

Panulirus White, 1847

PALIN Panul

Panulirus White, 1847, List of the Crustacea in the collection of the British Museum:69. Gender masculine. Name placed on the Official List of Generic Names in Zoology, in Opinion 507 (published in 1958).

Type Species: selected by Holthuis, 1956 (Bulletin of zoological Nomenclature, 12:55): **Palinurus japonicus** Von Siebold, 1824.

Synonyms: **Phyllosoma** Leach, 1817, in Tuckey, Narrative of an expedition to explore the River Zaire: plate without number. Type species, selected by Holthuis, 1956 (Bulletin of zoological Nomenclature, 12:55): **Phyllosoma commune** Leach, 1817 (= **Panulirus regius** De Brito Capello, 1864). Gender neuter. Name suppressed under the plenary power of the International Commission on Zoological Nomenclature in their Opinion 507 (published in 1958), and placed on the Official Index of Rejected and Invalid Names in Zoology.

Senex Pfeffer, 1881, Verhandlungen naturwissenschaftlichen Vereins Hamburg, 5:30. Replacement name for, and thereby objective junior synonym of **Panulirus** White, 1847; junior homonym of **Senex** Gray, 1838 (Aves). Gender masculine. Name placed on the Official Index of Rejected and Invalid Names in Zoology in Opinion 507 (published in 1958).

A circumtropical genus of large, often brightly coloured, spiny lobsters. All of the 19 species known are to a greater or lesser extent of commercial interest. All are treated below.

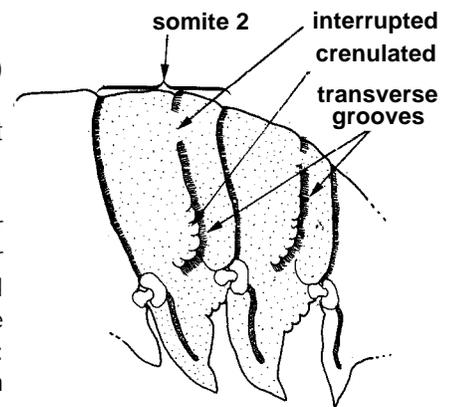
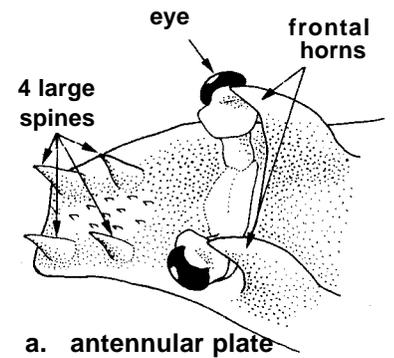
Key to Species:

1a. Abdominal somites with a distinct transverse groove, which may be interrupted in the middle. Third maxilliped with or without exopod

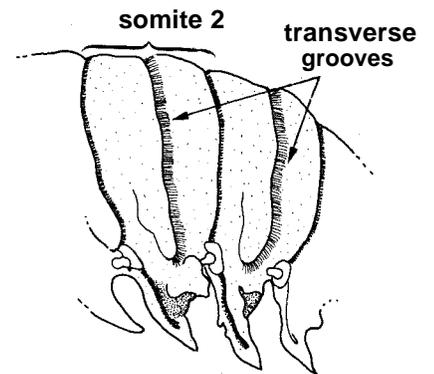
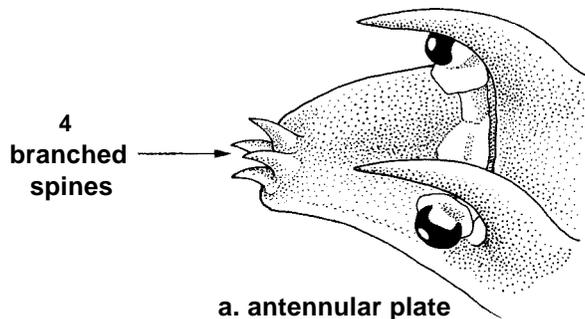
2a. Anterior margin of transverse groove of abdominal somites crenulated. Groove itself either complete or interrupted in the middle (Fig. 239b). Antennular plate with 4 equal, large, well separated spines, arranged in a square with additional very small spinules scattered in between (Fig 239a). Exopod of third maxilliped absent. Colour: body dark green or reddish brown, finely spotted with white. No distinct bands of light colour on the abdomen. A light anterior spot at the base of the abdominal pleura. Antennulae banded. Legs rather uniform in colour, sometimes with faint, longitudinal streaks. Indo-West Pacific **P. homarus** (Fig. 267)

2b. Transverse groove of abdominal somites with straight margins, not crenulated

3a. Antennular plate with 4 strong spines, which are fused at their bases, forming a single bunch of 4 diverging points; the anterior pair shorter than the posterior (Fig 240a). Exopod of third maxilliped present, with flagellum. Transverse grooves over the abdominal somites usually uninterrupted (Fig. 240b). Colour: body greenish or reddish, ranging from yellowish green through brown green to blue-black or dark reddish brown; speckled on carapace and abdomen with tiny whitish spots. No transverse colour bands on abdomen, but two rather large whitish spots on first somite. Antennulae not banded. Legs with wider or narrower longitudinal yellowish lines or streaks on a dark (greenish or reddish) background. Indo-West Pacific **P. penicillatus**



b. abdominal somites (lateral view) **P. homarus** Fig. 239



a. antennular plate **P. penicillatus** Fig. 240

3b. Antennular plate with 2 or 4 large spines, which are widely separated from each other

4a. Antennular plate with 2 large spines, sometimes with scattered small spinules behind these (Fig. 241)

5a. The transverse grooves of abdominal somites 3 and 4 do not join the groove along the anterior margin of the corresponding pleuron (Fig. 242)

6a. Japanese species. Exopod of third maxilliped present, with flagellum. Body of a uniform dark brownish red colour. No pale bands on abdominal somites. Antennulae not banded. Pereiopods with some narrow longitudinal yellowish lines. No conspicuous spots *P. japonicus* (Fig. 273)

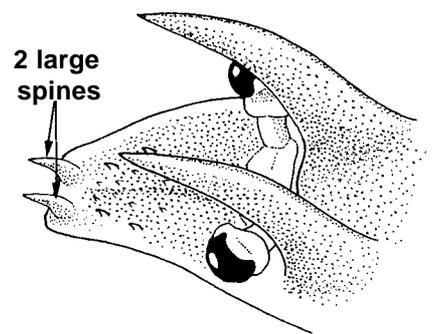
6b. Atlantic species (N.E. Brazil, Central Atlantic Islands from the Canary Islands to St. Helena). Exopod of third maxilliped reduced, without flagellum. Colour: body and especially the tail covered by distinct rounded whitish spots. Antennulae and legs streaked with yellowish or whitish longitudinal lines, not banded or spotted. *P. echinatus* (Fig. 262)

5b. The transverse grooves of abdominal somites 3 and 4 join the groove along the anterior margin of the corresponding pleuron (Fig 243, 244)

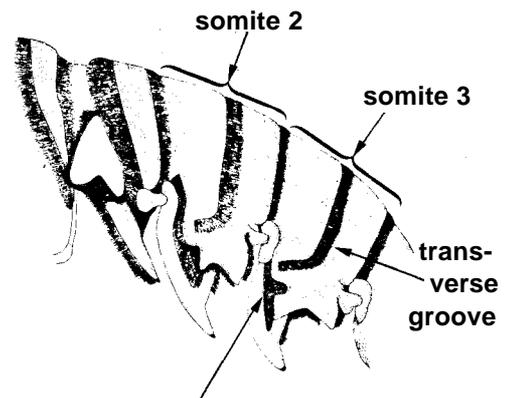
7a Transverse groove of abdominal somite 2 does not join the groove along the anterior margin of the corresponding pleura (Fig. 243). Exopod of third maxilliped present, with flagellum. Colour: body dark purple with some greenish, not speckled. Irregular pale bands along posterior margin of abdominal somites, sometimes with whitish spots mixed in with them; spots on basis of tail fan. Antennulae not banded. Legs with narrow pale longitudinal streaks. Only known from Easter and Pitcairn Islands *P. pascuensis* (Fig. 283)

7b Transverse groove of abdominal somite 2 confluent with groove along anterior margin of corresponding pleura (Fig. 244)

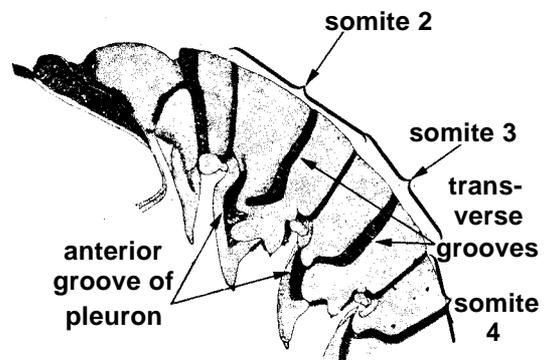
8a Anterior margin of pleuron of abdominal somite 2 with distinct teeth (Fig. 244). Exopod of third maxilliped present, with flagellum. Colour: carapace with yellowish, reddish and brownish colour, not spotted. Abdomen bright to dark purple with a very conspicuous transverse yellow band over the middle of each somite. Legs rather uniform in colour, with a few spots, but not streaked. Antennulae rather uniform in colour. Upper surface of abdomen pubescent in the grooves only Hawaiian Archipelago. *P. marginatus* (Fig. 279)



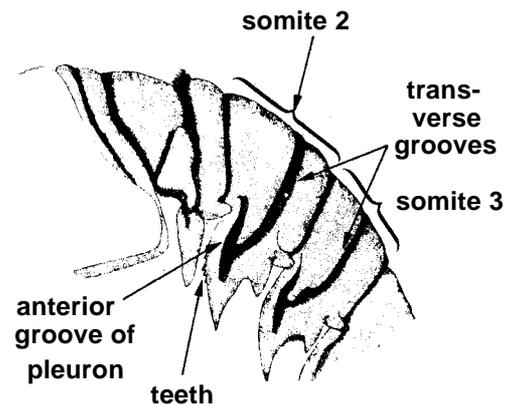
antennular plate
P. longipes Fig. 241



transverse groove
somite 2
somite 3
anterior groove of pleuron
abdominal somites (lateral view)
P. japonicus Fig. 242



transverse groove
somite 2
somite 3
anterior groove of pleuron
somite 4
abdominal somites (lateral view)
P. pascuensis Fig. 243



transverse groove
somite 2
somite 3
anterior groove of pleuron
teeth
abdominal somites (lateral view)
P. marginatus Fig. 244

8b. Anterior margin of pleura of abdominal somite 2 without distinct teeth. Colour: abdomen without a transverse light coloured band (although sometimes the hairs of the transverse groove may give the impression of such a coloured band), but with more or less distinct light spots. Legs with longitudinal streaks or with spots

9a. Abdominal somites with the grooves pubescent; a pubescent area on the dorsal surface of somites along the posterior margin (Fig. 245). Exopod of third maxilliped present and with flagellum. Colour: pale to dark purplish brown. Abdomen with widely scattered small pale spots, which sometimes are, hardly noticeable. Antennulae uniform in colour or with a pale longitudinal streak. Legs pale or dark brown with longitudinal streaks. Western Australia *P. cygnus* (Fig. 259)

9b. No pubescent area on the abdominal somites behind the transverse groove. Colour: abdomen dark purple with numerous very conspicuous rounded whitish spots

10a Indo-West Pacific. Exopod of third maxilliped present, with flagellum. Colour: body, and especially the abdomen covered with numerous distinct round spots. Legs with light longitudinal streaks, which sometimes end just before a single pale spot. Antennulae with longitudinal streaks .. *P. longipes* (Fig. 277)

10b Western Atlantic. Exopod of third maxilliped reduced, without flagellum. Body, especially abdomen with numerous distinct rounded pale spots. Also the legs spotted on carpus, merus and ischium, without streaks there; propodus longitudinally striped *P. guttatus* (Fig. 265)

4b. Antennular plate with 4 large spines arranged in a square (Fig. 246); scattered small spinules may be present in addition

11a. Eastern Pacific. Exopodite of third maxilliped present, with flagellum. Transverse grooves of abdominal somites wide, abruptly interrupted in the middle (Fig. 247). Colour: body and abdomen dorsally rather uniformly brownish red, without light bands or spots. Legs brownish red with one or more pale longitudinal streaks. California (USA) and Baja California (Mexico) *P. interruptus* (Fig. 271)

11b Atlantic. Transverse grooves of the abdomen, where interrupted, gradually narrowing towards the middle of the body, not ending abruptly. Colour: abdominal somites 2 and 6, or abdominal somites 2 to 6, with a single, large, white eyespot, surrounded by dark colour, on each half above the base of the pleuron

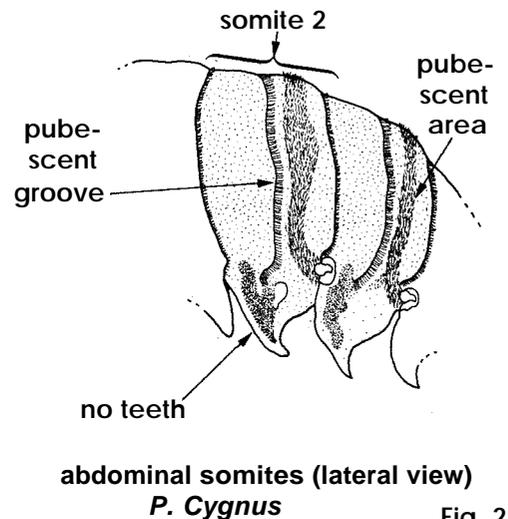


Fig. 245

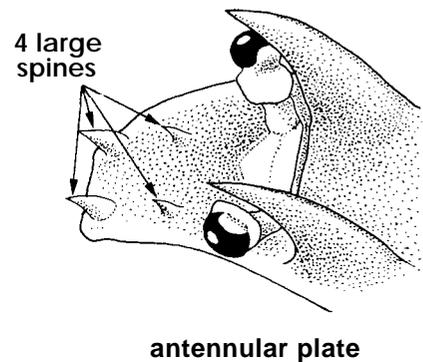
*P. ornatus*

Fig. 246

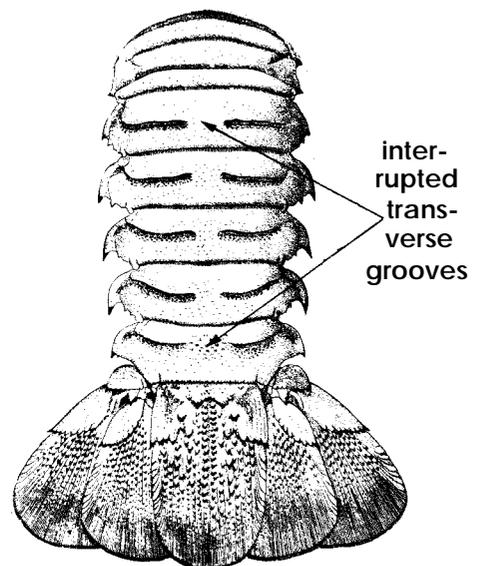
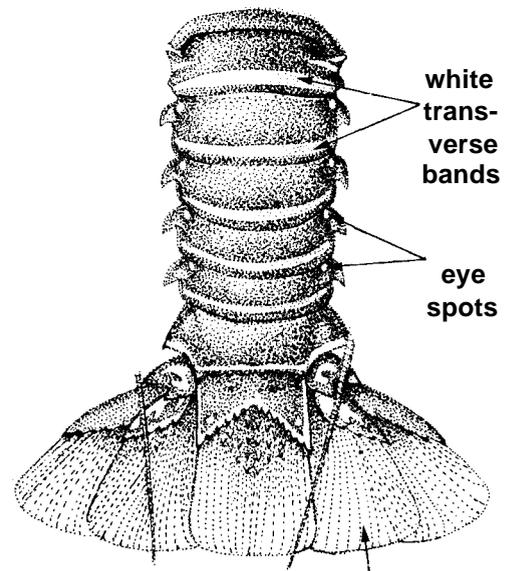


Fig. 247

12a. Eastern Atlantic. Third maxilliped without exopod. Colour: abdominal somites greenish with a very distinct white transverse band along the posterior margin and separated from that margin by a dark band. A distinct eyespot (white or yellowish surrounded by an open dark ring) above the bases of the pleura of somites 1 to 6; those of the posterior pleura smaller and more elongate than those of the anterior (Fig. 248). Tail fan rather uniformly greenish or brownish in colour *P. regius* (Fig. 289)



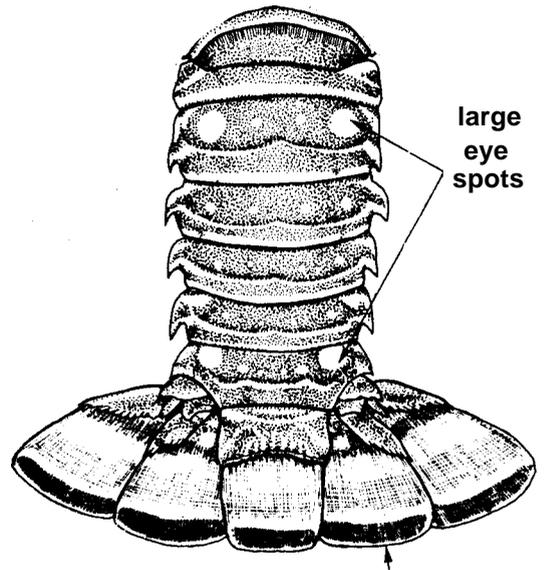
tail fan uniform
abdomen (dorsal view) *P. regius* Fig. 248

12b. Western Atlantic. Third maxilliped with an exopod provided with a flagellum. Colour: abdominal somites reddish or brownish, sometimes greenish, without transverse colour bands. A large eyespot of whitish or yellowish, surrounded by a dark colour is placed over the anterior end of the base of the pleura of abdominal somite 2, a similar, even slightly larger one in the anterolateral parts of somite 6. Tail fan with a broad transverse reddish band along or just before the posterior margin (Fig. 249) *P. argus* (Fig. 257)

1b. Abdominal somites smooth, without transverse groove. Third maxilliped without exopod

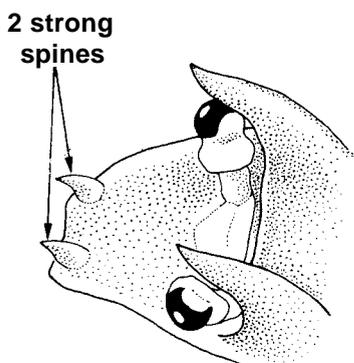
13a. Abdominal somites 1 to 6 with a distinct uninterrupted white transverse band along the posterior margin

14a. Antennular plate with 2 strong spines (Fig. 250a). Surface of abdominal somites naked and smooth. Colour: abdominal somites 2 to 5 with a white transverse band along the posterior margin which, however, is not set off by dark bands (Fig. 250b). Colour of body and abdomen usually greyish green without spots. Tailfan of a rather uniform colour. Legs irregularly spotted, not distinctly streaked. Indo-West Pacific *P. polyphagus* (Fig. 287)

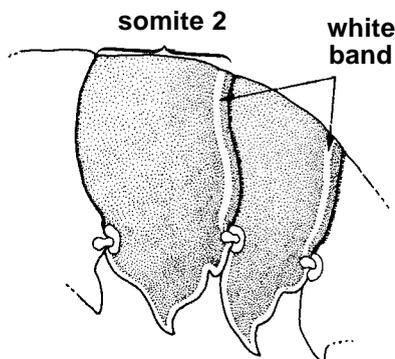


tailfan banded
abdomen (dorsal view) *P. argus* Fig. 249

14b Antennular plate with 4 strong spines arranged in a quadrangle (Fig. 252a). The whitish transverse bands along the posterior margin of the abdominal somites very distinct because they have a dark band in front and just behind them (Fig. 251,252b)

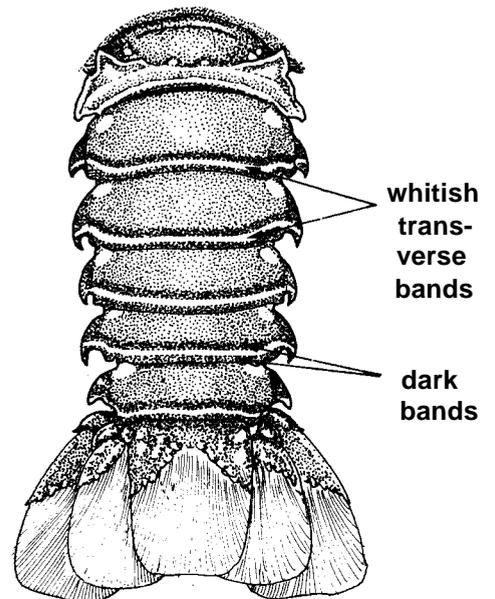


a. antennular plate



b. abdominal somites (lateral view)

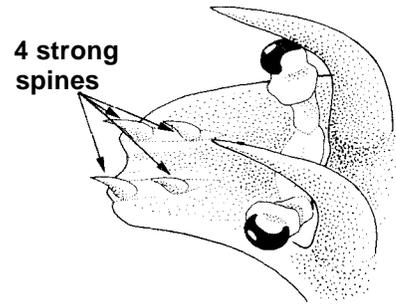
P. polyphagus Fig. 250



abdomen (dorsal view) *P. gracilis*

Fig. 251

15a. Eastern Pacific. Colour: carapace brownish or bluish green, almost uniform in colour or slightly and irregularly mottled. Antennae with the basal segments greenish, the flagella bluish green *P. gracilis* (Fig. 263)

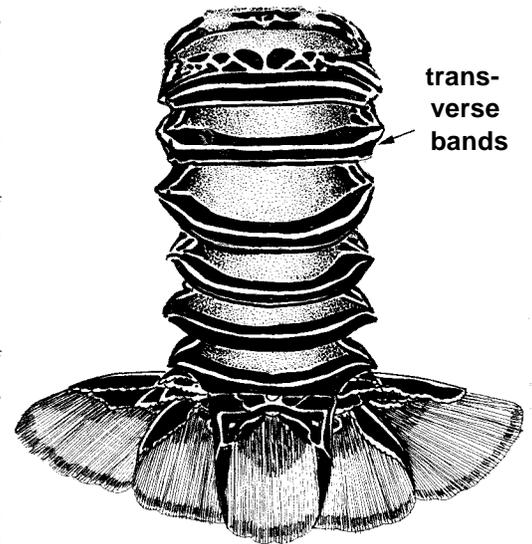


a. antennular plate (lateral view)

15b. Indo-West Pacific. Colour: carapace whitish with well defined, sharply delimited areas of bluish black, which contrast very conspicuously with the light background. Antennal peduncles pink, the flagella white *P. versicolor* (Fig. 293)

13b. Abdomen without distinct transverse bands on all somites, sometimes there is a line of pale spots there, or a narrow line is present on somites 1 to 3, but on somites 4 and 5 this is replaced by a row of spots. Antennular plate with 4 spines

16a. Abdominal somites 1 to 3 with a narrow transverse whitish line just before the posterior margin; somites 4 to 6 with a transverse row of rather large whitish spots there. Surface of abdominal somites smooth and naked (Fig. 253). Eastern Pacific *P. inflatus* (Fig. 269)



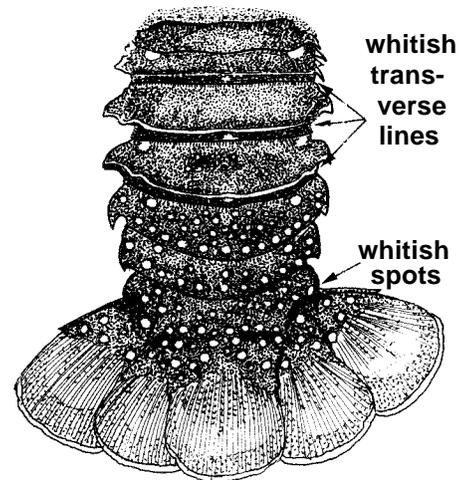
b. abdomen (dorsal view)

P. versicolor Fig. 252

16b. Abdominal somites 1 to 6 without transverse whitish bands; if a row of spots is visible along the posterior margin, these spots are very minute and the rows are found on all somites

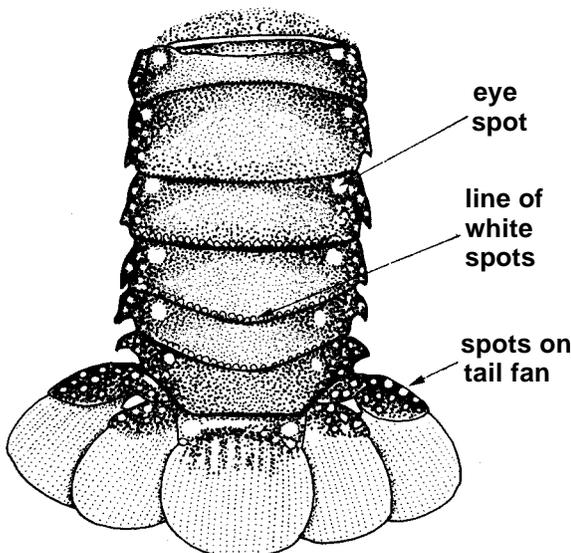
17a. Western Atlantic. A line of very small spots along the posterior margin of the abdominal somites, the rest of the upper surface of the abdomen not spotted. Pleura and hard part of tail fan with numerous very distinct spots in addition to a larger eye spot near the base of the pleura (Fig. 254). Frontal horns spotted *P. laevicauda* (Fig. 275)

17b. Indo-West Pacific. No line of small spots along the posterior margin of the abdominal somites. Colour of the abdominal pleura and of the hard part of the tail fan similar to that of the dorsal surface of the abdomen. Frontal horns with irregular transverse bands above, whitish below



abdomen (dorsal view)

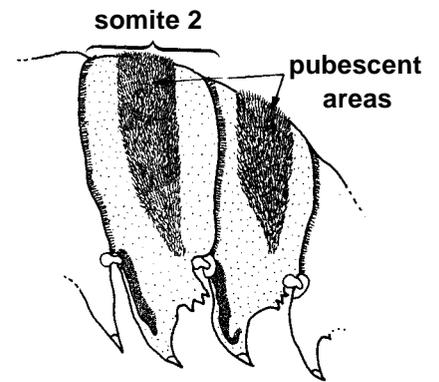
P. inflatus Fig. 253



abdomen (dorsal view)

P. laevicauda Fig. 254

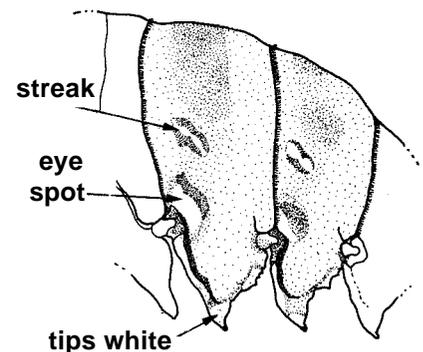
18a. Abdominal somites with a large pubescent area on each half of the dorsal surface (Fig. 255). The normal eyespot is present in the anterior half of the abdominal somites above the base of the pleura, but this spot is not accompanied by a light streak. Pleura without spots, but with a white line along the posterior margin. Tail fan of the same colour as the rest of the abdomen. Carapace without a peculiar marbling near the bases of the frontal horns. Legs longitudinally streaked*P. stimpsoni* (Fig. 291)



abdominal somites (lateral view)

P. stimpsoni Fig. 255

18b. Abdominal somites smooth and naked. Colour of abdomen brownish or greenish grey with at most minute indistinct speckles. The usual large eyespot in the anterior half near the base of the pleura is accompanied by an oblique pale streak placed somewhat mediad of the eyespot. The pleura have the tips white, sometimes this white colour extends slightly up the anterior and posterior margins (Fig. 256). Carapace with a peculiar and very characteristic marbling of -pale lines near the bases of the frontal horns. Legs not streaked, but with very sharply defined irregular dark spots of a bluish or brownish colour, which often form incomplete rings around the various segments. Antennal flagella distinctly ringed *P. ornatus* (Fig. 281)



abdominal somites (lateral view)

P. ornatus Fig. 256

Panulirus argus (Latreille, 1804)

Fig. 257

PALIN Panul 1

Palinurus argus Latreille, 1804, *Annales Muséum Histoire Naturelle*, Paris, 3:393.

Synonyms: *Palinurus ricordi* Guérin-Méneville, 1836; *Palinurus americanus* H. Milne Edwards, 1837; *Palinurus (Senex) argus* - Pfeffer, 1881.

FAO Names : **En** - Caribbean spiny lobster; **Fr** - Langouste blanche; **Sp** - Langosta común del Caribe.

Type : Type locality of *Palinurus argus*: unknown: "Je la soupçonne des Grandes-Indes", later corrected by Lamarck (1818) to "l'Océan du Bresil". Type material in MP: 3 possible syntypes from "Antilles", nos. Pa. 438, 439, 442 dry, in tolerable condition.

Type locality of *Palinurus ricordi*: "aux Antilles". Lectotype (dry specimen in reasonable condition) in ANSP, no. 207 (Guerin coll. no. 276).

Type locality of *Palinurus americanus*: "les Antilles". Syntypes in MP, possibly one, no. Pa. 443, left. "M. l'Herminier-Guadeloupe", a dry specimen in tolerably good condition.

Geographical Distribution : Western Atlantic: Bermuda and the east coast of USA at North Carolina, to Rio de Janeiro, Brazil, including the entire Gulf of Mexico and the Caribbean Sea (Fig. 258). Reported twice from West Africa (Ivory Coast).

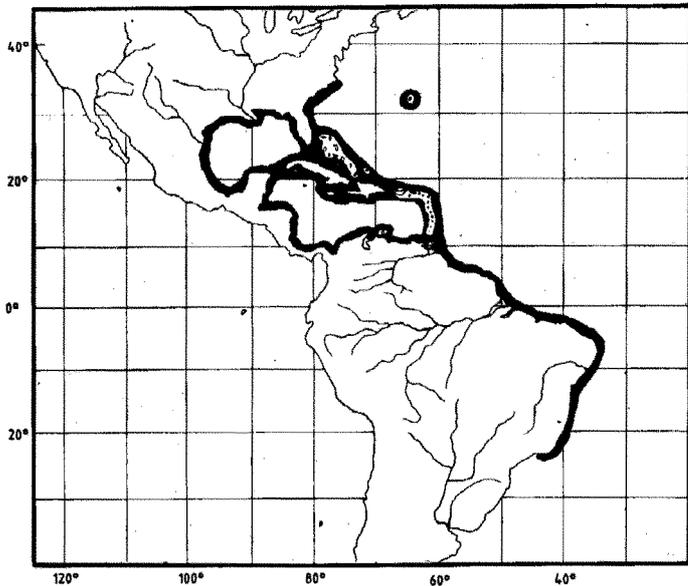


Fig. 258

Habitat and Biology : Inhabits shallow waters, occasionally down to 90 m depth, perhaps even deeper. Found among rocks, on reefs, in eelgrass beds or in any habitat that provides protection. The species is gregarious and migratory. Females move to deeper water for spawning and there are mass migrations in the autumn when the animals, in single files of up to 50 individuals, move in a certain direction in daytime, each animal having body contact with the next through the antennae. In the northern part of its range, larvae are found mainly from June to December.

Size : Maximum body length about 45 cm, average length to about 20 cm.

Interest to Fisheries : This is the most important commercial Palinurid in American waters. It is fished practically throughout its range. The catches of this species reported in the FAO Yearbook of Fisheries Statistics amounted to 32 854 metric tons in 1987 and 33 903 metric tons in 1988, taken mainly by Cuba, Brazil, Bahamas, USA and Honduras. The species is mostly caught with traps, but also taken by hand, speared and trawled. It is marketed fresh; the tails are exported frozen or canned.

Local Names : ARUBA: Kreef; CURACAO: Kreef; CUBA: Langosta; FRANCE: Langouste d'Amérique, Langouste américaine, Langouste argus; MARTINIQUE: Homard blanc; MEXICO: Langosta del Golfo; USA: Spiny lobster, Bermuda spiny lobster, Common spiny lobster, Crawfish, Florida spiny lobster, West Indian langouste, West Indian spiny lobster.

Literature : Fischer (ed.), 1978: vol. 6; Williams, 1986: 19, figs 44, 79 b,c.

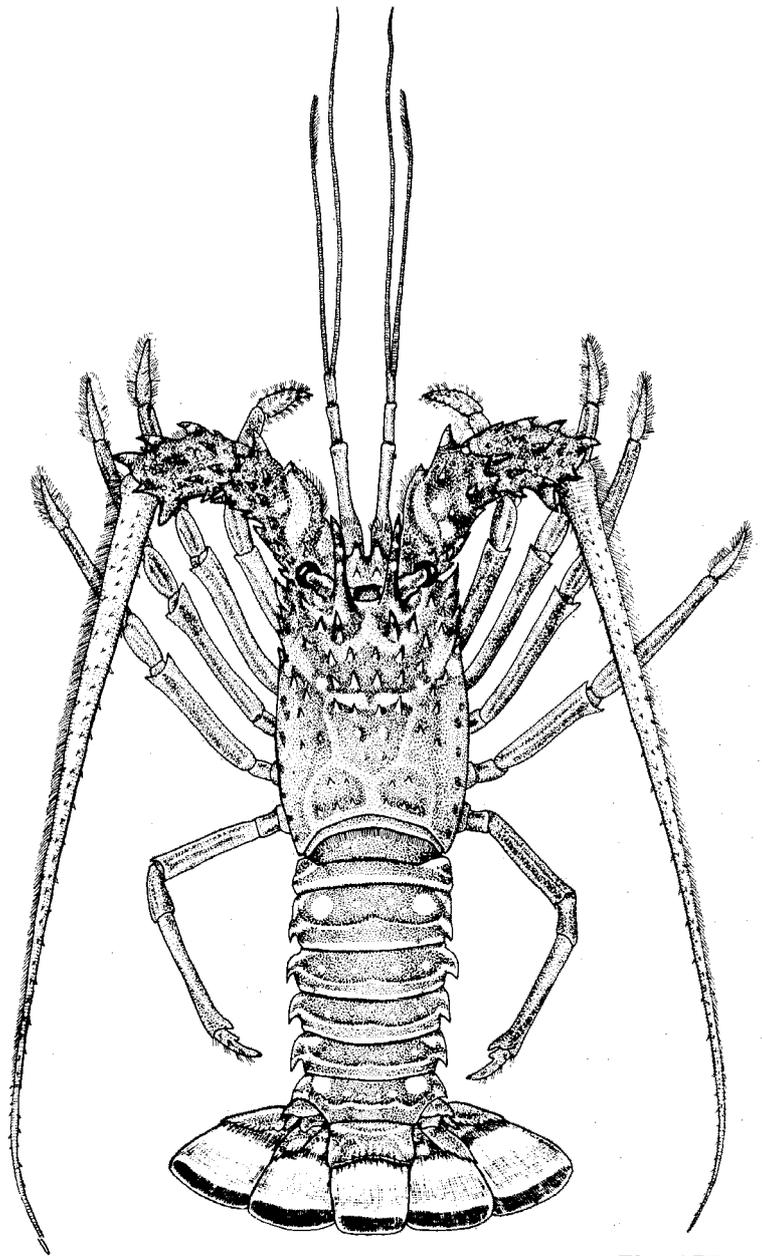


Fig. 257

Panulirus Cygnus George, 1962

Fig. 259

PALIN Panul 12

Panulirus Cygnus George, 1962, *Journal Royal Society Western Australia*, 45(4): 100, text-figs 1-4, pls 1,2.

Synonyms: *Panulirus longipes Cygnus* - Chittleborough & Thomas, 1969. In the older literature concerning Western Australian lobsters, the present species has often incorrectly been given the name *Panulirus longipes* (A. Milne Edwards).

FAO Names : **En** - Australian spiny lobster; **Fr** Langouste d'Australie; **Sp** - Langosta de Australia.

Type : Type locality: "Radar Reef, Rottnest Island, Western Australia (32°00'S 115°30'E), in reef pool at depth of 1 metre". Holotype male in WAM, no. 90-62.

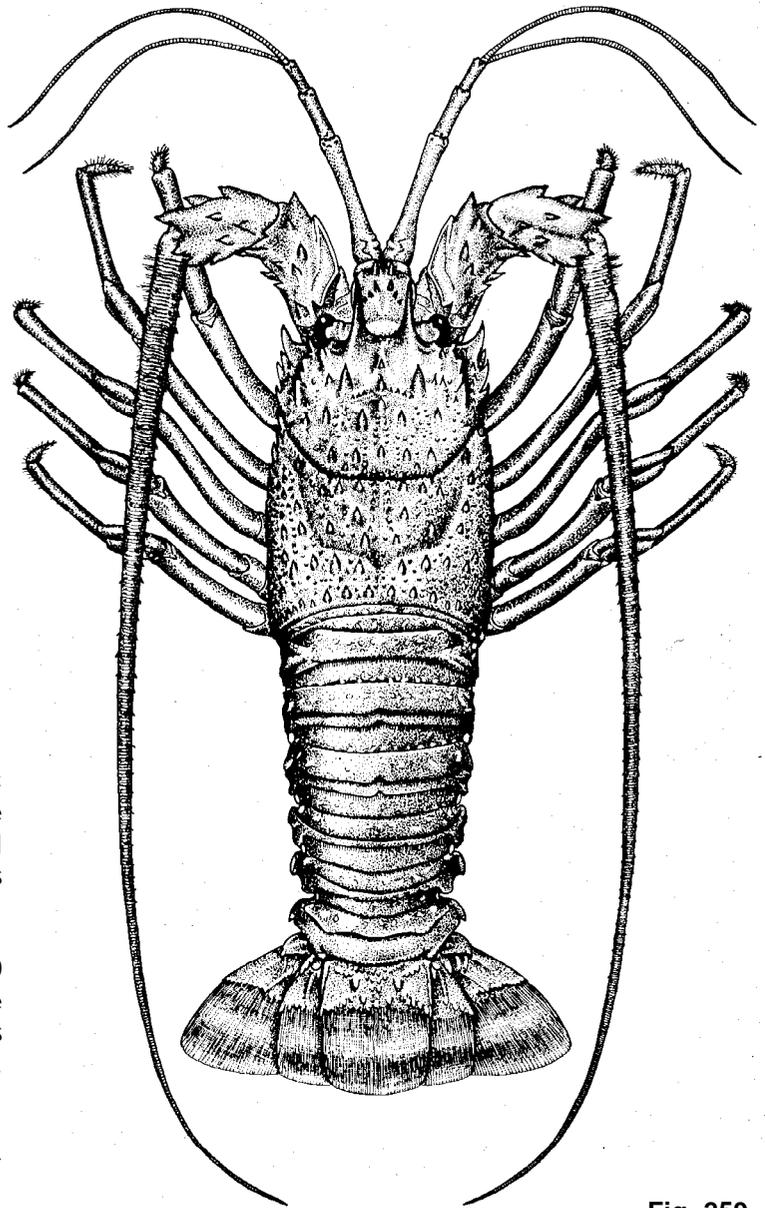
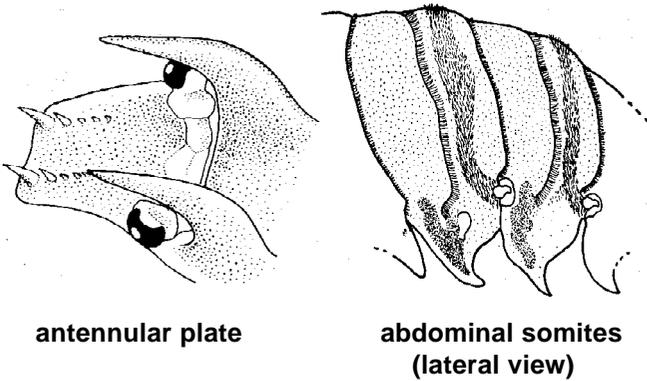


Fig. 259

Geographical Distribution : Indo-West Pacific region: restricted to Western Australia, namely on the west coast between Northwest Cape (21°48'S) and Hamelin Harbour (34°30'S) and at the offshore islands (Fig. 260).

Habitat and Biology : Found in depths between 0 and 90 m; rarely as deep as 120 m. The animals are nocturnal and shelter in the daytime in rock crevices and among coral. They undertake limited migrations. The species is omnivorous.

Size : Maximum carapace length 14 cm, corresponding to a total body length of about 40 cm. Average between 8 and 10 cm carapace length. The carapace length of ovigerous females or those with spermatophores is 9 to 11 cm..

Interest to Fisheries : The fishery of this species is of major importance in Australia. According to FAO Yearbook of Fisheries Statistics the annual catches were 11 025 metric tons in 1987 and in 1988. The season used to extend from 15 November to 14 August, but was reduced in 1978 from 15 November to 30 June. At the beginning of the season (November and December) the fishery takes the freshly moulted animals (the so-called "whites") which then leave the shallow reef areas. During the remaining part of the season, the "coastal red" lobsters are fished. The Arolhos Islands are exceptional as the season starts there on 15 March. The fishing activities are concentrated between 24° and 35°S, and the largest yields are obtained between 28° and 32°S.

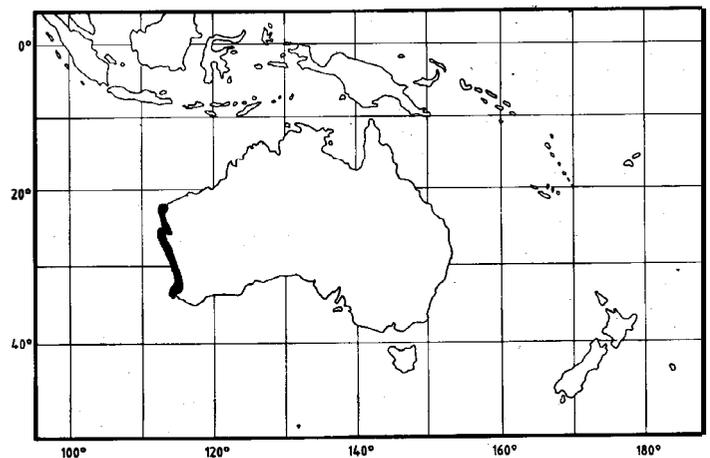


Fig. 260

The fishery operates lobster traps of various design and divers take specimens by hand. Apart from the closed season there are several protective measures: a minimum size limit (cl. 7.5 cm), bag limit for sports fishermen, restriction of the size of the lobster pots, etc.

The species is marketed fresh, but the greatest percentage is exported as frozen tails.

Local Names : AUSTRALIA: Western rock lobster (official name), Western Australian crayfish, Western cray.

Literature : Sheard, 1962; George & Holthuis, 1965:19, text-fig. 1d, pl. 4; Morgan & Barker, 1982-1987; Williams, 1986: 18, figs 39,78 k-l.

Panulirus echinatus Smith, 1869

Fig. 261

PALIN Panul 4

Panulirus echinatus S.l. Smith, 1869, Transactions Connecticut Academy Arts Sciences, 2:20,39.

Synonyms: ? *Panulirus inermis* Pocock, 1891; *Panulirus guttatus brasiliensis* Faria & Silva, 1937.

FAO Names : **En** - Brown spiny lobster; **Fr** - Langouste brune; **Sp** - Langosta marrón.

Type : Type locality: of *Panulirus echinatus*: "Pernambuco" (= Recife, Pernambuco State, Brazil). Whereabouts of type material unknown.

Type locality of *Panulirus inermis*: "Dredged in Water Bay [Fernando do Noronha, Brazil]. About 10 fathoms depth". Holotype (puerulus stage) in BM, no. 1888: 19, in alcohol, condition fair.

Type locality of *Panulirus guttatus brasiliensis*: "Atóll das Rocas. - latitude S.3°52'30" e longitude EM do Rio de Janeiro 9°20'26" - e Pernambuco". Whereabouts of type material unknown.

Geographical Distribution : Extreme N.E. Brazil (Ceará Rio Grande do Norte, and Pernambuco States) and the Central Atlantic Islands (Canary Islands, Cape Verde Islands, St. Pauls Rocks, Fernando do Noronha, Atol das Rocas, Ilha da Trindade, Ascension, St. Helena) (Fig. 262).

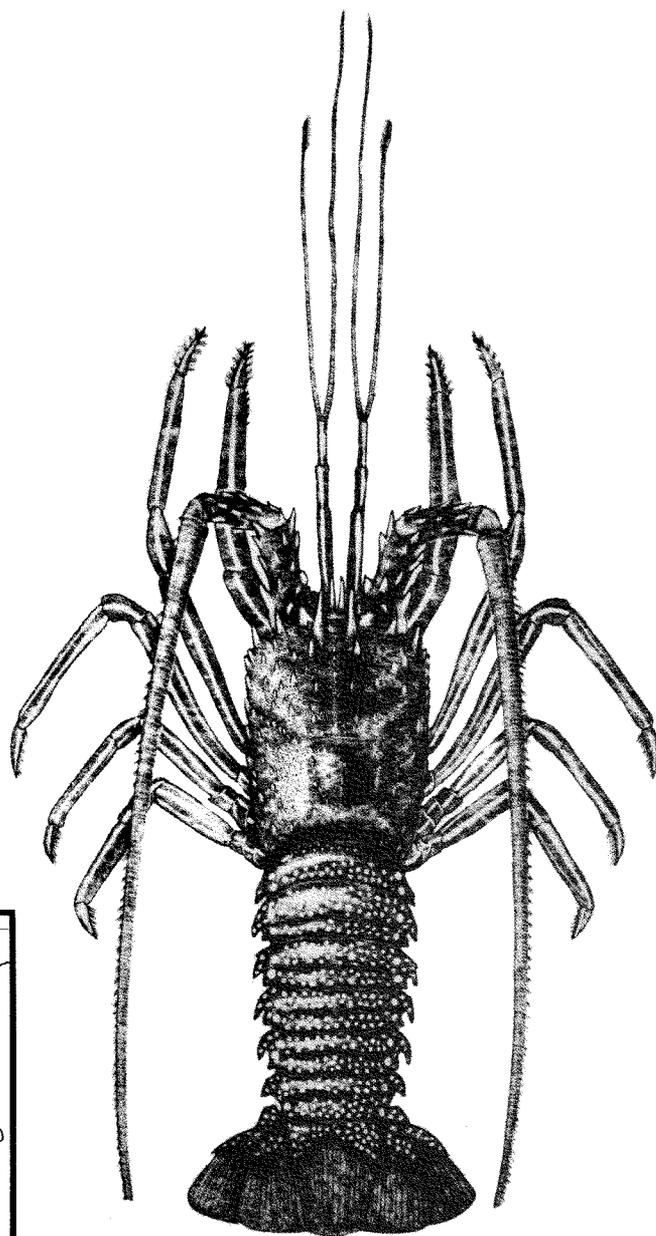


Fig. 261

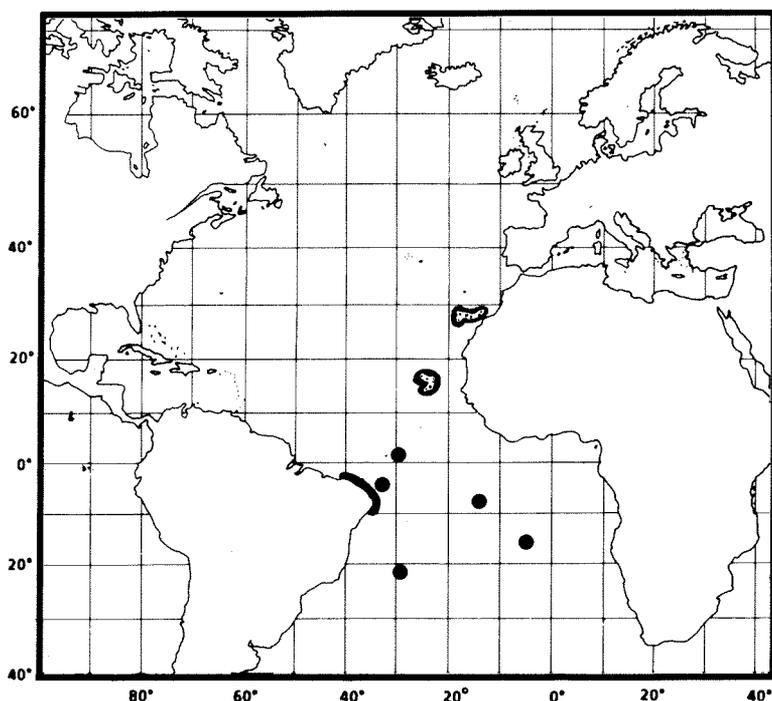


Fig. 262