille, 1803).

4. The basal part of the rear edge of the pleuras of the abdominal somite II is clearly concave ... 5.

The basal part of the rear edge of the pleuras of the abdominal somite II is clearly convex ... *S. brasiliensis* Rathbun.

5. One round brightly-red spot is found on the sides of the dorsal surface of the abdominal somite I ... *S. deceptor* Holthuis, 1963.

The pattern of the abdominal somite I is different from that described above ... 6.

6. There are no median crests on the abdominal somites II-IV ... 7.

The median crests are present on the abdominal somites II-IV ... *S. nodifer* (Stimpson, 1866).

7. In the branchial area of the carapace, there is a longitudinal row of large protuberances. In the center of the abdominal somite I, one large, round, red spot is located. At half the distance between this spot and the base of the pleuras, there is yet another smaller spot, approximately triangular in shape ... *S. delfosi* Holthuis, 1960.

In the branchial area of the carapace, the longitudinal row of large protuberances is absent. On the abdominal somite I, there are 4 large red spots, symmetrical in relation to the axial line of the creature ... *S. aequinoctialis* (Lund), 1793.

8. The basal section of the rear edge of pleuras of the abdominal somite II is clearly concave ... 9.

It is clearly convex ... *S. squamosus* (H. Milne-Edwards, 1837)

9. A carina is found on the abdominal somites II-IV. Spiny lobsters are not encountered around the Galapagos Islands ... 10.

Carinas are absent on the abdominal somites II-IV. Spiny lobsters live near the Galapagos Islands ... *S. astori* Holthuis, 1960.

10. The carina of the abdominal somite IV does not form a very high hunch ... 11.

The carina of the abdominal somite IV forms a very high hunch ... *S. haani* (De Haan, 1841).

11. Spiny lobsters are not encountered near the southeastern shores of Africa ... 12.

Spiny lobsters are encountered near the southeastern shores of Africa ... *S. elisabethae* (Ortmann, 1894).

12. The pregastric tooth on the carapace has one top. Species is known in the central regions of the Pacific Ocean (Easter Island) ... *S. rogeveeni* Holthuis, 1967.

The pregastric tooth on the carapace has two tops. Species lives in the Red Sea ... *S. tridaenophaga* Holthuis, 1967.

SCYLLARUS FABRICIUS GENUS, 1775

Key to determine species

1. Species lives in the Indo-Pacifica ... 11.

Species lives in the Atlantic Ocean ... 2.

2. Species lives in the West Atlantic ... 8.

Species lives in the East Atlantic (including the Mediterranean Sea)
... 3.

3. The rostral tooth is well developed and convex ... 4.

The rostral tooth is very small or is absent ... 6.

4. Pleuras of the abdominal somite II are sharp and bent backwards.
The frontal part of the abdominal somites, hidden under the preceding
somite, is without the transverse furrow, covered by hairs which are
directed backwards ... 5.

Pleuras of the abdominal somite II are blunt and directed ventrally.
The frontal part of the abdominal somites, hidden under the preceding
somite, is with a clearly defined transverse furrow which is covered
by hairs directed backwards ... *S. pygmaeus* Bate, 1888 (FIGURE 184,c&d).

5. The edge of the first tooth of the median carina of the carapace
(the pregastric tooth) is somewhat closer to the second (the gastric)
tooth than to the rostrum. The gastric tooth is only a little higher
than the other teeth of the median carina. The median protuberance of
the thoracic sternite is small and conical ... *S. arctus* (L.), 1758
(FIGURE 184, a&b).

The edge of the pregastric tooth is somewhat closer to the edge of the
rostrum than to the gastric tooth. The gastric tooth is considerably
higher than the other teeth of the median carina. The median protuber-
ance of the thoracic sternite is quite large, wide and with a rib on
the frontal edge ... *S. subarctus* Crosnier, 1969.

6. The frontal edge of thoracic sternites forms two convex lobes, separated by a small notch. The median carinas of the abdominal somites II, III and IV are high and convex ... *S. caparti* Holthuis, 1952 (FIGURE 185).

The frontal edge of thoracic sternites has a wide notch with either straight or bent-in edges. The median carinas of the abdomen are not high and only slightly convex ... 7.

7. The protuberance in the middle of the last thoracic sternite is small. The front tooth of the inner edge of the orbits is longer than the rear tooth ... *S. paradoxus* Miers, 1881 (FIGURE 186).

The small protuberance in the middle of the last thoracic sternite is sharp and bent backwards and only the males have another pair of powerful side teeth. The front tooth of the inner edge of the orbits is shorter than the rear tooth ... *S. posteli* Forest, 1963 (FIGURE 187).

8. Abdominal somites I-IV are with a small rounded notch in the center of the rear edge ... 9.

Abdominal somites I-IV have a deep notch with a sharp top in the center of the rear edge ... 10.

9. The inner edge of the orbits is with two sharp and powerful teeth ... *S. chacei* Holthuis, 1960.

The inner edge of the orbits is perfectly smooth ... *S. planorbita* Holthuis, 1969.

10. Secondary segments of the antennules are flattened dorsally. The abdominal somite IV has a crest-like protuberance ... *S. americanus* (Smith, 1896).

Secondary segments of the antennules are cylindrical in shape. The abdominal somite IV has no crest-like protuberance ... *S. nearctus* Holthuis, 1960.

11. Species is not encountered near Juan Fernandez Island ... 12.
Species lives near Juan Fernandez Island ... *S. delfini* (Bouvier), 1909.

12. The peraeopod III propodia have a large distoventral tooth; because of this, the extremity acquires the appearance of a pseudo-claw ... 13.
The distoventral tooth is absent on the peraeopod III propodia. The extremity is of the usual shape ... 14.

13. The second tooth of the median carina of the carapace is very high, considerably higher than the first tooth ... *S. cultrifer* (Ortmann), 1897.
The second tooth of the median carina of the carapace is not very high, but is slightly higher than the first tooth ... *S. aureus* Holthuis, 1963.

14. The abdominal somites are covered by a knobly-sculptured pattern ... 15.

The abdominal somites are covered by a pattern which is either like a branching tree or scaly, or are smooth ... 17.

15. The outer edge of the second segment of the antennae has at least four (4 or 7) teeth ... 16.

The outer edge of the second segment of the antennae has only three teeth ... *S. brevicornis* Holthuis, 1946.

16. The rear edge of the thoracic somite V sternite has a row of protuberances. The rear half of the abdominal pleuras has no protuberan-

ces ... *S. rugosus* H. Milne-Edwards, 1837.

The rear edge of the thoracic somite V sternite has no protuberances.
The rear half of the abdominal pleuras has longitudinal rows of protuberances ... *S. demani* Holthuis, 1963.

17. The median carina is present on the abdominal somites II-V ... 18.
The carina is absent on the abdominal somites II-V ... 27.

18. The abdominal tergites are either covered by a more-or-less well expressed pattern of a branching tree, or by a scaly sculpture ... 19
The abdominal tergites are not covered by any pattern and are smooth
The carina on abdominal somite II is higher than on the other somites.
Species is encountered near New South Wales (Australia) ... *S. crenatus* (Whitelegge), 1900.

19. The proximal antenna plate is dissected by two oblique crests ... 20.

The proximal antenna plate is dissected by only one oblique crest ... 21.

20. The scaly sculpture on the abdomen is best expressed on the somite VI and on the pleuras ... *S. rubens* (Alcock et Anderson), 1894.

The scaly sculpture is highly developed over the entire abdomen ... *S. martensi* Pfeffer, 1881.

21. There is no tooth on the last thoracic sternite, or if it is present, it is a small, blunt protuberance ... 22.

A large, sharp tooth is on the last thoracic sternite ... *S. ornatus* Holthuis, 1960.

22. The carinas on abdominal somites II-V are approximately the same in height ... 26.

The carina on one of the somites mentioned is noticeably higher than the other carinas ... 23.

23. The abdominal somite III carina is higher than the carinas on the other somites ... 24.

The abdominal somite IV carina is higher than all other carinas ... *S. gibberosus* (de Man), 1905.

24. There is a rostral tooth ... 25.

There is no rostral tooth. Species lives in the Red Sea ... *S. lewinsohni* Holthuis, 1967.

25. Abdominal somite I is smooth. Species was encountered near the Fiji Islands, northern coast of Celebes and Amboin Island ... *S. vitiensis* (Dana), 1852.

Numerous bent and branching longitudinal furrows are on abdominal somite I. Species was encountered near the Sulu Archipelago (Philippines) ... *S. aesopius* Holthuis, 1960.

26. Longitudinal furrows are on the abdominal somite I tergite; they are partially bent and branching. Species is encountered near the Hawaiian Islands ... *S. modestus* Holthuis, 1960.

Longitudinal furrows on the abdominal somite I tergites are straight and not branching. Species is encountered near Japan and the Sumbawa Islands (the Flores Sea) ... *S. bicuspidatus* (de Man), 1905.

27. The second median tooth of the carapace, if higher than the other median teeth, is so only slightly ... 28.

The second median tooth of the carapace is considerably higher than the other teeth. Species lives near the Sulu Archipelago (Philippines) and the Hawaiian Islands ... *S. timidus* Holthuis, 1960.

28. The propodia of the pereopods II and III are wider, but pressed from the sides ... 29.

The propodia of the pereopods II and III are only slightly pressed and are not wide ... 30.

29. The frontal non-sculptured section of the abdominal somite II tergite is smooth and without transverse furrows ... *S. batei* (Bate), 1888.

The frontal non-sculptured section of the abdominal somite II tergite has two parallel transverse furrows ... *S. bertholdi* Paulson, 1875.

30. A typical branching-tree pattern is on the abdominal somites II-IV ... 31.

The pattern on the abdominal somites II-IV represents a simple loop with straight side edges. Species is encountered in the Red Sea, near Madagascar and Mauritius ... *S. pumilus* Nobili, 1906.

31. The following are present: a clearly expressed rostral tooth and a large, pressed from the sides, triangular cardiac tooth ... 32.

The rostral tooth is absent and the cardiac tooth is very low, short and widely double-topped. Species is encountered near Australia ... *S. amabilis* Holthuis, 1963.

32. Between the rear side-furrow of the carapace and its rear edge,

there is no additional transverse furrow. On the last thoracic sternite, there is a median protuberance ... *S. dubius* Holthuis, 1963.

Between the rear side-furrow of the carapace and its rear edge, there is an additional transverse furrow. On the last thoracic sternite, there is no median protuberance ... *S. sordidus* (Stimpson), 1860.

ASTACURA BORRADAILE DIVISION, 1907
Key to determine families (Balss, 1957)

1. The last thoracic somites are free and mobile ... 2.

The last thoracic somites are attached to the foregoing somites ...
Homaridae.

2. The sub-branchias do not have plates, but their segments can be stretched out as a wing. There are short hooks at the end of the ligaments proceeding from them. The pleopods I are absent in both sexes ... 3.

The sub-branchias have wide, doubled plates at the end of the ligaments, branching from them with hooks on them. The pleopods I are present in both sexes ... Astacidae.

3. The antennules have well developed flagella. The carapace is not widened from beneath ... Parastacidae.

The flagella of the antennules are smaller or absent. The carapace is widened from beneath ... Austroastacidae.

HOMARIDAE FAMILY
Key to determine genera (Manning, 1969)

1. Eyes are present. The pleuras of the abdominal somites III-VI are triangular in shape ... 2.

Eyes are absent. Pleuras of the abdominal somites III-VI are rectangular in shape ... *Thaumastocheles*.

2. Scaphocerites are present ... 3.

Scaphocerites are absent ... 7.

3. Scaphocerites are leaf-like. The carapace is with a longitudinal carina ... 4.

Scaphocerites are triangular with a sharp top. The carapace is lacking a carina ... Homarus.

4. Eyes are with pigments ... 5.

Eyes are without pigments ... Neophoberus (one species: *N. caecus* A. Milne-Edwards).

5. The claw propodia have a longitudinal carina. The carapace has a pair of post-cervical rows of spines along the central line ... 6.

The claw propodia is without a longitudinal carina. The carapace is without a pair of post-cervical row~~s~~ of spines along the central line ... Enoplometopus.

6. The carapace is without a sub-median carina behind the cervical furrow ... Eunephrops.

The carapace is with a sub-median carina behind the cervical furrow ... Nephrops.

7. Eyes are ^{not} pigmented. Pleuras of the abdominal somite II are triangular in shape ... Nephropsis.

Eyes are pigmented. Pleuras of the abdominal somite II are rectangular with rounded corners ... Nephropides.

HOMARUS WEBER GENUS, 1795

Key to determine species

1. Species lives in the East Atlantic and Southwest Indian Oceans... 2.
Species lives near the Atlantic coast of North America in the region from Labrador to Carolina ... *H. americanus* H. Milne-Edwards.
2. Species lives in European waters to Troms (Norway) in the north, near the coasts of France and Portugal, in the Mediterranean and Black Seas and also near the northwest coast of Africa ... *H. gammarus* (L.).
Species lives near South Africa in the region from Cape of Good Hope to Algoa Bay ... *H. capensis* (Herbst).

EUNEPHROPS SMITH GENUS, 1885

Key to determine species

1. On the posteromedian edge of the cervical seam of the carapace, there are spines. The second segment of the antennae is not armed ... *E. bairdii* Smith, 1885.
There are no spines on the posteromedian edge of the cervical seam. The second segment of the antennae has an anterolateral spine ... *E. cadenasi* Chace, 1939.

ENOPLOMETOPUS A. MILNE-EDWARDS GENUS, 1862

Key to determine species

1. The post-cervical spines are present (one or two) on the carapace ... 2.
The post-cervical spines are absent on the carapace ... *E. pictus* A. Milne-Edwards.
2. One post-cervical spine is present ... 3.
Two post-cervical spines are present ... *E. holthuisi* Gordon.

the
 3. There are spines on/abdominal somites III-V pleuras ... 4.
 There are no spines on abdominal somites III-V ... *E. occidentalis*
 (Randall).

4. Pleura of the abdominal somite VI is rounded. Only two teeth are
 on the rear transverse edge of the somite ... *E. antillensis* Lütken.
 Pleura of the abdominal somite VI is sharp. On the rear edge of the
 somite, there are six teeth, one of which is larger and is on the
 central line of the somite ... *E. biafri* Burukovsky, 1972.

NEPHROPSIS WOOD-MASON GENUS, 1872
 Key to determine species (Bouvier, 1917)

1. The tergites of abdominal somites II-VI have a median carina ... 2.
 There are no median carina on the tergites of the abdominal somites
 II-VI ... 6.

2. There are rostral spines ... 3.
 There are no rostral spines, but there is one pair of post-rostral
 spines. The frontal edge of the epimerons of the abdominal somites
 is not armed. The epimerons of the abdominal somites II-V have long
 lower ends ... *N. ensirostris* Alcock, 1901.

3. Only one pair of rostral spines is present ... 4.
 At least two pairs of rostral spines and one pair of post-rostral
 spines are present; also, one spine on the frontal edge of epimerons
 of the abdominal somite II; one pair of hepatic spines, which some-
 times can be rudimentary ... *N. atlantica* Norman, 1882.

4. The hepatic spines are absent. The lower ends of the epimerons of
 the abdominal somites II-V are very short ... 5.

One pair of hepatic spines is present, at times smaller in size. The epimerons of abdominal somites II-V have long ends ... *N. aculeata* Smith, 1881.

5. A dorsal spine is present near the telson base ... *N. occidentalis* Faxon, 1895.

There is no dorsal spine on the telson ... *N. carpenteri* Wood-Mason, 1885

6. At least two pairs of rostral spines are present. The epimerons of abdominal somites II-V have long lower ends ... 7.

Only one pair of rostral spines is present. The epimerons of abdominal somites II-V have short lower ends; their frontal edge is not armed. A transverse seam is present on the uropod exopodite ... *N. stewarti* Wood-Mason, 1873.

7. A transverse seam is present on the uropod exopodite ... 8.

There is no transverse seam on the uropod exopodite. On the frontal edge of epimerons II-V, there is a spine ... *N. suhmi* Bate, 1888.

8. The frontal edge of epimerons of abdominal somite II is armed by a spine, but the hepatic spine is absent ... *N. malhaensis* Borradaile, 1910
The frontal edges of epimerons of the abdominal somites II, III and IV are armed with a spine. The hepatic spine is also present ... *N. agassizi* A. Milne-Edwards, 1880.

NEPHROPIDES, MANING GENUS, 1969
Key to determine species

1. No median carina is found on the abdomen ... *N. caribbaeus* Maning.
A median carina is present on the abdomen ... *N. birschteini* Zarenkov and Semjonow (FIGURE 188).

NEPHROPS LEACH GENUS, 1815
Key to determine species

1. On the carapace, behind the cervical furrow, there are seven longitudinal carinas. The dorsal-lateral edges of the rostrum continue on the carapace as post-rostral carinas. The antennal spines are large. The skaphocerites are wide and semispherical in shape ... 2.

On the carapace, behind the cervical furrow, there are five longitudinal carinas. The dorsolateral edges of the rostrum do not continue on the carapace. The antennal spines are small. The skaphocerites are narrow and lancet-like ... *N. norvegicus* (Linne, 1875).

2. Species lives in the Atlantic Ocean (West Atlantic) ... 3.

Species lives in the Indo-Pacific ... 4.

3. No spines are found between the rows of post-rostral teeth. The edge above the pleura base, of the abdominal somites III-V, is not armed by a spine ... *N. binghami* Boone, 1927.

Spines are found between the rows of post-rostral teeth. The edge of the pleuras of the abdominal somites III-V, is armed with a spine above the base ... *N. rubellus* Moreira, 1903.

4. The carapace is covered with spines ... 5.

The carapace is smooth or is covered by small granules ... 7.

5. One pair of transverse furrows is on the tergites of the abdominal somites II and III (on the section which is not under the preceding somite at the place where the abdomen bends) ... 6.

The abdominal somites II and III tergites have two pairs of transverse furrows ... *N. neptunus* Bruce, 1965.

6. Each furrow has a complex lateral end , fuzzy frontal and rear edges, smooth bottom and a transverse row of granules. In the middle of its frontal edge, an additional furrow is joined with the lateral edge of the main furrow, separating the articular and non-articular surfaces of the tergites ... *N. arafurensis* de Man, 1905.

Each furrow is simple and fully fuzzy ... *N. australiensis* Bruce, 1966.

7. The claws of one pair of legs have no longitudinal, convex and spiny crests ... 8.

The claws of one pair of legs have the longitudinal, convex and spiny crests ... 12.

8. Fuzzy, transverse furrows are found on some of the abdominal somites ... 9.

There are no transverse, fuzzy furrows on the abdominal somites ... 10.

9. There are well-defined transverse furrows on the first five abdominal somites. On the ventro-median sides of the claw I fingers, there are thick brushes of bristle ... *N. sinensis* Bruce, 1966.

The transverse furrows are distinguishable only on abdominal somites II and III; they are weakly developed on abdominal somites IV and V and are absent on abdominal somite I. The claw fingers have not the bristles just described ... *N. thompsoni* Bate, 1888.

10. A longitudinal crest with spines is in the cardiac area of the carapace ... 11.

In the cardiac area of the carapace, there are no spines on the longitudinal crest... *N. challengerii* Balss, 1914.

11. On the inner edge of the merus of the claw-legs I, a well-expressed tooth is in the center of the length. The widest part of the skaphocerite is in the center of its length ... *N. boschmai* Holthuis, 1964 (FIGURE 189).

On the inner edge of the merus of claw-legs I, there is no outstanding tooth among the small spines. The widest part of the skaphocerite is observed in its distal section ... *N. sibogae* de Man, 1916.

12. Two pairs of small spines are on the abdominal segment VI ... *N. japonicus* Tapparone Canefri, 1873 (? *N. sagamiensis* ^aPrisi, 1917, *N. intermedium* Balss, 1921).

There are no spines on abdominal somite VI ... *N. andamanicus* Wood-Mason, 1892.

THAUMASTOCHELES WOOD-MASON GENUS, 1874
Key to determine species

1. Species lives near West India ... *T. zaleucus* (Willemoes-Suhm, 1875).

Species lives near Japan ... *T. japonicus* Bate, 1888.

Translator: Lydia A. Hutchison
UNIVERSITIES^o TRANSLATION SERVICE
2910 Lloyd Street
San Diego, CA, 92117
[Tel: 619-276-2910]

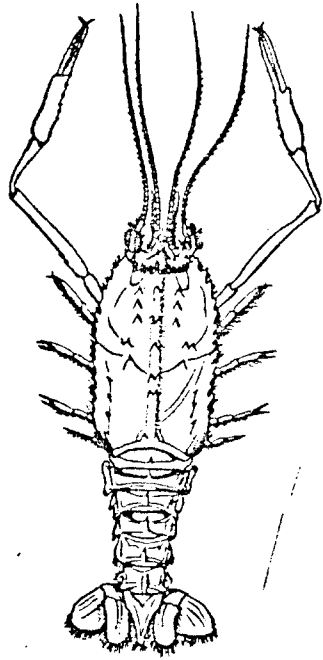


FIGURE 179:

Stereomastis sculpta (Smith)
(Holthuis, 1952)

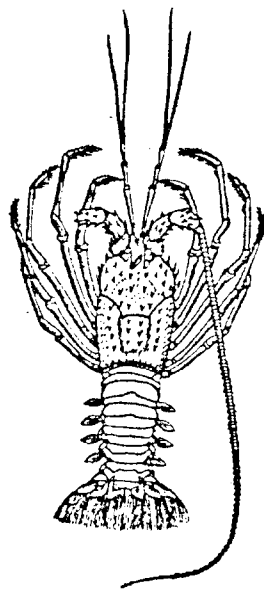


FIGURE 180:

Panulirus japonicus (Von Siebold, 1924)

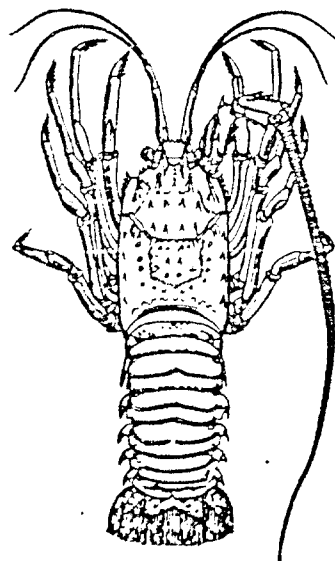


FIGURE 181:

Panulirus pascuensis Reed
(female) (George et Holthuis, 1965)

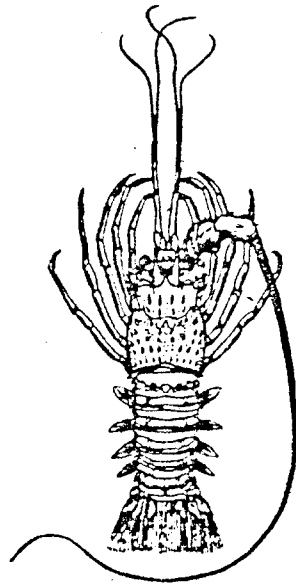


FIGURE 182:
Panulirus marginatus (Quoy et Gaimard) (male) (George et Holthuis, 1965)

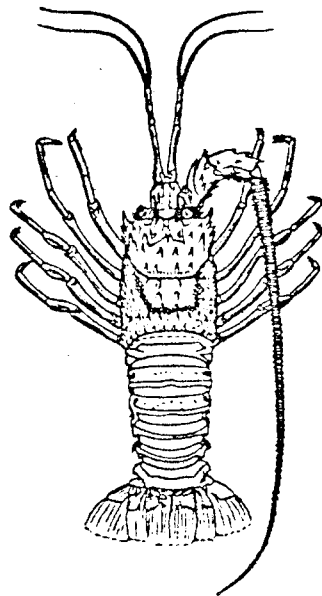


FIGURE 183:
Panulirus cygnus George (male) (George et Holthuis, 1965)

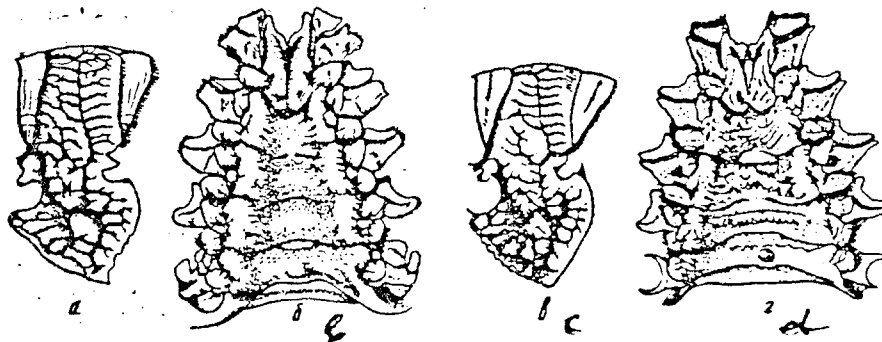


FIGURE 184: *Scyllarus arctus* (L.):
 a - abdominal somite II and the smooth part of abdominal somite III (side view);
 b - sternites of the cephalothorax (view from below);
 c, d - *Scyllarus pygmaeus* (Bate), same symbols (Forest et Holthuis, 1960)

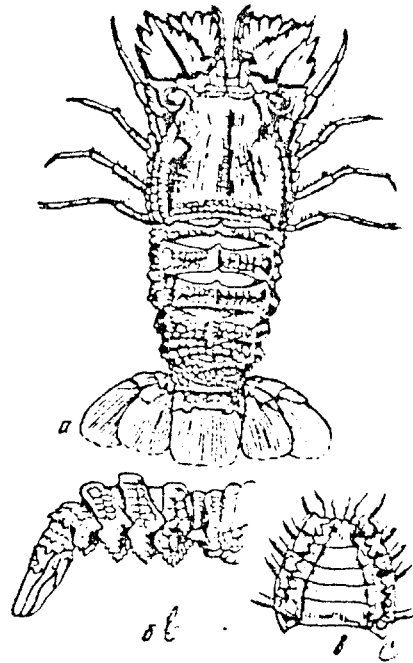


FIGURE 185:

Scyllarus caparti Holthuis:

a - view from above

b - abdomen (side view)

c - thorax sternites (view from below) (Holthuis, 1952)

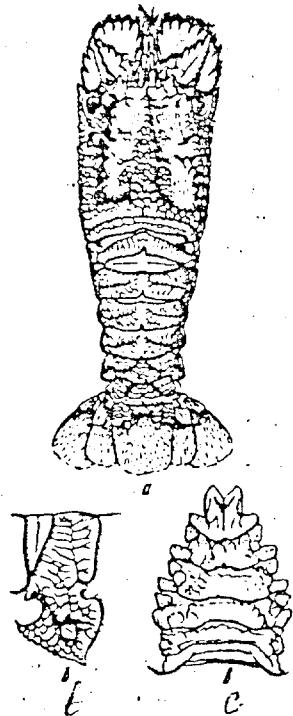


FIGURE 186:

Scyllarus paradoxus Miers:

a - view from above

b - abdominal somite II (side view)

c - thorax sternites

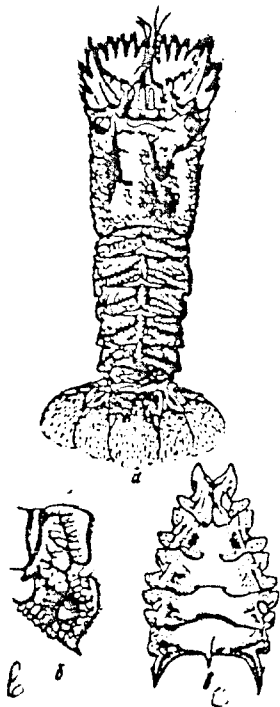


FIGURE 187:

Scyllarus posteli Forest:

- a - view from above
 - b - abdominal somite II (side view)
 - c - thorax sternites (view from below)
- (Forest, 1963)

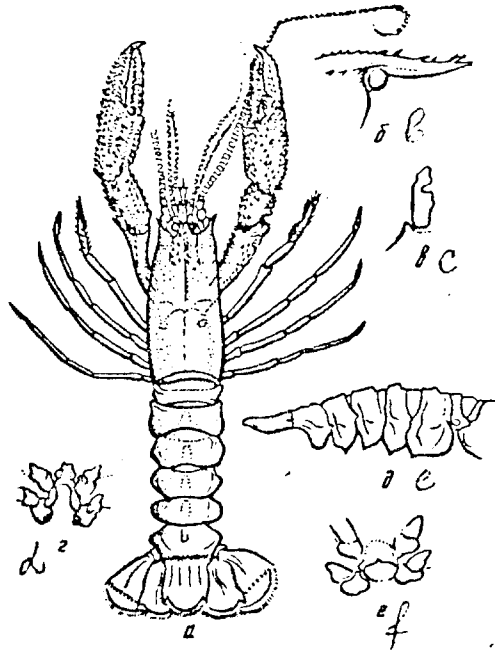


FIGURE 188:

Nephropides birschteini Zarenkov et Semjonov:

- a - general view (from above)
- b - rostrum (side view)
- c - pleopod I of a male
- d - basal part of peraeopods IV and V in a male
- e - abdomen (side view)
- f - basal part of peraeopods IV and V in a female

(Zarenkov and Semjonov, 1972)

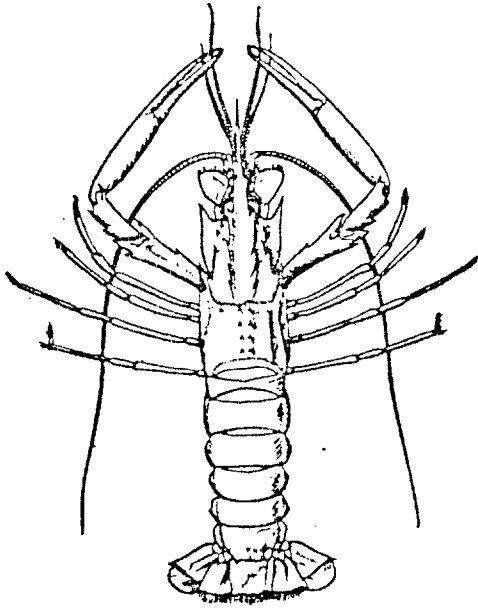


FIGURE 189:
Nephrops boschmai Holthuis
(Holthuis, 1964)