

Habitat and Biology : Depth range from 1 to 4 m, rocky substrates. In clear water, not influenced by rivers, often in surf zone and in surge channels. Therefore often near arid coasts and on small islands. The species is not gregarious and is nocturnal, hiding in the daytime in crevices in the rocks and coral reefs.

Size : Maximum total body length about 40 cm, average adult length about 30 cm. Males usually much larger than females.

Interest to Fisheries : The species is fished wherever it occurs. Mostly taken by hand or with spears during diving in daytime, or with torch light near the surface at night. Traps do not seem not to be very effective, but are used in places; trammel nets seem to give better results. On the west coast of Thailand the species is sold in local markets or directly to restaurants. In the Galapagos the average catch is 50 to 100 lobsters per day. They are sold fresh for local consumption or as frozen lobster tails.

Local Names : AUSTRALIA: Coral cray, Double spined rock lobster; FIJI: Golden rock lobster, Uraukuta, Urauvatuvatu; GALAPAGOS ISLANDS: Langosta roja, Red lobster; HAWAII: Tufted spiny lobster, Uta; INDONESIA: Udang barong; JAPAN: Shima ise-ebi; MALAYSIA: Udang karang; MEXICO: Langosta de Isla Socorro; MOZAMBIQUE: Lagosta cornuda; NEW CALEDONIA: Grosses têtes (name used for large males), Vraie tangouste verte; PALAU: Raiklius; PHILIPPINES: Banagan, Spiny lobster, Tufted spiny lobster; SOUTH AFRICA: Variegated crayfish; TAHITI: Oura-miti; THAILAND: Kung king kong (for large specimens, Phuket), Kung mangkon; TUAMOTU ISLANDS: Komanga; USA: Socorro spiny lobster; VIETNAM: Tôm hum.

Literature : Fischer & Bianchi (eds), 1984:vot. 5; Williams, 1986:18, figs 40,78 m-n.

Panulirus polyphagus (Herbst, 1793)

Fig. 287

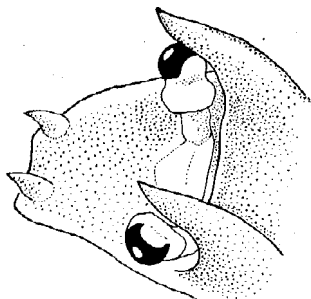
PALIN Panul 10

Cancer (Astacus) polyphagus Herbst, 1793, Versuch einer Naturgeschichte der Krabben und Krebse, 2:90, pl.32.

Synonyms: *Palinurus fasciatus* Fabricius, 1798; *Palinurus polyphagus* - Bosc 1802; *Panulirus orientalis* Doflein, 1900.

FAO Names : **En** - Mud spiny lobster; **Fr** - Langouste de vase; **Sp** - Langosta fanguera.

Type : Type locality of *Cancer polyphagus*: "Das Vaterland ist Ostindien". The dry holotype or lectotype in ZMB, no. 1973, in good condition.



antennular plate

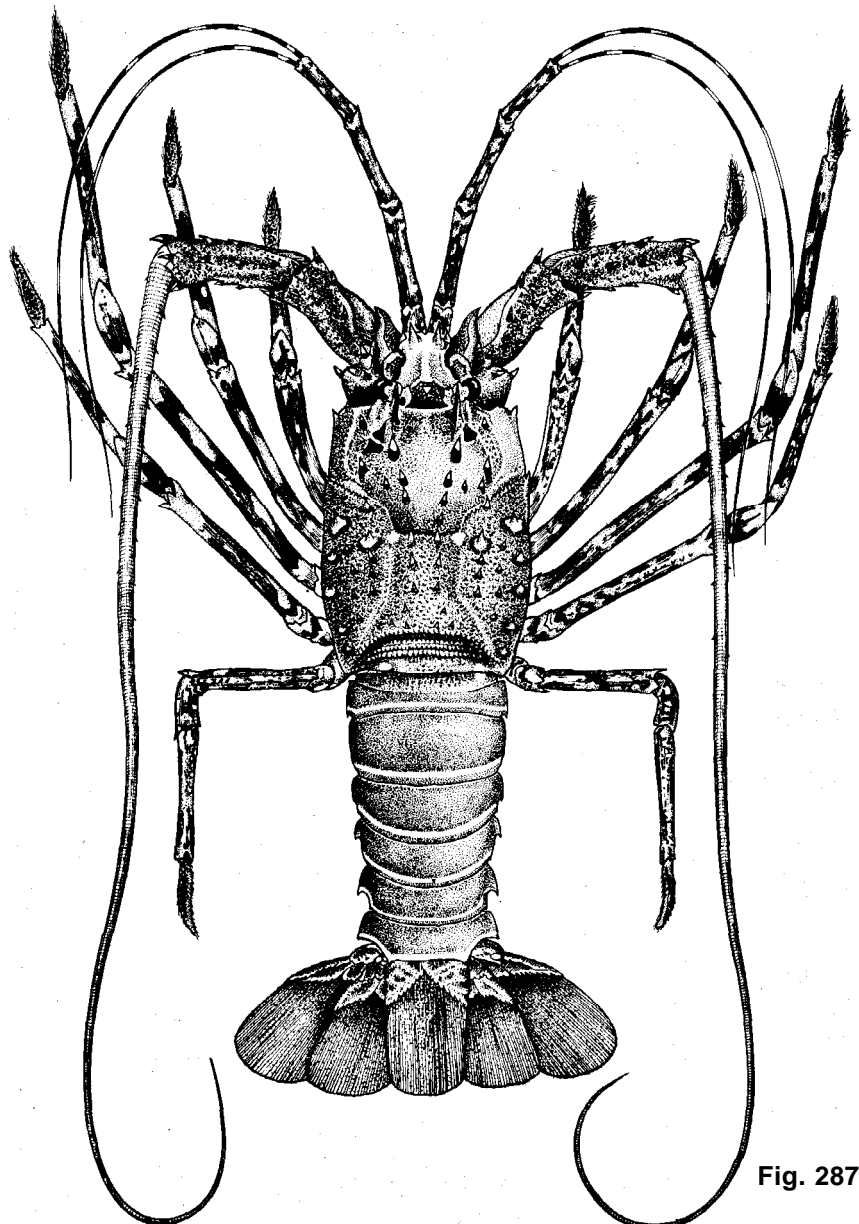


Fig. 287

Type locality of *P. fasciatus*: "Habitat in Oceano Indico Dom. Daldorff". I.K. Daldorff, a Danish officer at Tranquebar, SE. India, collected there for Fabricius and also Herbst obtained material from him. The type material of *P. fasciatus* almost certainly came from the Tranquebar area, and there even is a possibility that Herbst's material of *C. polyphagus* was also obtained from Daldorff, so that the type localities of the two species would be very close, but this is only a guess. Three syntypes of *P. fasciatus* are in UZM, preserved in alcohol, condition reasonable.

The statement of the type locality of *P. orientalis* is: "Japan. Salmin". Balss (1914:76), who examined Doflein's type specimen and synonymized *P. orientalis* with the present species, remarked that the locality indication "Japan" is doubtful "da auf Salmins Fundorte in unserer Sammlung kein Verlass ist" and as the species was not known from Japan. C-L. Salmin was a dealer in natural history objects in Hamburg in the second half of the last century (the Lei den Museum had dealings with him between 1863 and 1875) and evidently, like several of such dealers at that time was not very accurate with labelling his material. The true type locality of *P. orientalis* thus is unknown; the holotype was in ZSM, now probably lost (not located in 1989).

Geographical Distribution : Indo-West Pacific region, from the coasts of Pakistan and India to Vietnam, the Philippines, Indonesia, N.W. Australia and the Gulf of Papua (Fig. 288).

Habitat and Biology : The species is found on muddy substrates and sometimes on rocky bottoms. Often found near river mouths, in turbid water. Depth range from 3 to 90 m, but usually far less than 40 m.

Size : Maximum total body length: about 40 cm, common from 20 to 25 cm.

Interest to Fisheries : In the Bay of Bengal and the Gulf of Thailand, the species is quite important commercially. In India, the main fishing season extends from November to March. The animals are caught by trawling, but also with set nets, seines, etc.; they rarely enter traps. Sold fresh and frozen in local markets and also transported to the larger towns. Served regularly in restaurants in Thailand, and else-where. In Thailand, mounted dry specimens, usually in fancy glass cases, are sold as curios to tourists.

Local Names : BURMA: Kyauk-pazun; INDONESIA: Udang barong; PAKISTAN: Kikat (Sindhi), Kikka (Baluchi); PHILIPPINES: Banag, Banagan; THAILAND: Kung mangkon; VIETNAM: Tom hum.

Literature : Fischer & Bianchi (eds), 1984: vol. 5.

Remarks: As the specific name *fasciatus* formerly has often been used not for this species but for *P. versicolor*, old records of *P. fasciatus* have to be treated with much reserve.

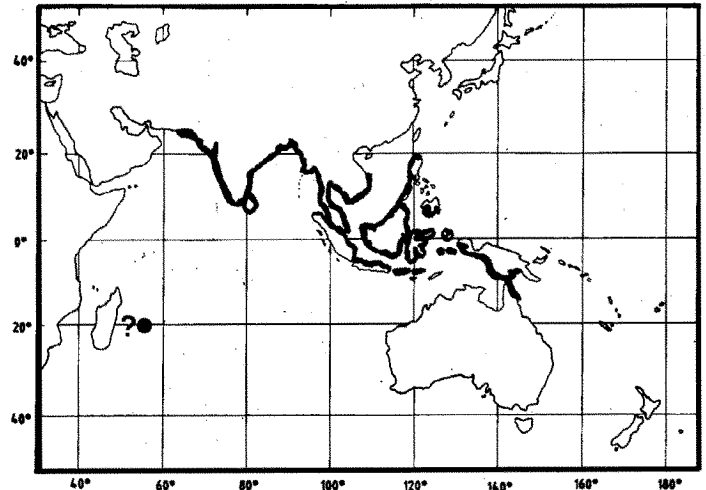


Fig. 288

Panulirus regius De Brito Capello, 1864

Fig. 289

PALIN Panul 5

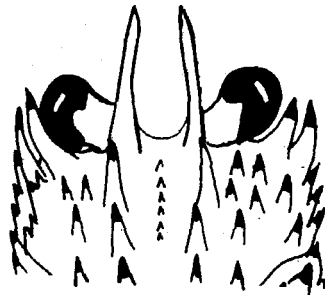
Panulirus regius De Brito Capello, 1864, *Memorias Academia real ciencias Lisboa (classe ciencias matematicas, physicas e naturaes)*, (2)3:5, fig. 1.

Synonyms: *Phyllosoma commune* Leach, 1817; *Palinurus rissonii* Desmarest; 1825; *Palinurus (Senex) longipes* Pfeffer, 1881 (non A. Milne Edwards, 1868); *Palinustus phoberus* De Rochebrune, 1883; *Puer atlanticus* Bouvier, 1905.

FAO Names : En - Royal spiny lobster; Fr - Langouste royale; Sp - Langosta real.

Type : Type locality of *P. regius*: "Habita os mares das ilhas de Cabo-Verde. Na ilha de S. Vicente d'este archipelago foi encontrado o exemplar que nos serviu de typo" (= São Vicente, Cape Verde Archipelago). Holotype in MNL, Lisbon, Portugal, lost in the fire of 1978.

Type locality of *Phyllosoma commune*: "Taken at Porto Praya and during the voyage until 2,58,0 S lat. 9,21,22 E long." (West Africa from Porto da Praia, Ilha de São Tiago, Cape Verde Islands, 14°54'N, 23°31'W, and from there to off Gabon 2°58'S, 9°21'22"E). Four syntypes in BM, no. 170 (dry, condition fair).



front margin of carapace

Type locality of *P. rissonii*: "Nice", s. France. Whereabouts of type material unknown.

Type locality of *P. longipes* Pfeffer: "Monrovia" (Liberia, 6°19'N 10°48'W) and "St. Thomé West-Afrika" (Ilha de São Thomé 0°12'N, 6°39'E). Syntypes in ZMH.

Type locality of *Palinustus phoberus*: "Embouchure de la Gambie et de la Casamence" (= mouths of the Gambia River, Gambia, and of the Casamence River, southern Senegal). Types in MP, no longer extant.

Type locality of *Puer atlanticus*: " dans le trémail, par 20 mètres de profondeur, au voisinage de Sainte-Lucie, île du Cap Vert " (= Ilha de Santa Luzia, Cape Verde Islands, 16°46'N 24°45'W); holotype in MOM, no. 380624 (in alcohol).

Geographical Distribution : Eastern Atlantic region: west coast of Africa between Cape Juby (Morocco) and Mocâmedes (S. Angola), and western Mediterranean (east coast of Spain, south coast of France) (Fig. 290).

Habitat and Biology : The species inhabits shallow water from the sublittoral to 40 m, but is mostly found between 5 and 15 m. It seems to prefer rocky bottoms.

Size : Maximum total body length 35 cm, usually not more than 25 cm.

Interest to Fisheries : The species is fished for throughout its range, mostly with vertical nets or by trawling; it is also taken by hand or with lobster pots. The lobsters are sold fresh locally. French (Breton) and Spanish fishing boats bring the specimens alive (or frozen) to France and Spain where they are marketed. In some places in Spain, the lobsters are kept alive in "viviers" before being sold. In Angola "the quantity of "lobsters" is not sufficient to assure the development of fisheries on large commercial scale" (Da Franca, 1966: 1).

Local Names : ANGOLA: Lagosta Verde; CAPE VERDE ISLANDS: Lagosta Verde; GAMBIA: Soum; GHANA: Blue crawfish; MOROCCO: Azeffane, Bakhouche, Langusta (also used for *Palinurus* species); SENEGAL: Soum, Soumpé

Literature : Fischer, Bianchi & Scott (eds), 1981 :vol 5; Williams, 1986:21, figs 50, 79 j-k; Fischer, Bauchot & Schneider (eds), 1987:311.

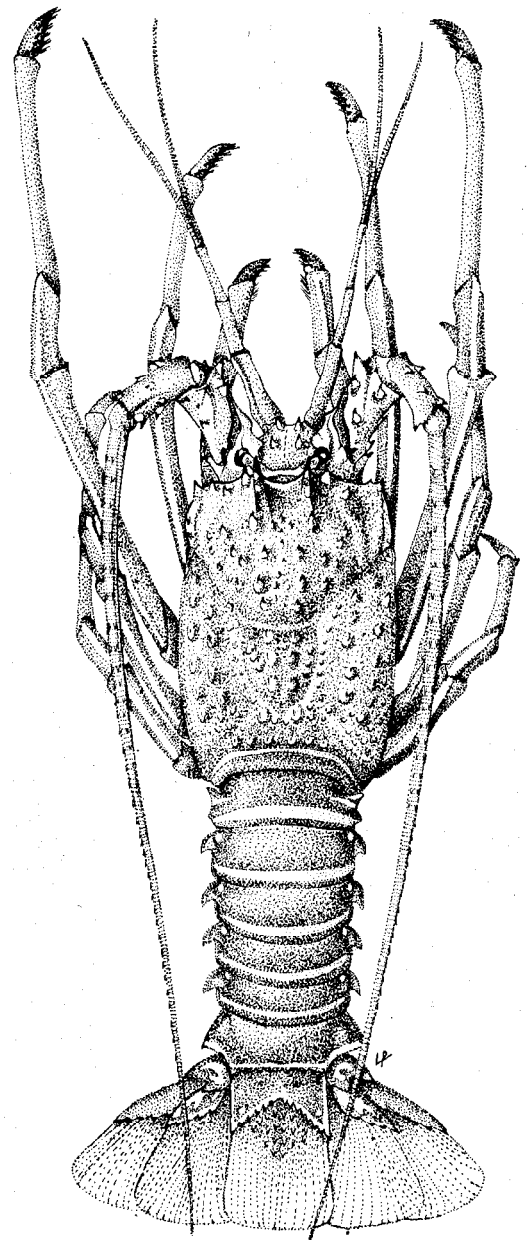


Fig. 289

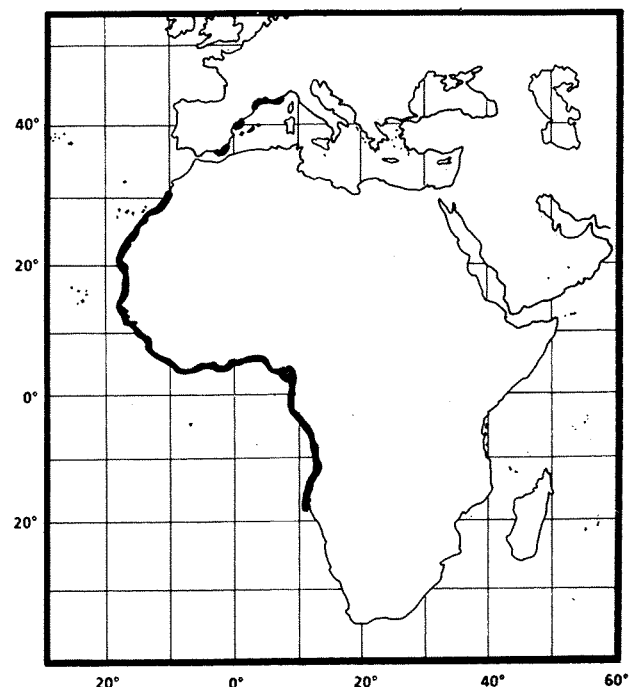


Fig. 290

Panulirus stimpsoni Holthuis, 1963

Fig. 291

PALIN Panul 19

Panulirus stimpsoni Holthuis, 1963, *Proceedings Koninklijke Nederlandse Akademie Wetenschappen*, (C) 66:54.

Synonyms: *Palinurus godeffroyi* (Pfeffer MS.) Holthuis, 1978.

FAO Names : En - Chinese spiny lobster.

Type : Type locality of *Panulirus stimpsoni*: "Hong Kong". Holotype female in RMNH, no. D 3541.

Type locality indication of *Palinurus godeffroyi*: "Südsee" [= Pacific Ocean], indication probably incorrect. Holotype male in ZMH, no. 8005.

Geographical Distribution : Indo-West Pacific region. Coast of southern China between Shanghai and Shantou (= Swatow); Hong Kong; Taiwan. Recently also found in the Gulf of Thailand off Chonburi province (Fig. 292).

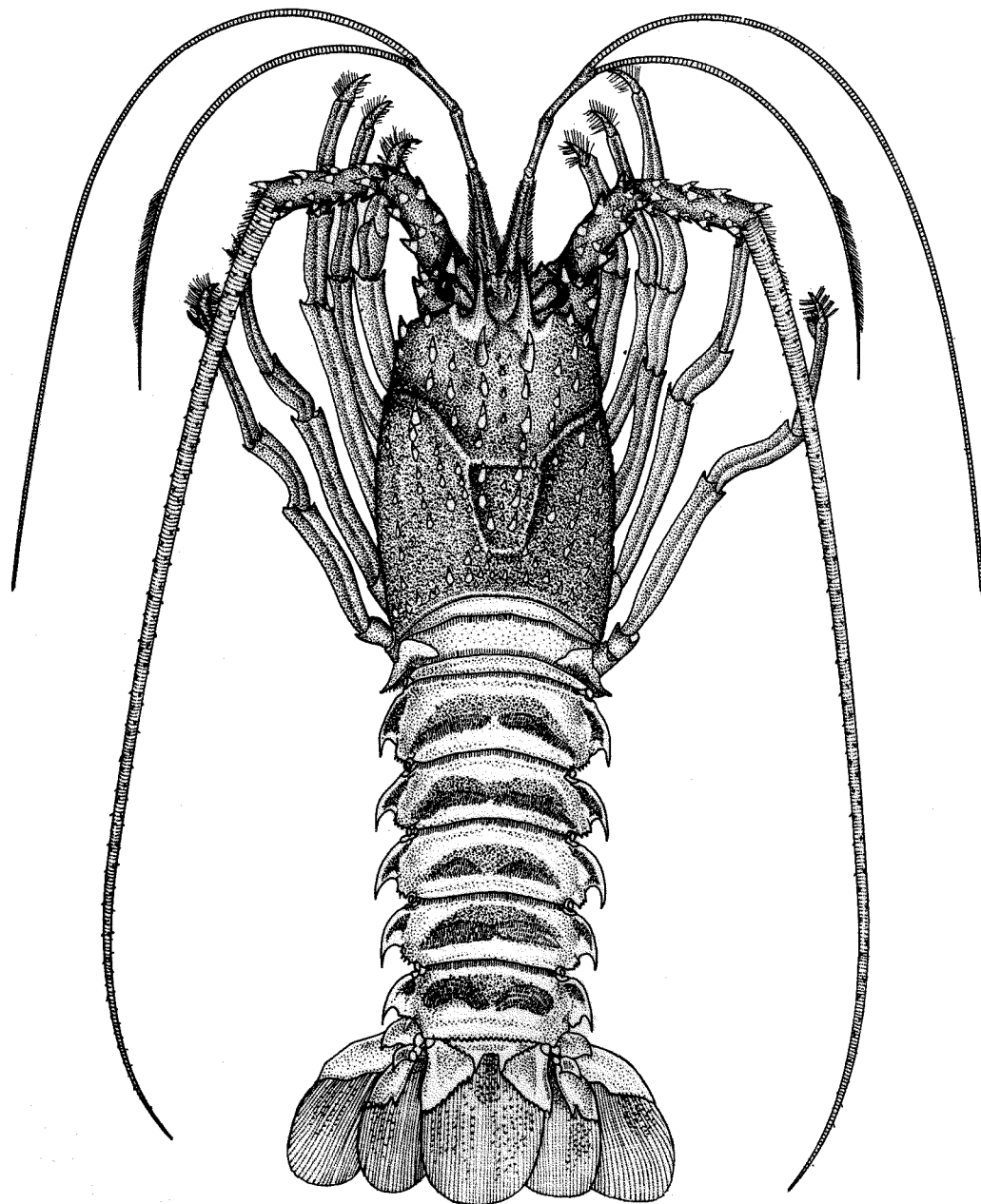
Habitat and Biology : The species seems to inhabit rocky areas in shallow water.

Size : Known carapace lengths: 6.5 to 10.5 cm (males), and 5 to 6.5 cm (females). The corresponding total body lengths are about 16 to 28 cm (males), and 13 to 16 cm (females).

Interest to Fisheries : The species is of commercial interest notwithstanding its relatively small size. Caught throughout its range, mostly with tangle nets, rarely by lobster traps. Sold fresh on local markets. In Hong Kong, it is mainly caught in February/March and August, September. The species is reared and cultured in China (Liu, 1986:44).

Local Names : HONG KONG: Green lobster, Luk Sik Lung Ha; THAILAND: Kung mangkon

Literature: George & Fischer, 1978:93-95,fig1; Holthuis,1978:95-100, pl. 1 Liu, 1986:45



(after George & Fischer, 1978)

Fig. 291

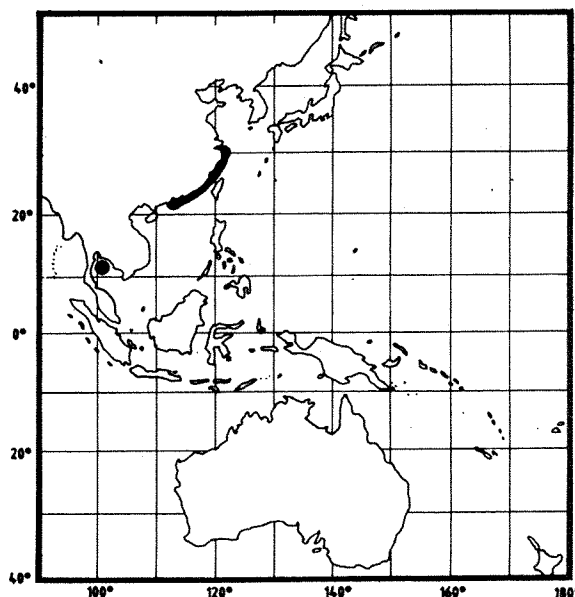


Fig. 292

Panulirus versicolor (Latreille, 1804)

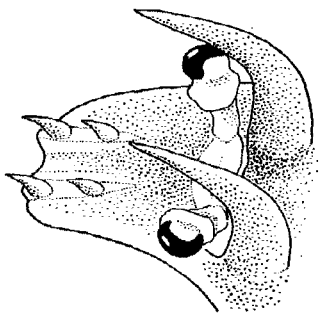
Fig. 293

PALIN Panul 11

Palinurus versicolor Latreille, 1804, *Annales Muséum Histoire naturelle*, Paris, 3:394.

Synonyms: *Palinurus taeniatus* Lamarck, 1818; *Panulirus taeniatus* - White, 1847; *Palinurus (Panulirus) ornatus decoratus* Heller, 1865; *Puer spiniger* Ortmann, 1894; *Panulirus demani* Borradaile, 1899; *Senex ornatus laevis* Lanchester, 1901; *Puerulus spiniper* - Calman, 1909; *Panulirus ornatus laevis*- De Man, 1916.

FAO Names : En - Painted spiny lobster; Fr - Langouste barriolée; Sp - Langosta colorete.



antennular plate

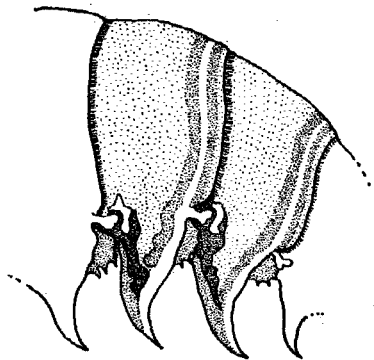
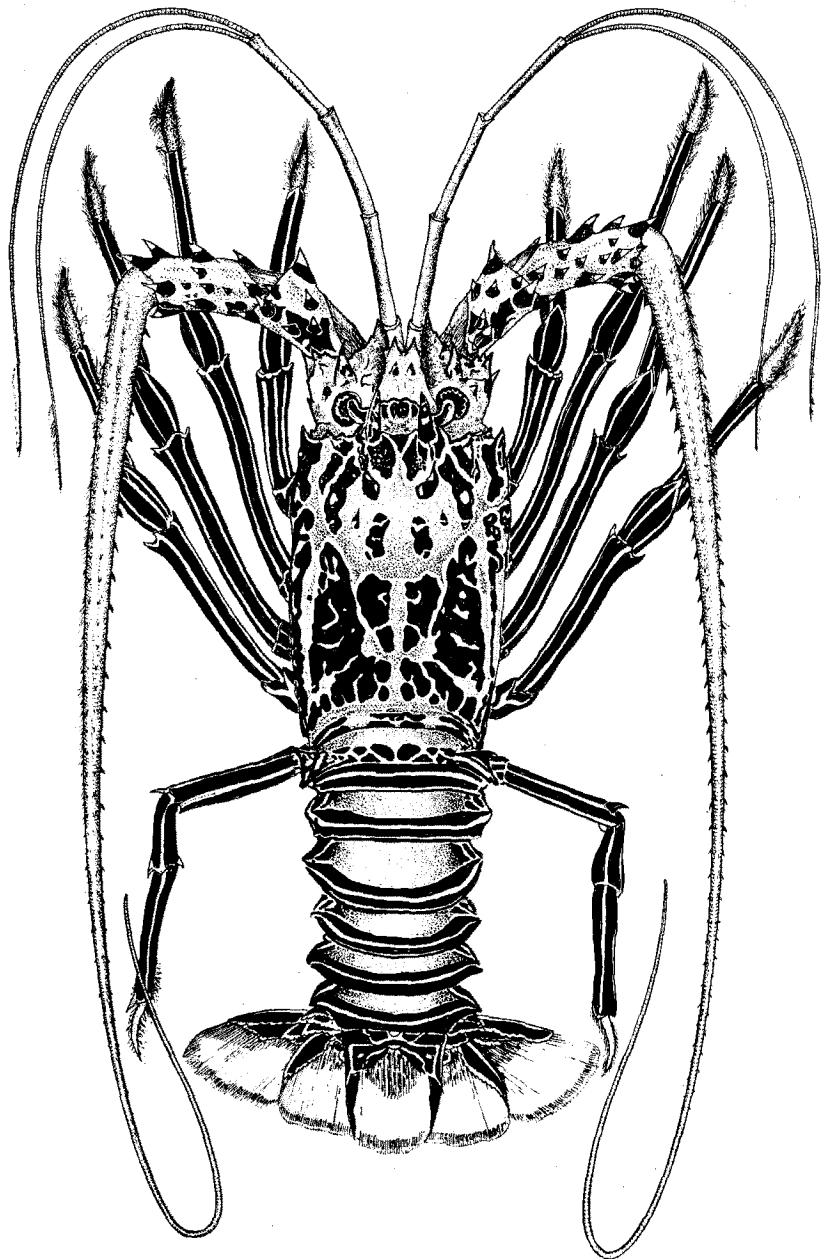
abdominal somites
(lateral view)

Fig. 293

Type : Type locality of *Palinurus versicolor*: "Cette jolie espece nous est arrivée par la frégate le Naturaliste".. The "Naturaliste" together with the "Geographe" left Le Havre, France, on 18 October 1800 on a voyage of discovery to Australia. F. Peron and CA. Lesueur, whose names as zoologists are well known in connection with this expedition, shipped on the Géographe, the zoologists on board the "Naturaliste" were G.J.B.M. Bory de St Vincent and D. Dumont. Bory de St Vincent, however, did not travel beyond Mauritius, where he stayed for a year. The two ships arrived at Mauritius (Ile de France) on 16 March 1801 and left 25 April. The "Naturaliste" reached SW. Australia on 27 May 1801 and went from there to Timor where she stayed from 22 August to 13 November 1801. From Timor the "Naturaliste" went around S.W. Australia to Tasmania and Port Jackson, Sydney, and returned from there the same way to Shark Bay, Western Australia, which was left 23 March 1803 for Timor. On 3 June 1803 the ship headed home from Timor via Mauritius. The only two localities where the "Naturaliste" could have collected *Panulirus versicolor* are Mauritius and Timor. It seems best to select Mauritius as the restricted type locality. Types in MP, see under type of *P. taeniatus*.

Type locality of *P. taeniatus*: "Habite les mers de la Nouvelle Hollande" Lamarck (1818:211) cited *P. versicolor* Latreille as a synonym of his *P. taeniatus* (although he himself used the name *versicolor* for a species that probably is *P. penicillatus*). As Lamarck claims that the type specimens of his *P. taeniatus* are rather small, just as Latreille (1804) did for his own *P. versicolor*, it is possible, that *taeniatus* is just a new name for *versicolor* Latreille, and that the type material of the two is the same. The fact that the object of the voyage of the "Naturaliste" was to explore Australia ("Nouvelle Hollande"), may be the reason that Lamarck gave Australia as type locality for *P. taeniatus*, while its types probably were actually collected in Mauritius or Timor. In the Paris Museum, there are 3 specimens identified by Lamarck as *P. taeniatus* labelled "Ile de France" (= Mauritius), which may be the syntypes of this species and of *P. versicolor*.

Type locality of *P. ornatus decoratus*: "Java", Indonesia. Type material in NMW.

Type locality of *Puer spiniger*: "Amboina", Moluccas, Indonesia. Depository of syntypes unknown.

Type localities of *Panulirus demani*: "Blanche Bay, New Britian" (1 male syntype in ZMC, in alcohol, good condition), "Amboina" (Moluccas, Indonesia), "Neu-Guinea" (= southeast coast of Papua New Guinea between Yule Island and East Cape), "Thursday island" (Torres Strait, Australia) (material from the last three localities reported upon by Ortmann, 1894, the syntypes probably in the Zoological Institute, University of Jena, Germany), "Java-See" (Java Sea, Indonesia) (De Man, 1896; 2 juveniles syntypes in ZML).

Type locality of *Senex ornatus laevis* "Singora" (= Songkhla, S. Thailand on coast of Gulf of Thailand). Holotype male in ZMC, in alcohol, condition good.

Geographical Distribution : Indo-West Pacific region: entire Red Sea and east coast of Africa (south to Natal), to southern Japan, Micronesia, Melanesia, northern Australia and Polynesia (Fig. 294).

Habitat and Biology : In shallow water, from the sublittoral down to 15 m depth; in coral reef areas, often on seaward edges of the reef plateau. In clear water also in surf areas. The species is nocturnal and not gregarious; in daytime, it hides in crevices and cavities of the rocks.

Size : Maximum total length about 40 cm, average length less than 30 cm.

Interest to Fisheries : The species is taken wherever it occurs, mostly for local use; like all spiny lobsters it is considered to be excellent food. It is taken in daytime by divers, either by hand or with spears; at night it is hunted and speared at the reefs with the help of torch lights, it rarely enters traps. On the west coast of Thailand, it is sold fresh in markets or directly to restaurants; mounted specimens, usually in fancy glass cases are sold as curios to tourists.

Local Names : AUSTRALIA: Painted rock lobster; FIJI: Painted rock lobster, Uraudina; HONG KONG: Huk paak mun lung ha; INDONESIA: Udang barong; JAPAN: Goshiki ebi, Goshiki-ise-ebi; MALAYSIA: Udang karang; MOZAMBIQUE: Lagosta pintada; NEW CALEDONIA: La porcelaine, Porcelain crayfish; PAKISTAN: Kikat (Sindhi), Kikka (Baluchi); PHILIPPINES: Banag, Banagan, Marine crayfish, Painted crayfish; SOUTH AFRICA: Striped crayfish; THAILAND: Kung mangkon; VIETNAM: Tôm hum.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:23, figs 55,80c-d.

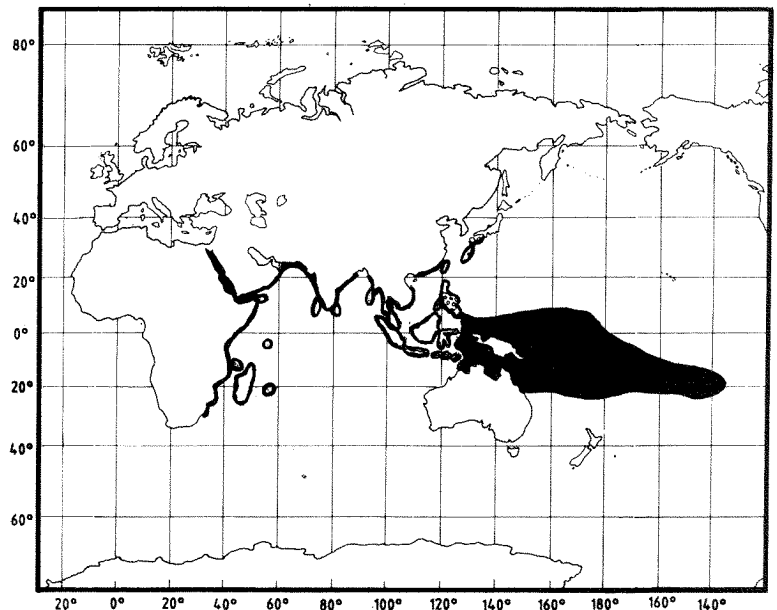


Fig. 294

Projasus George & Grindley, 1964

PALIN Proja

Projasus George & Grindley, 1964, Journal Royal Society Western Australia, 47(3):87. Gender masculine.

Type Species: by original designation and monotypy: *Jasus parkeri* Stebbing, 1902.

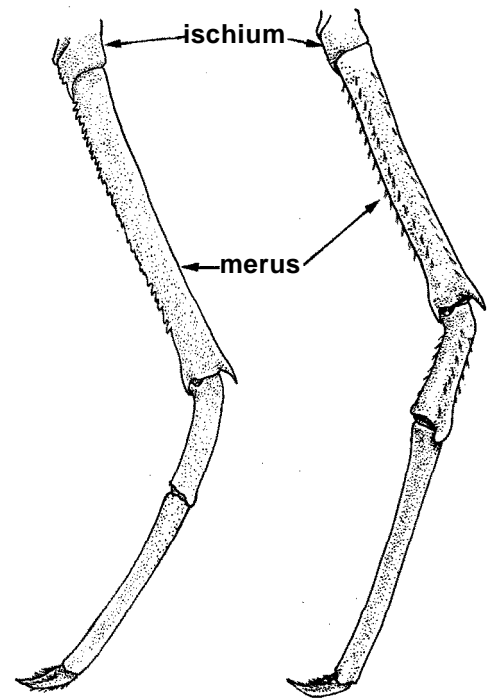
Synonyms : *Isopuerulus* Bahamonde, 1963, Noticiario mensual Museo Nacional Historia Natural, Santiaao, Chile, 7(81):4. Type species, by monotypy: *Jasus parkeri* Stebbing, 1902. Gender masculine. Name unavailable as it, when established, was not "accompanied by a description or definition that states in words characters that are purported to differentiate the taxon", and neither is there "a bibliographic reference to such a published statement" (Art. 13 of the International Code of Zoological Nomenclature).

Isopuerulus Bahamonde, 1965, Noticiario mensual Museo Nacional Historia natural, Santiago, Chile, 10(112):5. Type species by monotypy: *Jasus parkeri* Stebbing, 1902. Gender masculine. This time the name is availably established, even though barely so, as the author states that the genus is smaller than the genus *Jasus* ("de menor talla que la anterior"). However, now it is a junior objective synonym of *Projasus* George & Grindley, 1964.

At present two species are known to belong to this genus, neither is of importance to fisheries. On account of the scarcity of available material the taxonomy at the species level is not yet quite clear.

Key to Species :

- 1a Eastern Pacific. Spinules present on the ventral margin of the merus and ischium of the pereiopods (Fig. 295a) *P. bahamondei* (Fig. 296)
- 1b. Indo-West Pacific. No spinules on merus and ischium of the pereiopods (295b) *P. parkeri* (Fig. 298)



a. *P. bahamondei* pereiopod b. *P. parkeri* pereiopod
Fig. 295

Projasus bahamondei George, 1976

Fig. 296

PALIN Proja 1

Projasus bahamondei George, 1976, Crustaceana, 30(1):27, text-fig. 1, pl. 1.

Synonyms : Before 1976 not distinguished from *Projasus parkeri*.

FAO Names : En - Chilean jagged lobster.

Type : Type locality: "San Ambrosio Island, south-east Pacific, 26°21'S 79°47'W, 175 m". Holotype female in WAM, no. 104-72.

Geographical Distribution : Off the Chilean Coast between Huasco (Atacama) and Constitución (Maule), roughly between 29° and 35°S; also at the Islas Desventuradas, and near Juan Fernandez (Fig. 297).

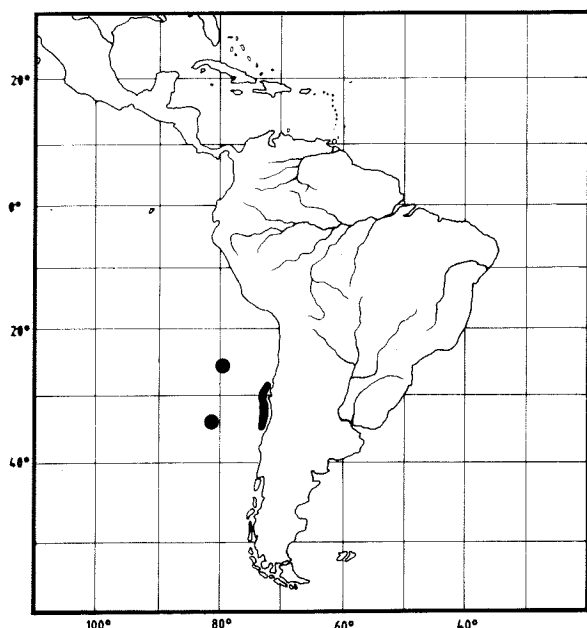


Fig. 297

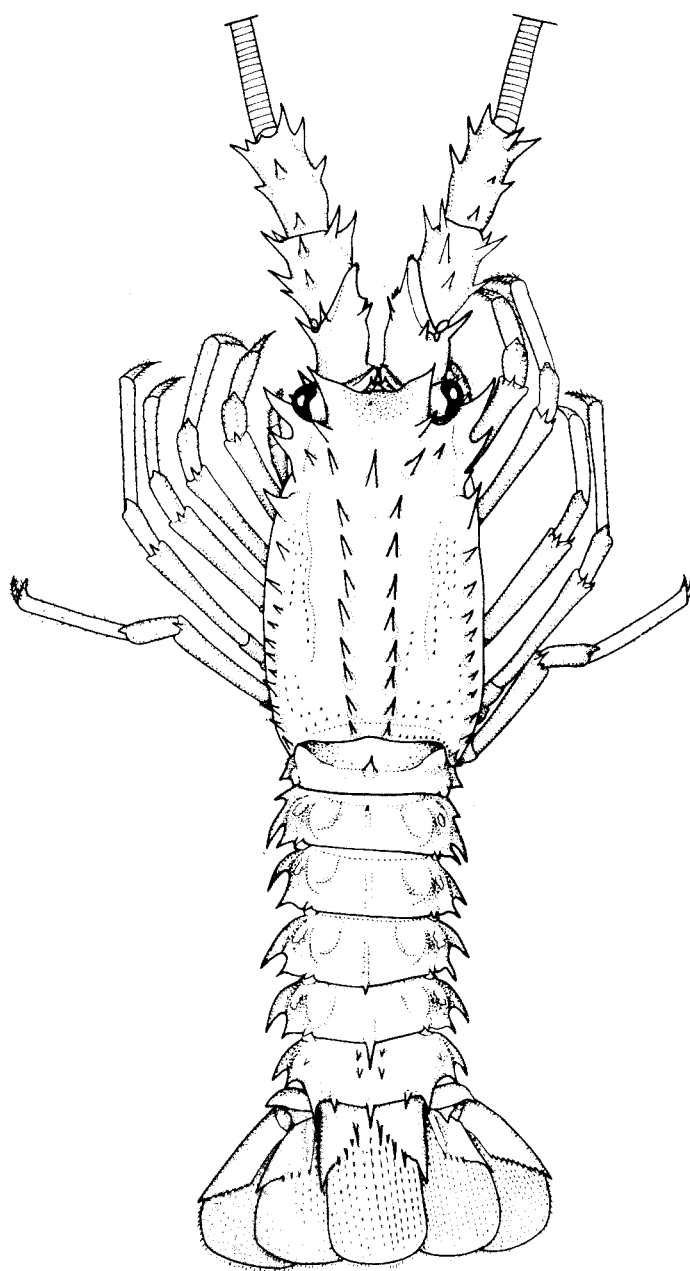
Habitat and Biology : Depth range from 175 to 300 m, on substrates of sandy mud, muddy sand and gravel.

Size : Maximum total body length about 18.5 cm; carapace length up to 7.5 cm.

Interest to Fisheries : Practically none. The species is taken as by-catch by the trawlers that fish for the shrimp *Heterocarpus reedi* Bahamonde. Báez & Ruiz (1985) suggested that the species might be sufficiently abundant near Juan Fernandez and the Islas Desventuradas to be of interest to fisheries.

Local Names : CHILE: Dalmacita, tangosta de Valparaiso, Langosta enana.

Literature : Original description; Webber & Booth, 1988:89-92, figs 6,8,9.



(from Retamal, 1981)

Fig. 296

Projasus parkeri (Stebbing, 1902)

Fig. 298

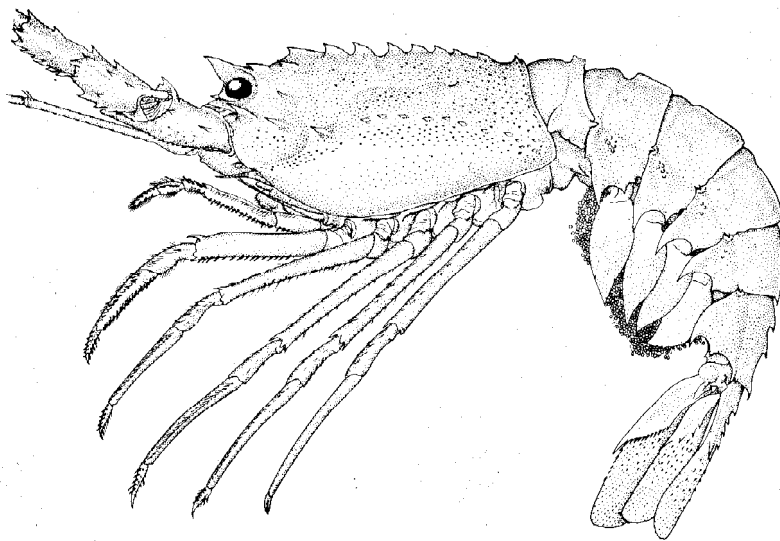
PALIN Proja 2

Jasus parkeri Stebbing, 1902, *Marine Investigations South Africa*, 2:39, pl. 7.

Synonyms : *Puerulus parkeri* - Holthuis, 1946; *Isopuerulus parkeri* - Bahamonde, 1963.

FAO Names : **En** - Cape jagged lobster.

Type : Type locality: "Buffalo River north 15 miles. Depth, 310 fathoms [= 567 m]. Bottom, coral and mud", Natal, South Africa, about 33°S 28°E. Holotype male in SAM, no. A 993 (in alcohol; condition good).



lateral view

Geographical Distribution : S.W. Africa (Valdivia Bank off Namibia); S.E. Africa (Cape Province north of East London, and Natal, South Africa); St. Paul Island; New Zealand (Fig 299). **A *Projasus* puerulus** stage taken off New South Wales, might belong here. A distribution map IS provided by Webber & Booth (1988).

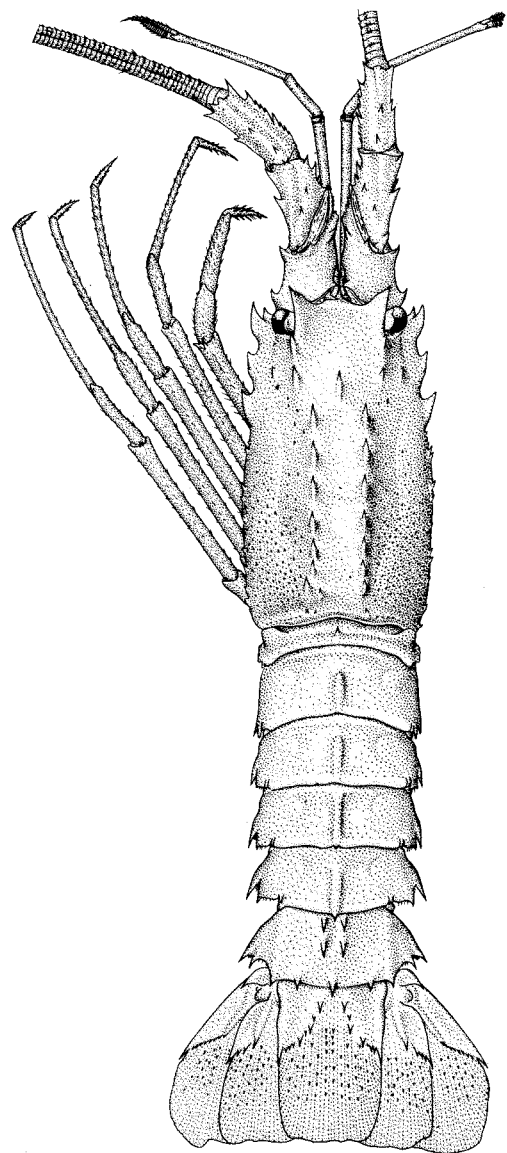
Habitat and Biology : Depth range from 370 to 841 m; bottom: mud with rocks and coral.

Size : Carapace length of S.W. African females 7.0-7.8 cm. Maximum total length for East African material: 13.4 cm (males) and 15 cm (females), maximum carapace length about 6 cm for both sexes. Specimens from St Paul Island had carapace length 7 cm (in both sexes). However, the sizes of specimens from New Zealand reported upon by Webber & Booth (1988) were distinctly larger: carapace length 6.9-8.2 cm (males) and 6.8-9.2 cm (females).

Interest to Fisheries: So far none. The species is rare, and even though lives on soft substrates, evidently is seldom caught in trawls

Local Names : SOUTH AFRICA: Parker's crayfish.

Literature : Barnard, 1950:540; Webber & Booth, 1988:81-92, figs 1-9; Melville-Smith, 1990.



dorsal view

Fig. 298

(both from Webber & Booth, 1988)

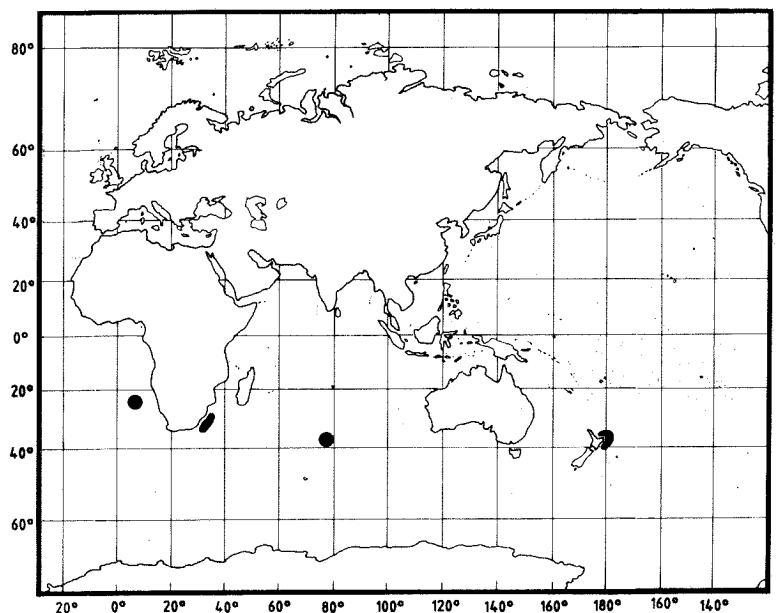


Fig. 299

Puerulus Ortmann, 1897, *American Journal Science*, (4)4:290. Replacement name for the preoccupied **Puer** Ortmann, 1891; therefore with the same type species. Gender masculine. Name placed on the Official List of Generic Names in Zoology, in Opinion 519 (published in 1958).

Type Species: *Panulirus angulatus* Bate, 1888.

Synonyms: **Puer** Ortmann, 1891, *Zoologische Jahrbücher, Systematik*, 6: 15,37. Type species, selected by Calman, 1909, *Annals Magazine Natural History*, (8)3:442: **Panulirus angulatus** Bate, 1888. Gender masculine. An invalid junior homonym of **Puer** Lefebvre, 1842 (Insecta Neuroptera).

So far 4 species have been recognized in this genus, all deepwater forms. One of them (*P. sewelli*) is the subject of a minor fishery. The others are not fished for, but are of potential interest.

Key to Species (after Berry, 1969):

1a. Postorbital spine present. No teeth, but 6 postcervical and 6 intestinal tubercles on the median keel of the carapace. Tubercles on carapace low and largely obscured by pubescence (Fig. 300a). Eyes large, much broader than long **P. velutinus** (Fig. 307)

1b. Postorbital spine absent. Median keel of carapace with 3 to 5 post-cervical and 2 to 4 intestinal teeth. Tubercles of carapace usually distinct and not obscured by the pubescence. Eyes smaller, longer than broad

2a Three or more teeth between the frontal horns and the cervical groove. Median keel of the carapace with 3 post-cervical and two intestinal teeth (Fig. 300b). Fifth pereopod of male not chelate **P. angulatus** (fig. 301)

2b. Two teeth between frontal horns and the cervical groove (Fig. 300c,d)

3a. Median keel of carapace with 3 postcervical and 2 (occasionally 3 or 4) intestinal teeth (Fig. 300c). Fifth pereopod of male chelate **P. carinatus** (Fig. 303)

3b. Median keel of carapace with 5 postcervical and 2 or 3 intestinal teeth (Fig. 300d). Fifth pereopod of male not chelate **P. sewelli** (Fig. 305)

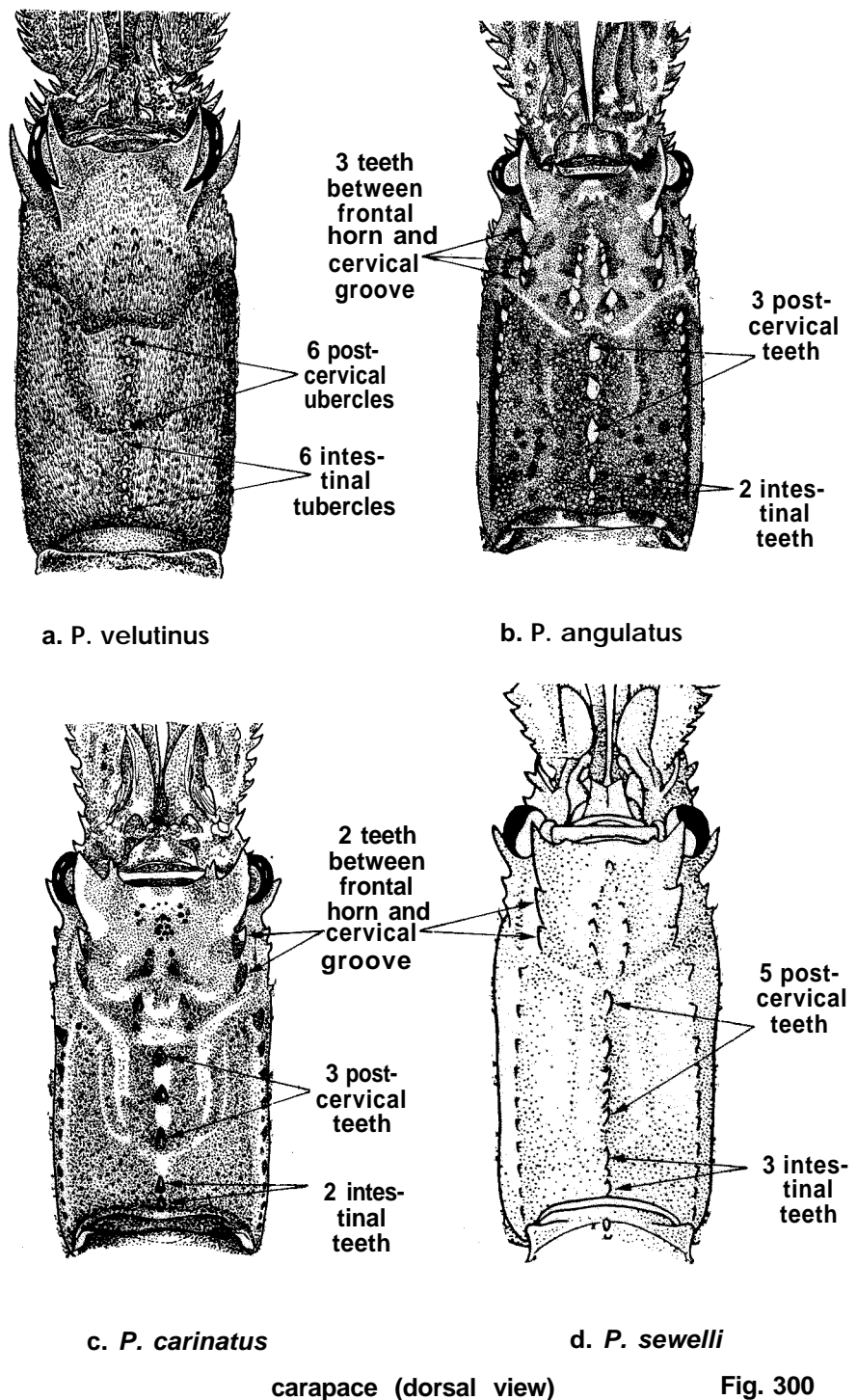


Fig. 300

Puerulus angulatus (Bate, 1888)

Fig. 301

PALIN Puer 2

Panulirus angulatus Bate, 1888, Report Voyage Challenger, Zool., 24:81, pl. 11 figs 2-4. Name placed on the Official List of Specific Names in Zoology, in Opinion 519 (published in 1958).

Synonyms: **Puer angulatus** - Ortmann, 189 1; **Puerulus gracilis** Kubo, 1939.

FAO Names : En - Banded whip lobster

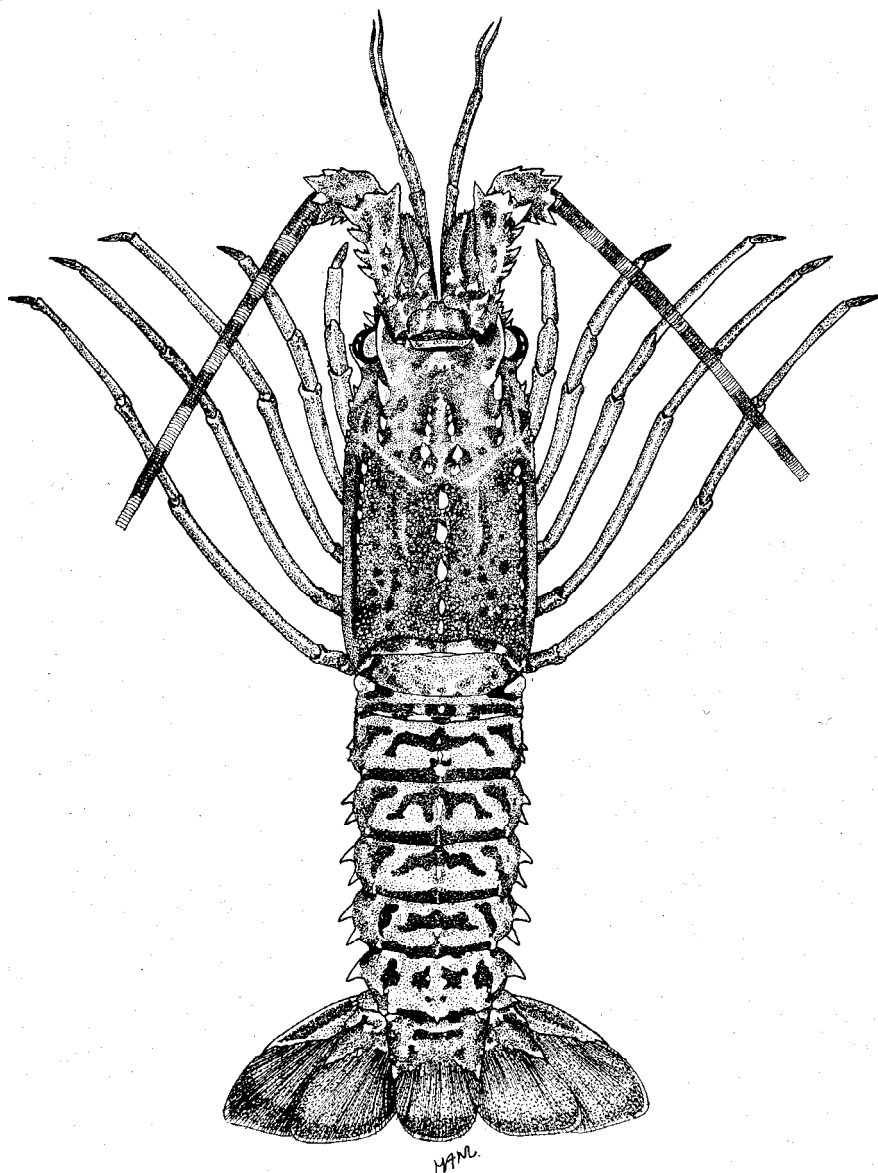
Type : Type locality of **P. angulatus**: "Challenger" Station 219, "lat. 1°54'S. long. 146°39'40" E; Eastern [read: Western] Pacific, north of New Guinea; depth, 150 fathoms [= 274 m]; bottom, coral mud". Holotype male in BM, no. 88.22 (in alcohol, condition fair).

Type locality of **Puerulus gracilis**: "off Kominato, Prov. Bōsyū [Honshu, Japan] at at depth of about 170 fathoms [= 310 m]". Depository of types unknown.

Geographical Distribution: Indo-West Pacific region, from the east and south-east coast of Africa (Zanzibar, Mozambique, Natal) and the western Indian Ocean, to Japan, the Philippines, Indonesia, New Guinea and Western Australia (Fig. 302).

Habitat and Biology : Depth range from 274 to 536 m, on soft substrates (mud or sand).

Size : Maximum carapace length is 7.3 cm, corresponding to a total body length of about 21 cm.



(after Berry, 1969)

Fig. 301

Interest to Fisheries : At present the species is accidentally caught by fishermen, as is the case for the type of **Puerulus gracilis**, which was taken in a gill net ("naname-ami") intended for flatfishes; specimens from Natal and Mozambique were taken by commercial trawlers, but in very small numbers. Crosnier & Jouannic (1973:13) report that experimental fishing near Madagascar produced only very few specimens. George (1983: 16) observed that off Port Hedland, Western Australia, "the commercial prospects [of 4 species of **Metanephrops** and of] the whip lobster **Puerulus angulatus** are probably the most encouraging". Experimental fishing with different types of gear, and better knowledge of habitat and biology of this species are required in order to assess its real potential as a fisheries resource.

Local Names : AUSTRALIA: Whip lobster; JAPAN: Gusoku-ebi; MOZAMBIQUE: Lagosta listrada

Literature : Holthuis, 1966:267; Berry, 1969:247, pl. 1 fig. 2, pl. 2 fig. 2, pl. 3 fig. 2.

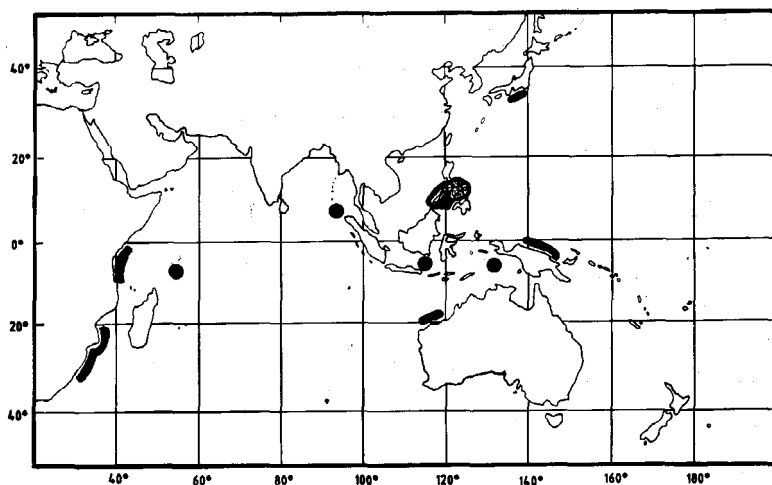


Fig. 302

Puerulus carinatus Borradaile, 1910

Fig. 303

PALIN Puer 3

Puerulus carinatus Borradaile, 1910, *Transactions Linnean Society London*, (Zool.), (2)13: 261.

Synonyms: The species was synonymized with **P. angulatus** by Holthuis (1966:267) but incorrectly so, as shown by Berry (1969)

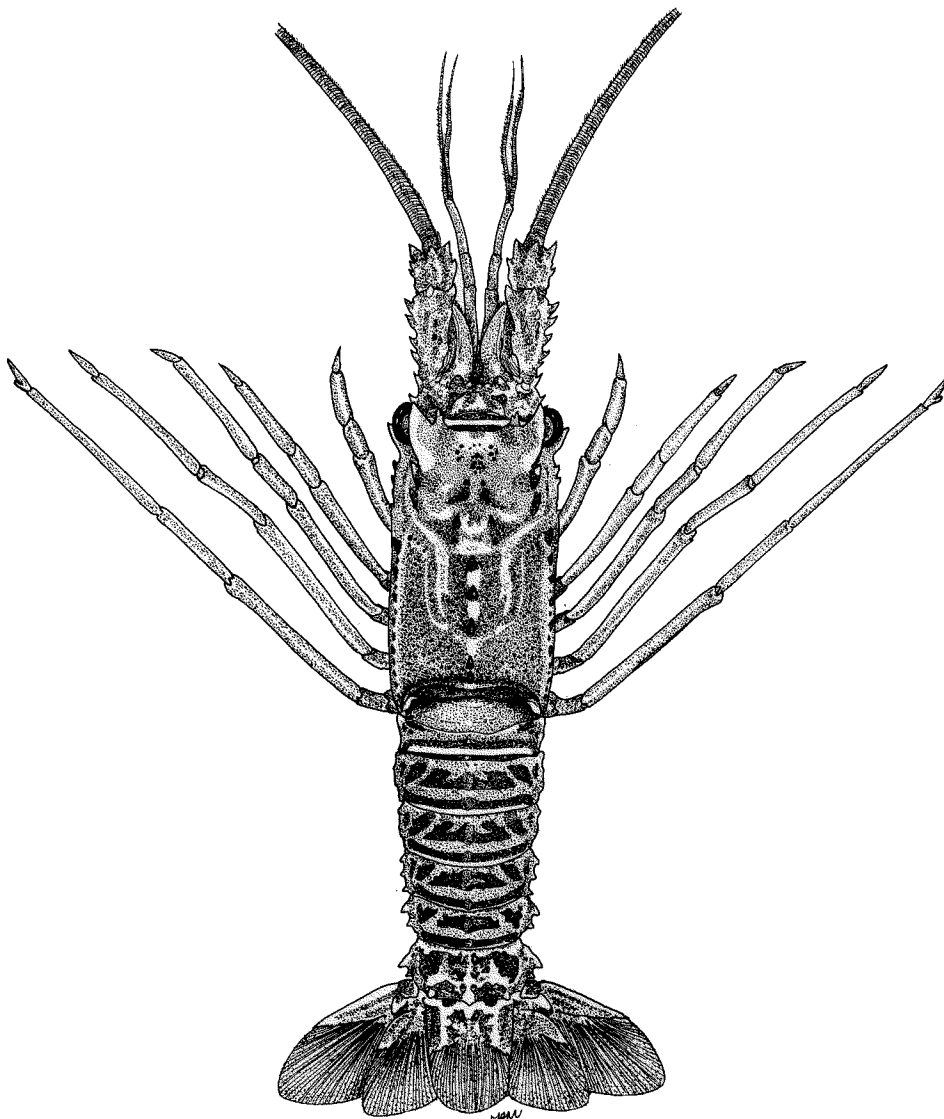
FAO Names : En - Red whip lobster.

Type : Type locality: "Dredged in 125 fathoms off Saya de Malha bank", western Indian Ocean. Holotype in ZMC, lost. Neotype locality: "N.E. of Ouro Point, southern Mozambique, approx. 26°50'S 33°00'E, depth 320 metres". Neotype male, selected by Berry (1969:240), in RMNH no. D. 25535.

Geographical Distribution: Western Indian Ocean: Zanzibar, Mozambique, Natal (South Africa), Madagascar, Saya de Malha Bank (Fig. 304).

Habitat and Biology : Known from depths between 228 and 450 m; on soft substrates (sandy mud, or sand).

Size : Maximum total body length: 18 cm (males), and 20 cm (females); maximum carapace length: 6.4 cm (males), and 7.4 cm (females); average total body length about 15 to 16 cm.



(after Berry, 1969)

Fig. 303

Interest to Fisheries : Very slight at present. Although evidently occurring on trawlable bottoms, very few specimens have been accidentally taken by trawlers.

Local Names : MOZAMBIQUE: Lagosta carinada.

Literature : Berry, 1969:240, text-fig. 1a,b, pl. 1 fig.1, pl. 2fig. 1, pl. 3fig. 1.

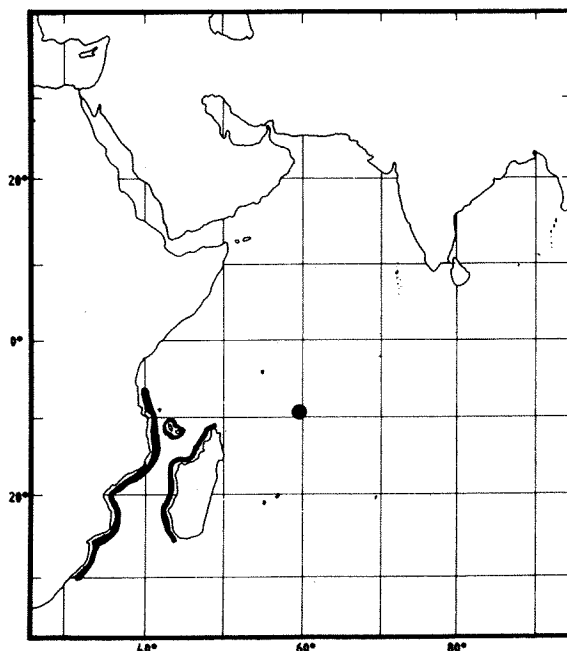


Fig. 304.

Puerulus sewelli Ramadan, 1938

Puerulus sewelli Ramadan, 1938, *Scientific Reports John Murray Expedition*, 5(5): 128, figs 3-5.

Synonyms: ? *Phyllamphion santuccii* Belloc, 1959.

FAO Names: **En** - Arabian whip lobster; **Fr** - Langouste fouet arabe; **Sp** - Langosta de fusta arábica.

Type: Type locality of *P. sewelli*: "Gulf of Aden", "Gulf of Manaar and the Arabian Sea", through the lectotype selection by Holthuis (1966:271) restricted to Gulf of Aden, 13°16'00"N, 46°20'24"E - 13°16'36" N 46°14'00" E, 220 m deep, bottom green mud. Lectotype male in. BM, no. 1969:61-64 (in alcohol, condition good); paralectotypes in BM, ZSI, USNM.

Type locality of *Phyllamphion santuccii*: "dans le sud-est de Perim", Gulf of Aden; depository of type unknown, possibly in MOM, but not yet located there.

Geographical Distribution: Western Indian Ocean: Somalia, Gulf of Aden, off Pakistan, southwest and south India, Gulf of Mannar (Fig. 306).

Habitat and Biology: Known from depths between 180 and 1 300 m, most common between 180 and 300 m; on a substrate of coarse sand, hard mud and shells.

Size: Maximum total body length about 20 cm, maximum carapace length about 8 cm. Average total length about 15 cm.

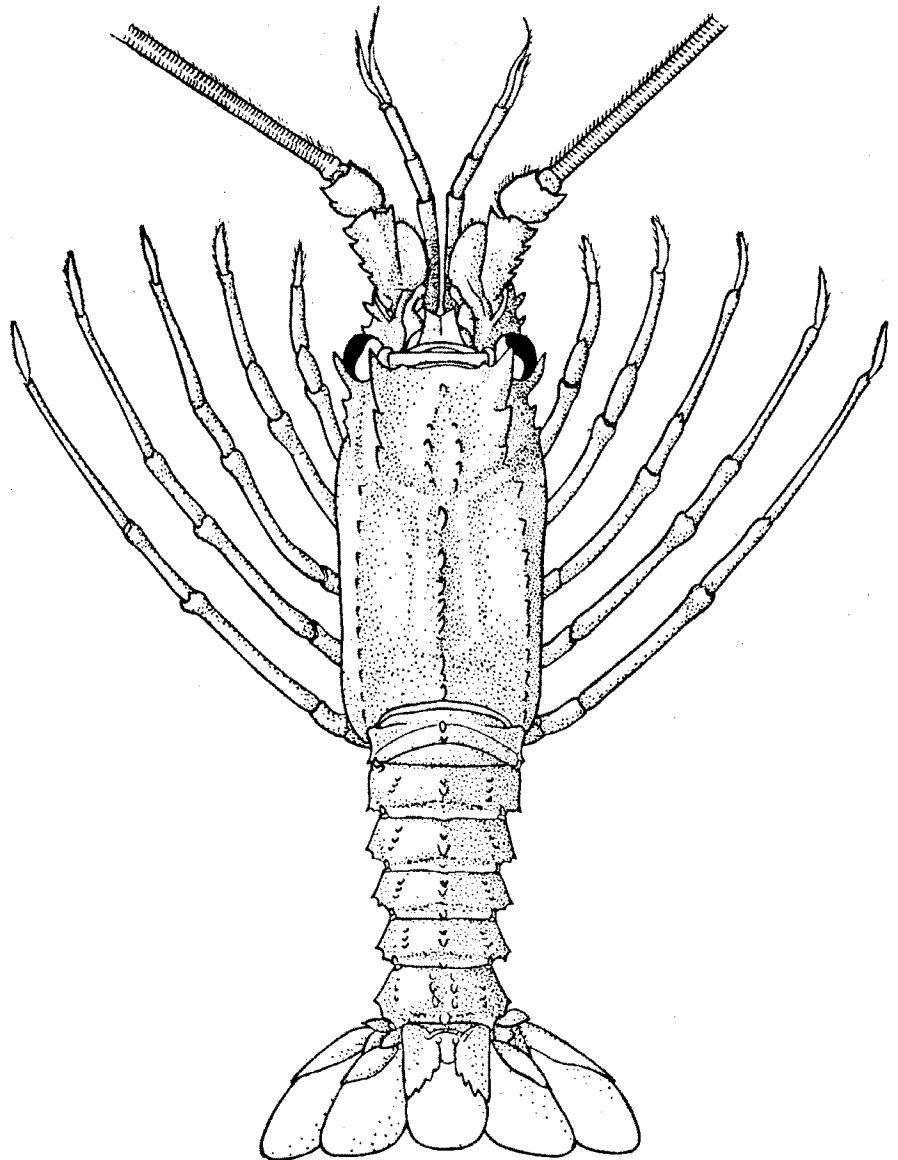
Interest to Fisheries: Between 1974 and 1977, the species was commercially fished off the east coast of Somalia. In the Gulf of Aden, experimental trawling was carried out with average catches of 10 to 129 kg/hour. Off SW. India, rich grounds were found, where the fishery for this species might become commercially rewarding. The annual sustainable yield in that area was estimated at 6 700 tons. The operations were carried out by deep-sea trawlers. The lobster tails were sold deep-frozen.

Local Names: PAKISTAN: Khada kikka (Baluchi), Kikat (Sindhi).

Literature: Fischer & Bianchi (eds), 1984:vol. 5.

Fig. 305

PALIN Puer 1



(from Ramadan 1938)

Fig. 305

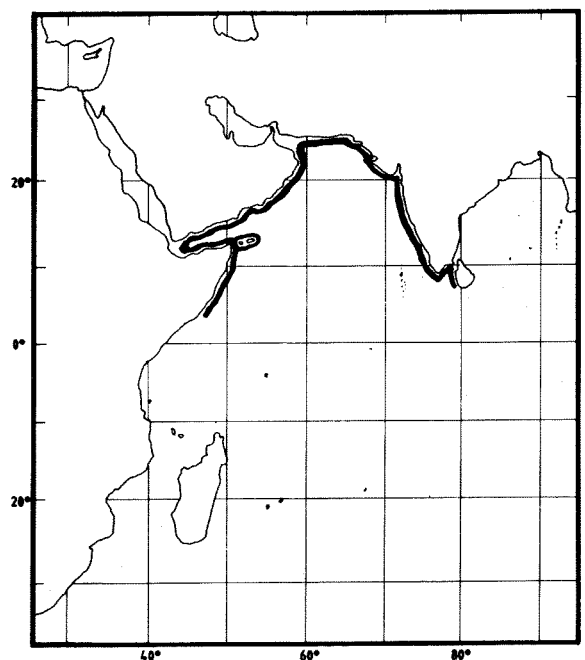


Fig. 306

Puerulus velutinus Holthuis, 1963

Fig. 307

PALIN Puer 4

Puerulus velutinus Holthuis, 1963, *Proceedings Koninklijke Nederlandse Akademie Wetenschappen*, (C)66: 55.

FAO Names : En - Velvet whip lobster.

Type : Type locality: "Siboga" Expedition Station 297 "between Roti and Timor, Lesser Sunda Islands, 10°39'S 123°40'E", depth 520 m, soft grey mud with brown upper layer. Holotype male in ZMA, no. De. 101.823, condition fair; paratypes in ZMA no De. 101.823 + 101.824.

Geographical Distribution : Indo-West Pacific region: Malay Archipelago: Philippines and Indonesia (Fig. 308).

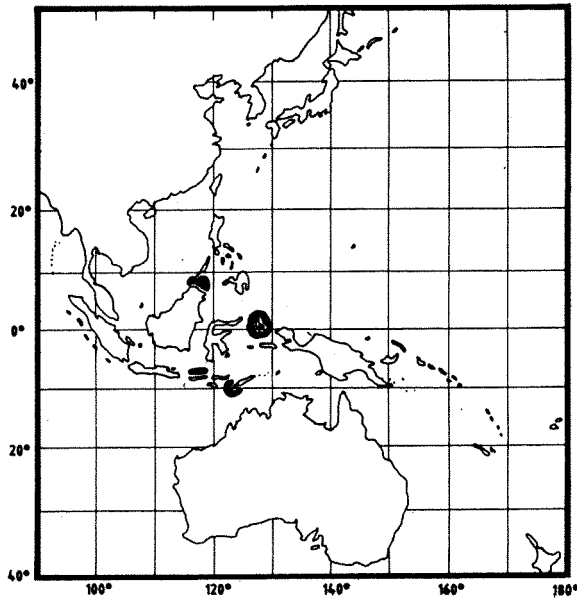


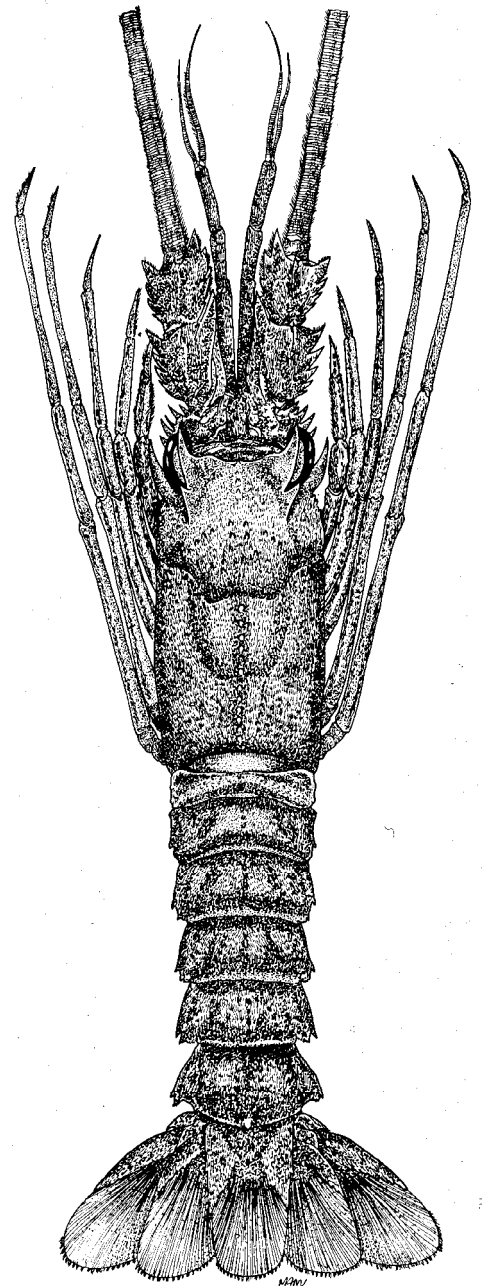
Fig. 308

Habitat and Biology : Depth range from 520 to 683 m; bottom: soft substrate of mud, sand or coral. Ovigerous females have been found in April.

Size : Maximum carapace length: 6.5 cm (males), and 6.2 cm (females), corresponding with a total length of about 19 cm (males) and 18 cm (females). Ovigerous females have a carapace length of 4.7 to 6.1 cm.

Interest to Fisheries : So far none. The fact that the species occurs on soft bottoms and is sometimes collected in relatively great numbers (at "Siboga" Sta. 38 no less than 23 specimens were taken in one haul) indicates that the species might be of commercial interest.

Literature : De Man, 1916:36-42, pl. 2 fig. 5 (as *P. angulatus*); Holthuis, 1966:273-274.



(after De Man, 1916)

Fig. 307

2.2.4 **FAMILY SYNAXIDAE** Bate, 1881

SYNTAX

Synaxidae Bate, March 1881, *Annals Magazine Natural History*, (5)7:228.

Type Genus: *Synaxes* Bate, March 1881.

Synonyms : *Araeosternidae* De Man, July 1881, *Notes Leyden Museum*, 3: 137.

Type Genus: *Araeosternus* De Man, July 1881.

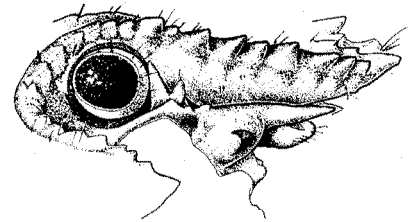
This family consists of two genera and a total of three species.

Key to Genera :

1a. Antennular plate with stridulating organ (Fig. 309a). Rostrum transversely oval, wider than long. Lateral margin of carapace with distinct teeth behind anterolateral tooth (Fig. 309b). Posterior margin of pleura of abdominal somites 2 to 5 with a deep and abrupt excavation near the top, most distinct in somites 4 and 5. Total length to 27 cm **Palibythus**

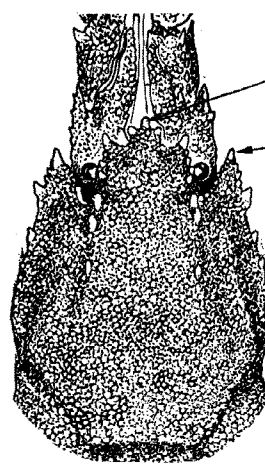


a. lateral view of orbital region and antennular plate
(from Davie, 1990)



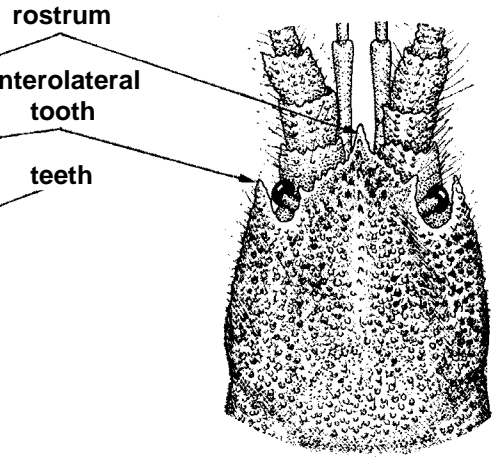
a. lateral view of orbital region and antennular plate
(from Davie, 1990)

1b. Antennular plate without stridulating organ (Fig. 310a). Rostrum triangular, longer than wide. Lateral margin of carapace without teeth behind anterolateral tooth (Fig. 310b). Posterior margin of abdominal pleura evenly sinuously rounded, without a deep and sudden concavity near the top. Maximum known length 20 cm **Palinurellus**



b. anterior part of carapace (dorsal view)
(after Davie, 1990)

Palibythus Fig. 309



b. anterior part of carapace (dorsal view)

Palinurellus Fig. 310

Palibythus Davie, 1990

SYNTAX Palib

Palibythus Davie, 1990, *Invertebrate Taxonomy*, 4:685. Gender masculine.

Type Species : By original designation and monotypy: **Palibythus magnificus** Davie, 1990.

A single species is known of this genus.

Palibythus magnificus Davie, 1990

Fig. 311

SYNTAX Palib 1

Palibythus magnificus Davie, 1990, *Invertebrate Taxonomy*, 4:685,686, figs 1A,B, 3A,C,4A, 5A.

FAO Names : En - Musical furry lobster.

Type : Type locality of **Palibythus magnificus** : "off coast of Savaii, Western Samoa, trapped . . . 220-275 m". Female holotype, QM, no. W 16402, 2 female paratypes, QM, no. w 15941.

Geographical Distribution: Central Pacific: W. Samoa and Tuamotu Archipelago (Fig. 312).

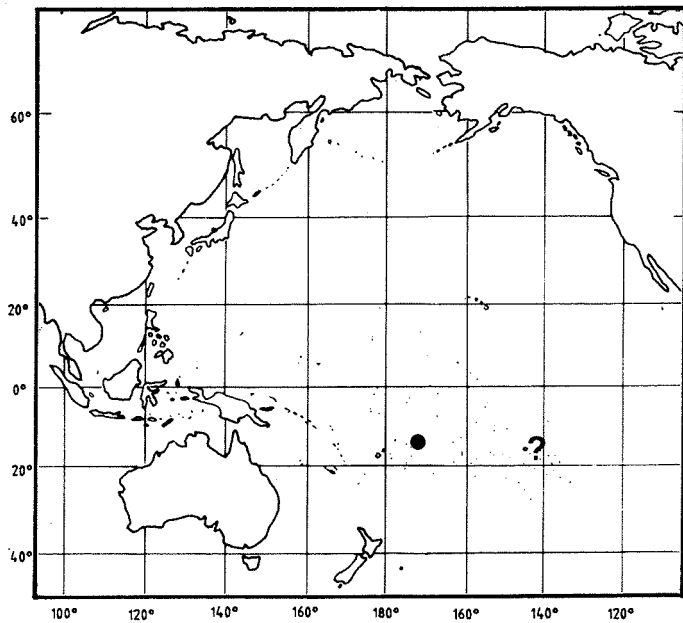


Fig. 312

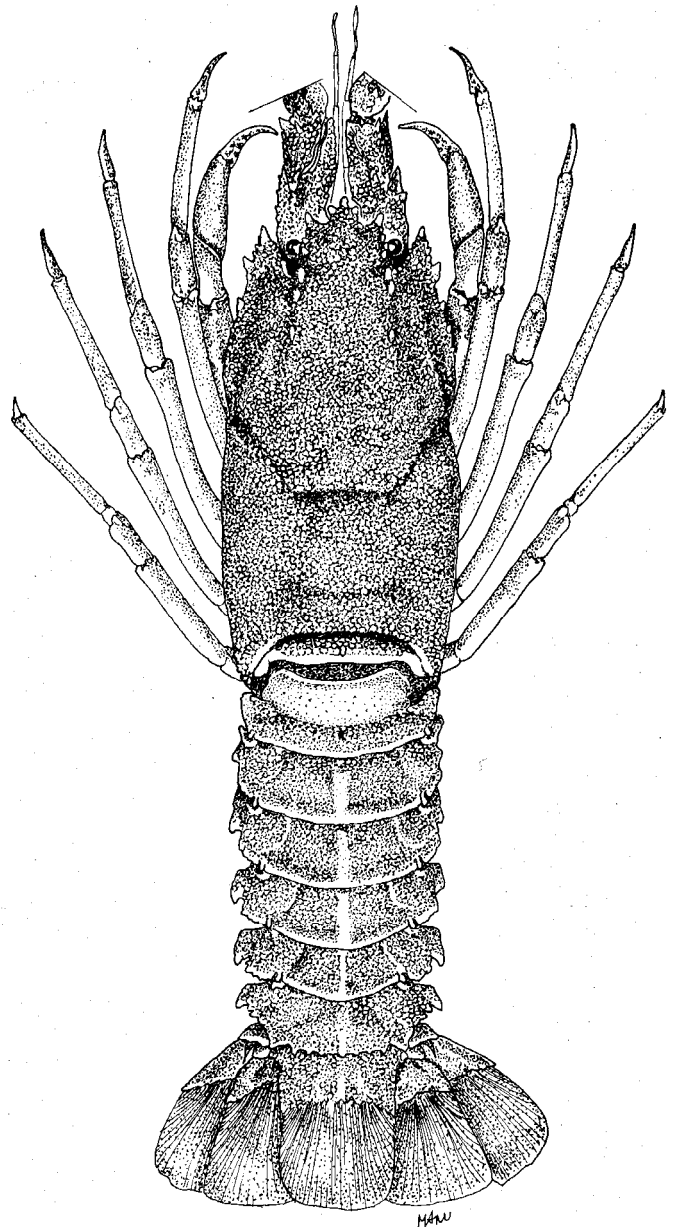
Habitat and Biology : Depth range between 220 and 300 m.

Size : Carapace length in females 13.1 to 13.7 cm, corresponding with a total length of about 27 cm. Males unknown.

Interest to Fisheries : So far none, as the species seems to be very rare and lives in deep water. The three females from Samoa were obtained in a fish trap, evidently during commercial or exploratory fishing.

Literature : Original description.

Remarks: The specimens from the Tuamotu Islands are only known from photographs, but were "almost definitely this species" (Davie, 1990:688).



(after Davie, 1990)

Fig. 311

Palinurellus Von Martens, 1878

SYNTAX Pali

Palinurellus Von Martens, 1878, Sitzungsberichte Gesellschaft naturforschender Freunde, Berlin, 1878: 131. Gender masculine. Name placed on the Official List of Generic Names in Zoology, in Opinion 519 (published in 1958).

Type Species: by monotypy: **Palinurellus gundlachi** Von Martens, 1878

Synonyms : ? **Phyllamphion** Reinhardt, 1849, Videnskabelige Meddelelser naturhistoriske Forening Kobenhavn, 1849-1850:2. Type species, by monotypy: **Phyllamphion elegans** Reinhardt, 1849. Gender masculine.

Synaxes Bate, 1881 (March), Annals Magazine Natural History, (5)7:228. Type species, by monotypy: **Synaxes hybridica** Bate, 1881 (March). Gender feminine.

Araeosternus De Man, 1881 (July), Notes Leyden Museum, 3: 137. Type species, by monotypy: **Araeosternus wieneckii** De Man, 1881 (July). Gender masculine.

Two species are recognized in this genus, neither of commercial importance. If **Phyllamphion** is based on larvae of the present genus, which, in the light of recent investigations seems most likely, the generic name **Phyllamphion** is the oldest for the genus and therefore has to replace **Palinurellus**.

The two species are very similar. Some of the alleged differences proved to be due to abnormalities (e.g., the shape of the rostrum in the holotype of **P. wieneckii**), incorrect observations, or incorrect interpretation of the variability of characters. As both species are rather rare the study of larger series of specimens is necessary to clarify their taxonomic status.

Key to Species :

1a. Western Atlantic . . **P. gundlachi** (Fig. 313)

1b. Indo-West Pacific . **P. wieneckii** (Fig. 315)

Palinurellus gundlachi Von Martens, 1878

Fig. 313

SYNTAX Pali 1

Palinurellus gundlachi Van Martens, 1878, Sitzungsberichte Gesellschaft naturforschender Freunde, Berlin, 1878: 131. Name placed on the Official List of Specific Names in Zoology, in Opinion 519 (published in 1958).

Synonyms : **Synaxes hybridica** Bate, 1881; ? **Phyllamphion reinhardti** Belloc, 1959.

FAO Names : **En** - Caribbean furry lobster; **Fr** - Cacahouète cara'ibe; **Sp** - Langostita del Caribe

Type : Type locality of **P. gundlachi**: "an der Küste von Cuba, bei Camaricoia östlich von Matanzas". Holotype female in ZMB no. 5833, in alcohol, condition excellent.

Type locality of **Synaxes hybridica**: "West Indies". Holotype female in NMI, dry but in reasonable condition (don. Sir F.L. McClintok).

Type locality of **Phyllamphion reinhardtii**: "entre la Pointe orientale de la Guadeloupe (Pointe des Châteaux) et le petit archipel situé dans le sud-est connu sous le nom de Petite-Terre". Holotype larva in MOM, at present not located.

Geographical Distribution : Western Atlantic: Bermuda, Bahama islands, southern Florida, Yucatán, Caribbean Arc (Cuba to Barbados), Curaçao, N.E. Brazil (Pernambuco) (Fig. 314).

Habitat and Biology : Depth range from 1.5 to 35 m; found in rather inaccessible places among rock and coral. Rather scarce.

Size : Maximum total length about 1.5 cm.

Interest to Fisheries : Caught by hand, and occasionally in traps, but of no interest to commercial fisheries.

Local Names : MARTINIQUE: Vraie langouste de metropole; USA: Copper lobster (Florida).

Literature : Fischer (ed.), 1978: vol. 6.

Remarks : There appears to be little doubt that the larvae described as **Phyllamphion** belong to the present genus. Should this be confirmed, the correct name of the present species must be **Phyllamphion gundlachi** (Von Martens, 1878).

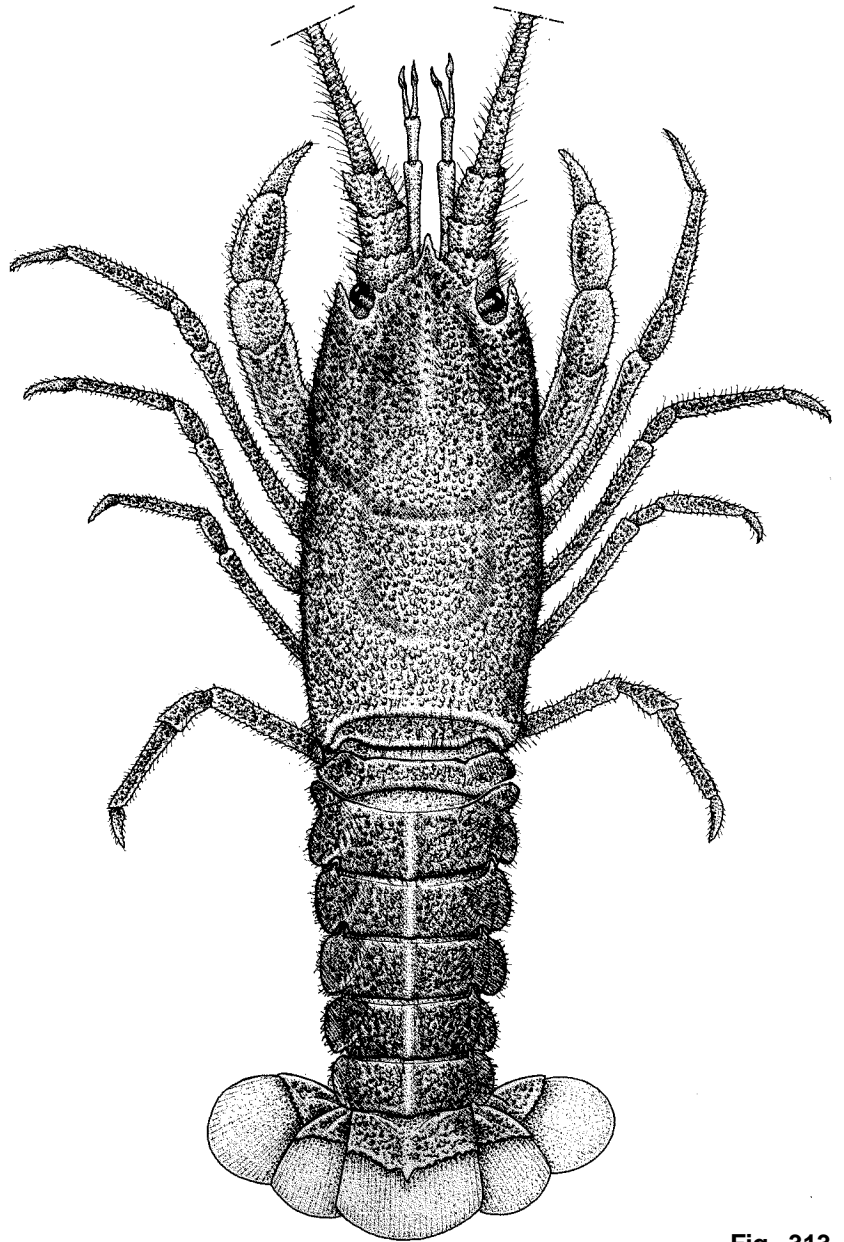


Fig. 313

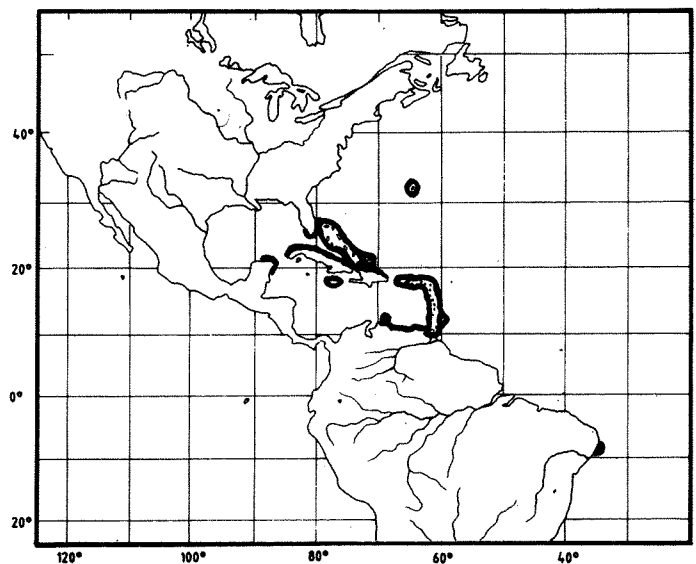


Fig. 314

Palinurellus wieneckii (De Man, 1881)

Fig. 315

SYNTAX Pali 2

Araeosternus wieneckii De Man, 1881, *Notes Leyden Museum*, 3:131.

Synonyms: ? **Cancer cassideus** Forster, 1782; ? **Phyllamphion elegans** Reinhardt, 1849; **Palinurellus gundlachi wieneckii**. Gruvel, 1911.

FAO Names : **En** - Indo-Pacific furry lobster; **Fr** - Cacahouete indopacifique; **Sp** - Langosta del Indo-Pacífico.

Type : Type locality of **Cancer. cassideus**: "Bewohnt das Indische Meer". "Habitat in Mari Indico" "Zwischen dem Vorgeborge der guten Hoffnung und Indien im grossen Ozean, dreihundert grosse Seemeilen weit von irgend einem Lande". Depository of types unknown.

Type locality of **Phyllamphion elegans**: "har hjemme i det chinesiske Hav, hvor jeg dog kun en Gang har erholdt 3 Exemplarer, som fangedes med Slaebenaettet i nogle Miles Afstand fra Oen Luçon at Par Timer efter Solnedgang (d. 11. Juni 1846)" (has its home in the Chinese Sea, where I once obtained 3 specimens caught with a drag net at several miles off the island of Luzon, a few hours after sunset on 11 June 1846). Depository of syntypes unknown.

Type locality of **Araeosternus wieneckii**: "Rat-Island near Benkuler (Sumatra)" (= Pulau Tikus, S.W. coast of Sumatra, Indonesia. about 3°50'S 102° 11 'E) Holotype male in RMNH no. D 965

Geographical Distribution: Indo-West Pacific region: Arabian coast of Red Sea, East Africa (larvae), South Africa (Natal, juvenile), western Indian Ocean (larvae), Mauritius, Thailand, (Phuket Island), Japan (Ryukyu Islands), Philippines (larvae), Indonesia (Sumatra, Borneo), New Guinea (Kiriwina Islands), Solomon Islands (Savo Id.), Caroline Islands (Ifaluk), New Caledonia (larvae and juveniles), New Hebrides (larvae), Hawaiian Islands (Oahu, Hawaii, Maui), Tuamotu Islands (larvae and juveniles) (Fig. 316).

Habitat and Biology : In shallow water (from 9 to 27 m) on coral reefs and in marine caves. Probably nocturnal. Larvae planktonic

Size : Maximum total body length about 20 cm, maximum carapace length about 8 cm. Body length usually around 10-14cm.

Interest to Fisheries : Very slight at present: the species is taken only occasionally, being too rare for a commercial Fishery. It is taken by hand and sometimes gets entangled in gill nets. It has caught the attention of the tropical marine aquarium trade, but is too infrequently taken to be of great economic value. The only specimen so far reported from Thailand, was offered for sale in a fancy glass case as a tourist souvenir.

Local Names : HAWAII: Mole lobster; MOZAMBIQUE: Lagosta peluda; THAILAND: Kung boran.

Literature : Fischer & Bianchi (eds), 1984:vol. 5.

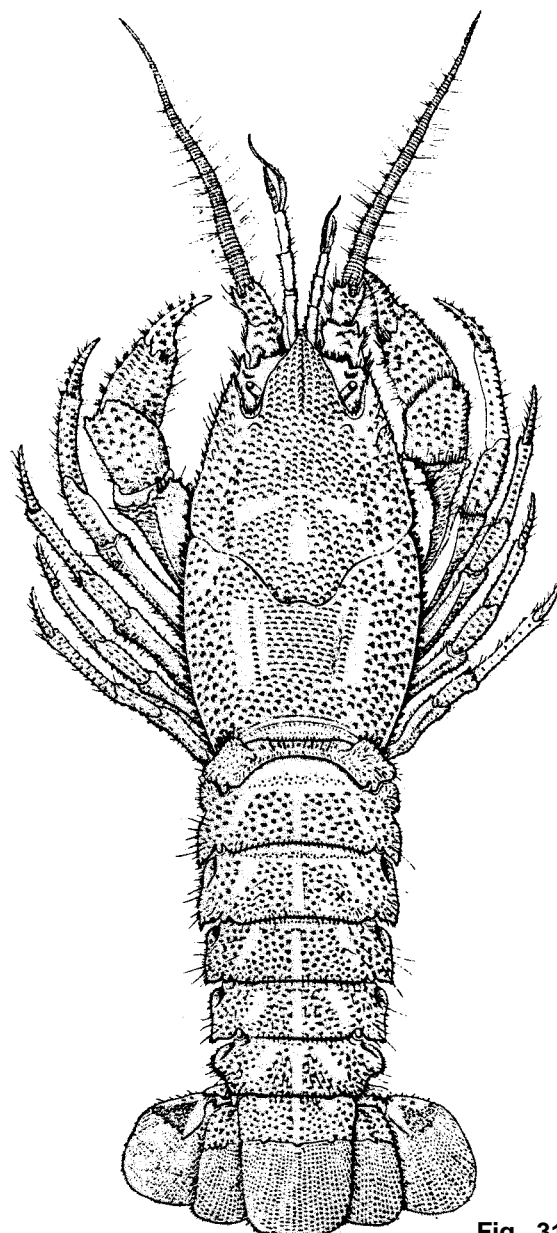
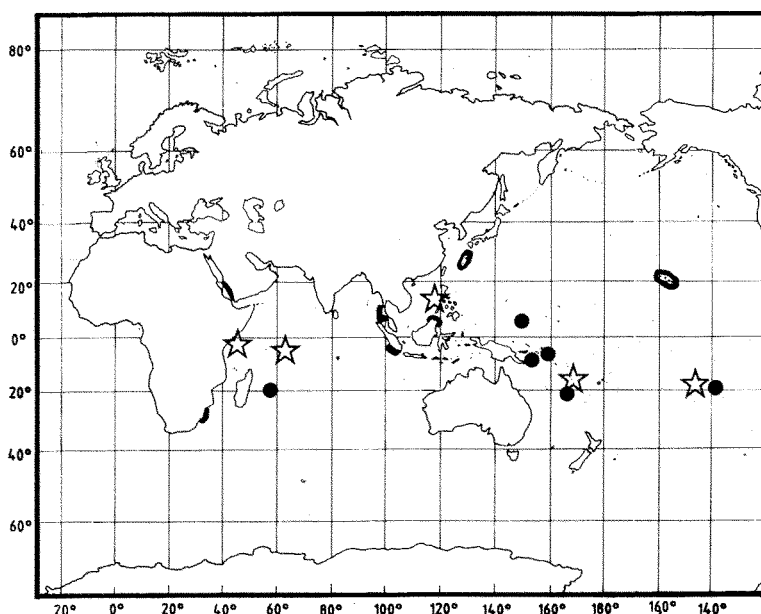


Fig. 315



☆ larval records (supposedly of this species) **Fig. 316**

Remarks : There appears to be little doubt that the larvae described as **Cancer cassideus** and **Phyllamphion elegans** are those of the present species. If this is confirmed, the name of the species should change to **Phyllamphion cassideus** (Forster, 1782).

2.2.5 FAMILY SCYLLARIDAE Latreille, 1825

SCYL

Scyllarides Latreille, 1825, Familles Naturelles du Règne Animal: 278. Name placed on the Official List of Family Names in Zoology, in Opinion 519 (published in 1958).

The family Scyllaridae includes 7 recent genera, which are distributed in 4 subfamilies: Arctidinae, Ibacinae, Scyllarinae, and Theninae. Except for most representatives of **Scyllarus**, which are of no interest to fisheries, all species of Scyllaridae are treated in this catalogue.

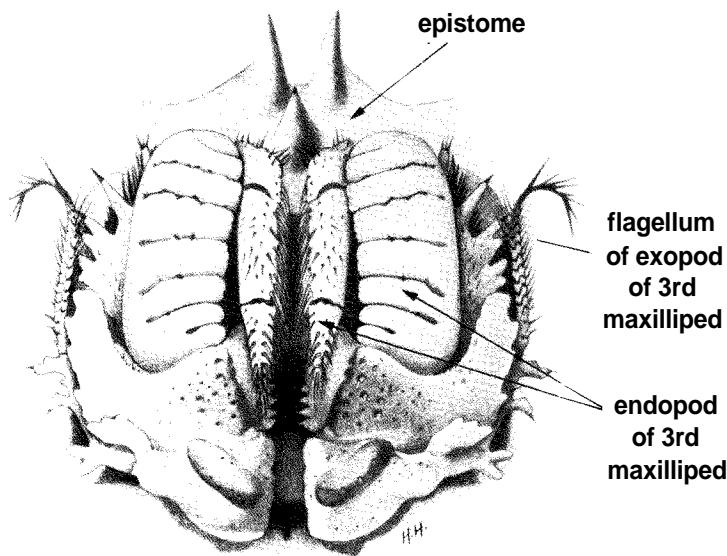
Key to Genera :

1a. Exopods of all maxillipeds with a multiarticulate flagellum (Fig. 317)

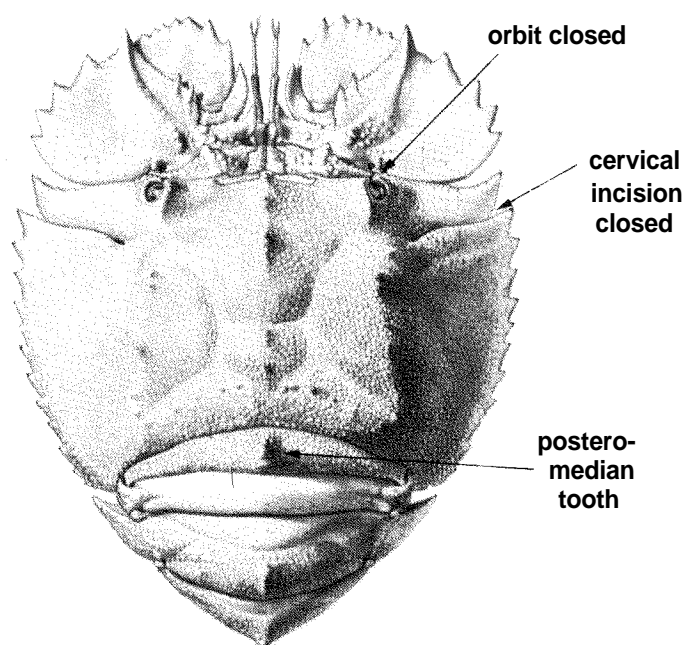
2a. Carapace strongly depressed, with a deep cervical incision in the lateral margin. Mandible with a simple or two-segmented palp (subfamily Ibacinae)

3a. Orbits entirely closed, placed behind the anterior margin of the carapace. Cervical incision closed. Carapace with a postero-median tooth. Fifth abdominal somite in the adults without postero-median spine. Body smooth and tuberculate. East Pacific (Fig. 318) **Evibacus**

3b. Orbits anteriorly open, placed on the anterior margin of the carapace. Cervical incision usually open, at least at the base. Carapace without postero-median tooth (Fig. 319, 320). Atlantic and Indo-West Pacific



mouth region (ventral view) (from Holthuis, 1985) **Fig. 317**



Evibacus (dorsal view) (from Holthuis, 1985) **Fig. 318**

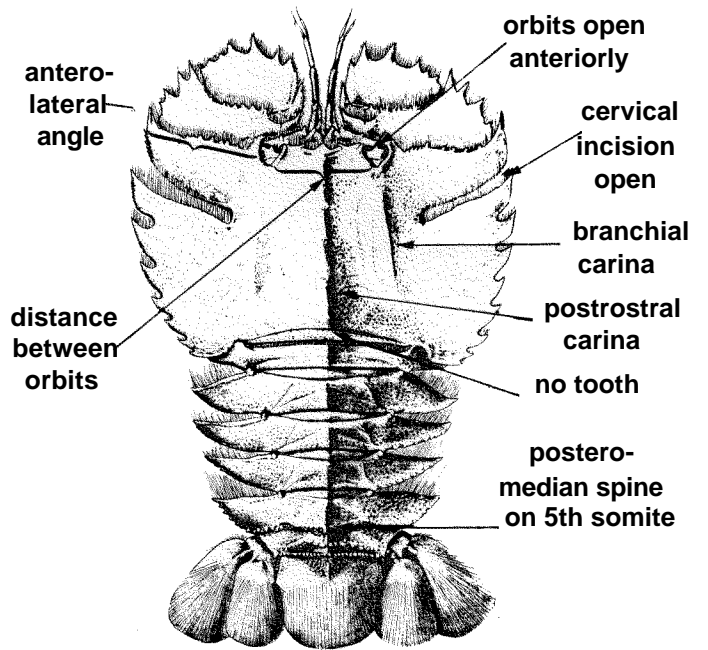
4a. Dorsal surface of the body smooth and punctate, not tuberculate, sometimes pubescent. Carapace with postrostral and branchial carinae distinct. Distance between the orbits as long as or shorter than the distance separating each orbit from the nearest anterolateral angle. Fifth abdominal somite with postero-median spine. Mandibular palp consisting of a single segment (Fig. 319) **Ibacus**

4b. Dorsal surface of the body coarsely squamose-tuberculate, without postrostral or branchial carinae. Distance between the orbits more than twice as long as the distance between each orbit and the anterolateral angle of the carapace. Fifth abdominal somite without posteromedian spine. Mandibular palp two-segmented (Fig. 320) **Parribacus**

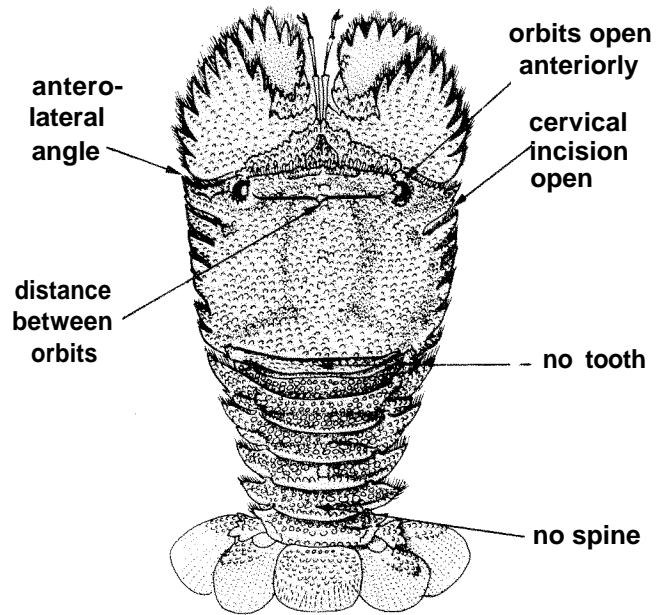
2b. Carapace rather highly vaulted, with a small, shallow cervical incision, which may be lacking altogether. Mandible with three-segmented palp (subfamily Arctidinae)

5a. First abdominal somite without a transverse groove dorsally; it is smooth there and shows a pattern of coloured spots. Carapace without postorbital spine. Apart from a median ridge, the abdomen shows no dorsal sculpturation (Fig. 321) **Scyllarides**

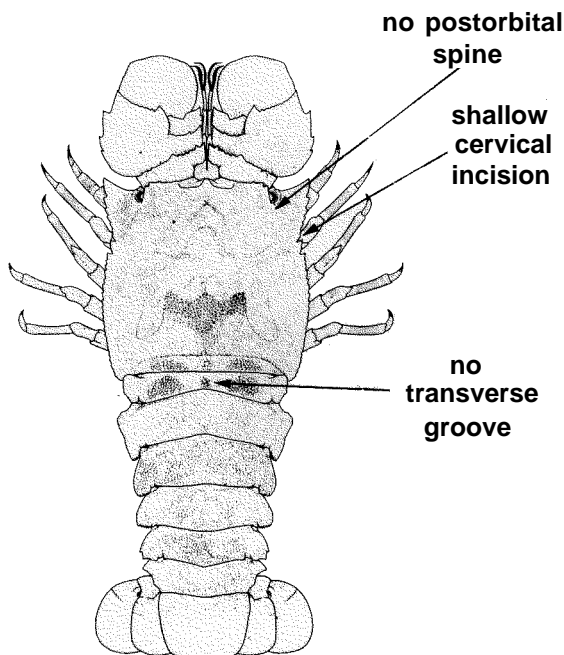
5b. First abdominal somite with a distinct transverse groove dorsally. Carapace with postorbital spine. Abdominal somites with a distinct sculpturation on either side of the median line (Fig. 322) **Arctides**



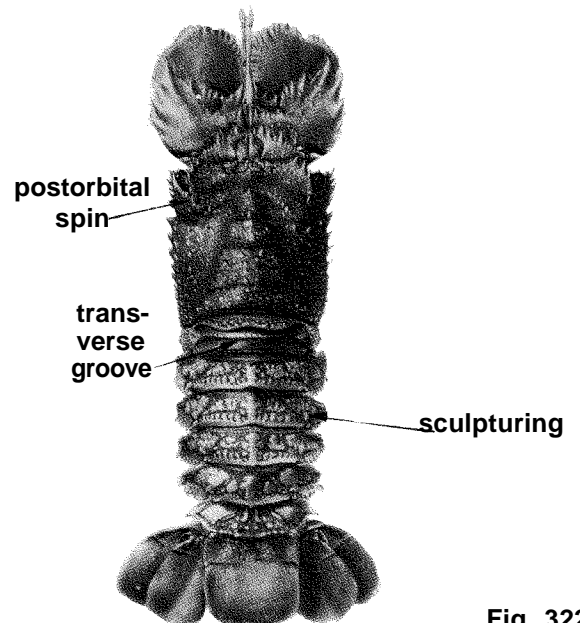
Ibacus (dorsal view) (from Holthuis, 1985) **Fig. 319**



Parribacus (dorsal view) **Fig. 320**



Scyllarides (dorsal view) **Fig. 321**

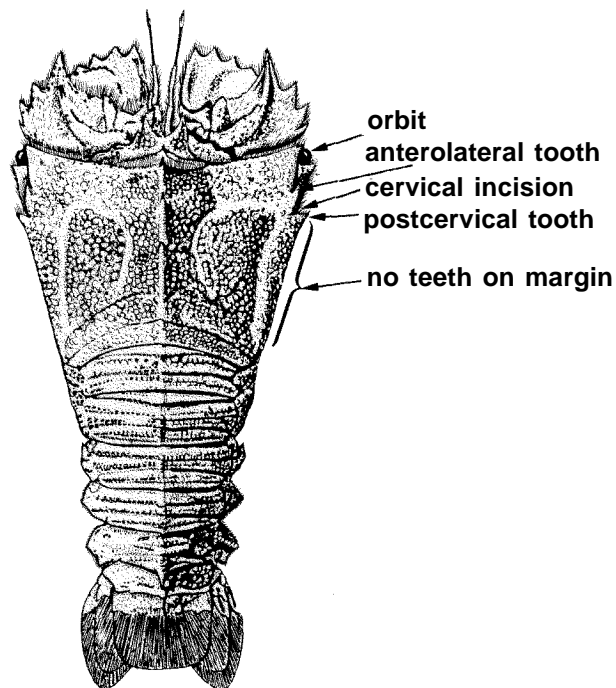


Arctides (dorsal view) **Fig. 322**

1b. Exopod of third and first maxilliped without a flagellum; the flagellum of the second maxilliped transformed to a single laminate segment

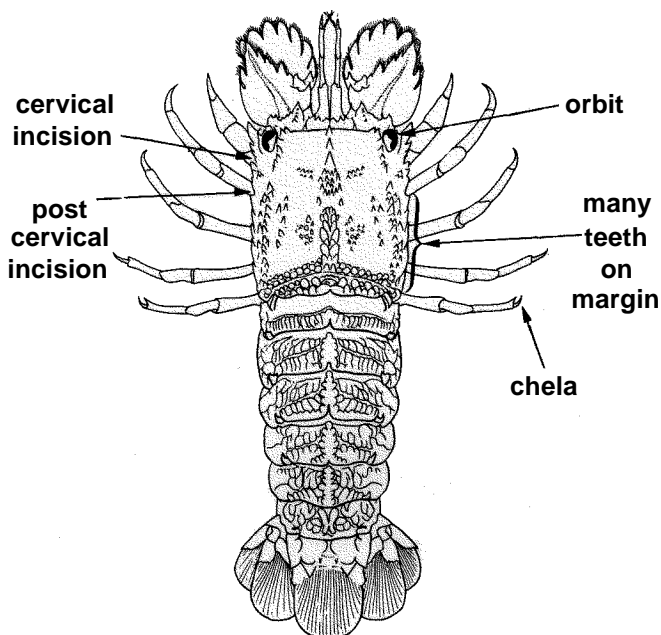
6a. Orbits on the anterolateral angle of the carapace. Body strongly depressed. Lateral margin of the carapace with only the cervical incision. 'No teeth on the lateral margin of the carapace, apart from the anterolateral and postcervical(Fig. 323). Fifth leg of female without a chela (subfamily Theninae) **Thenus**

6b. Orbits on the anterior margin of the carapace, some distance from the anterolateral angle. Body not depressed, but rather high and vaulted. Lateral margin of the carapace with both cervical and postcervical incisions, neither of which is very deep. Lateral margin of the carapace with numerous teeth or squamiform tubercles. Fifth leg of female with a chela (Fig. 324) (subfamily Scyllarinae) **Scyllarus**



Thenus (dorsal view)

Fig. 323



Scyllarus (dorsal view) Fig. 324

SUBFAMILY ARCTIDINAE Holthuis, 1985

Arctidinae Holthuis, 1985, *Zoologische Verhandelingen, Leiden* , 218: 10,11

The subfamily Arctidinae contains two genera, **Arctides** and **Scyllarides**. The species of this subfamily are edible, but are caught only incidentally.

Arctides Holthuis, 1960

SCYL Arct

Arctides Holthuis, 1960, *Proceedings Biological Society Washinaton* , 73: 154. Gender masculine.

Type Species: by original designation: **Scyllarus guineensis** Spengler, 1799.

All three species of this genus are treated here. There is no great interest for any of them, as far as fishery is concerned.

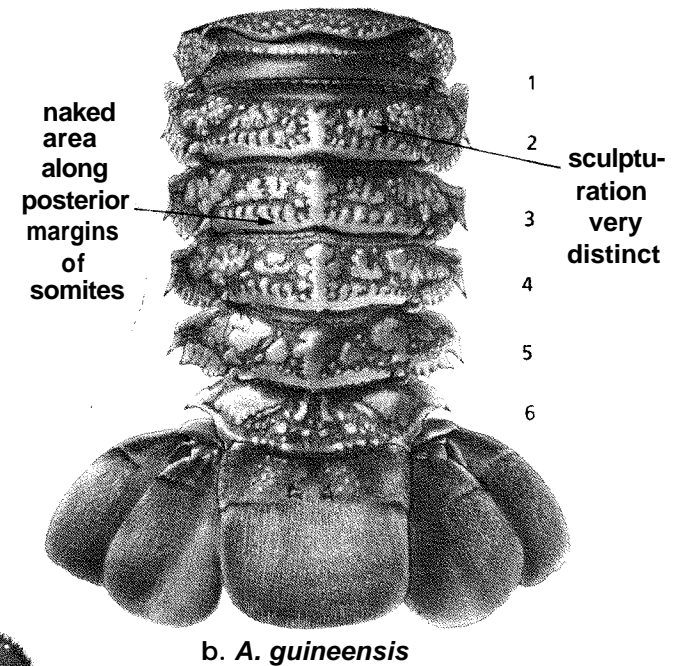
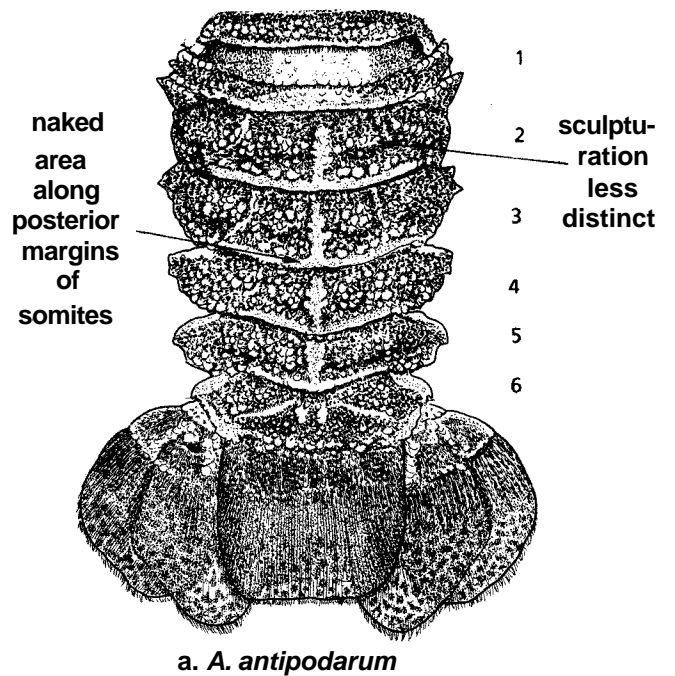
Key to Species :

1a. Sculpturation of abdomen not very distinct, partly obscured by hairs and tubercles, hairy grooves between naked portions wide. Median figures elongate and narrow, usually much elevated above surface of somites. Naked area along posterior margin of somite 2 to 5 occupying about 1/3 of the length of the posterior half of the somite (Fig. 325a). Legs more robust, propodus of second leg about three times as long as wide. No coloured bands on the legs. Dactylus and propodus of first and second legs purplish with small white spots. Larger species, carapace length up to more than 10 cm. Australasia **A. antipodarum** (Fig. 327)

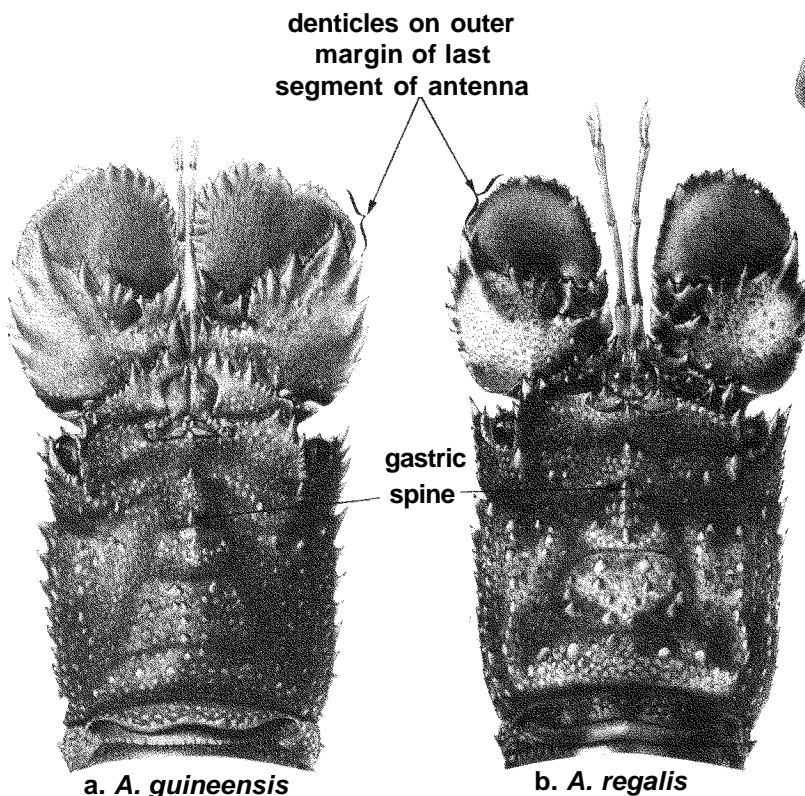
1b. Sculpturation of abdomen very distinct, the naked elevated parts distinct and separated by narrow hairy grooves. The median figures with broad lateral lobes. The naked area along posterior margin of somites 2 to 5 occupying almost half the length of the somites (Fig. 325b). Legs slender, propodus of second leg about 5 to 6 times as long as wide. Propodus, carpus and merus of second to fifth legs each with a coloured band. Smaller species, carapace length less than 7 cm.

2a. Behind gastric spine of carapace two doubletopped spinules present. Denticles on outer margin of last segment of antenna smaller (Fig. 326a). Atlantic **A. guineensis** (Fig. 329)

2b Behind gastric spine a longitudinal row of three single spinules. Denticles on outer margin of last segment of antenna larger (Fig. 326b). Indo-West Pacific region **A. regalis** (Fig. 331)



abdomen (dorsal view) Fig. 325



carapace (dorsal view) Fig. 326

Arctides antipodarum Holthuis, 1960

Fig. 327

SCYL Arct 1

Arctides antipodarum Holthuis, 1960, *Proceedings Biological Society Washinaton*, 73: 154.

FAO Names : En - Rough Spanish lobster.

Type : Type locality: "Off Malabar [= 27°35'S 152°35'E], New South Wales, Australia, depth 80 fathoms [= 146 m]". Holotype male in RMNH, No. D. 10648.

Geographical Distribution : East, coast of Australia (New South Wales: Malabar, Port Stephens, Newcastle, Port Jackson), New Zealand (North Island: Hauraki Gulf) (Fig. 328). Michel (1971: 467, 471, 472) mentioned larvae from the New Caledonia-New Hebrides area and from the Tuamotu Archipelago that he assigned with some doubt to the present species. It is possible, however, that they actually belong to **A. regalis**.

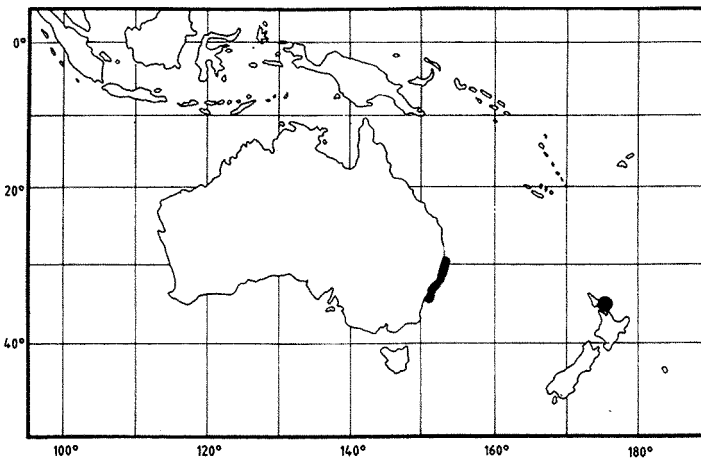


Fig. 328

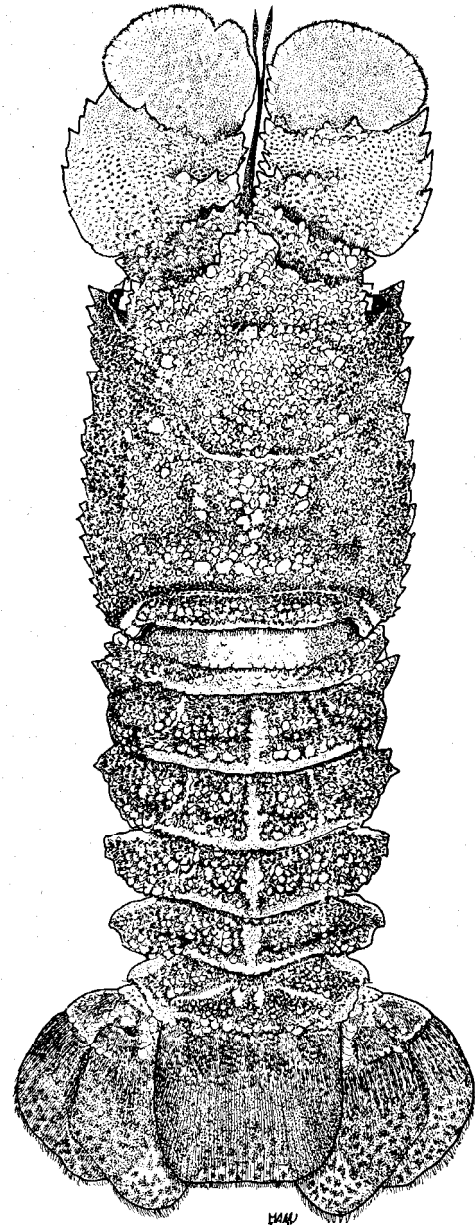


Fig. 327

Habitat and Biology : The species has been found in depths from 5 to 146 m, usually between 5 and 30 m; it seems to prefer clear water and rocky bottoms

Size : Maximum total length about 30 cm, average carapace length 9 to 10 cm.

Interest to Fisheries : The species is sometimes caught in lobster traps set for species of *Jasus*, and also is taken by hand by divers. The number of specimens caught, however, is so small that the species is of hardly any commercial interest notwithstanding that it is edible and of a reasonable size.

Local Names : AUSTRALIA: Red flapjack, Squat crayfish, Southern shovel-nosed cray, South-eastern shovel-nosed crayfish, South-eastern squat crayfish; NEW ZEALAND: Spanish lobster.

Arctides guineensis(Spengler, 1799)

Fig. 329

Scyllarus guineensis Spengler, 1799, *Kongelige Danske Videnskabers Selskab Skrifter* (n.ser.) 5:333, pl. 1.

Synonyms: *Scyllarus sculptus* Latreille, 1818; *Scyllarides sculptus bermudensis* Verrill, 1922; *Scyllarides sculptus* - Chace, 1937; *Scyllarides guineensis* - Holthuis, 1946.

FAO Names : En - Small Spanish lobster.

Type : Type locality of *S. guineensis*: "Dens Faedreneland er Kysten af Guinea" (= Its fatherland is the coast of Guinea, West Africa). As the species never, before or since, has been reported from West Africa and it is rather frequently met with in the West Indies, there is some doubt about the correctness of the type locality indication. Holotype male in UZM, now lost (not located in 1989).

Type locality of *S. sculptus*: none of the early publications dealing with the type gives any indication of its locality. The dry holotype in MP (no. Pa. 964, in good condition); bears the inscription "Méditerranée" which most likely is incorrect.

Type locality of *S. sculptus bermudensis*: "Bermuda"; syntypes in YPM, no. 814 (not located in 1989), and USNM (no. 21608).

Geographical Distribution : Western Atlantic: Bermuda, Florida, Bahama Islands, Martinique. Larvae have been collected in the "Bermuda triangle" area (Bermuda, the coast of USA from N. Carolina to S. Florida, the Bahamas and north of Puerto Rico) (Fig. 330).

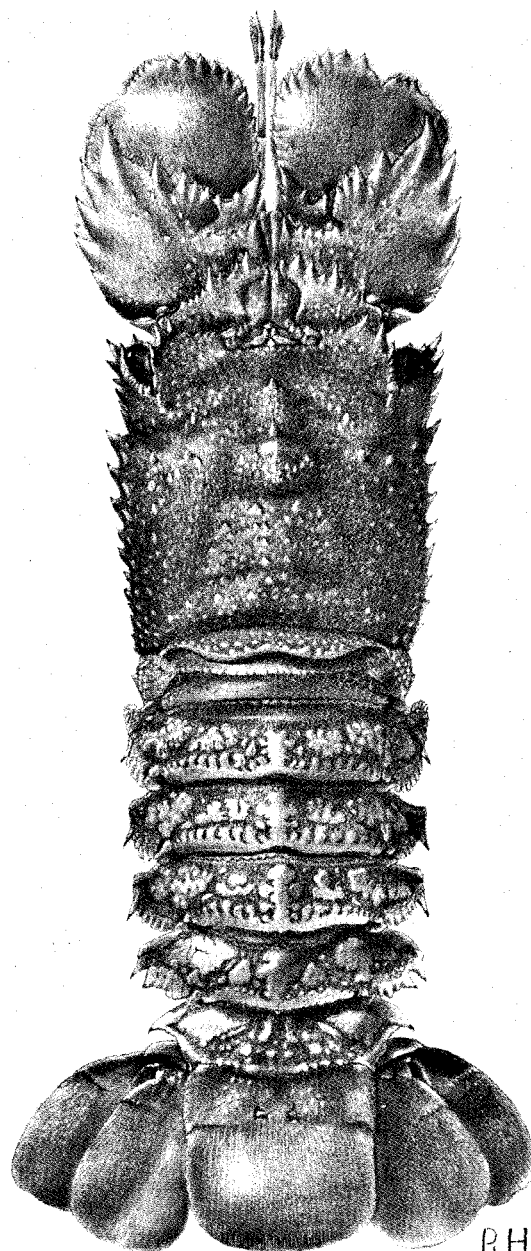
Habitat and Biology : The species is found on the outer reefs. The larvae are planktonic.

Size : Total body length up to about 20 cm, carapace length about 4 to 6 cm.

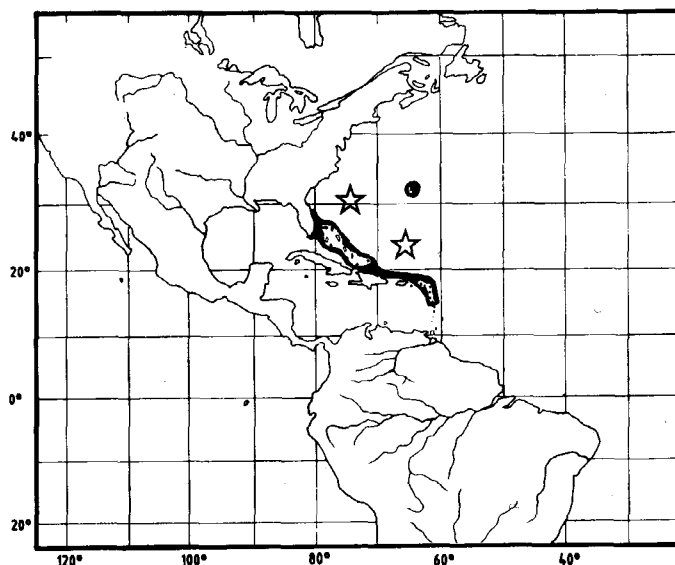
Interest to Fisheries : The species is too rare to be of much economic interest. Most specimens known so far have been taken in lobster pots set for other species

Local Names : BERMUDA: Small Spanish lobster.

Literature : Verrill, 1922:30-31, pl. 7 fig. 1. for larval development see Robertson, 1969: 143-151.



B.H.
Fig. 329



☆ larval records

Fig. 330

Arctides regalis Holthuis, 1963

Fig. 331

SCYL Arct 3

Arctides regalis Holthuis, 1963, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C) 66:58.

FAO Names : En - Royal Spanish lobster.

Type : Type locality: "reef near Coconut Island, Kaneohe Bay, Oahu, Hawaii". Holotype male in RMNH, no D. 17700.

Geographical Distribution : Indo-West Pacific region: western Indian Ocean (Mauritius, Reunion), New Caledonia, Hawaiian Islands, Easter Island. Johnson (1971:98, fig. 88-92) described larvae from east of Johnston Island. The larvae reported by Michel (1971:467) from the New Caledonia-New Hebrides area and from the Tuamotu Islands as *A. antipodarum*, might well belong to the present species (Fig. 332).

Habitat and Biology : Depth range from 5 to 50 m; it is found on the outer edges of coral reefs. The animals are nocturnal and hide in the daytime in cavities in the rocks. They seem to be scavengers and feed on detritus.

Size : Total body length up to 17 cm; carapace length about 1.5 to 6 cm.

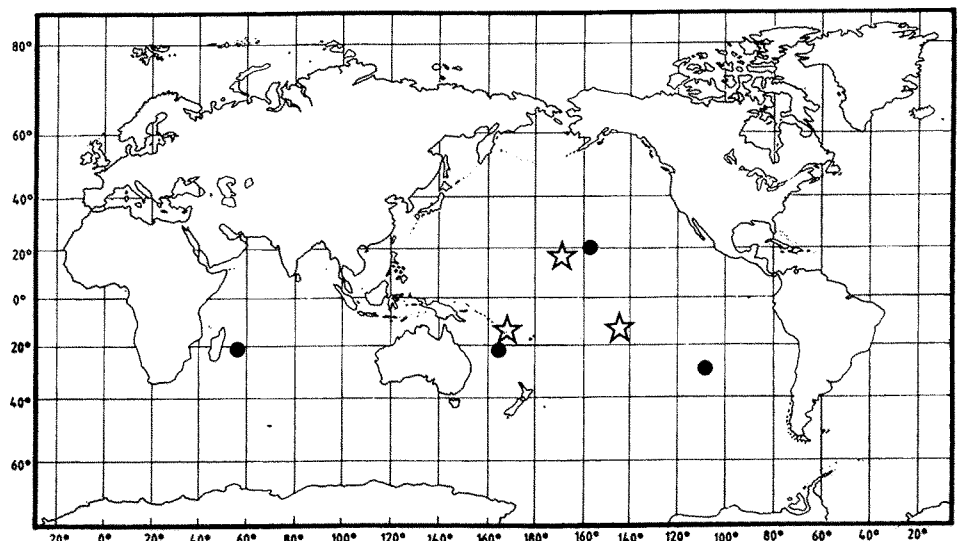
Interest to Fisheries : Minor, as the species is so rare and difficult to obtain. Therefore it is of little importance as food. But the aquarium trade has discovered that "when imported, their bright colours (for a slipper lobster) and unusual form make them popular and expensive novelties" (1984, *Tropical Fish Hobbyist*, 32(6):6).

Local Names : HAWAII: Royal slipper lobster, King's Hawaiian lobster, Shovel-nosed lobster, Spanish lobster, Ula-papapa.

Literature : Tinker, 1965:46, pl. 11.



Fig. 331



☆ larval records, probably of this species

Fig. 332

Scyllarides Gill, 1898**SCYL Arct 3**

Scyllarides Gill, 1898, *Science, New York* (n.ser.) 7:98. Gender masculine. Name placed on the Official List of Generic Names in Zoology, in Opinion 293 (published in 1954).

Type Species: by original designation: *Scyllarus aequinoctialis* Lund, 1793

Synonyms: *Pseudibacus* Guérin-Méneville, 1855, *Revue Magasin Zoologie*, (2)7:137. Type species, by monotypy: *Pseudibacus veranyi* Guerin-Meneville, 1855 (= junior subjective synonym of *Scyllarides latus* (Latr.)). Gender masculine. Name suppressed by the International Commission on Zoological Nomenclature under its plenary power in Opinion 293 (published in 1954) and placed on the Official Index of Rejected and Invalid Names in Zoology.

Scyllaridia Bell, 1857, *Monograph of the fossil malacostracous Crustacea of Great Britain*, 1:35. Type species, by monotypy: *Scyllaridia koenigi* Bell, 1857. Gender feminine. Name suppressed by the International Commission on Zoological Nomenclature under its plenary power in Opinion 293 (published in 1954) and placed on the Official Index of Rejected and Invalid Names in Zoology.

At present 13 species of the genus *Scyllarides* are known. All are treated in the present catalogue. They attain a large size and are edible.

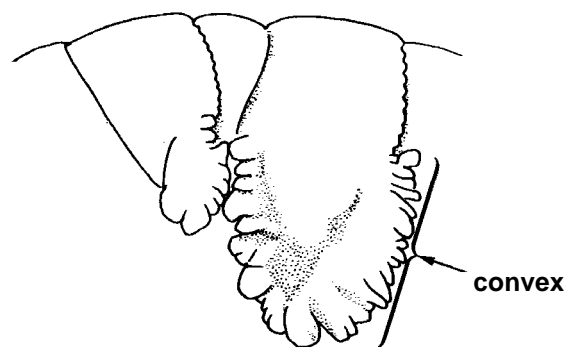
Key to Species :

1a. Outline of the posterior margin of the pleura of the second abdominal somite straight or evenly convex (Fig. 333)

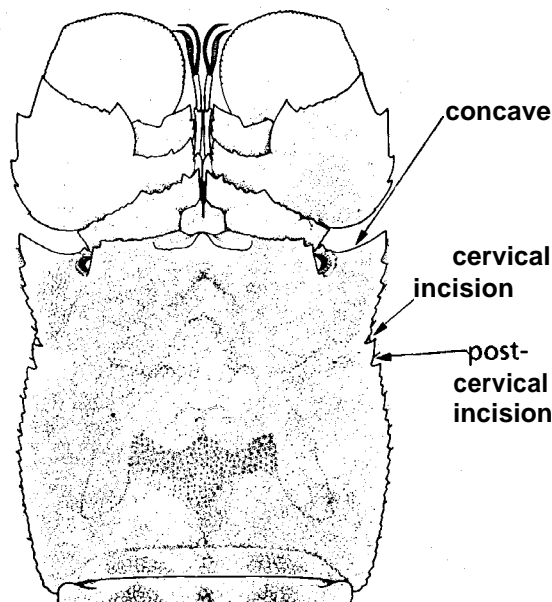
2a Lateral margin of carapace with distinct cervical and postcervical incisions. Anterior margin of the carapace between the eye and the anterolateral angle evenly concave (Fig. 334).
South Africa *S. elisabethae*
(Fig. 357)

2b Lateral margin of carapace with a cervical incision only. Anterior margin of carapace between the eye and the anterolateral angle convex or sinuous

3a. Inner orbital margin evenly tuberculate with 3 or 4 rounded tubercles. Lobe of inner orbital angle not touching the outer angle. Grooves of carapace rather indistinct. Gastric tooth not distinguishable from the other tubercles of the area. First abdominal somite with only two red spots (the laterals), the median spot being absent (Fig. 335a). Median carinae on abdominal somites hardly noticeable. Western Atlantic *S. brasiliensis*
(Fig. 351)



lateral view of pleuron of 2nd abdominal somite
S. brasiliensis
(from Williams, 1986) **Fig. 333**



carapace (dorsal view)
S. elisabethae

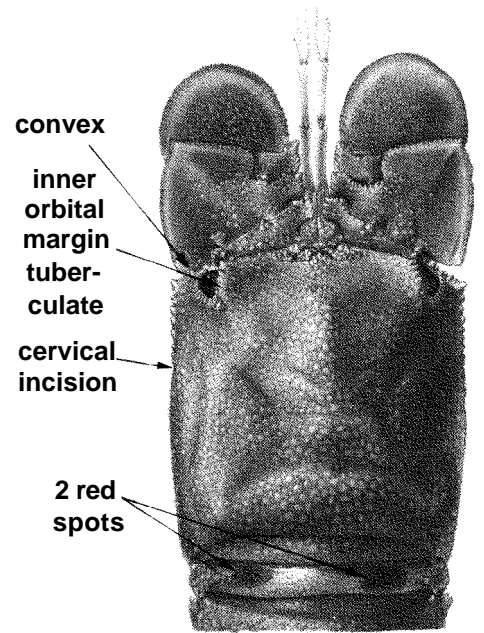
Fig. 334

3b. Inner orbital margin with two strong, pointed teeth, which are larger than any of the tubercles on that margin. Inner orbital angle with a toothed lobe which in adults practically touches the outer orbital angle and so closes the orbit. Grooves on the carapace distinct. First abdominal somite with three red spots, one rather ill-defined in the middle, and two more distinct laterally; seldom the three are fused to a single broad spot (Fig. 335b). Median carinae present on abdominal somites. Indo-West Pacific *S. squamosus* (Fig. 369)

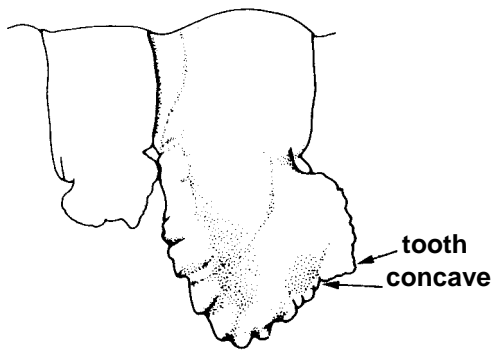
1b. Outline of the posterior margin of the pleura of the second abdominal somite concave in the middle through the presence of a strong tooth (Fig. 336)

4a. Carpus of first pereiopod with a large, swollen hump in the upper basal part; a very shallow groove extends over this hump (Fig. 337). Western Atlantic

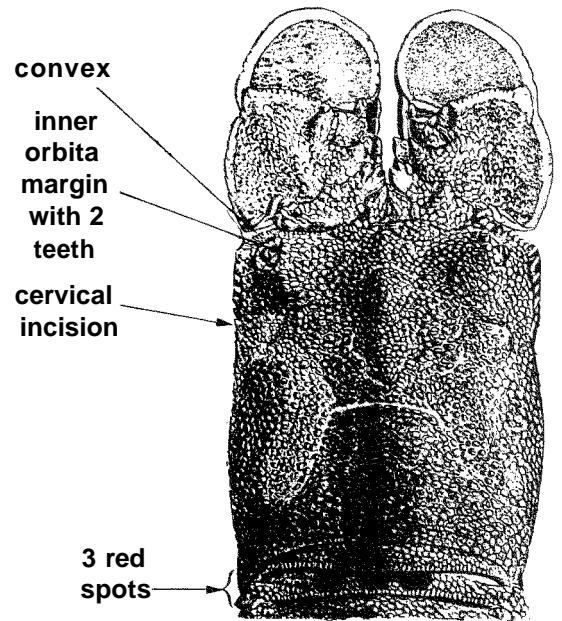
5a. Abdominal somites 2 to 4 with a very distinct broad elevated median carina, which is sharply set off from the rest of the surface. First abdominal somite with three distinct red spots. Tuberculation of carapace and abdomen coarse (Fig. 338a). Legs, even in specimens preserved for a long time in alcohol, with conspicuous sharply delimited red bands on propodus, merus and carpus *S. nodifer* (Fig. 365)



a. *S. brasiliensis*

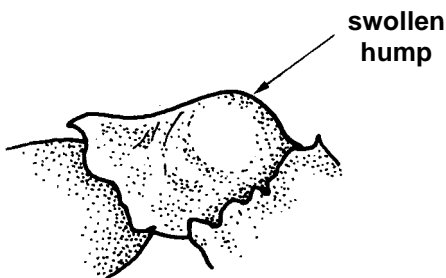


lateral view of pleuron of 2nd abdominal somite
S. deceptor Fig. 336
(from Williams, 1986)



b. *S. squamosus*

carapace and first abdominal somite (dorsal view) Fig. 335



carpus of first pereiopod
S. aequinoctialis Fig. 337

5b. Abdominal somites without a broad elevated median ridge, although there may be an indication of a median longitudinal line (Figs 338b,c,d). Tubercles of carapace and abdomen low, hairs inconspicuous

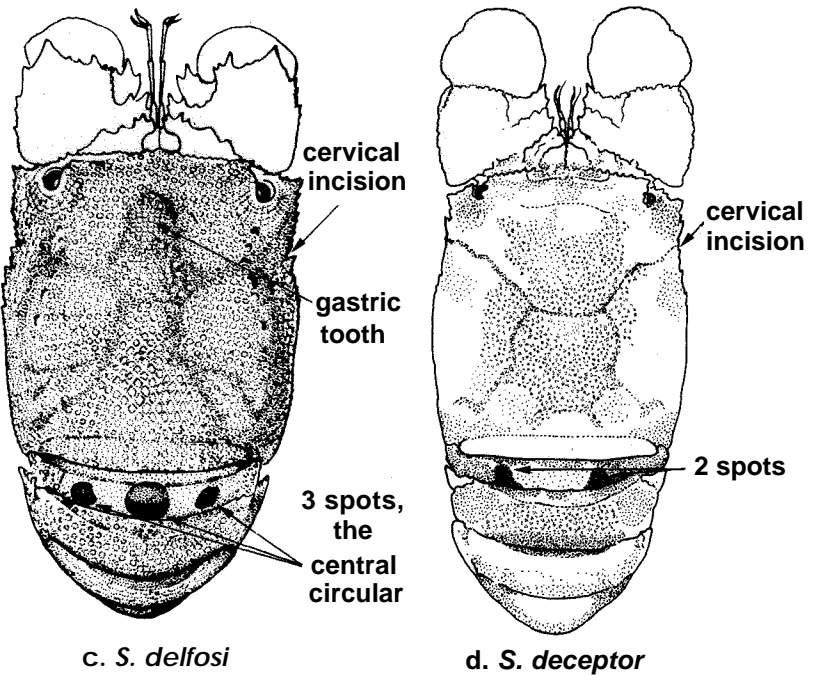
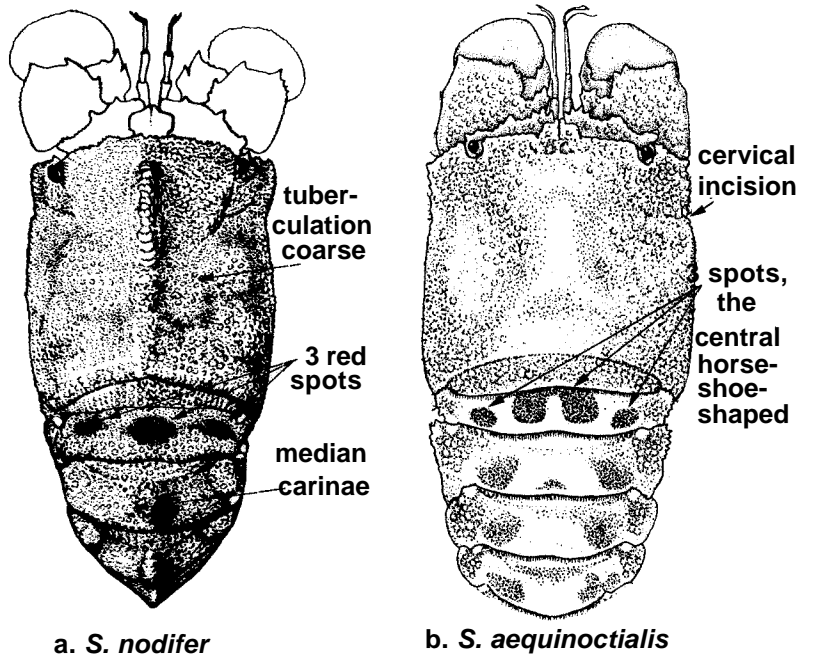
6a. Grooves on the carapace very inconspicuous. Pregastric and gastric teeth hardly if at all set off from the surface of the carapace. Cervical incision of the lateral margin hardly at all indicated. No indication at all of a median carina on the abdominal somites. Second abdominal sternite of male evenly denticulate, without a deeper median incision. First abdominal somite dorsally in the middle with a well defined horseshoe-shaped spot, consisting of two rounded submedian spots, which are connected anteriorly (Fig. 338b) *S. aequinoctialis* (Fig. 347)

6b. Grooves on the carapace distinct. Pregastric and gastric teeth well-defined. Cervical incision in lateral margin distinct and carapace constricted there. A faint elevated median line visible on abdominal somites 2 to 5. The sternite of the second abdominal somite in the male serrate, with the median incision usually deeper than the rest. No horseshoe-shaped coloured figure on the first abdominal somite (338c,d)

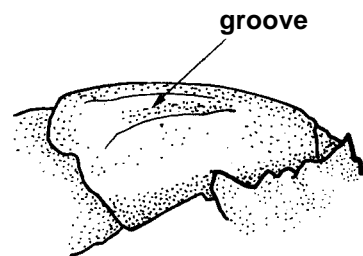
7a. First abdominal somite with a circular central spot and two irregular lateral spots. The cervical incision is narrow and distinct though short (Fig. 338c). The epistome bears two tubercles between the inner teeth *S. delfosi* (Fig. 355)

7b. First abdominal somite without a median spot but with two very distinct and sharply defined lateral spots. The cervical incision is wide and not very distinct (Fig. 338d). The epistome shows no tubercles or teeth between the two inner teeth *S. deceptor* (Fig. 353)

4b. Carpus of first pereopod with a distinct dorsal groove, and without a conspicuous basal swelling (Fig. 339). Eastern Atlantic, Indo-Pacific

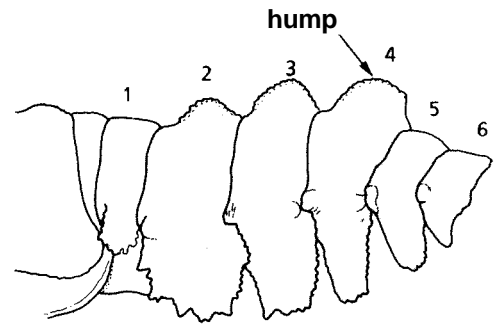


carapace and anterior abdominal somites Fig. 338 (dorsal view)



carpus of first pereopod *S. latus* Fig. 339

8a. Fourth abdominal somite in adult specimens produced into a very strong median hump which is about twice as high as those on the second and third somite (Fig. 340a). First abdominal somite with 2 distinct but rather small lateral spots and a large, less dark and irregular median spot (Fig. 340b) *S. haanii* (Fig. 359)

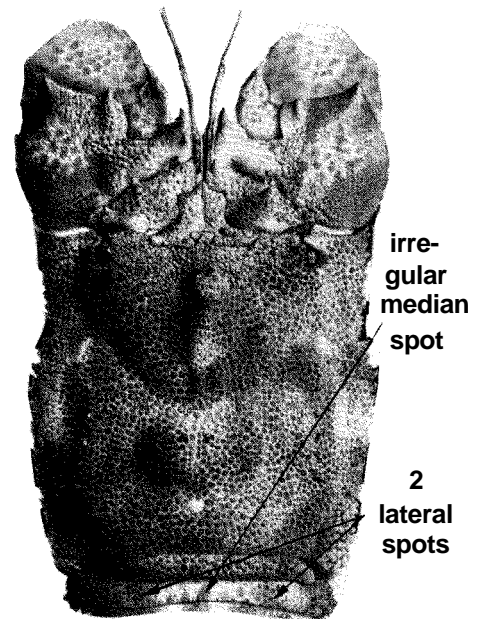


a. abdomen (lateral view)

8b. Fourth abdominal somite of adult specimens not conspicuously higher than the third (fig. 341)

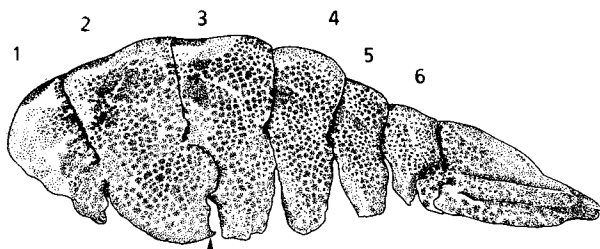
9a. Pleura of second abdominal somite ending in a sharp somewhat posteriorly directed point (Fig 341). Eastern Atlantic

10a. Tubercles on the carapace high and conspicuous. Dorsal carinae of abdomen distinct and consisting of a row of pointed or blunt tubercles. Anterolateral tooth of fourth antennal segment hooked and twisted up out of the plane of the segment. Central spot on the first abdominal somite circular, separated by a narrow yellowish ringlike zone which surrounds the entire spot from the lateral spots, which are broadly triangular with the inner margin concave (Fig. 342a) *S. latus* (Fig. 363)



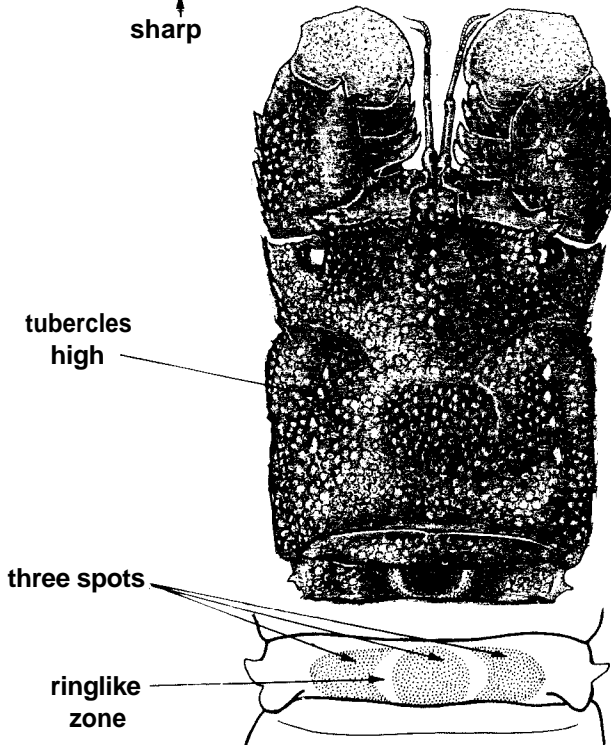
b. carapace and first abdominal somite (dorsal view)

10b. Tubercles on the carapace low and blunt, entire sculpturation less pronounced and sharp than in *S. latus*. Anterolateral tooth of fourth antennal segment although sometimes somewhat hooked, not twisted up. The first abdominal somite with three circular or irregular widely separated red spots (Fig. 342b) *S. herklotsii* (Fig. 361)



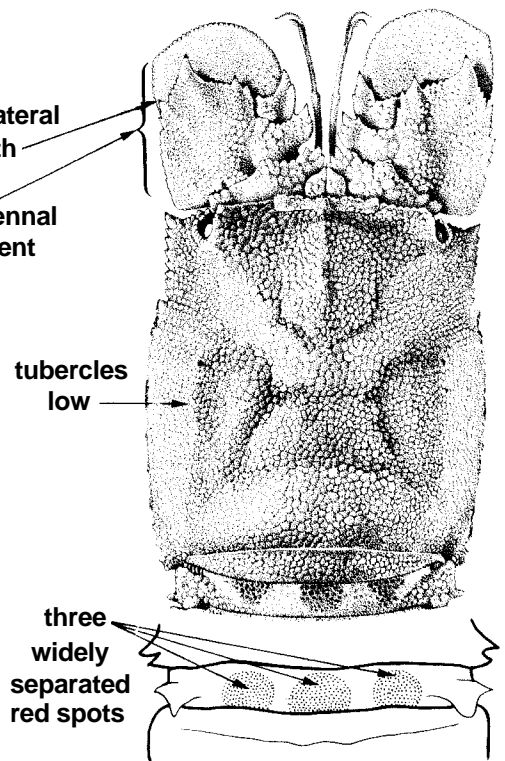
abdomen (lateral view) *S. herklotsii* Fig. 341

S. haanii Fig. 340



a. *S. latus*

anterolateral tooth
4th antennal segment



b. *S. herklotsii*

carapace and first abdominal somite (dorsal view)

Fig. 342

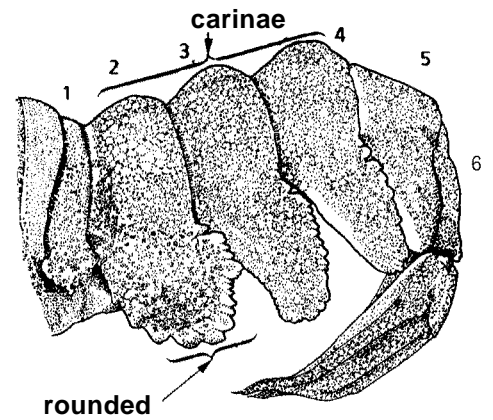
9b. Outline of pleura of second abdominal somite broadly rounded (Fig. 343). Indo-Pacific

11a. Gastric and pregastric teeth hardly noticeable, forming only faint & broad elevations. No median carinae on abdomen. First somite of abdomen with two distinct lateral spots, between which numerous small spots, which in the median area are somewhat fused (Fig. 344). Eastern Pacific *S. astori* (Fig. 349)

11 b. Gastric and pregastric teeth distinct, well set off from the rest of the carapace. Abdominal somites 2 to 4 with median carinae (Fig. 343). First abdominal somite with 3 distinct spots, the central sometimes of irregular shape (Figs 345,346)

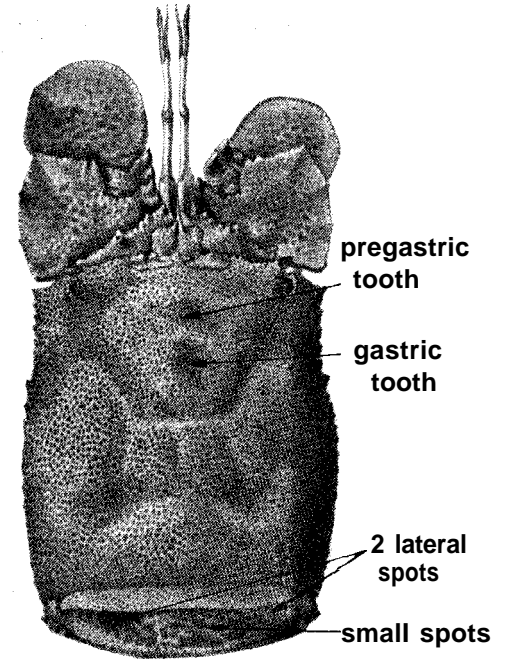
12a. Cervical groove wide and deep in its median area, anterior margin of cardiac knob thereby high. Pregastric tooth with a single tip. Median ridges on the second to fourth abdominal somites more in the shape of humps, gradually merging with the rest of the surface. Central spot on first abdominal somite very indistinct, the laterals distinct (Fig. 345) (Easter Island) *S. roggeveeni* (Fig. 367)

12b. Cervical groove narrow and shallow in its median area; the cardiac knob thereby very little pronounced. Pregastric tooth distinctly two-topped. Median ridges on second to fourth abdominal somite sharp and distinctly set off from the rest of the surface. Central spot on first abdominal somite sharply defined, as distinct as the laterals (Fig. 346) *S. tridacnophaga* (Fig. 371)

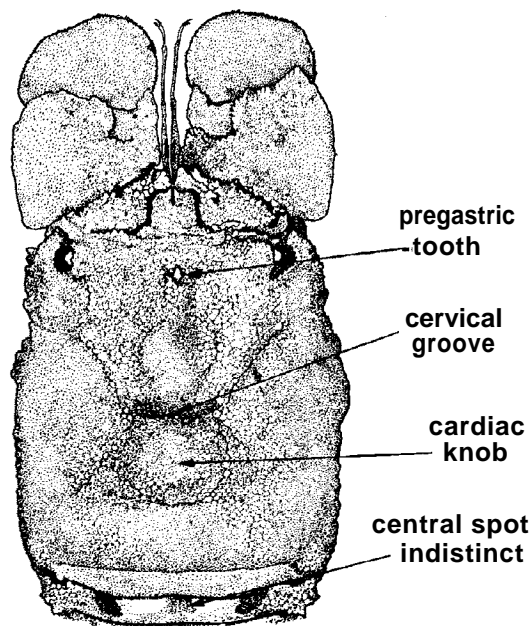


abdomen (lateral view)
S. roggeveeni

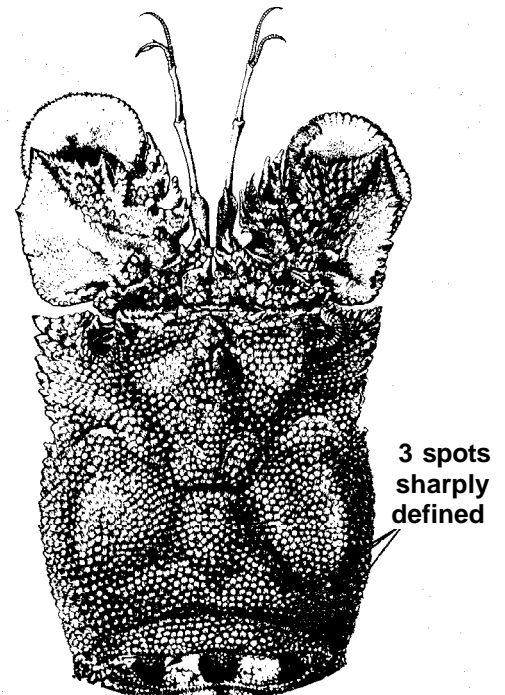
Fig. 343



S. astori (dorsal view) Fig. 344
carapace and first abdominal somite



S. roggeveeni
carapace and first abdominal somite
(dorsal view)
Fig. 345



S. tridacnophaga
carapace and first abdominal somite
(dorsal view)
Fig. 346

Scyllarides aequinoctialis (Lund, 1793)

Scyllarus aequinoctialis Lund, 1793, *Kongelige Danske Videnskabers Selskab Skrifter*, (n.ser.) 2(2):21. Name placed on Official List of Specific Names in Zoology, in Opinion 293 (published in 1954).

Synonyms: *Pseudibacus gerstaeckeri* Pfeffer, 1881.

FAO Names : **En** - Spanish slipper lobster; **Fr** - Cigale marie-carogne; **Sp** - Cigarra español.

Type : Type locality of *S. aequinoctialis*: "seldom seen in Jamaica, though a native of those seas" (Browne, 1765:424). The male specimen figured by Browne (pl. 41 fig. 1) is chosen as the lectotype of Lund's species; its present whereabouts are unknown.

Typelocality of *Parribacus gerstaeckeri*: "Atlantischer Ocean" Type material in ZMH.

Geographical Distribution : Western Atlantic, from S. Carolina (USA) and Bermuda via the West Indies to S. Brazil (São Paulo State), including the Gulf of Mexico and the Caribbean Sea (Fig. 348).

Habitat and Biology : Depth range from 0.6 to 180 m, usually between 0.6 and 64 m; on a substrate of sand or rocks, often on outer reefs. The animals are sluggish and nocturnal and feed on (dead) animals, detritus, etc. They bury themselves in the sand.

Size : Maximum total body length over 30 cm; carapace length up to about 12 cm.

Interest to Fisheries : The species is used as food, but is not of great economic importance; it is eaten mostly by the poorer people. Verrill (1922:23) remarked that it "is not commonly sold in the markets" at Bermuda, and "is rarely used as food there" Morice (1958:86) remarked that with *Panulirus argus* this species is the most common lobster in the market of Fort-de-France, Martinique. In Belize, the species "though occasionally caught, is never prepared for export and therefore is of no significance in the fishery" (Allsopp, 1968). Almost throughout its range *S. aequinoctialis* is eaten, but evidently not very highly esteemed. Its meat also serves as bait in lobsterpots. The animals are mostly taken in traps set for other species, but also with fixed gill nets and seines. It is sold fresh.

Local Names : BERMUDA: Locust lobster, French lobster, Long-tailed crab, Sea crayfish, Sea crawfish, Slipper lobster, Stump; BRAZIL: Lagostim, Cigarra, Fradinho, Lagosta sapateira; CUBA: Langosta de arena, Langosta española, Langostina; GRENADA: Lady crab; JAMAICA: Mother lobster, Turtle lobster; MARTINIQUE: Maman homard, Marie-carogne, Mere homard, Savate; NETHERLANDS ANTILLES: Beer-kreeft, Schoenkreeft, Zandkreeft (Dutch; Aruba, Bonaire, Curaçao), Kreef zapatu (Papiamentu; Aruba, Bonaire, Curaçao); ST. THOMAS: Turtle lobster.

Fig. 347

SCYL Scyld 2

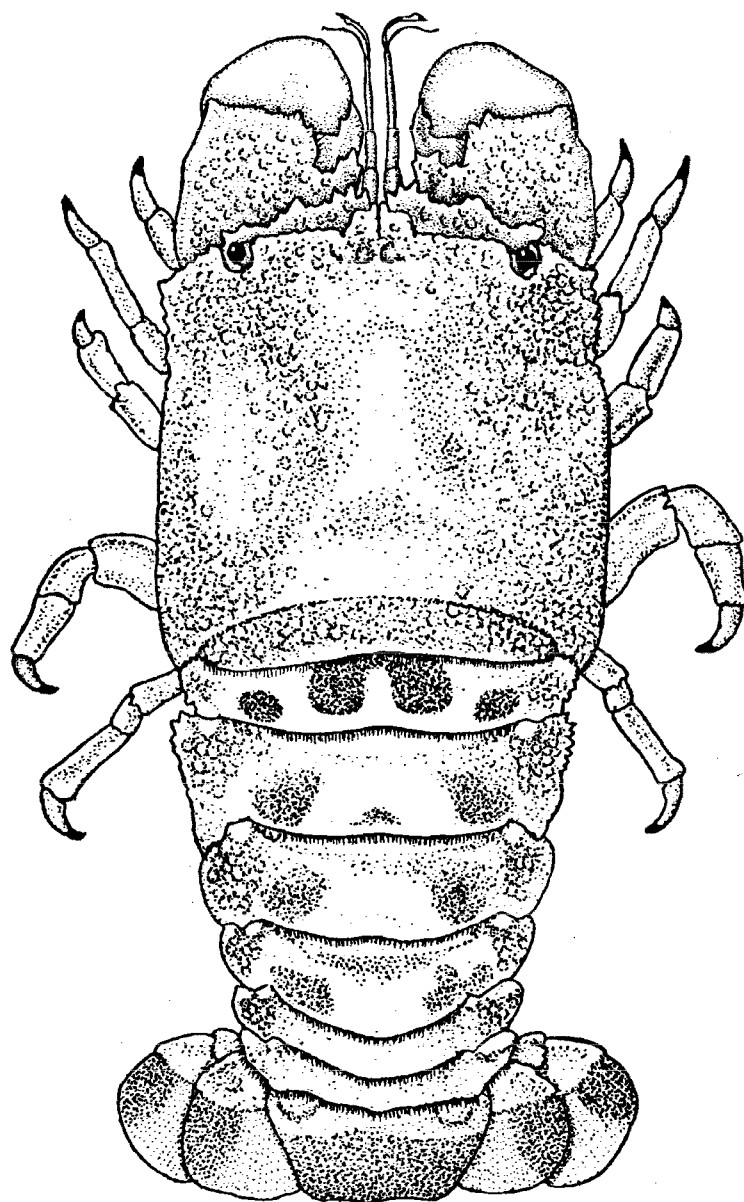


Fig. 347

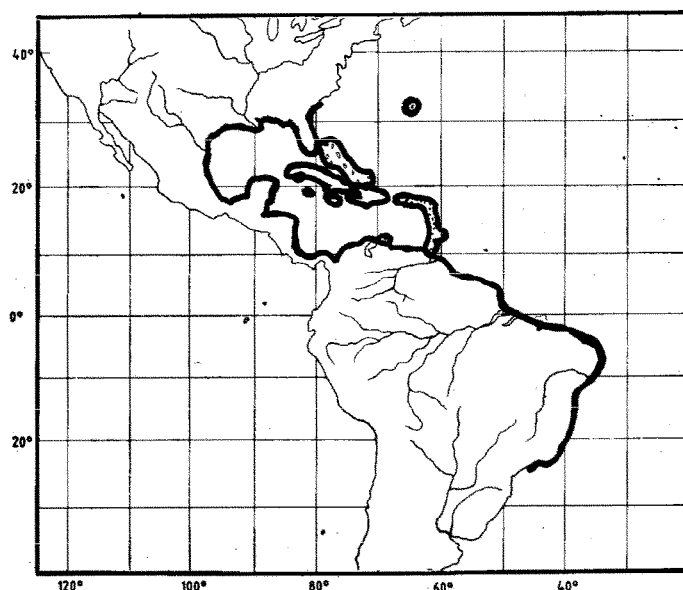


Fig. 348

Literature : Fischer (ed.), 1978: vol. 6; Williams, 1986:29, figs 62 (61 and 62 have been interchanged), 72,80 l-m.

***Scyllarides astori* Holthuis, 1960**

Fig. 349

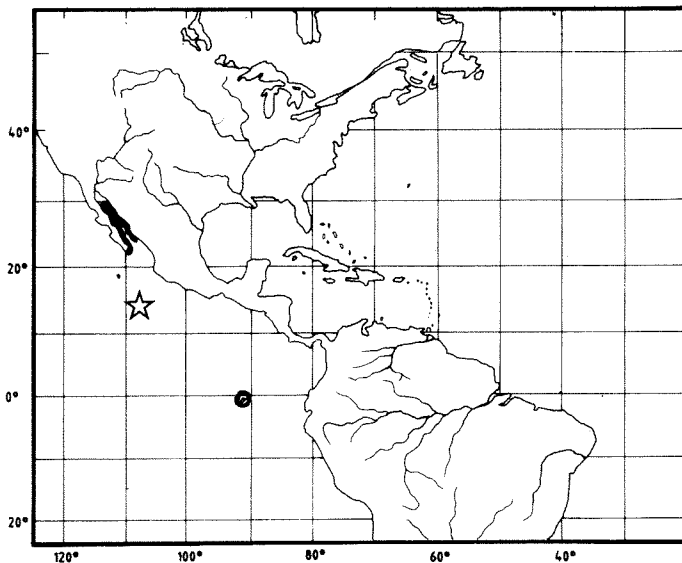
SCYL Scyld 7

***Scyllarides astori* Holthuis, 1960, Holthuis, Proceedings Biological Society Washinaton , 73; 152.**

FAO Names : **En** - Galapagos slipper lobster; **Fr** - Cigale de Galapagos; **Sp** - Cigarro de Galapagos.

Type : Type locality: "Post Office Bay, Charles Island, Galapagos Archipelago". Holotype male in USNM, no. 104557.

Geographical Distribution : Eastern Pacific: Gulf of California, Mexico; Galápagos Archipelago, Ecuador. A larva probably of this species, at 200 miles N. of Clipperton Island (Fig. 350).



☆ larval record (probably of this species)
Fig. 350

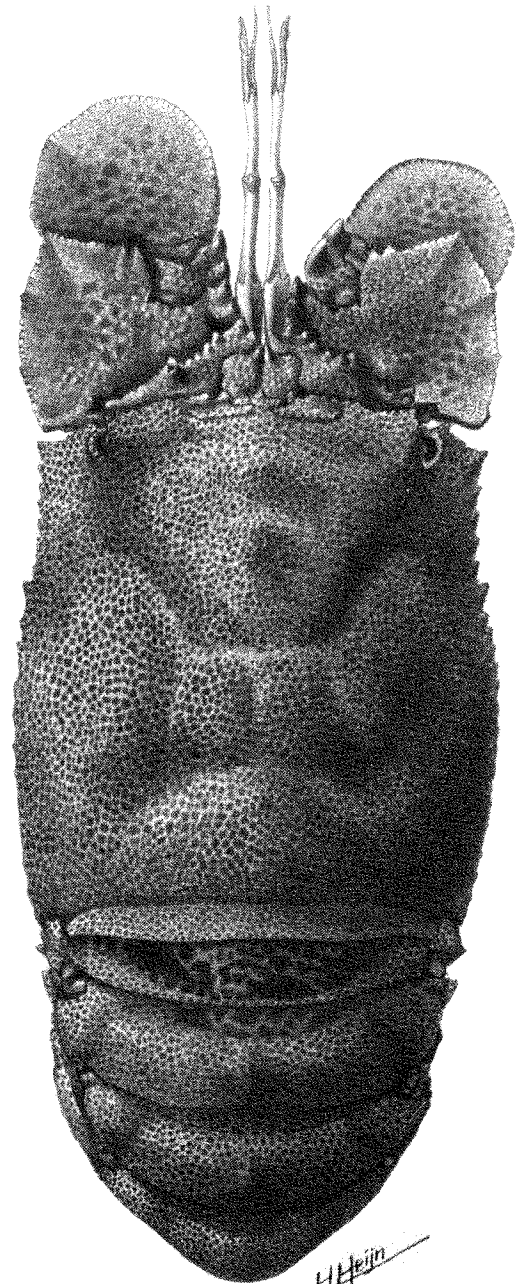
Habitat and Biology : In shallow water, around 10 m; hardly any accurate depths are known. Probably on rocky substrate. Nocturnal.

Size : Total length up to about 25 cm; carapace length from 8 to 12 cm.

Interest to Fisheries : There is no special fishery for this species, but animals are occasionally caught in traps and trammel nets for spiny lobsters or other species. When caught the animals are used for food. Also the aquarium trade showed interest in this species, but it is caught too infrequently to be of economic importance.

Local Names : ECUADOR: Langostino (Galapagos islands)

Literature : Holthuis & Loesch, 1967:216, pl. 7.



(from Holthuis & Loesch, 1967)

Fig. 349

Scyllarides brasiliensis Rathbun, 1906

Fig. 351

SCYL Scyld 8

Scyllarides brasiliensis Rathbun, 1906, Proceedings Biological Society Washinston , 19: 113.

FAO Names : En - Brazilian slipper lobster.

Type : Type locality: "Bahia, Brazil". Holotype female in USNM, no. 21612

Geographical Distribution : Western Atlantic region: Brazil (from Maranhão State to Bahia State). There is also a record from Dominica in the West Indies (Fig. 352).

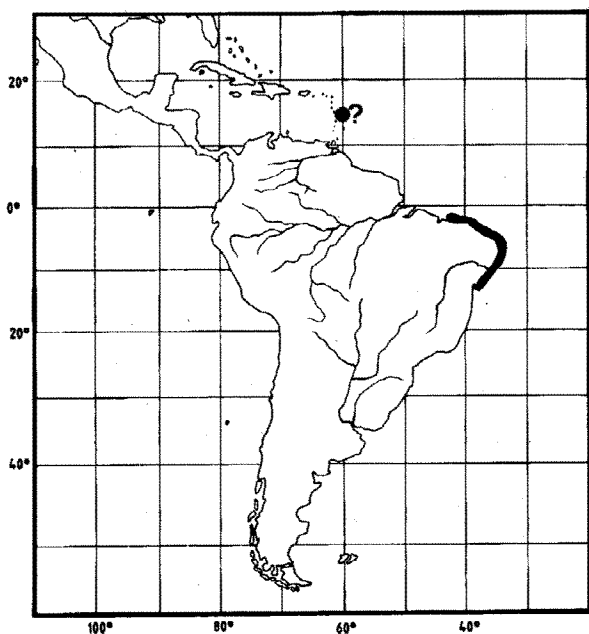


Fig. 352

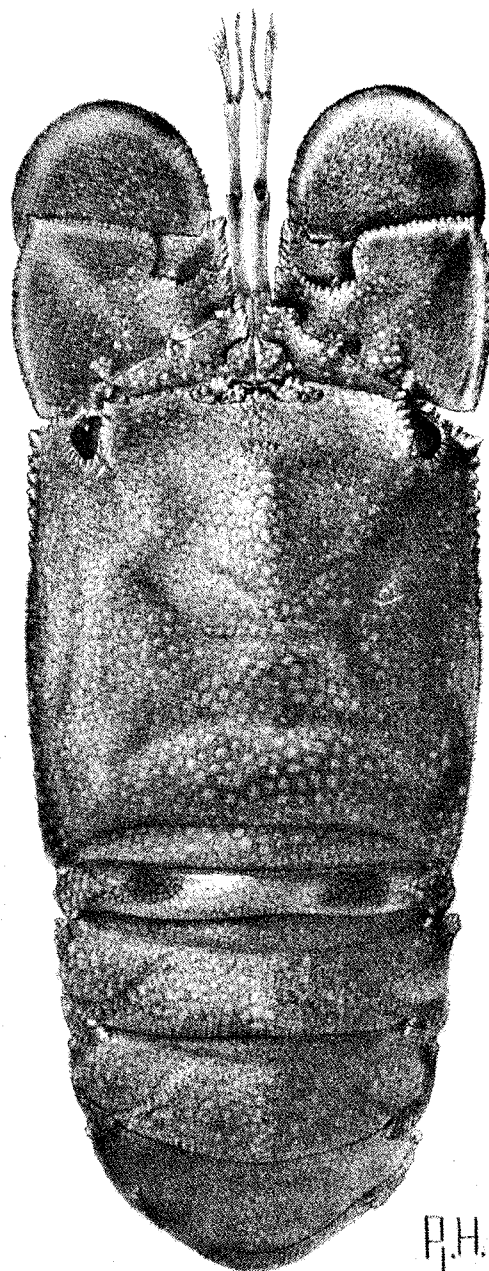
Habitat and Biology : Depth range from 22 to 38 m. Very little is known about this species.

Size : Total body length to about 20 cm; carapace lengths 7.5 to 10 cm.

Interest to Fisheries : Fausto Filho et al. (1966) remarked that the species is of "alguma importancia econdmica" in northern Brazil.

Local Names : BRAZIL: Sapateira, Lagosta japonesa, Lagosta sapateira.

literature : Original description; Williams, 1986:27, figs 66,80 h-i.



B.H.

Fig. 351

Scyllarides deceptor Holthuis, 1963

Fig. 353

SCYL Scyld 9

Scyllarides deceptor Holthuis, 1963, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C) 66:57.

Synonyms: The species has been confused with *S. brasiliensis* by some authors.

FAO Names : En - Hooded slipper lobster.

Type : Type locality: "Ubatuba, São Paulo State, Brazil"
Holotype female in RMNH, no. D. 15451.

Geographical Distribution : Western Atlantic region: from southern Brazil (States of Rio de Janeiro, São Paulo and Santa Catarina) south to northern Argentina (Buenos Aires Province), 23.5°-39°S (Fig. 354).

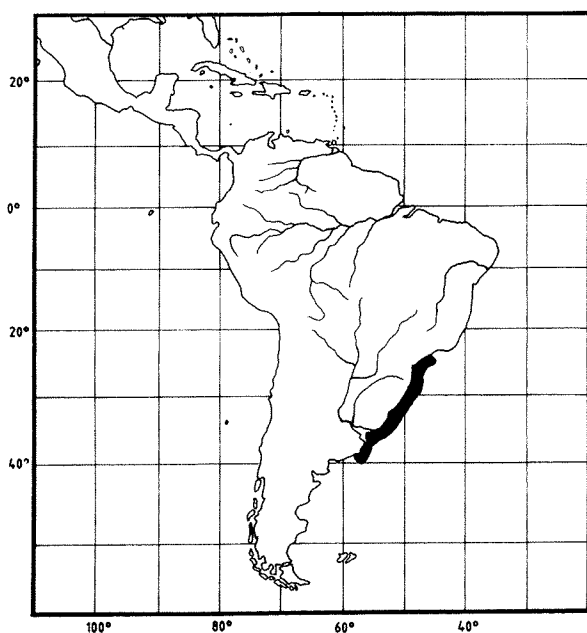


Fig. 354

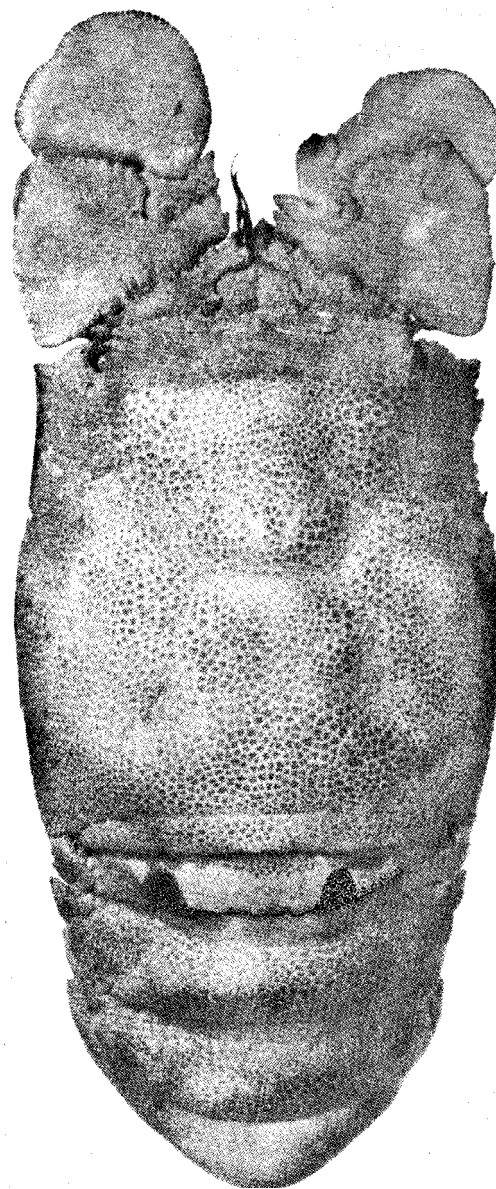


Fig. 353

Habitat and Biology : Found in depth between 45 and 200 m. Little is known about the substrate on which the animals live, except for one record from a sandy bottom.

Size : Total body length about 13 to 27 cm; carapace length 5 to 12 cm.

Interest to Fisheries : The species is occasionally caught in trawls, but it is not specially fished for and evidently is too rare to become of economic interest.

Local Names : BRAZIL: Lagosta, Lagostim.

Literature : Ramos, 1951: 125, pls 1,2 (as *S. brasiliensis*); Williams, 1986:27, fig. 67.

Scyllarides delfosi Holthuis, 1960

Fig. 355

SCYL Scyld 10

Scyllarides delfosi Holthuis, 1960, Proceedings Biological Society Washinaton, 73: 153.

FAO Names : En - Three-spot slipper lobster.

Type : Type locality: "off the Suriname coast (6°41'N, 55°26.5'W, depth 23 fathoms [= 42 m], bottom mud, shells, and coral)". Holotype male in RMNH, no. D 12735.

Geographical Distribution : Western Atlantic region: north coast of South America from Venezuela (Sucre State) to Brazil (Ceará State) (Fig. 356).

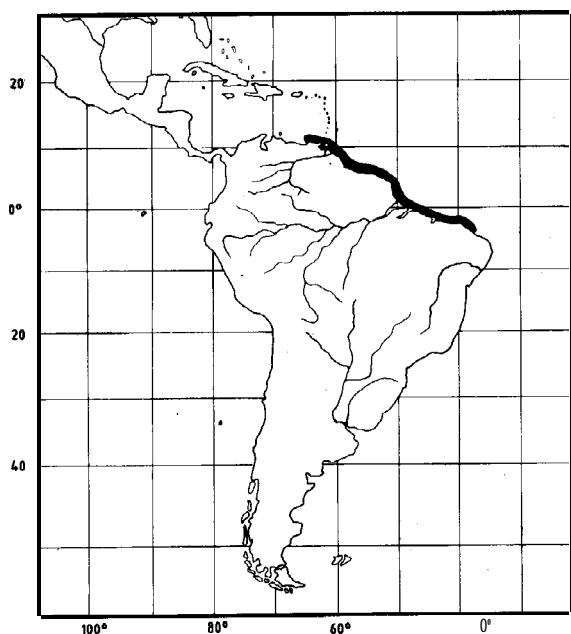


Fig. 356

Habitat and Biology : Reported from depths between 42 and 80 m, substrate mud.

Size : Total body length to 25 cm; carapace lengths of 6 to 9 cm have been reported.

Interest to Fisheries : Minor. The species is sometimes taken in trawls and dredges, but not in commercially interesting quantities. Fausto Filho (1968:27,28) classed this species as of "insignificante valor comercial". Opresko et al. (1973:38) remarked that "the species probably could be taken commercially by either trawl or trap if sufficient populations are found".

Local Names : BRAZIL: Lagosta japonesa, Lagosta sapateira, Sapata.

Literature : Opresko et al., 1973:38, fig. 14.

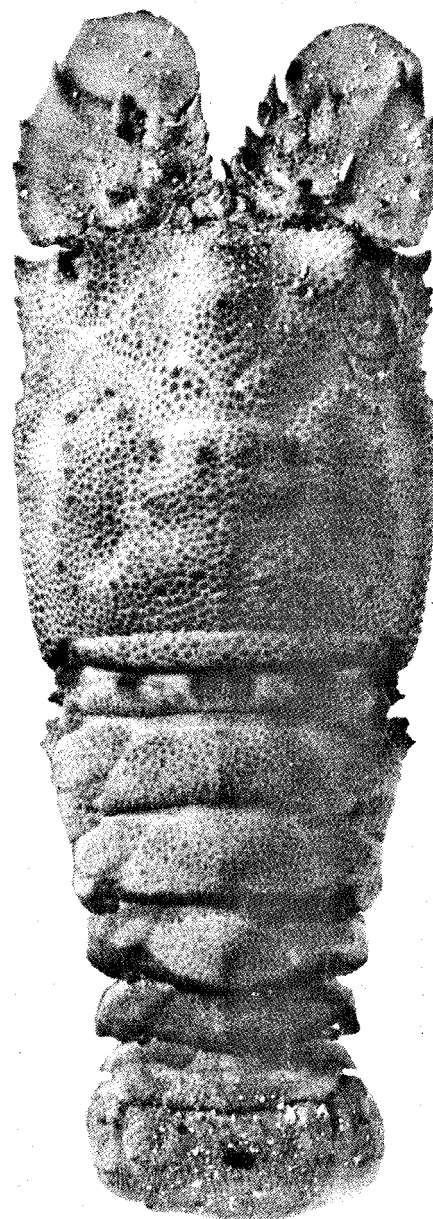


Fig. 355

Scyllarides elisabethae (Ortmann, 1894)

Fig. 357

SCYL Scyld 5

Scyllarides elisabethae (Ortmann, 1894), *Denkschriften medicinisch-naturwissenschaftlichen Gesellschaft, Jena*, 8:20, pl. 2 fig. 3.

FAO Names : **En** - Cape slipper lobster; **Fr** - Cigale du Cap; **Sp** - Cigarra del Cabo.

Type : Type locality: "Port Elisabeth" (= Port Elizabeth, Cape Province, South Africa). Holotype male in MZS, preserved dry, condition poor.

Geographical Distribution : Indo-West Pacific region: only known from SE. Africa (from Inhambane, Mozambique to Cape Agulhas, Cape Province, South Africa; about from 24° to 34°50'S) (Fig. 358).

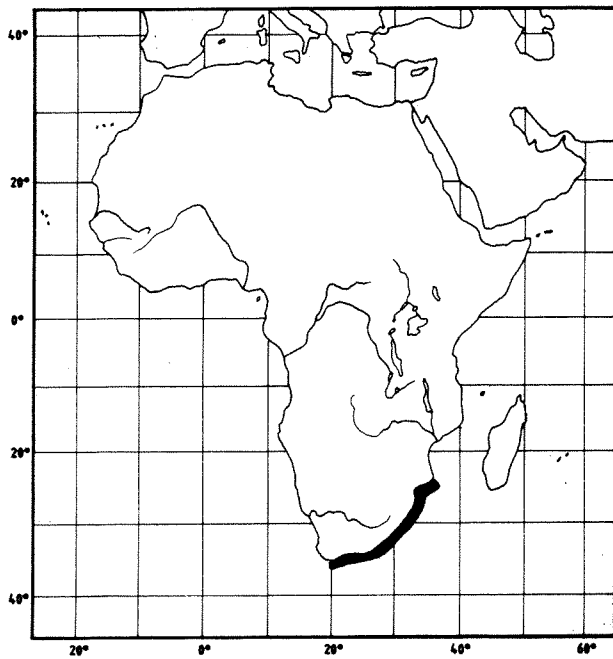


Fig. 358

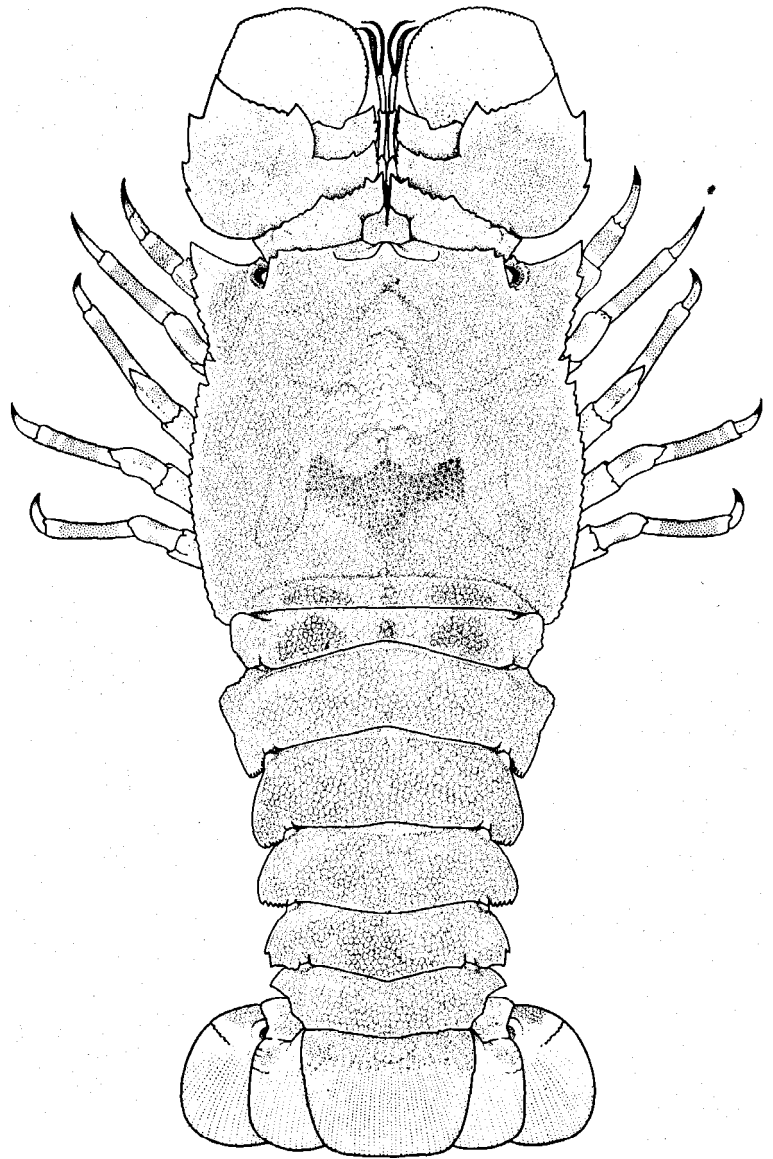


Fig. 357

Habitat and Biology : Depth range from 37 to 380 m (mostly less than 100 m) on a substrate of fine sediments, mud or fine sand. The animals seem to dig into the mud.

Size : Maximum total body length over 20 cm; carapace length to 9 cm.

Interest to Fisheries : Minor. The species is occasionally taken by trawlers, but there is no special fishery for it, although Von Bonde (1930:5) remarked that it "occurs off the coast of Natal in such numbers as to be of economic importance".

Local Names : MOZAMBIQUE: Cava-cava do Cabo; SOUTH AFRICA: Port Elizabeth crayfish, Digging lobster, Port Elizabeth crawfish, Port Elizabeth rock lobster.

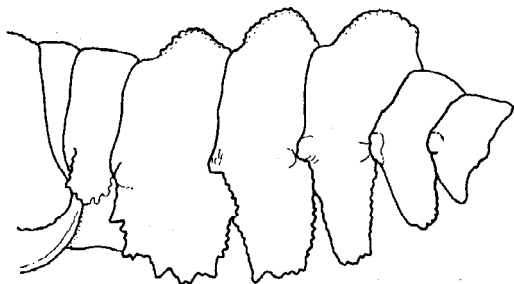
Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:29, figs 73,80 n-o.

Scyllarides haanii (De Haan 1841)

Scyllarides haanii De Haan 1841, in P.F. von Siebold, *Fauna Japonica*, (Crust.), (5): 152.

FAO Names : En - Aesop slipper lobster.

Type : Type locality: "Japonia", probably in the area of Nagasaki, Kyushu. Lectotype male in RMNH, no. D 5520.



lateral view of abdomen

Geographical Distribution : Indo-West Pacific region: from the Red Sea and the western Indian Ocean (Mauritius) to Japan (Sagami Bay and south), Korea, China (southeast coast and Taiwan Island), Indonesia, Australia, and Hawaii (Fig. 360).

Habitat and Biology : Known from depths between 10 and 135 m. Probably on rocky bottom.

Size : Total body length up to 50 cm. The carapace lengths reported vary between 4.5 and 17 cm.

Interest to Fisheries : The species as a rule is only incidentally caught, but it is used for food and offered for sale fresh at local markets (e.g., in Korea, Japan and Hawaii). It is usually taken with lobster pots.

Local Names : JAPAN: Kobu semi-ebi.

Fig. 359

SCYL Scyld 11

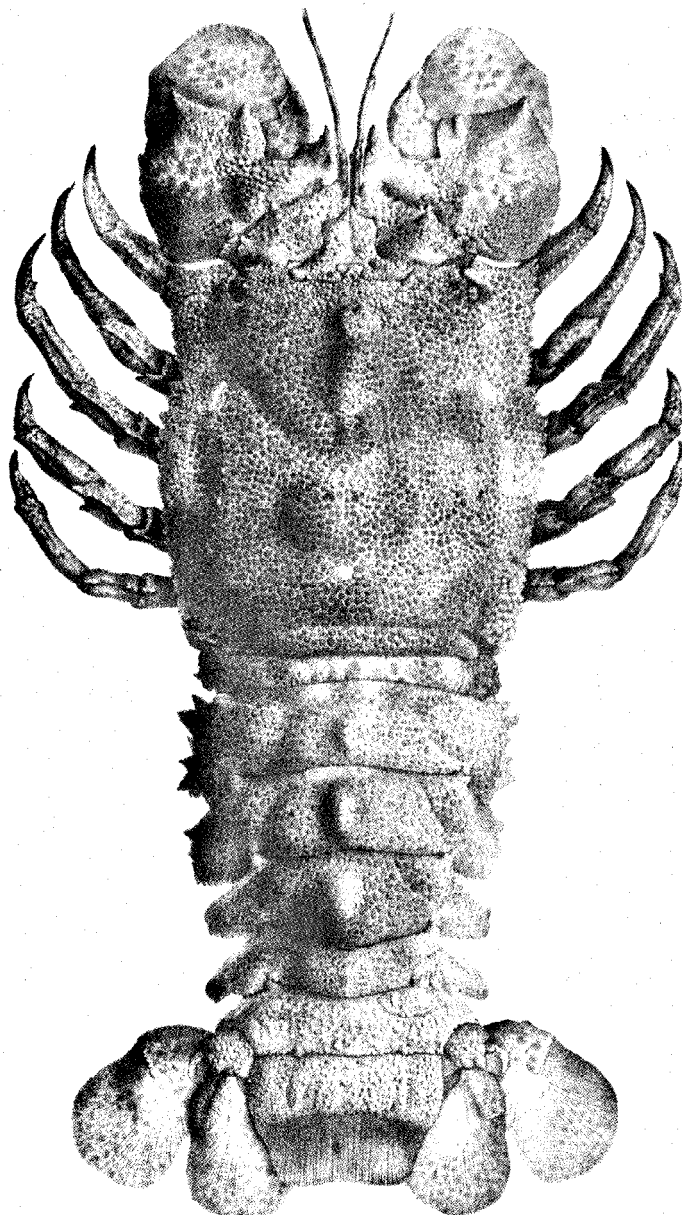


Fig. 359

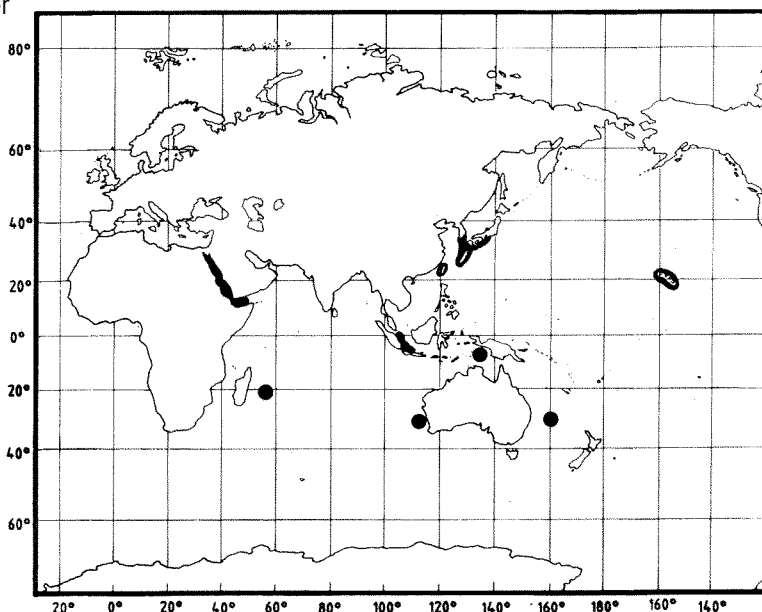


Fig. 360

Scyllarides herklotsii (Herklots, 1851)

Fig. 361

SCYL Scyld 4

Scyllarus herklotsii Herklots, 1851, *Additamenta ad faunam carcinologicam Africae occidentalis*: 14, pl. 2 figs. 14, 15.

Synonyms: Formerly sometimes identified with *Scyllarides latus*.

FAO Names : **En** - Red slipper lobster; **Fr** - Cigale rouge; **Sp** - Cigarra roja.

Type : Type locality: "prope Boutiy" [= Butri, Ghana, 4°50'N 1°56'W]. Lectotype male in RMNH, no. D. 973.

Geographical Distribution : Eastern Central Atlantic region: West Africa from northern Senegal (St. Louis, 16°N) to southern Angola (Ponta do Pinda, 1 5°45'S) (Fig. 362).

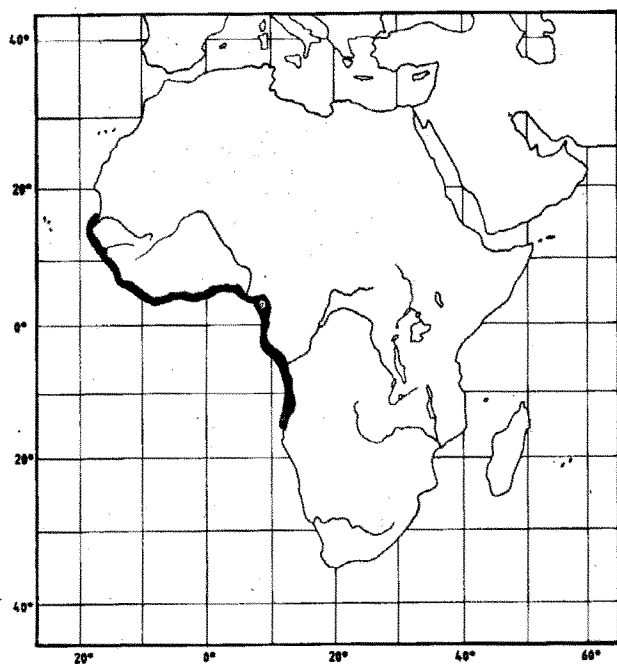


Fig. 362

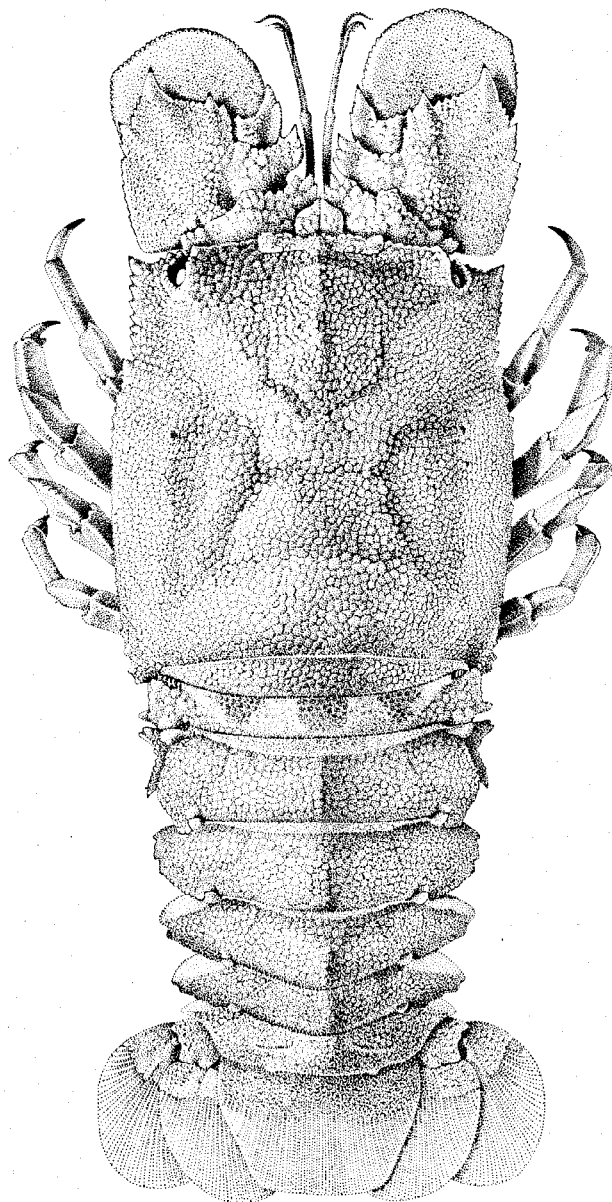


Fig. 361

Habitat and Biology : Found mostly in depths between 5 and 70 m, but also reported from deeper waters (beyond 200 m); on substrates of sand and rock, sometimes on mud.

Size : Maximum total body length about 32 cm, usually not more than 25 cm.

Interest to Fisheries : Minor. The species is fished for food everywhere it occurs; it usually is caught in vertical nets, sometimes in trawls. There is no special fishery for it, it is taken only accidentally. It is marketed fresh on the local markets.

Local Names : ANGOLA: Cigarra do mar, Lagosta da pedra; GHANA: Po-sesaw (Fante language), Red squat lobster.

Literature : Fischer, Bianchi & Scott (eds), 1981 :vol. 5; Williams, 1986:28, figs 68,80 j-k.

Scyllarides latus (Latreille, 1802)

Fig. 363

SCYL Scyld 1

Scyllarus latus Latreille, 1802, *Histoire naturelle générale et particulière, des Crustacés et des Insectes*, 6: 182

Synonyms: *Pseudibacus veranyi* Guérin Méneville, 1855.

FAO Names : **En** - Mediterranean slipper lobster; **Fr** - Grandecigale; **Sp** - Cigarra.

type : Type locality of *S. latus*: "Méditerranée". As lectotype is now chosen the specimen figured by C. Gesner (1558, *Historia Animalium liber III:1097*); this specimen was drawn by Cornelius Sittardus in Rome and evidently came from the coast near Rome, as the figure was made after a fresh specimen. The type is lost, but the original figure by C. Sittardus, published by Gesner is now in RMNH (in collection L.B. Holthuis).

Type locality of *Pseudibacus veranyi*: "aux environs de Nice", S. France. Whereabouts of type unknown.

Geographical Distribution : Mediterranean and eastern Atlantic from the coast of Portugal (near Lisbon) to Senegal, Madeira, the Azores, the Selvagens Islands and Cape Verde Islands (Fig. 364).

Habitat and Biology : Found in depths between 4 and 100 m on a rocky or sandy substrate. Food consists mainly of molluscs, especially limpets (*Patella* sp.). Ovigerous females from June to August.

Size : Maximum total body length about 45 cm, usually not more than 30 cm. Carapace length to 12 cm.

Interest to Fisheries : The species is taken and eaten wherever it occurs, but because it is rather rare, there is no commercially important fishery. It is incidentally taken with trammel nets, trawls and lobster pots, also by hand (divers). Scuba diving made its habitat more accessible to collectors, and in some areas the population of *Scyllarides* had to pay a heavy toll because of this. The species is sold on the local markets, either fresh or frozen. In Israel 2 to 3 tons are taken annually, elsewhere it is only occasionally offered for sale. The meat is very tasty; already Risso (1816:60) remarked that "la chair égale, par sa bonté celle des meilleurs crustacés de la Méditerranée"

Local Names : ALGERIA: Grosse cigale, Cigale courte; CAPE VERDE: Carrasco; FRANCE: Cigale, Grand Scyllare, Grande cigale, Grosse cigale, Homard plat, Macietta; GERMANY: Grosser Bärenkreb; GREECE: Caravida; ITALY: Cicala grande, Magnosa (official names), Cicala di mare; MALTA: Ccala hamra, Ccala seula; MOROCCO: Feritah; PORTUGAL: Lagosta (Madeira), Lagosta de ped ra; SPAIN: Cigarra de mar, Cigala gran, Sapa; TUNISIA: Cigale noire, Farzit; YUGOSLAVIA: Kuka, Kukica.

Literature : Palombi & Santarelli, 1961:373,374 (many local names); Fischer, Bianchi & Scott (eds), 1981:vol 5; Fischer, Bauchot & Schneider (eds), 1987:316.

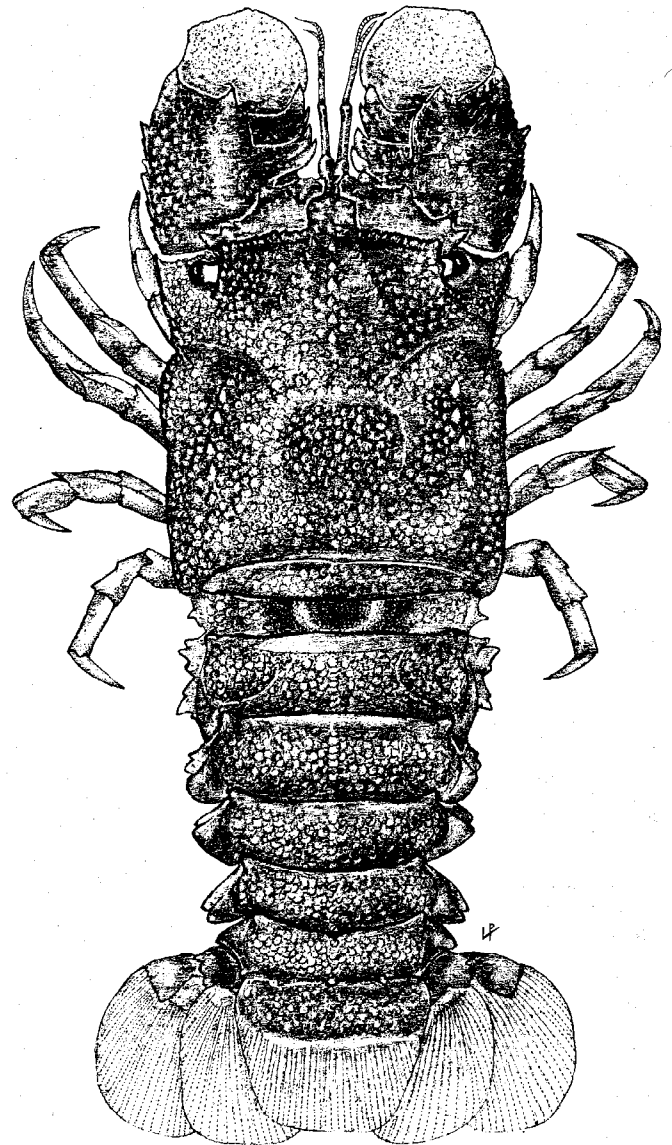


Fig. 363

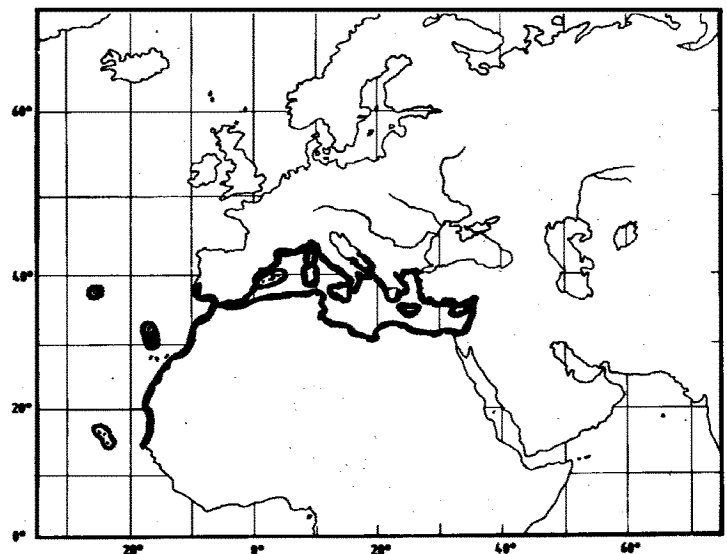


Fig. 364

Scyllarides nodifer (Stimpson, 1866)

Fig. 365

SCYL Scyld 3

Scyllarus nodifer Stimpson, 1866, *Proceedings Chicago Academy Sciences*, 1:48.

Synonyms: *Scyllarides americanus* Verrill, 1922.

FAO Names : **En** - Ridged slipper lobster; **Fr** - Cigale chambre; **Sp** - Cigarra de quilla.

Type : Type locality of *S. nodifer*: "Found among the Florida Keys at the Tortugas and from Key West". Syntypes in USNM and MCZ, now probably lost.

Type locality of *S. americanus*: "Bermuda". Lectotype male (coll. by T.H. Bean) in USNM, no. 21607.

Geographical Distribution : Western Atlantic region: Bermuda and coast of USA south of Cape Lookout, North Carolina, entire Gulf of Mexico (Florida to Yucatan) (Fig. 366).

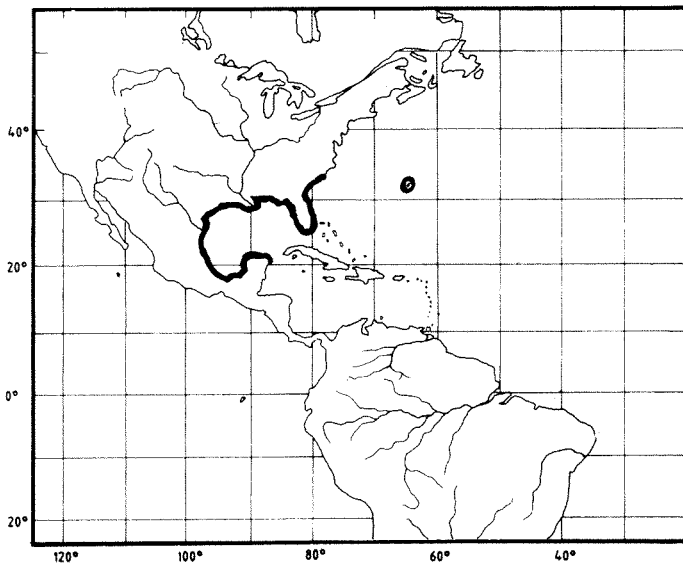
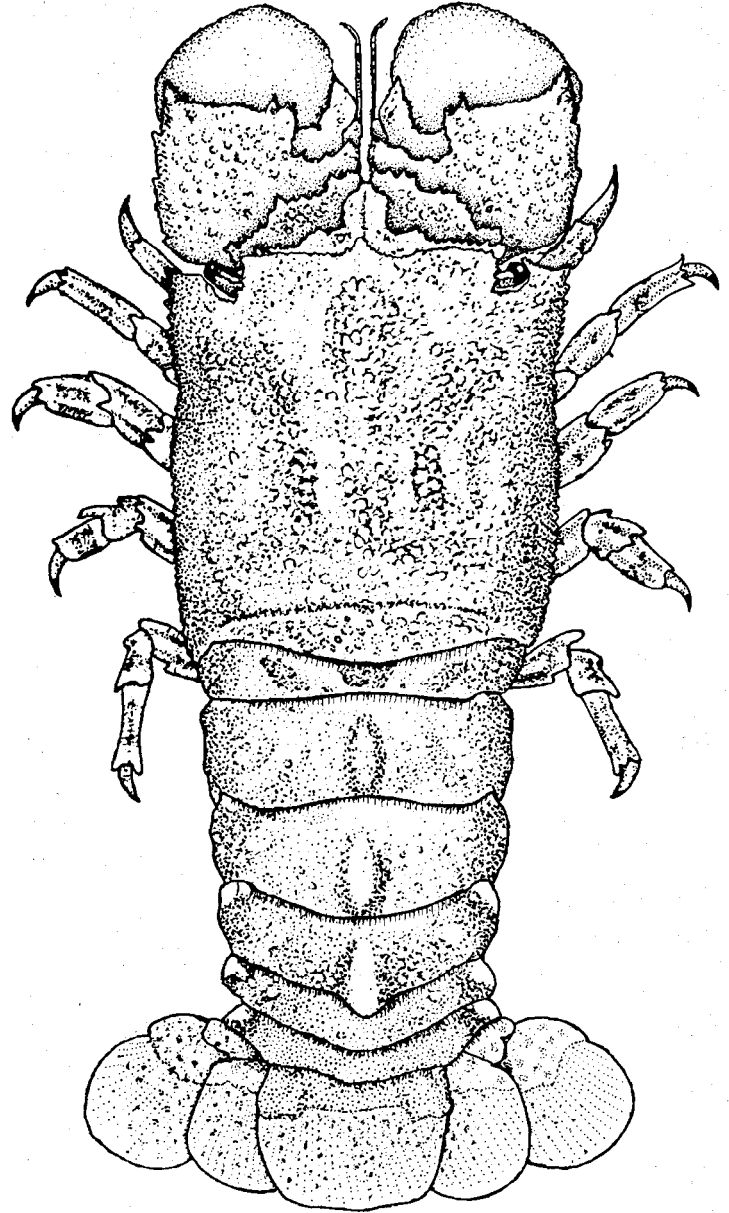


Fig. 366

Fig. 365

Habitat and Biology : Known from depths between 2 and 91 m on a sandy substrate, sometimes mixed with mud, shells or corals.

Size : Total body length to about 35 cm; carapace length to 11 cm.

Interest to Fisheries : Minor. There is no special fishery for the species, but if taken it is used as food or bait. It is mostly obtained in traps set for other species. Marketed fresh.

Local Names : USA: Bulldozer, Ridged slipper lobster, Spanish lobster.

Literature : Lyons, 1970:7, text-fig.3, pl. 1 figs A, B; Fischer (ed.), 1978:vol. 6.

Scyllarides roggeveeni Holthuis, 1967

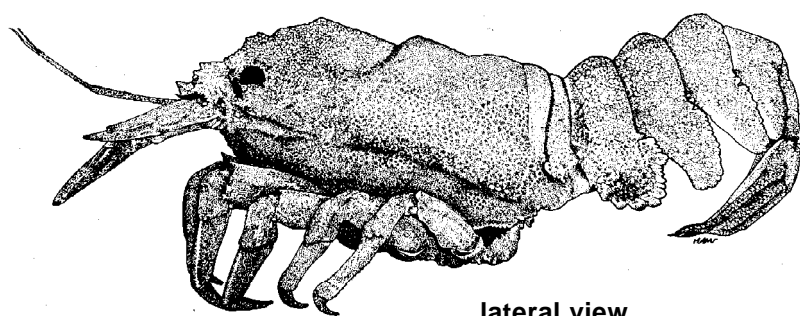
Fig. 367

SCYL Scyld 12

Scyllarides roggeveeni Holthuis, 1967, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C) 70:306.

FAO Names : En - Easter Island slipper lobster

Type : Type locality: "Hanga Pico, S.W. Easter Island". Holotype male in RMNH, no. D 21258.



lateral view

Geographical Distribution : Only known from Easter Island (Fig. 368).

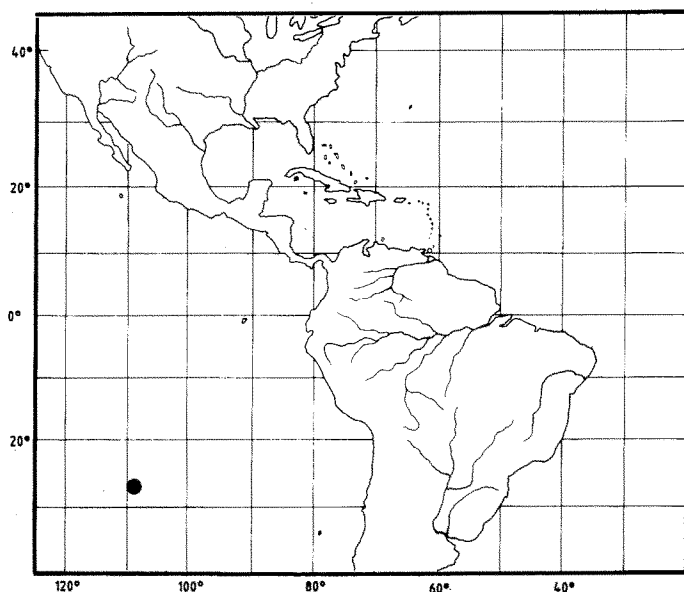
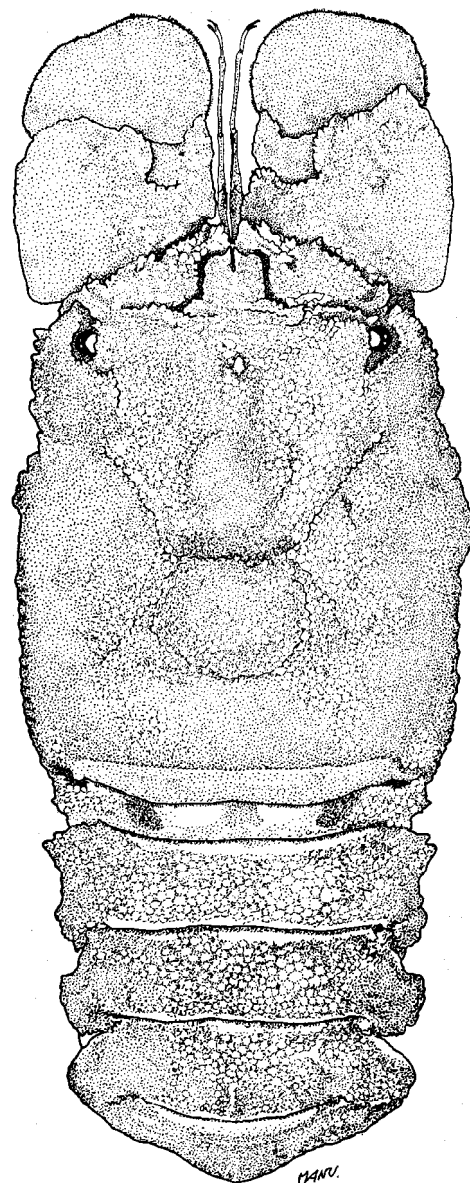


Fig. 368



dorsal view

Fig. 367

Habitat and Biology : Very little is known about the ecology of the species, except that all known specimens were caught in lobster traps.

Size : The carapace length of the type is 11 cm, the total body length about 30 cm..

Interest to Fisheries : The species so far is known only from 4 specimens all taken in lobster traps. There is no regular fishery for the species, the known specimens being all caught accidentally (Henriquez, 1974:4). Judging by the size of the specimens and by the fact that the other species of the genus are eaten, it is most likely that also *S. roggeveeni* is used as food.

Local Names : CHILE: Raperape, Ura raperape (Easter Island).

Literature : Holthuis, 1972:49, pl. 2.

Scyllarides squammosus (H. Milne Edwards, 1837)

Fig. 369

SCYL Scyld 6

Scyllarus squammosus H. Milne Edwards, 1837, *Histoire naturelle des Crustacés*, 2:284.

Synonyms: ? *Scyllarus australis* Fabricius, 1781; *Scyllarus sieboldi* De Haan, 1841; *Pseudibacus pfefferi* Miers, 1882.

FAO Names : En - Blunt slipper lobster; Fr - Cigale grenue; Sp - Cigarra ñato.

Type : Type locality of *S. squammosus*: "Habite l'île-de-France" (= Mauritius). Type in MP, now lost; there is a dry specimen in good condition in the Paris Museum (Pa 408) from "île de France" but it is much smaller than the type, 21.5 cm instead of "15 pouces" (= about 37.5 cm).

Type locality of *S. sieboldi*: "Nagasaki", Kyushu, Japan; in manuscript notes on the type material the collector wrote (in translation) "is caught sometimes in the months of spring in the outer bays near Nagasaki" (see Holthuis & Sakai, 1970: 113). Lectotype male in RMNH, no. D 959.

Type locality of *Pseudibacus pfefferi*: "Mauritius". Three syntypes in BM, no. 81.7, condition poor.

Type locality of *S. australis*: "Habitat in Oceano australiori. Mus.Dom.Banks". Type lost.

Geographical Distribution : Indo-West Pacific region: from East Africa to Japan, Hawaii, Melanesia, New Caledonia and Australia (Fig. 370)

Habitat and Biology : In depths of "a few fathoms" to about 80 m, most common between 20 and 50 m.. On reefs and rocky areas. Nocturnal.

Size : Maximum total body length about 40 cm; carapace length up to about 15 cm.

Interest to Fisheries : Its large size and well developed fleshy tail make this species, like other species of the genus, a sought-after delicacy. It is scarce and lives in inaccessible places and therefore is not commercially fished. The animals are mostly taken by hand usually at night, but also wire traps are used. They are sold fresh on the local markets.

Local Names : AUSTRALIA: Slipper lobster; JAPAN: Semi-ebi, Seni-gani, Sjako-ebi; MOZAMBIQUE: Cava-cava scamosa; USA: Scaly slipper lobster, Sea crawfish, Ula-pdpapa (Hawaii);

Literature : Fischer & Bianchi (eds), 1984:vol. 5.

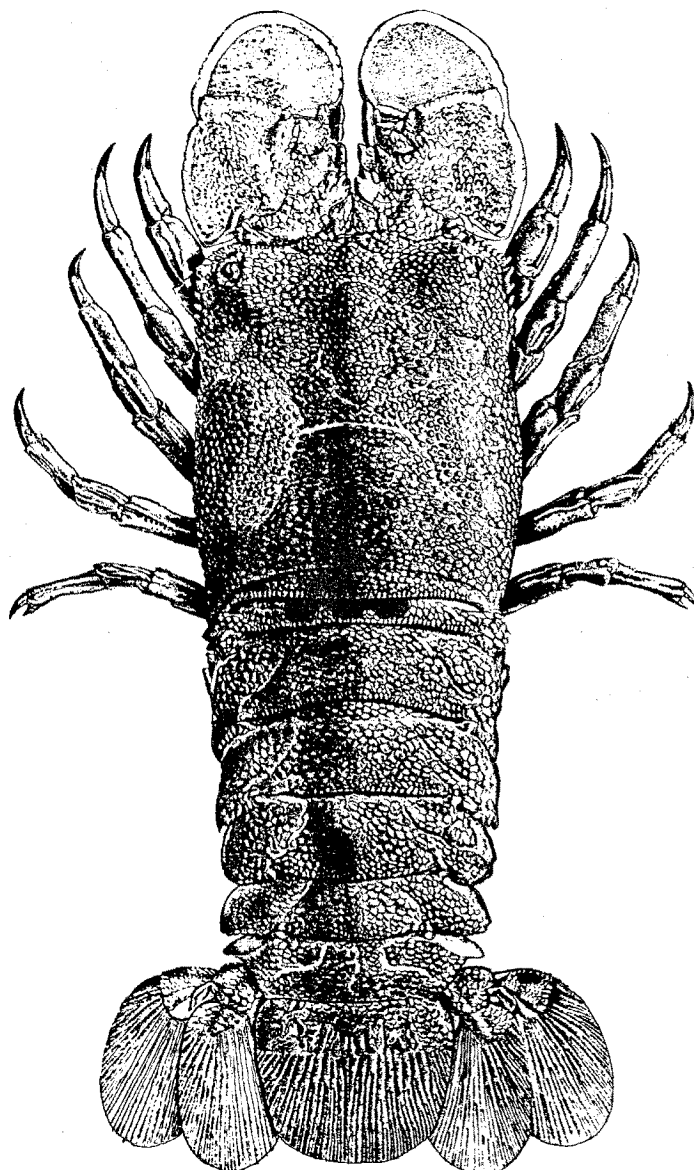


Fig. 369

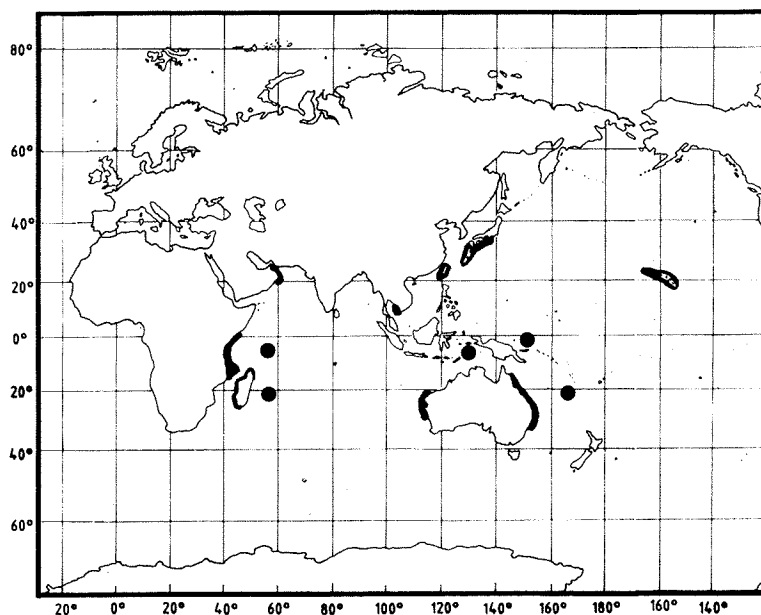


Fig. 370

Scyllarides tridacnophaga Holthuis, 1967

Fig. 371

SCYL Scyld 13

Scyllarides tridacnophaga Holthuis, 1967, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C)70: 307.

FAO Names : En - Clamkiller slipper lobster.

Type : Type locality: "Eylath, Gulf of Aqaba, Israel". Holotype female in RMNH, no. D 23023.

Geographical Distribution : Indo-West Pacific region: Red Sea, E. Africa (Somalia, Kenya), Gulf of Aden, Pakistan, west coast of Thailand (Fig. 372).

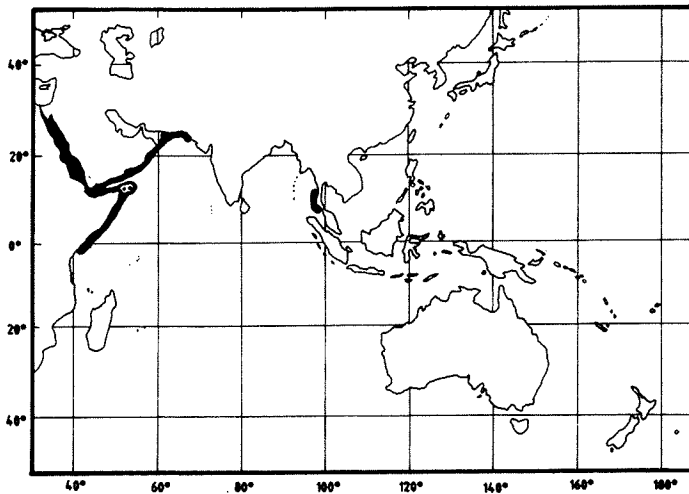


Fig. 372

Habitat and Biology : Depth range from 5 to 112 m; substrates unknown. The species has been observed to open live *Tridacna* shells; it also eats other molluscs and dead fish.

Size : Total body length up to about 30 cm; carapace lengths reported vary between 6 and 12 cm.

Interest to Fisheries : There are no reports about the economic value of the species, but judging by its size and the fact that all other species of the genus are comestible, it is likely that the specimens caught will be used as food.

literature : Holthuis, 1968:295, pls 1,2.

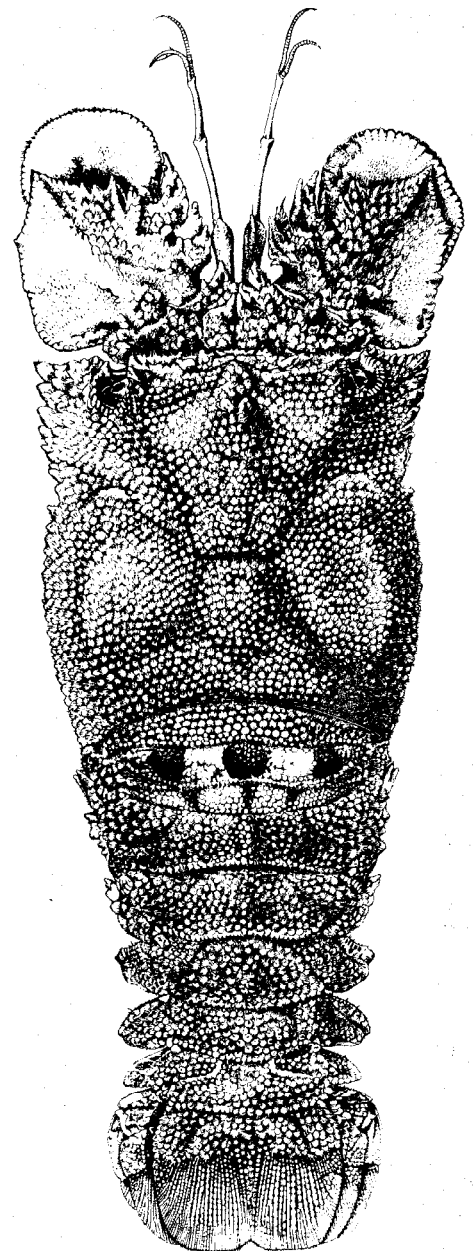


Fig. 371

SUBFAMILY **IBACINAE** Holthuis, 1985

Ibacinae Holthuis, 1985, Zoologische Verhandelingen, Leiden, 218:10-12.

Type Genus: *Ibacus* Leach, 1815.

The subfamily which Holthuis (1985) revised, providing keys to all species, includes three genera, all of which are treated here.

Evibacus S.I. Smith, 1869

SCYL Ev

Evibacus S.I. Smith, 1869, American Journal Science, (2)48: 118. Gender masculine.

Type Species: by monotypy: *Evibacus princeps* S.I. Smith, 1869.

This genus, which is restricted to the Eastern Pacific region, has only a single species.

Evibacus princeps S.I. Smith, 1869

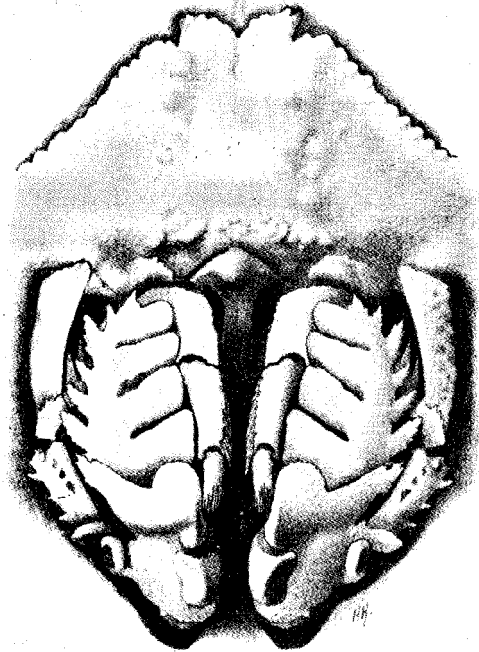
Fig. 373

SCYL Ev 1

Evibacus princeps S.I. Smith, 1869, *American Journal Science*, (2) 48: 119.

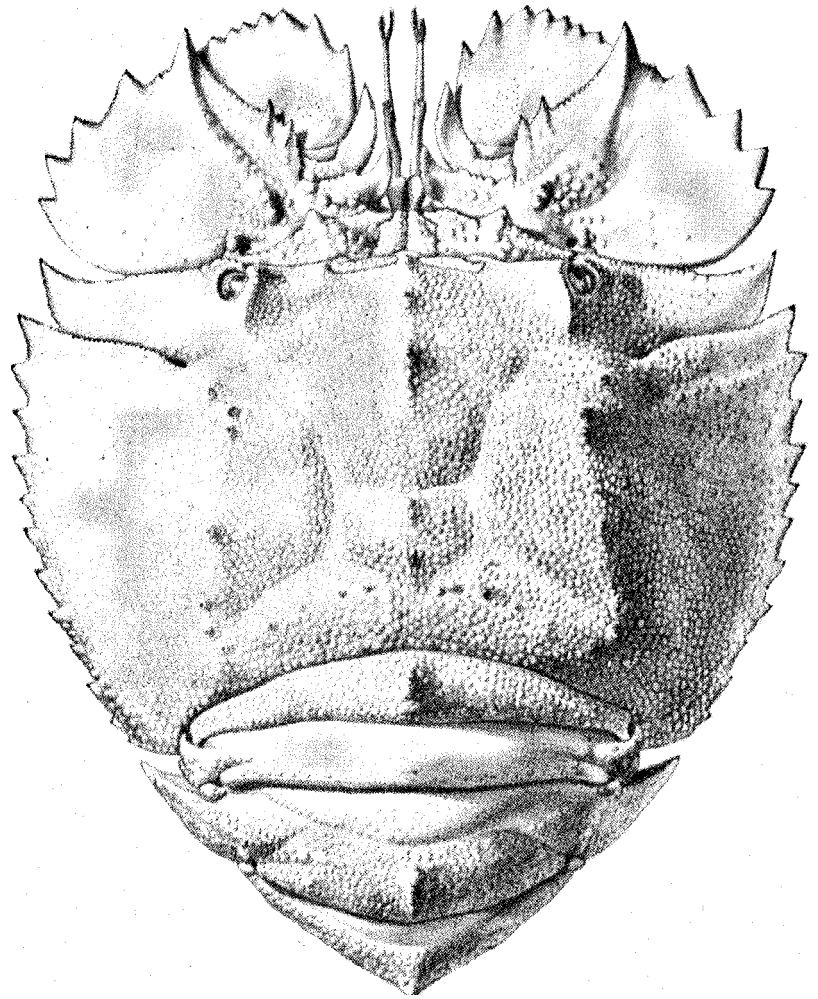
FAO Names : **En** - Shield fan lobster; **Fr** Cigale écusson; **Sp** - Cigarra chato.

Type : Type locality: "La Paz, Lower California" (=La Paz, Baja California, Mexico) Holotype female, depository unknown.



mouth field (ventral view)

(from Holthuis, 1985)



(dorsal view)

Fig. 373

Geographical Distribution : Eastern Pacific region: from Gulf of California (Mexico) to near Tumbes (Peru) (Fig. 374).

Habitat and Biology : Found in depths between 2 and 90 m, most common between 2 and 25 m. Bottom sand or mud, or a mixture, sometimes with rocks.

Size : Carapace length from 1 to 14.5 cm. Maximum total length about 33 cm.

Interest to Fisheries : Although the species is of excellent taste, reasonably large size, and occurs on trawlable substrates, it is not commercially exploited at present. Exploratory trawling in the Gulf of Panama showed it to be present there in fairly large quantities. When caught it is sold fresh in the local markets.

Local Names : COSTA RICA, EL SALVADOR, GUATEMALA: Langosta de arena; MEXICO: Langosta de arena, Zapatera, Boot lobster, Flat lobster, Sand lobster, Slipper lobster; PANAMA: Langosta china, Chinese lobster, Pacific sand lobster, Sand lobster; PERU: Langosta chata, Langosta filipina.

Literature : Holthuis, 1985: 13-20, figs 3,4.

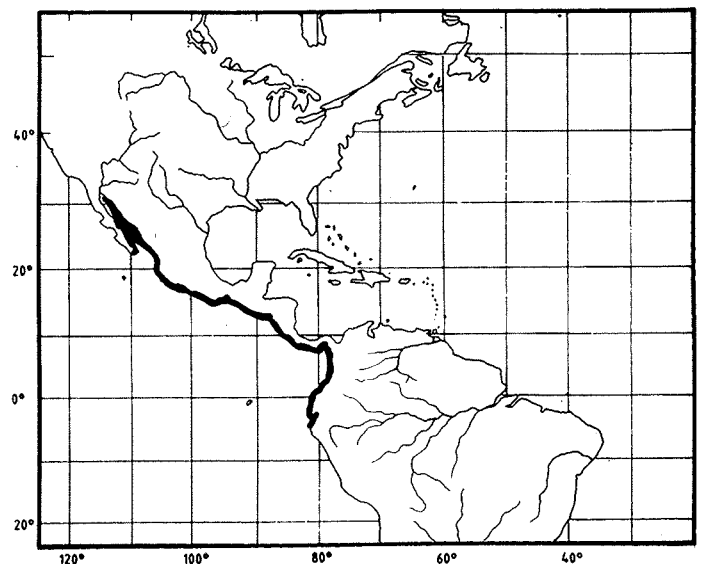


Fig. 374

***Ibacus* Leach, 1815**

SCYL Ib

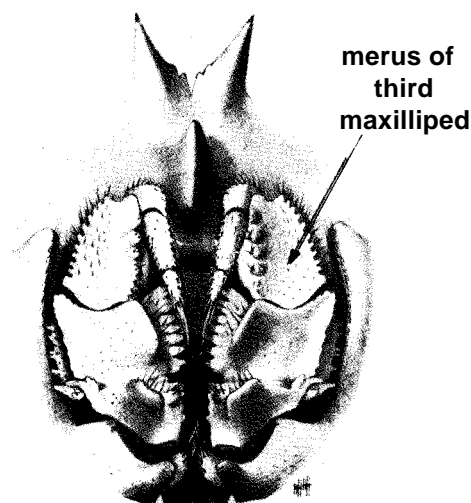
Ibacus Leach, 1815, *Zoological Miscellany*, 2:151. Gender masculine. Name placed on the Official List of Generic Names in Zoology in Opinion 519 (published in 1958).

Type Species: by monotypy: *Ibacus peronii* Leach, 1815.

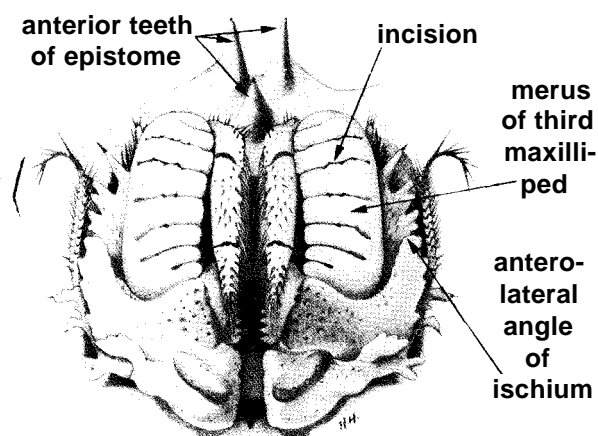
At present 6 species of *Ibacus* are known. All are found at great depths in the Indo-West Pacific region, and most are of little or no economic importance. All are dealt with here.

Key to Species:

- 1a. Merus of third maxilliped with the ventral surface slightly concave, not swollen, and not coloured differently from the other segments; inner margin sometimes crenulate but not with deep incisions (Fig. 375a)
- 2a. Anterior margin of the wide cervical incision of the carapace forming the posterior margin of the anterolateral angle of the carapace; the carapace shows no lateral margin between the anterolateral angle and the cervical incision. The carapace has 7 to 9 posterolateral teeth (Figs 376,377)
- 3a. Dorsal surface of the body with a short, woolly pubescence. Fourth segment of antenna slender, without lateral teeth, regularly narrowing from base to tip (Fig. 376)*I. alticrenatus* (Fig. 382)
- 3b. Dorsal surface of the body naked to the unaided eye, with microscopically small, scattered setae. Fourth segment of the antenna not slender, at first widening in a lateral direction before narrowing into the apex, with a distinct lateral margin that is provided with well-developed teeth (Fig. 377) *I. brucei* (Fig. 386)

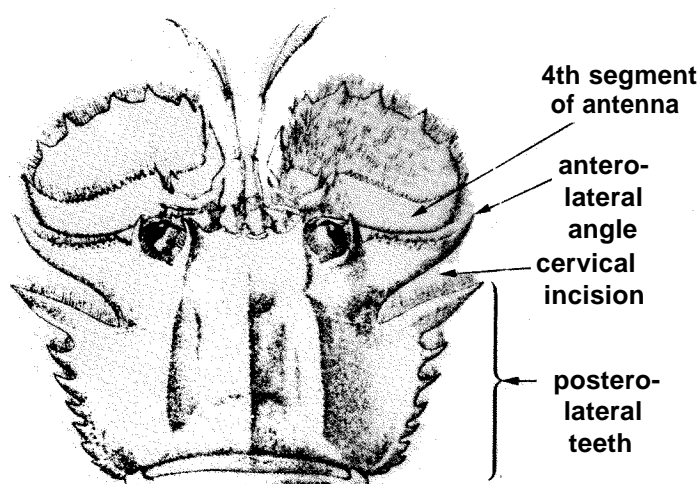


a. *I. ciliatus ciliatus*

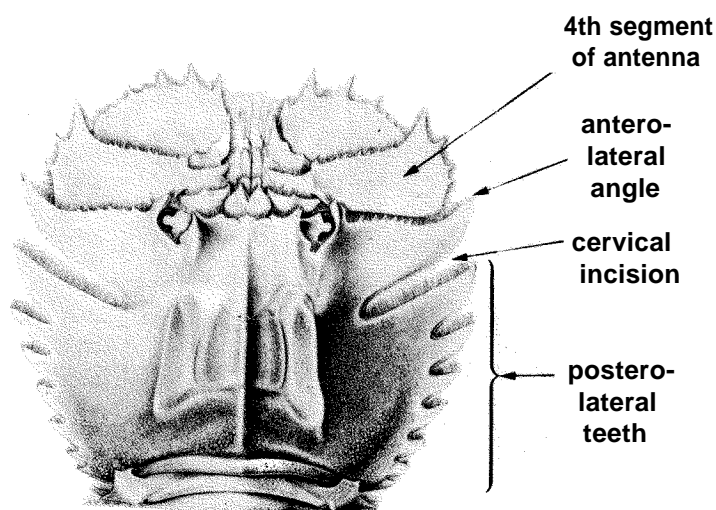


b. *I. peronii*

mouth field (ventral view) Fig. 375



I. alticrenatus
carapace (dorsal view)
Fig. 376



I. brucei
carapace (dorsal view)
Fig. 377

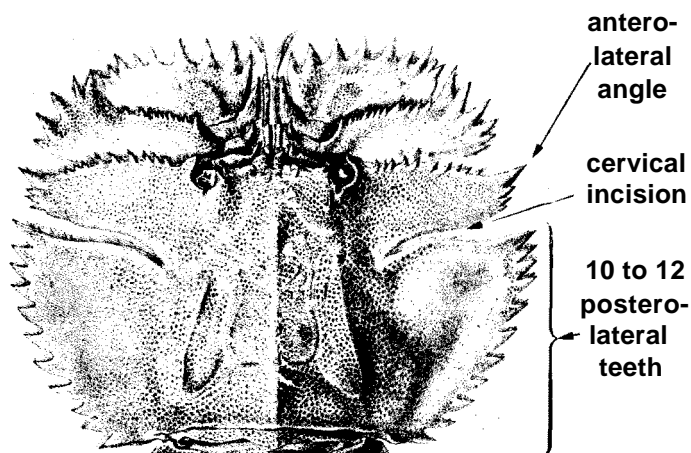
2b. Anterior margin of the narrow cervical incision of the carapace reaching the lateral margin some distance behind the anterolateral angle. Part of the lateral margin of the carapace extends between the anterolateral angle and the cervical incision and bears some teeth there. The carapace bears 10 to 13 posterolateral teeth (Fig. 378a,b)

4a. Carapace of adult specimens naked. Lateral margin of carapace with 10 to 12, usually 11 posterolateral teeth (Fig. 378a). *I. ciliatus ciliatus* (Fig. 388a)

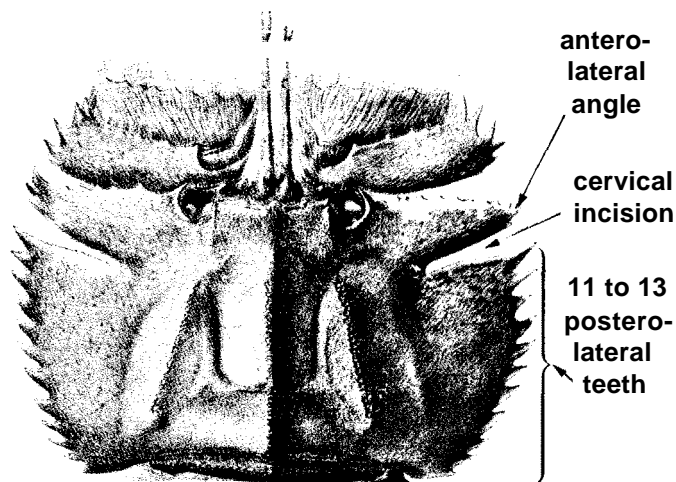
4b. Carapace of adult specimens with a thick cover of a velvety pubescence. Lateral margin of carapace with 11 to 13, usually 12 posterolateral teeth (Fig. 378b) *I. ciliatus pubescens* (Fig. 388b)

1b. Merus of third maxilliped swollen, often with a yellowish tinge, with deep incisions on the inner margin, several of which may reach beyond the middle of the merus (Fig. 375b)

5a. Lateral margin of carapace behind cervical incision with 12 to 17 teeth (Fig. 379a). Merus of third maxilliped strongly swollen at the distal end, less so in the rest of its length; the incisions of the inner margin, though rather deep, not reaching the median line of the merus; anterolateral angle of ischium strongly produced, pointed, almost reaching halfway the length of the merus (Fig. 379b) *I. brevipes* (Fig. 384)



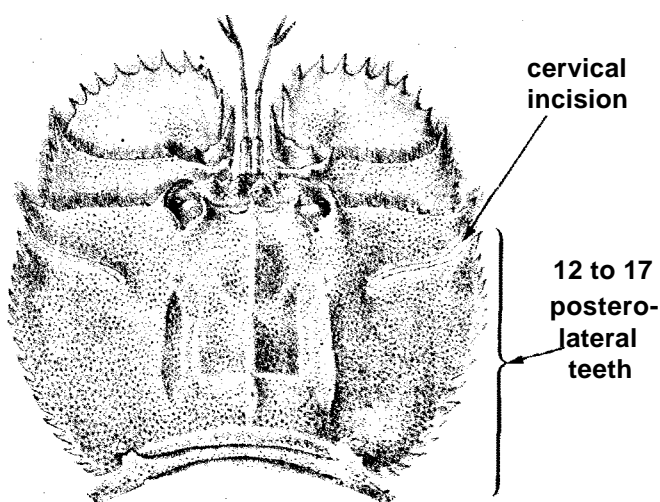
a. *I. ciliatus ciliatus*



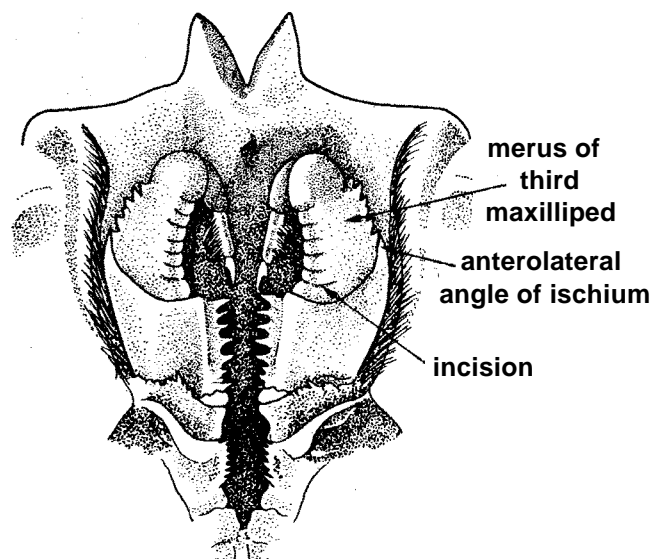
b. *I. ciliatus pubescens*

carapace (dorsal view)

Fig. 378



a. carapace (dorsal view)



b. mouth field (ventral view)

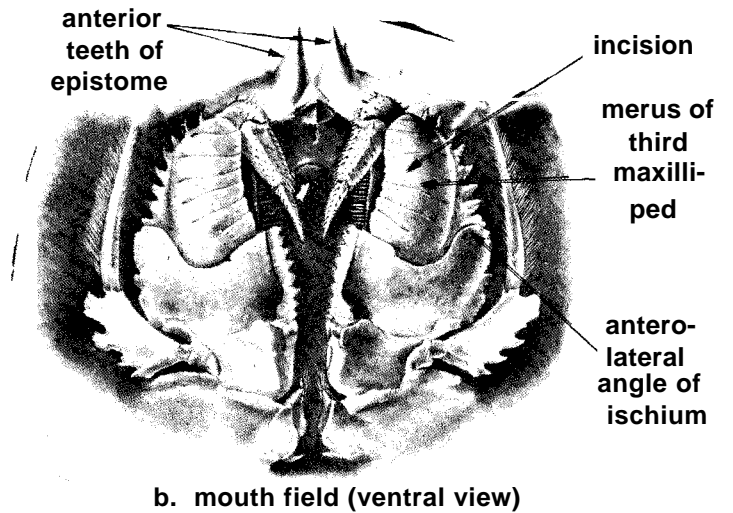
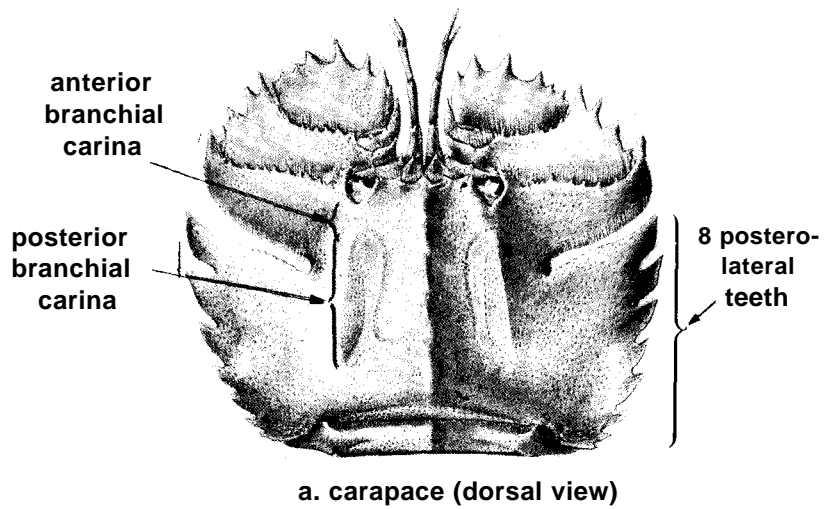
I. brevipes

Fig. 379

5b Lateral margin of carapace behind cervical incision with 6 to 8 teeth (Figs 380a, 381). Merus of third maxilliped evenly swollen, most of the incisions of the inner margin reach beyond the middle of the segment; anterolateral angle of ischium reaching only slightly beyond the base of the merus, top rounded (Figs 375b, 380b)

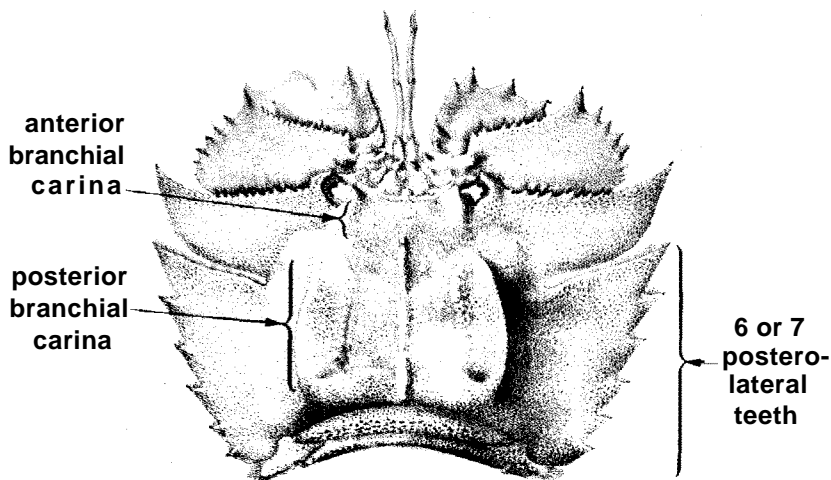
6a. Posterior branchial carinae of the carapace straight or only slightly convex, lying in one line with the anterior branchial carinae. Posterior incision of the orbit without tubercle. Lateral margin of carapace with 8 (rarely 7) posterolateral teeth (Fig. 380a). Anterior teeth of the epistome directed forwards (Fig. 380b)..... *I. novemdentatus* (Fig. 390)

6b. Posterior branchial carinae of the carapace strongly convex, not lying in one line with the anterior branchial carinae. Posterior incision of the orbit with a distinct tubercle. Lateral margin of carapace with 6 or 7, seldom 8, posterolateral teeth (Fig. 381). Anterior teeth of epistome directed ventrally (Fig. 375b) *I. peronii* (Fig. 392)



I. novemdentatus

Fig. 380



I. peronii
carapace (dorsal view) Fig. 381

Ibacus alticrenatus Bate, 1888

Fig. 382

SCYL Ib 2

Ibacus alticrenatus Bate, 1888, Report Voyage Challenger, Zool., 24:63, pi. 9 fig. 2.

Synonyms : *Ibacus alticrenatus septemdentatus* Grant, 1905.

FAO Names : En - Velvet fan lobster

Type : Type locality of *I. alticrenatus*: "Challenger" "Station 167, west of New Zealand . lat. 39°32'S., long. 171°48'E.; depth, 150 fathoms [= 274 m]; bottom, blue mud". Four syntypes in BM, no. 88.22, in alcohol, condition fair.

Type locality of *I. a. septemdentatus*: "About 28 miles east from Port Jackson Heads" near Sydney, N.S.W. Australia. "250-300 fathoms [= 457-549 m]". Two syntypes in AM, no. G. 5424.

Geographical Distribution : Australia (New South Wales, Bass Straits, Tasman Sea, Victoria, South Australia); New Zealand (North Island, South Island, Chatham Islands) (Fig. 383).

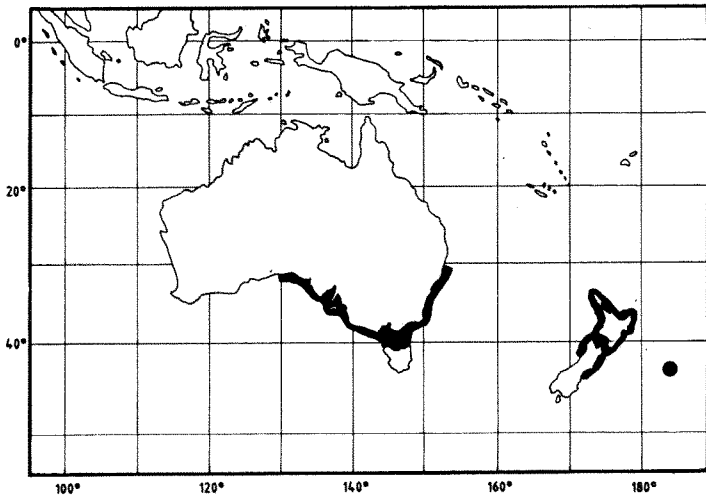
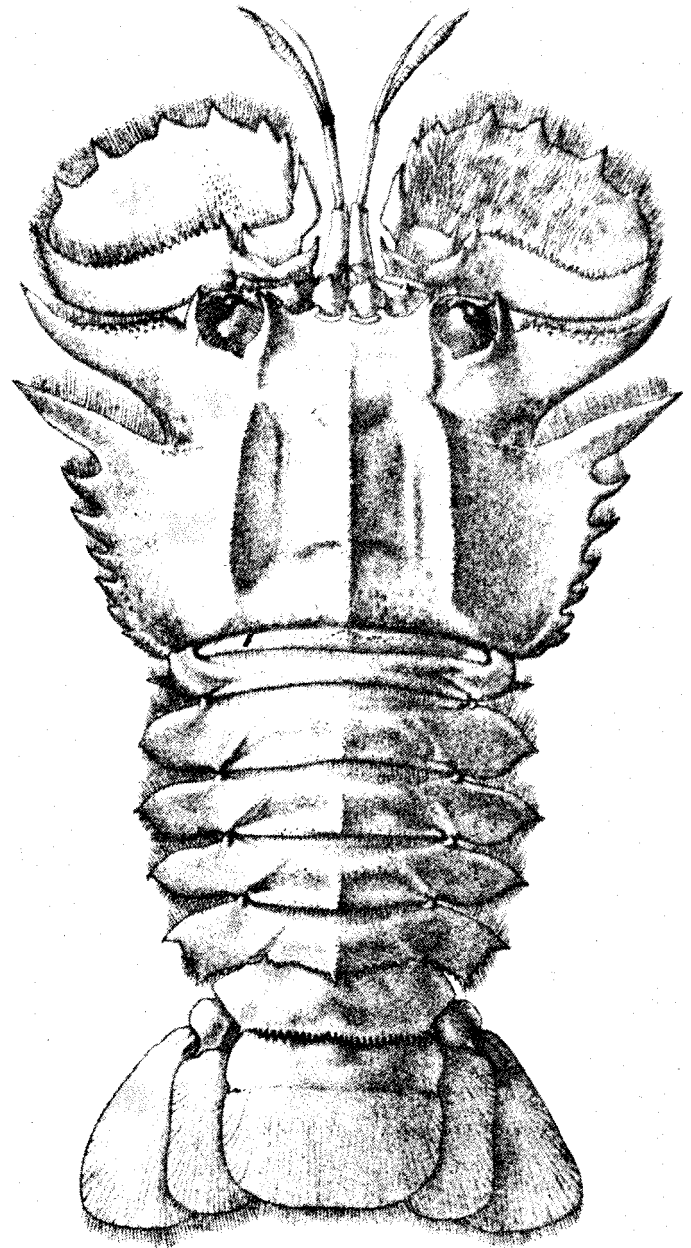


Fig. 383



(from Holthuis, 1985)

Fig. 382

Habitat and Biology : Depth range from 20 to 455 m, on soft muddy bottoms. Digs into the substrate and covers itself with the mud and sand. Ovigerous females from May to October.

Size : Carapace length 1.5 to 6.3 cm; maximum total length about 16 cm.

Interest to Fisheries : According to Lesser (1974:260) the species has no commercial value in New Zealand. But in New South Wales, Australia, "commercial quantities of *Ibacus alticrenatus* are still taken by trawlers working off the continental shelf by day and by night" (Coleman, 1977: 132), and the species is sold at the Sydney market.

Local Names : AUSTRALIA: Deep water bug, Sandy bug; NEW ZEALAND: Prawn killer.

Literature : Holthuis, 1985:36-41, fig. 9.

Ibacus brevipes Bate, 1888

Ibacus brevipes Bate, 1888, Report Voyage Challenger, Zool . 24:62, pi. 9 fig. 1.

Synonyms: *Ibacus verdi* Bate, 1888.

FAO Names : En - Serrate fan lobster.

Type : Type locality of *I. brevipes*: "Challenger" Sta. 192, "lat. 5°49'15"S., long. 132°14'15"E.; off the Ki Islands [= Kai Islands, = Kepulauan Ewab, Eastern Indonesia; depth, 140 fathoms [= 256 m]; blue mud". Holotype male in BM, no 88.22, in alcohol, condition fair.

Type locality of *I. verdi*: "Challenger" "St. Vincent, Cape Verde Islands ... depth 7 to 20 fathoms" (= 13-37 m). Lectotype female and 6 paralectotypes in BM, no. 88.22, in alcohol condition fair. Statement of type locality of *I. verdi* probably erroneous.

Geographical Distribution : Indo-West Pacific region: South China Sea, Philippines, Moluccas (Indonesia) and New Caledonia (Fig. 385). The record from the Cape Verde Islands almost certainly is erroneous, as no species of the genus has ever been found in the Atlantic.

Habitat and Biology : Known from depths between 186 and 457 m; on smooth substrates: Sand, mud or a mixture of the two. The record of 7 to 20 fathoms (= 13-37 m) of the so-called Cape Verde specimens, like the rest of their label, is clearly incorrect.

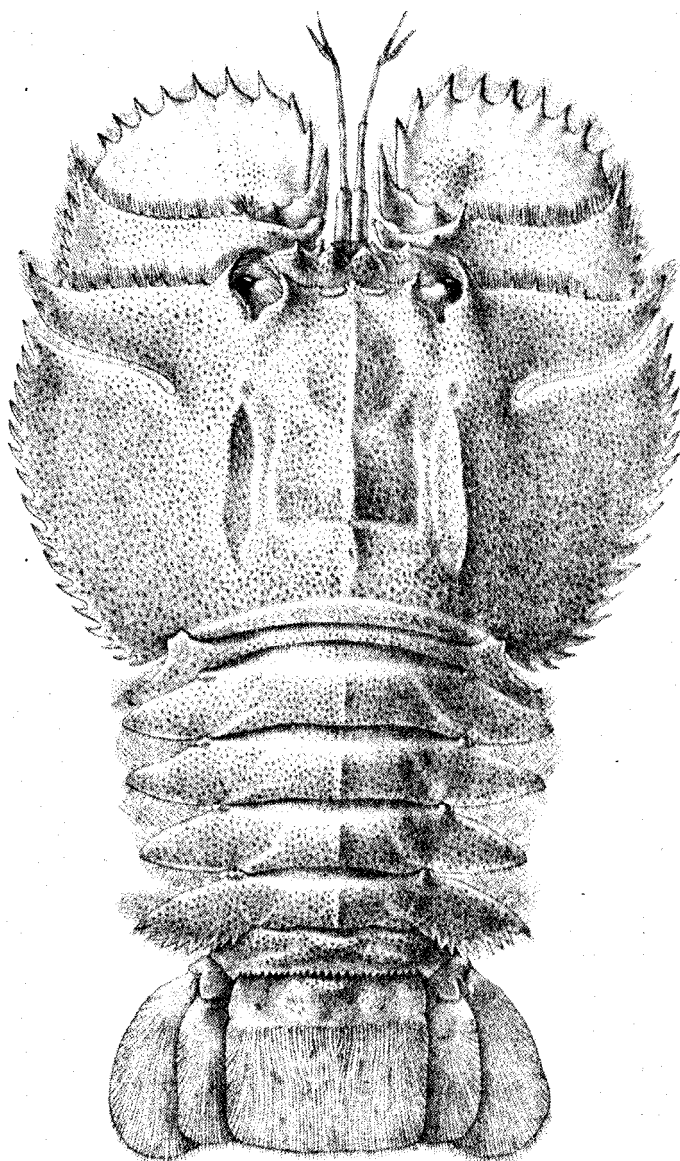
Size : Carapace length between 2 and 4.5 cm; maximum known total body length about 12 cm.

Interest to Fisheries : So far none. This is a flat, relatively small species, with little meat and it is found only at great depths. Therefore, it is not a promising commercial species.

Literature : Holthuis, 1985:47-52, figs 13,14

Fig. 384

SCYL Ib 3



(from Holthuis, 1985)

Fig. 384

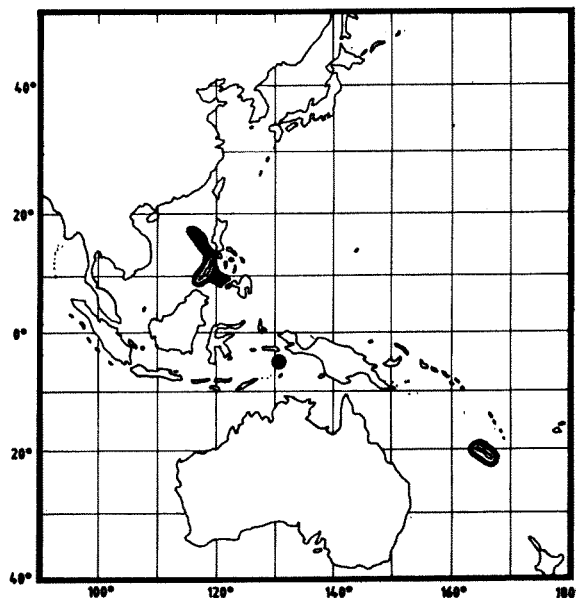


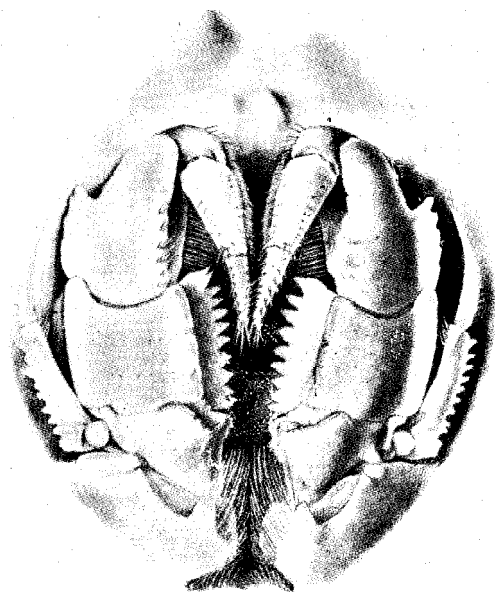
Fig. 385

Ibacus brucei Holthuis, 1977

Ibacus brucei Holthuis, 1977, *Zoologische Mededelingen Leiden*, 52:191, pls 1.2.

FAO Names : En - Glabrous fan lobster.

Type : Type locality: "Due east of Point Lookout, North Stradbroke Island, Queensland; 86 fathoms (= 157 m)". Male holotype in RMNH, no. D 24744.



mouth field (ventral view)

Geographical Distribution : Australia (Queensland, New South Wales) and New Zealand (Kermadec Islands) (Fig. 387).

Habitat and Biology : Depth range from 90 to 183 m; substrates soft with stones.

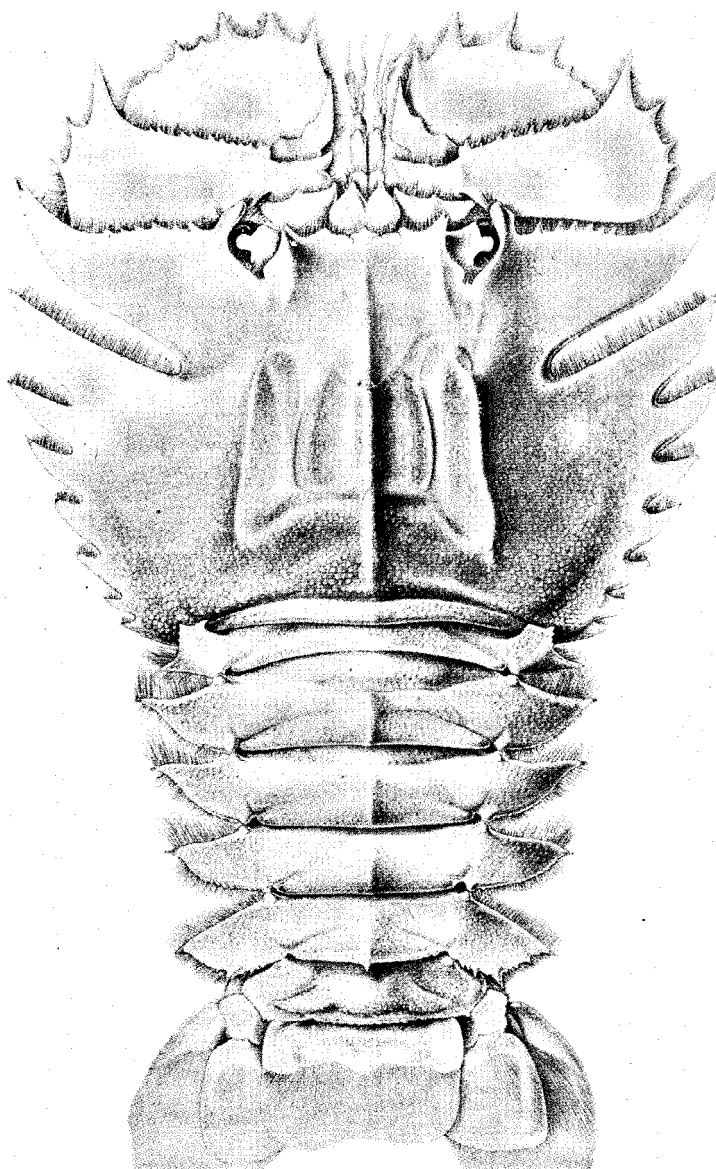
Size : The carapace length of the known specimens varies between 2 and 5.7 cm; the maximum total body length being about 13 cm.

Interest to Fisheries : So far none. As the species lives on trawlable grounds (all the types were obtained by trawl), it might be possible that, if the right fishing grounds are found, the species could become commercially important.

Literature : Holthuis, 1985:41-47, figs 10-12

Fig. 386

SCYL Ib 4



(from Holthuis, 1985)

Fig. 386

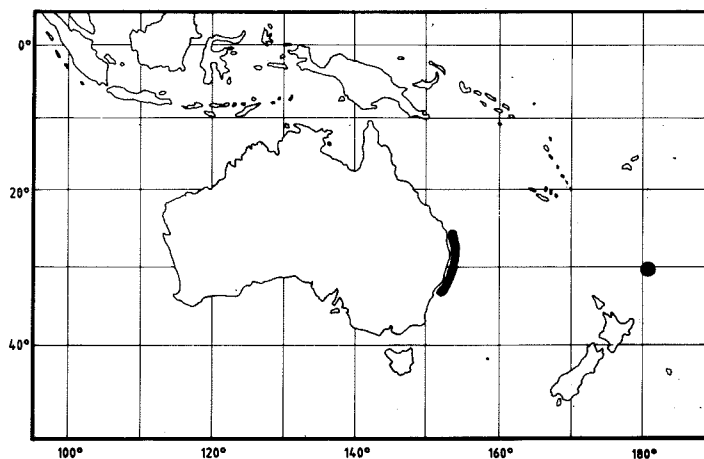


Fig. 387

Ibacus ciliatus (Von Siebold, 1824)

Fig. 388

SCYL Ib 5

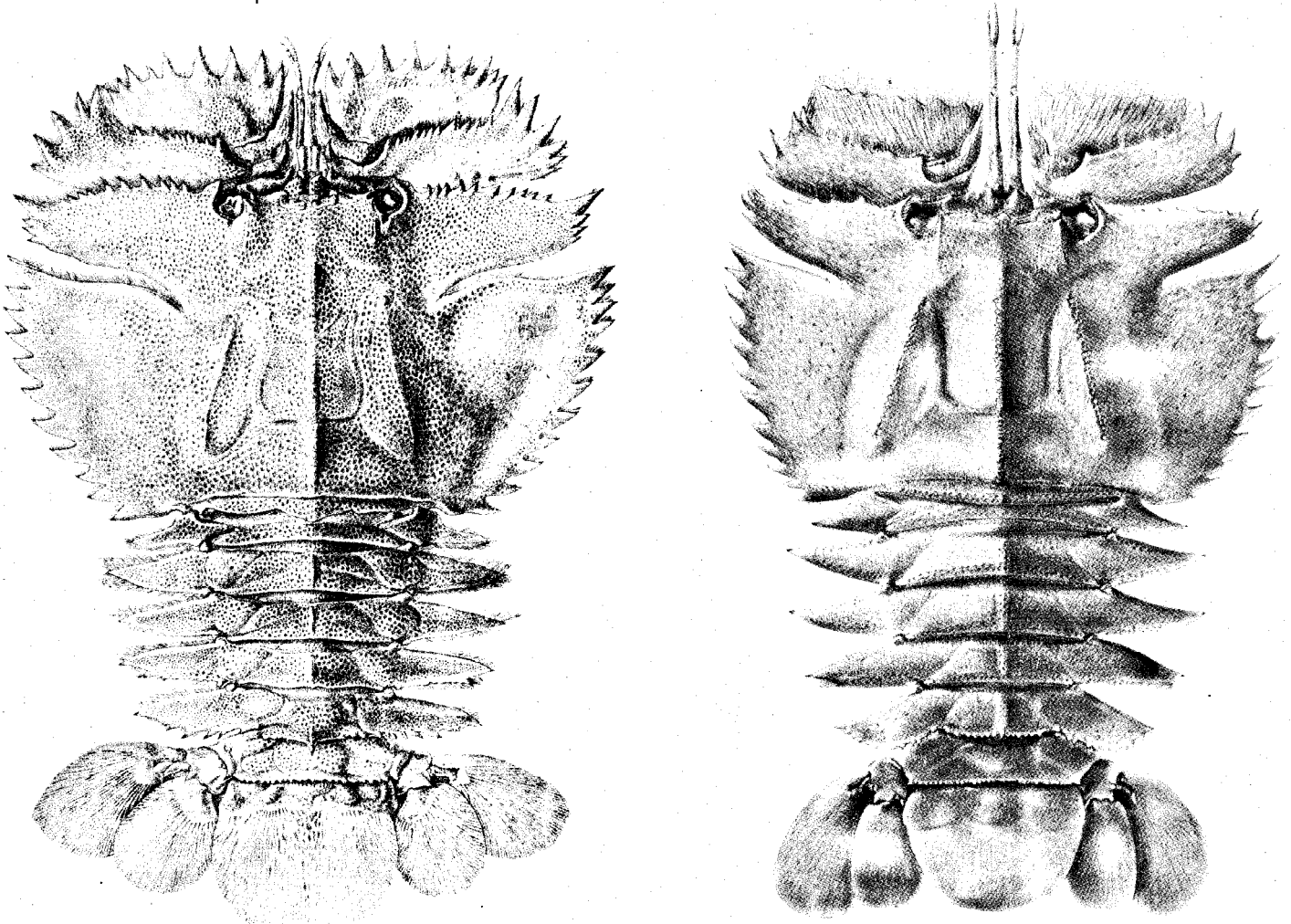
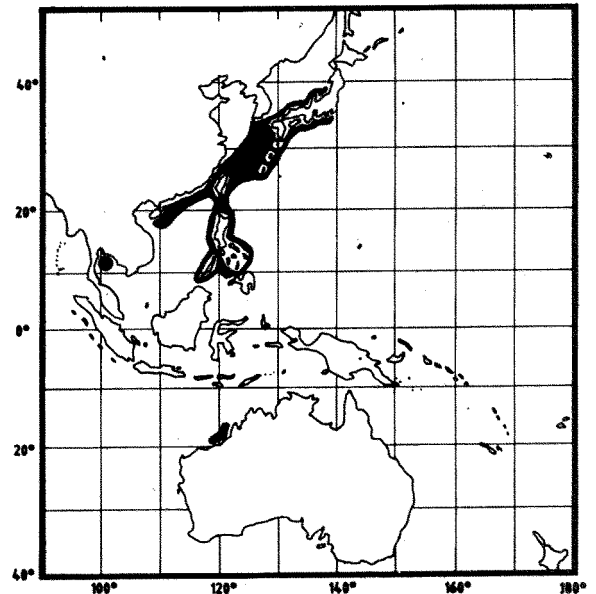
Scyllarus ciliatus Von Siebold, 1824, *De Historiae Naturalis in Japonia statu*: 15.**Synonyms:** *Phyllosoma guerini* De Haan, 1849; *Ibacus pictus* Vilanova y Piera, 1875; *Phyllosoma utivaebi* Tokioka, 1954; *Ibacus ciliatus pubescens* Holthuis, 1960**FAO Names :** En - Japanese fan lobster.a. *I. ciliatus ciliatus* (male) (from Holthuis, 1985)b. *I. ciliatus pubescens* (old male) Fig. 388**Type :** Type locality of *Scyllarus ciliatus*: "Japonia", probably near Nagasaki, Kyushu; lectotype in RMNH, no. D 969, in alcohol, condition good.Type locality of *Phyllosoma guerini*: "Japonia", probably near Nagasaki, Kyushu; lectotype in RMNH, no. D. 5588, dry, condition poor.Type locality of *Ibacus pictus*: "en las aguas del Japon"; whereabouts of type material unknown,Type locality of *phyllosoma utivaebi*: "along the shore near our Laboratory" (= Seto marine biological laboratory, Sirahama, Wakayama-ken, Japan); 3 syntypes in Seto marine biological laboratory.Type locality of *I. c. pubescens*: "'Albatross" Station D 5394, near Talajit Island, Philippines, 12°00'30"N, 124°05'36"E"; holotype male in USNM, no. 104285.**Geographical Distribution :** Indo-West Pacific region: Japan (southward from Niigata on the west coast (ca. 38°N), and from Tokyo Bay on the east coast (ca. 35.5°N)), south coast of Korea to Hainan Island (S. China), South China Sea, Taiwan, east coast of Philippines and Thailand. The subspecies *I. c. pubescens* (Fig. 388b) has been reported from the Philippines (among the islands and along the west coast), and from Western Australia (W. of Broome) (Fig. 389).

Fig. 389

Habitat and Biology : Depth range from 49 to 314 m, mostly between 100 and 250 m. The species is found on soft substrates of sand, mud or clay.

Size : Maximum total length about 23 cm; the carapace lengths reported are 4 to 7.6 cm (males), 4 to 8 cm (females), 6 to 8 cm (ovigerous females).

Interest to Fisheries : The species is mostly caught by trawlers and sold on the fish markets of Japan, Korea, Taiwan and the Philippines. A report by H. Bürger from about 1830 mentioned that the species could be found every day on the fish markets of Nagasaki and nearby area (Holthuis & Sakai, 1970: 112).

Local Names : JAPAN: Uchiwa-ebi, Utiva-ebi, Kai rô, Takuma-ebi; PHILIPPINES: Cupapa, Pitik-pitik; THAILAND: Kung. kradan deng.

Literature : Holthuis, 1985:24-36, figs 5-8.

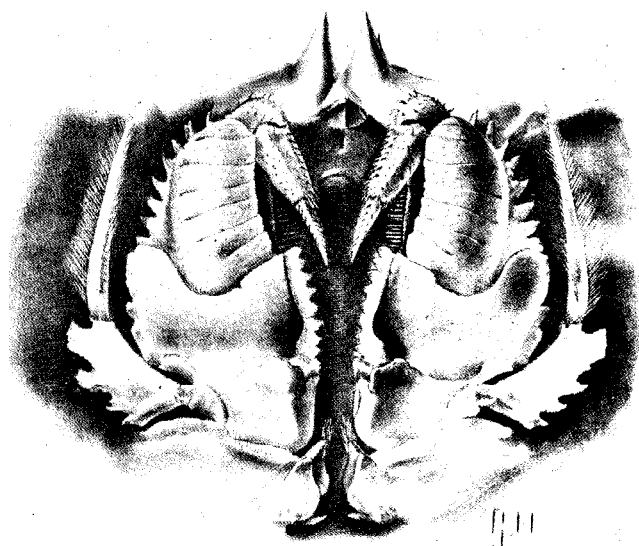
***Ibacus novemdentatus* Gibbes, 1850**

Ibacus novemdentatus Gibbes, 1850, Proceedings American Association Advancement Science, 3:19.

Synonyms: Sometimes confused with *I. ciliatus* or *I. peronii*.

FAO Names : **En** - Smooth fan lobster; **Fr** - Cigale glabre; **Sp** - Cigarra liso.

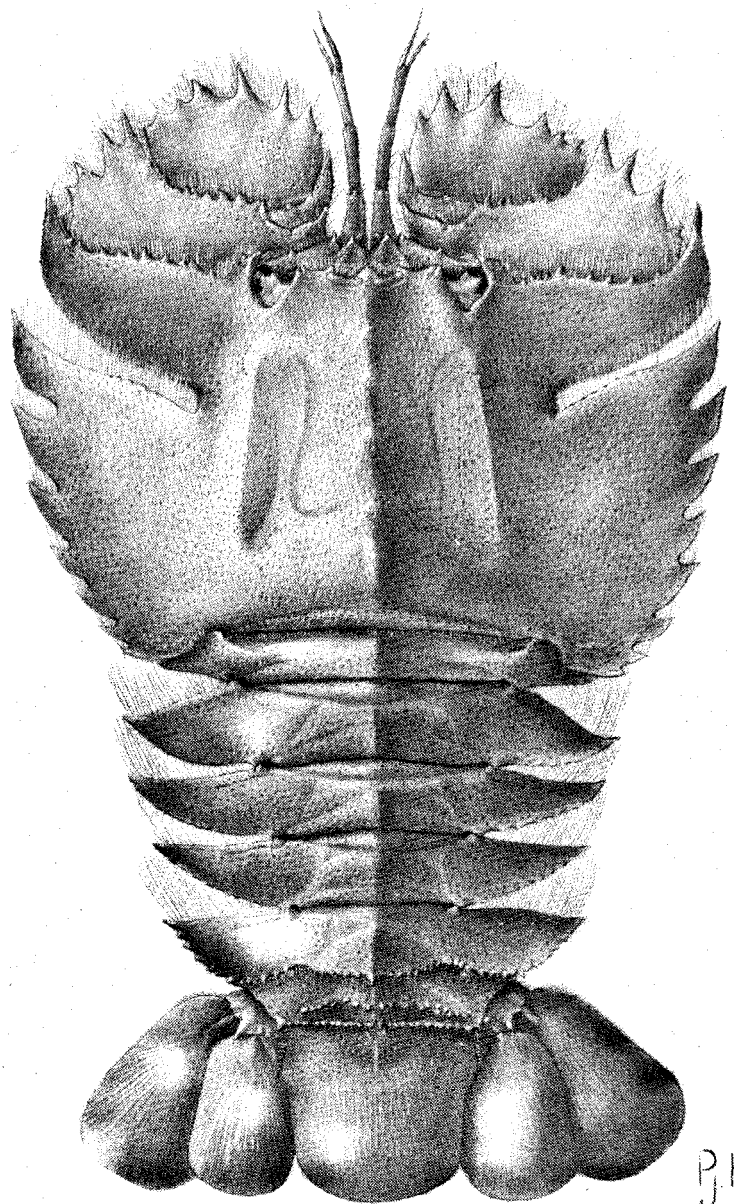
Type : Type locality: unknown. Holotype in "Cabinet of the Lyceum of Natural History, of New York", present whereabouts unknown.



mouth field (ventral view)

Fig. 390

SCYL Ib 1



(from Holthuis, 1985)

Fig. 390

Geographical Distribution : Indo-West Pacific region: East Africa (Kenya to Cape Province), Western Indian Ocean (N.W. Madagascar, Mauritius-Seychelles Ridge), and from Korea and Japan, to the South China Sea, Taiwan, Vietnam, the Philippines and Western Australia (Fig. 391).

Habitat and Biology : Depth range from 37 to 400 m; substrates of fine sediments (sand and mud).

Size : Carapace lengths 3 to 7.7 cm; maximum total body length about 19 cm.

Interest to Fisheries : In Korea and Japan, as well as in Taiwan, the species is sold at the markets. In Japan and Taiwan it is obtained by trawlers, in Japan also by long line fishery. Ivanov & Krylov (1980:287) recorded catches of 19.2 kg/hour and 22.6 kg/hour in the western Indian Ocean.

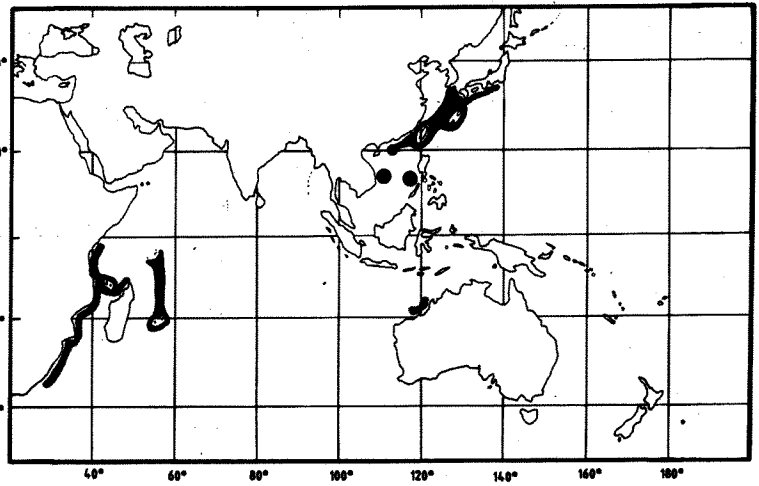


Fig. 391

Local Names : JAPAN: Ohba-uchiwa-ebi, Kejirami-gani (Shimane); MOZAMBIQUE: Cava-cava lisa; SOUTH AFRICA: Digging lobster.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Holthuis, 1985:52-61, figs 15-17.

Ibacus peronii Leach, 1815

Fig. 392

SCYL Ib 6

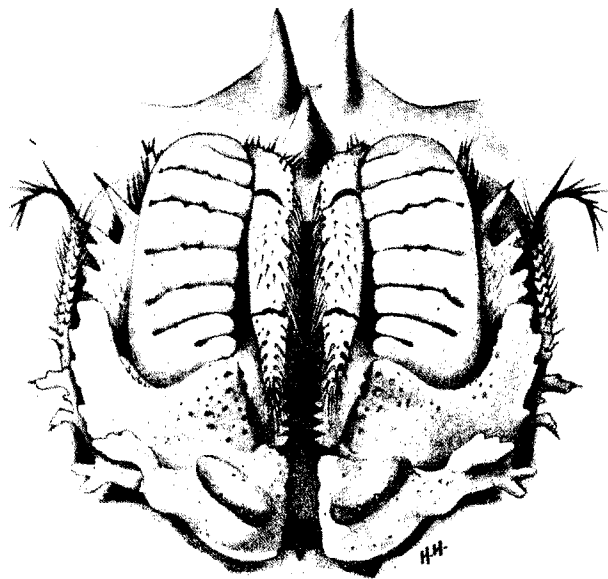
Ibacus peronii Leach, 1815, *Zoological Miscellany*, 2: 152, pl. 119. Name placed on Official List of Specific Names in Zoology in Opinion 519 (published in 1958).

Synonyms : *Scyllarus incisus* Leach, 1815; ? *Phyllosoma duperreyi* Guérin, 1829.

FAO Names : En - Butterfly fan lobster.

Type : Type locality of *I. peronii* and *S. incisus*: "New Holland" (= Australia). Manuscript notes in the Museum d'Histoire naturelle in Le Havre, France, show that the actual type locality is King Island, Tasmania, 39°50'S 144°00'E. Holotype in MP, no. Pa 146, dry, in good condition.

Type locality of *Phyllosoma duperreyi*: "Port Jackson", Sydney, New South Wales, Australia; type in MP, no longer extant.



mouth field (ventral view)

Geographical Distribution : S.W., S. and S.E. coasts of Australia from Geraldton (Western Australia) to Southport (S.E. Queensland) (Fig. 393).

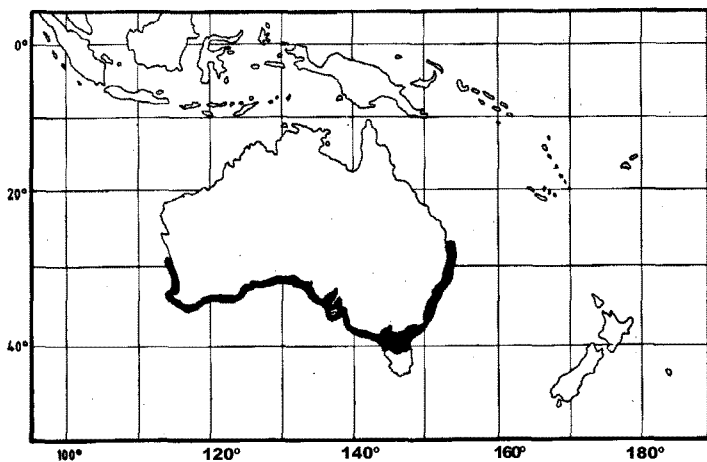
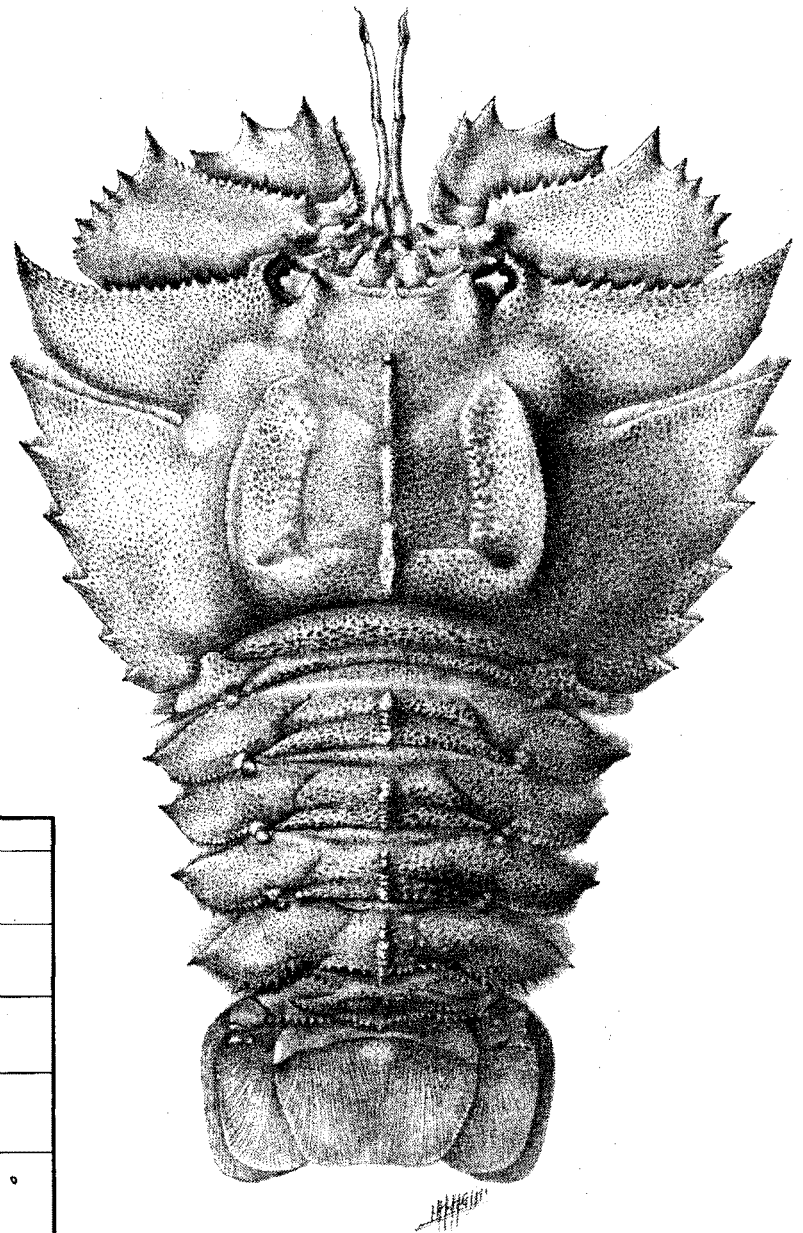


Fig. 393



(from Holthuis, 1985)

Fig. 392

Habitat and Biology : Depth range from 40 to 250 m; on soft substrates of sand or sand and mud. Larvae obtained from the plankton.

Size : Carapace length between 2 and 8 cm, maximum total length about 23 cm.

Interest to Fisheries : Regularly fished and almost always present at Sydney market. The species is taken by prawn trawls. Some fishermen go out specifically to catch "bugs", and sometimes over 100 kg is brought in per day. Dakin, Bennett & Pope (1969: 184) observed that "it has quite a good flavour when cooked", but Grant (1978:685) found that its flesh "sometimes tastes and smells strongly of garlic" and that it therefore is considered inferior to *Thenus*.

Local Names : AUSTRALIA: Balmain bug, Butterfly lobster, Flapjack, Péron's Ibacus crab, Prawn-killer, Sand crayfish, Sand lobster, Southern shovel-nosed lobster, Squagga.

Literature : Holthuis, 1985:61-69, figs 18-20.

Parribacus Dana, 1852

SCYL Par

Parribacus Dana, 1852, Proceedings Academy Natural Sciences Philadelphia, 6: 14. Gender masculine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in their Opinion 519 published in 1958.

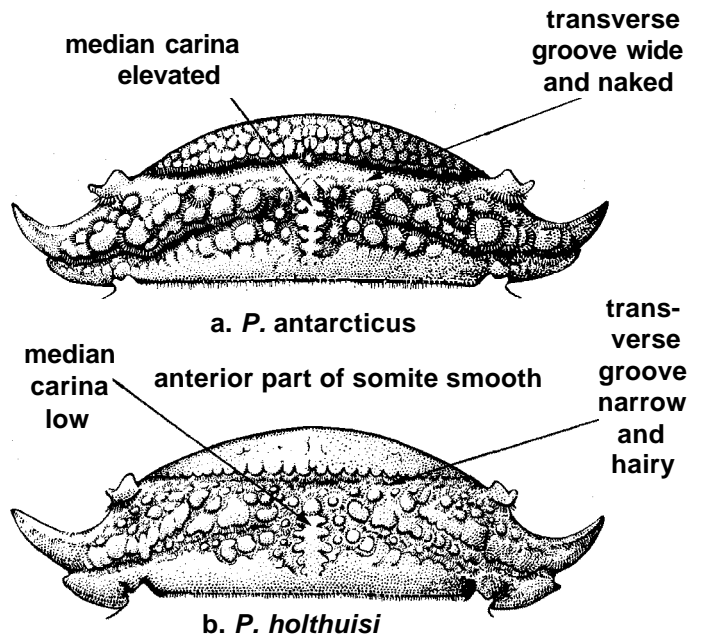
Type Species: selected by Ward (1942:61): *Scyllarus antarcticus* Lund, 1793.

The genus contains 6 species, all of which are used as food, but all are only of local interest.

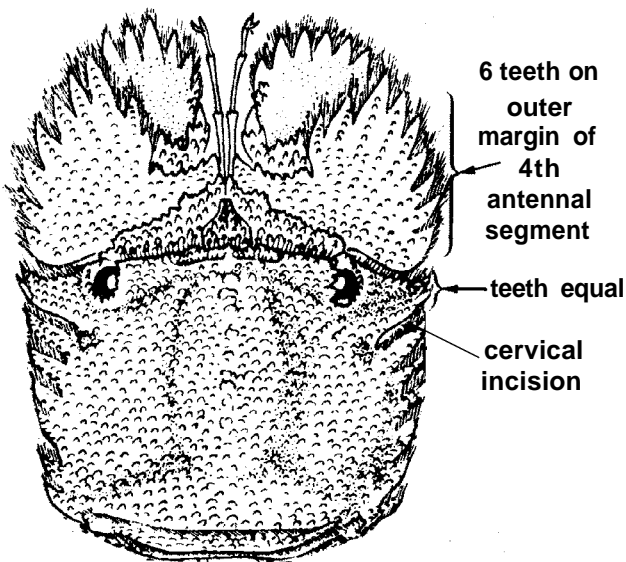
Key to Species:

1a. The transverse groove which separates the anterior from the posterior part of the abdominal somites and which in the fully stretched animal forms the anteriormost part of the visible portion of the somites, is wide and naked, bearing at most a few hairs and tubercles in the median area. The anterior part of the second to third abdominal somites, situated before the just-mentioned groove, bears distinct tubercles. The median carinae of the second and third abdominal somites are elevated (Fig. 394a). The lateral margin of the fourth segment of the antenna as a rule bears six teeth (exclusive of the apical tooth). The two lateral teeth before the cervical incision are of almost equal size (Fig. 395). Indo-West Pacific and West Indian regions *P. antarcticus* (Fig. 401)

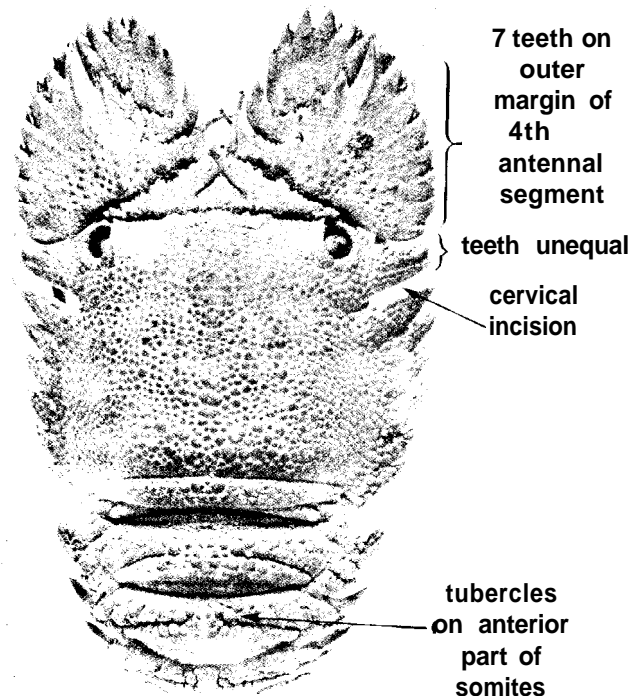
1b. The transverse groove which separates the two parts of the abdominal somites is narrower and filled with many short hairs. The median carinae of the second and third abdominal somites are usually almost level with the surface of the somites (Fig. 394b). The posterior of the two lateral teeth of the carapace before the cervical incision is always smaller than the first (Fig. 396), Indo-West Pacific



third abdominal somite (dorsal view) Fig. 394 (after Forest, 1954)



carapace (dorsal view) *P. antarcticus* Fig. 395



dorsal view *P. caledonicus* Fig. 396

2a. The anterior part of the second to fifth abdominal somites, which disappears under the previous somite when the abdomen is fully stretched, carries distinct tubercles (Figs 396, 397). Fourth segment of antenna with 6 or 7 teeth on the outer margin (apical tooth not included). Legs short and robust

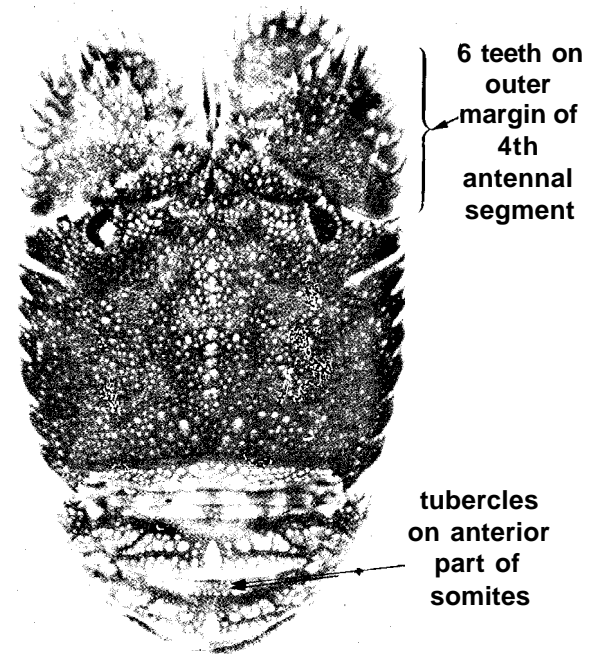
3a. Fourth segment of antenna with seven teeth on the outer margin (apical tooth not included). Squamiform tubercles on upper surface of carapace blunt and appressed (Fig. 396) (Queensland, New Caledonia, Loyalty Islands, New Hebrides and Fiji) *P. caledonicus* (Fig. 403)

3b. Fourth segment of antenna with six teeth on the outer margin (apical tooth no included). Squamiform tubercles on upper surface of carapace pointed and not appressed (Fig. 397) (Easter Island) *P. perlatus* (Fig. 409)

2b. The anterior part of the second to fifth abdominal somites smooth or with a reticular pattern of shallow and narrow grooves (Fig. 394b). Fourth segment of antenna as a rule with 5 or 6 teeth on the outer margin. Legs more slender

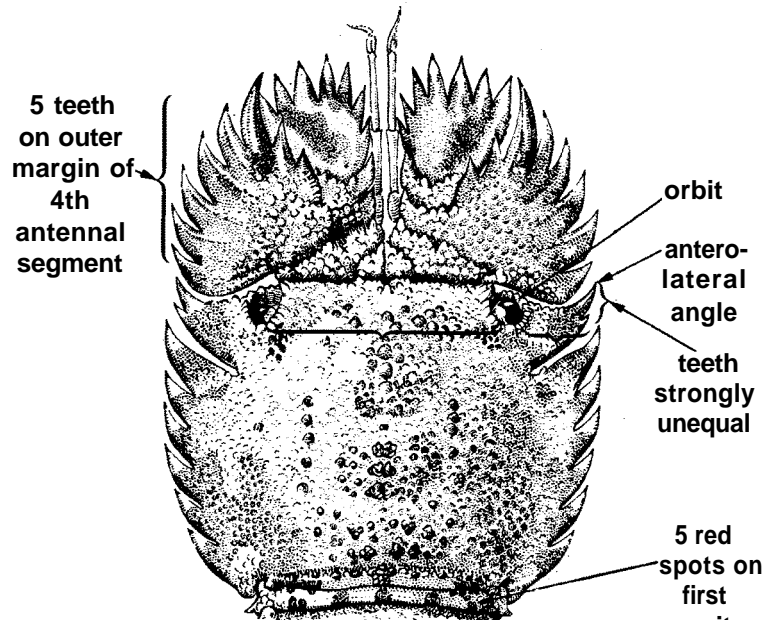
4a. Distance between the orbit and the anterolateral angle of the carapace more than 2/5 of the distance between the two orbits; outer margin of second segment of antenna as a rule with five teeth. The posterior of the two lateral teeth of the carapace before the cervical incision much smaller than the first. First abdominal somite with five red, sharply defined spots on the posterior margin, and a row of smaller spots which is placed more anteriorly (Fig. 398) *P. holthuisi* (Fig. 405)

4b. Distance between the orbit and the anterolateral angle of the carapace 2/5 or less than 2/5 of the distance between the two orbits. The posterior of the two lateral teeth of the carapace before the cervical incision smaller, but not very much smaller than the anterior. The first abdominal somite with 3 to 5 not very sharply defined spots on the posterior margin: no second row of spots is present (Figs 399,400)



dorsal view
P. perlatus

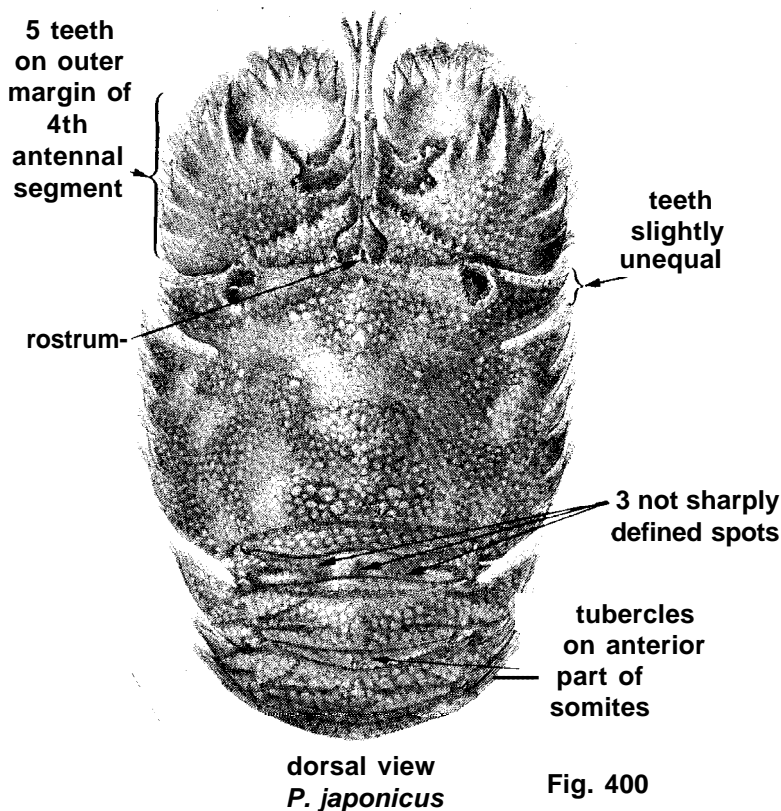
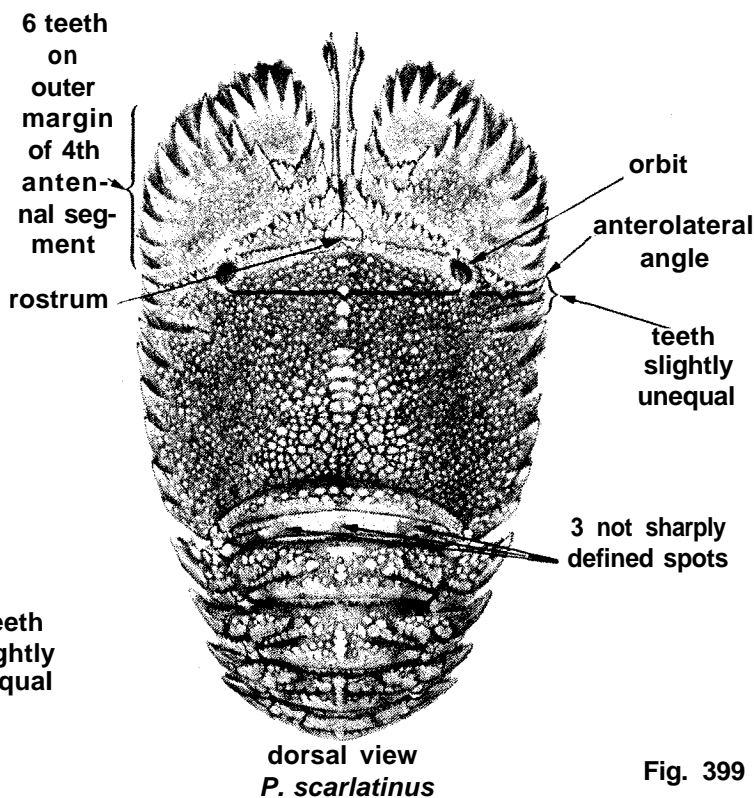
Fig.397



carapace and first somite
(dorsal view)
P. holthuisi

Fig. 398

- 5a. Rostrum with a dorsal rostral tooth. Outer margin of second segment of antenna as a rule with six teeth (Fig. 399) *P. scarlatinus* (Fig. 411)
- 5b. Rostrum without a dorsal rostral tooth. Outer margin of second segment of antenna as a rule with five teeth (Fig. 400) *P. japonicus* (Fig. 407)



Parribacus antarcticus (Lund, 1793)

Fig. 401

SCYL Par 1

Scyllarus antarcticus Lund, 1793, *K.Danske Videnskabers Selskab Skrifter*, (n.ser.) 2(2):22. Name placed on the Official List of Specific Names in Zoology, in Opinion 519 (published in 1958).

Synonyms: *Cancer (Astacus) ursus major* Herbst, 1793; ? *Scyllarus carinatus* Guilding, 1825; *Ibacus ciliatus* Guilding, 1825; *Ibacus parrae* H. Milne Edwards, 1837; *Ibacus antarcticus* - H. Milne Edwards, 1837; *Parribacus parrae* - Dana, 1852; *Scyllarus (Ibacus) parrae* - Herklots, 1861; *Parribacus antarcticus carinatus* Pfeffer, 1881; *Parribacus papyraceus* Rathbun, 1906; *Parribacus ursus major* - De Man, 1916; *Cancer barffi* Curtiss, 1938.

FAO Names : En - Sculptured mitten lobster; Fr - Cigale savate; Sp - Cigarra china.

Type : Type locality of *Scyllarus antarcticus*: not cited in the original publication, but by the lectotype selection of the specimen figured by Rumphius (1705) (see Holthuis, 1956: 111) it is restricted to Amboina, Moluccas, Indonesia. Type specimen no longer extant.

Type locality of *Cancer (Astacus)ursus major*: "Das Vaterland ist Japan", through Herbst's references to Rumphius (1705) and Seba (1759). Amboina also belongs to the type localities, and through the lectotype selection for this species by Holthuis (1956: 111) of the animal figured by Rumphius, Amboina has become the restricted type locality.

The lectotype specimen of *C. ursus major* being the same as that of *S. antarcticus* the two names are objective synonyms. Herbst's own paratype is no longer extant.

Type locality of *Scyllarus carinatus* Guilding: "in mari Caribeo", probably near St. Vincent. Depository of type unknown.

Type locality of *Ibacus ciliatus* Guilding: "in Caribeo mari", probably near St. Vincent. Depository of type unknown.

Type locality of *Ibacus parrae*: "les Antilles", restricted to Cuba by Holthuis (1985:73); 2 syntypes in MP, nos Pa 409 and 465, dry, in good condition.

Type locality of *P. antarcticus carinatus*: "Südsee" (South Pacific). Holotype male in ZMH.

Type locality of *Parribacus papyraceus*: "South coast of Molokai Island", Hawaiian Archipelago. Lectotype male in USNM, no. 30265

Type locality of *Cancer barffi*: "On the barrier reef at Tautira", Tahiti. Depository of type unknown.

Geographical Distribution : Western Atlantic region: from Florida to N.E. Brazil (Bahia), including the West Indian islands and the mainland coast of the Caribbean Sea. Indo-West Pacific region: E. and SE Africa to Hawaii and Polynesia (Fig. 402).

Habitat and Biology : Taken at depths from 0 to 20 m; in coral or stone reefs with a sandy bottom. The species is nocturnal and in the daytime hides in crevices, sometimes in small groups.

Size : Carapace lengths between 2 and 9 cm; maximum total length about 20 cm.

Interest to Fisheries : The species is of excellent taste and eaten where it occurs. It is usually hunted at night on the reefs with torch light. The animals are taken with dipnets or speared or taken by hand. There is no special fishery for it on a commercial scale, but it is sometimes taken in nets set for spiny lobsters. Although its taste is usually highly praised and considered better than that of other lobsters, the species is considered too small and the abdomen too flat to become of commercial interest. It is sold fresh or cooked and used for local consumption. At Phuket Island, Thailand, specimens, mounted in fancy glass cases, are occasionally sold to tourists.

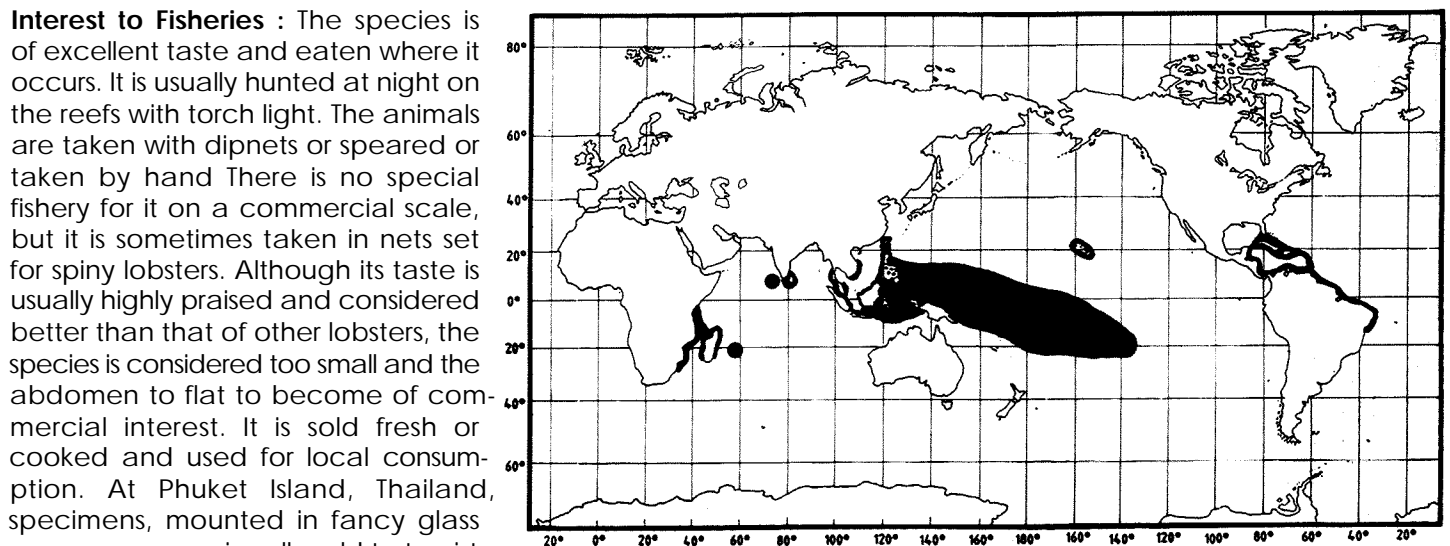
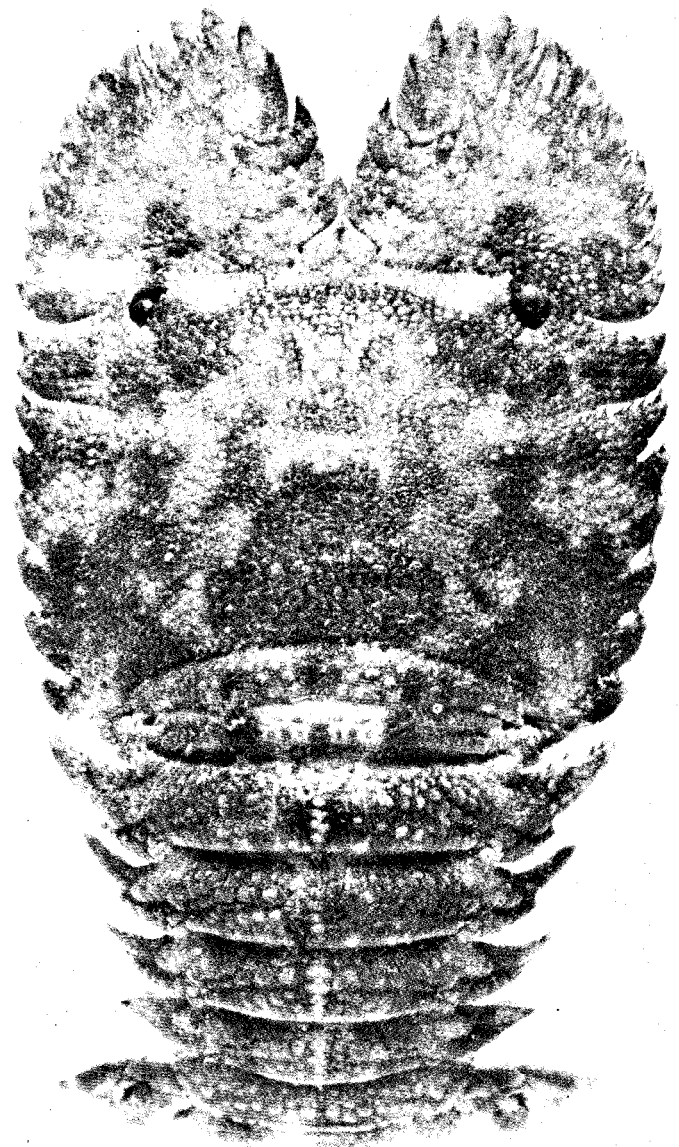


Fig. 402

Local Names : BARBADOS: Horseshoe crab ; BRAZIL: Chineza, Potiquiyixe (Recife, 17th Century); CAROLINE IS.: Allpap; CUBA: Langostino; HAWAII: Ula-pápapa; INDONESIA: Udang laut lebar, Miyu uhut, Ketam gonosso, Udang pasir laut, Uhut; JAMAICA: Sea cockroach; KAPINGAMARANGI: Tapa tapa; KIRIBATI: Te Mnawa; MALAYSIA: Udang laut lebar; MANGAREVA: Kopapa; MARTINIQUE: Savate, Maman homard, Marie-carqgne; MARSHALL IS.: Jipukpuk, Uraber; MOZAMBIQUE: Cava-cava esculpida; PALAU: Braber; REUNION: Cigale de mer, Taille de boeuf; SAMOA: Papata; TAHITI: Tianée; THAILAND: Kung kamayi; TUVALU: Tappa tappa.



(from Holthuis, 1985)

Fig. 401

Literature : Fischer (ed), 1978: vol. 6; Fischer & Bianchi (eds), 1984:vol. 5; Holthuis, 1985:73-88, figs 21,25A.

***Parribacus caledonicus* Holthuis, 1960**

Parribacus caledonicus Holthuis, 1960, *Proceedings Biological Society Washington*, 73: 147.

Synonyms: Formerly not distinguished from *P. antarcticus*.

FAO Names : En - Caledonian mitten lobster

Type : Type locality: "Ile des Pins", New Caledonia. Holotype female in RMNH, no. D 14506.

Geographical Distribution : Indo-West Pacific region: Queensland, Australia; New Caledonia and Loyalty Islands; New Hebrides; Fiji Islands; Samoa (Fig. 404).

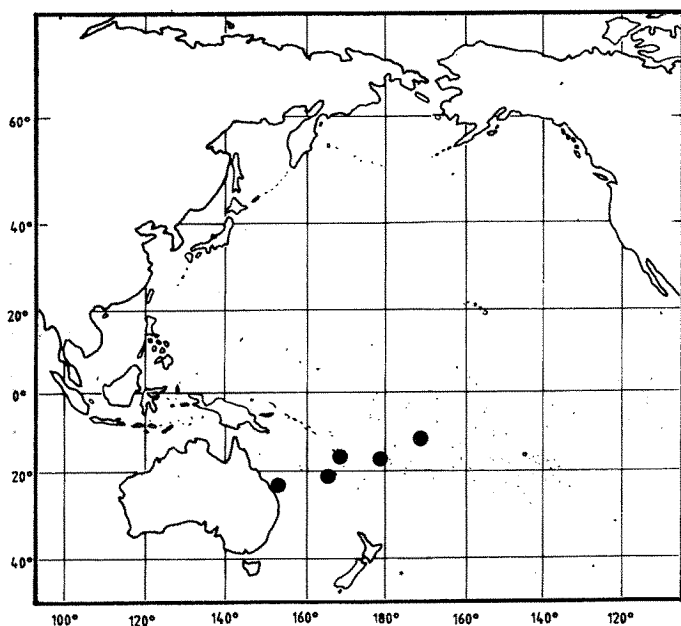
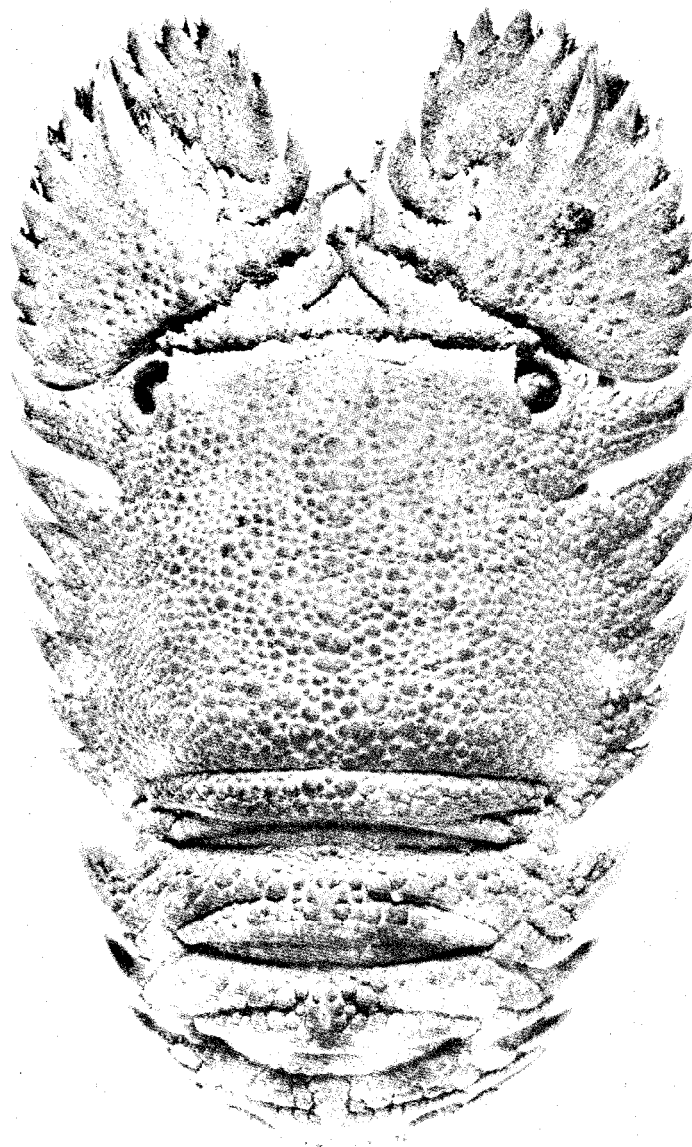


Fig. 404

Fig. 403

SCYL Par 2



(from Holthuis, 1985)

Fig. 403

Habitat and Biology : In shallow water on reefs, usually on the exposed side, often in surge channels. The animals hide in crevices and marine caves in the day time, often attached to the ceilings of the caves.

Site : The carapace length varies between 4.5 and 8 cm; maximum total body length is about 18 cm.

Interest to Fisheries : The species is caught by divers with gloved hands (George, 1971:4). They are eaten and found on the local markets, where they are sold fresh. According to George (1971:9) in Samoa the species is "not in demand by the hotel trade".

Local Names : FIJI: Butterfly lobster, Ivinibila, Vavaba; NEW CALEDONIA: Popinée.

Literature : Holthuis, 1985:88-93, fig 22.

Parribacus holthuisi Forest, 1954

Fig. 405

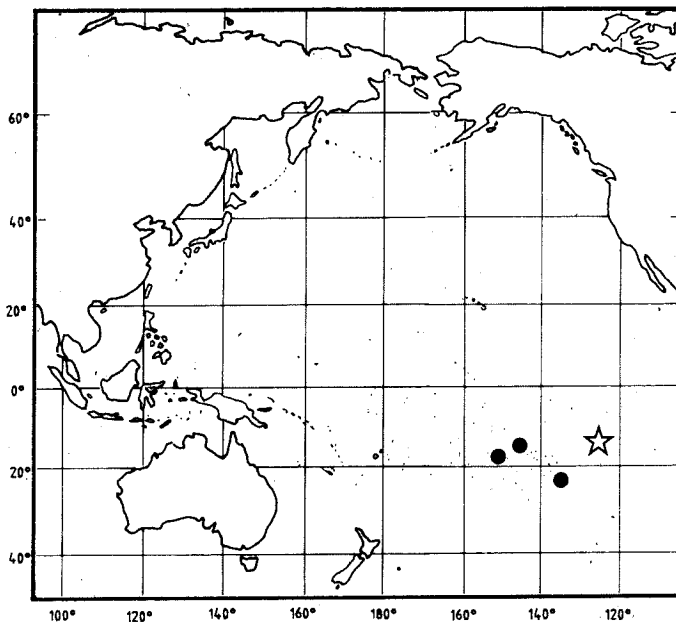
SCYL Par 3

Parribacus holthuisi Forest, 1954, Bulletin Muséum National Histoire naturelle, Paris, (2)26:346, figs 25, 26B.

FAO Names : En - Red-spotted mitten lobster.

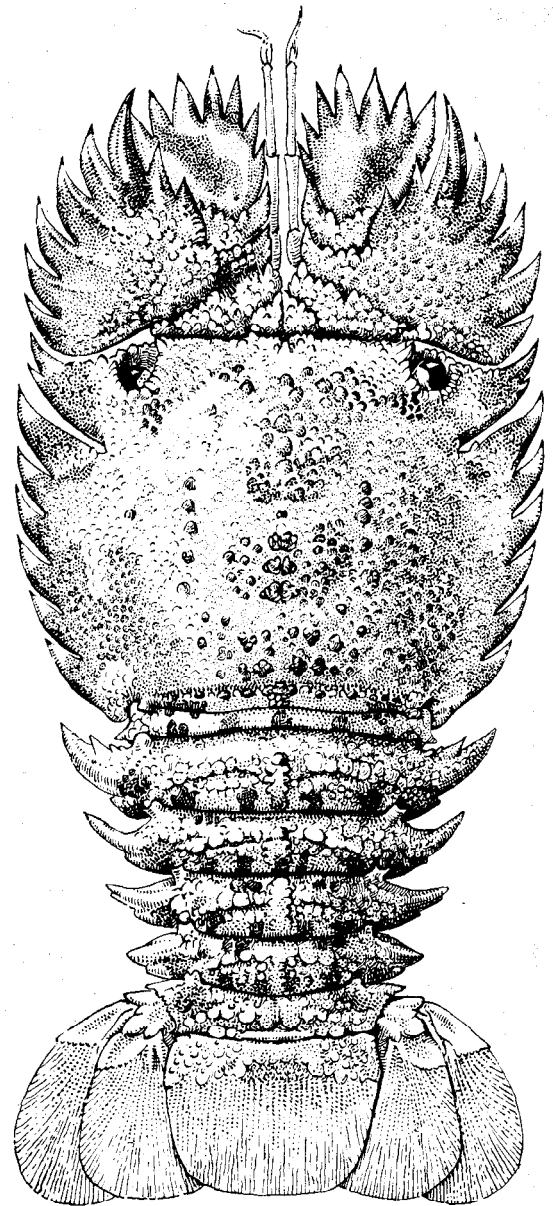
Type : Type locality: "Hikueru", Tuamotu Archipelago. Lectotype female in MP no. Pa 141; paralectotypes in MP and RMNH, all types preserved in alcohol, condition excellent.

Geographical Distribution : The species is only known from the Society, Tuamotu and Gambier Islands in the southern Pacific. A larva, possibly belonging to this species, was reported from 14°13.6'S 126°00'W, in the Pacific Ocean (Fig. 406).



☆ larval record possibly of this species

Fig. 406



(after Forest, 1954)

Fig. 405

Habitat and Biology : In shallow water on the sandy bottom of coral reefs.

Size : Carapace lengths measured vary from 2.5 to 6.5 cm; maximum total length about 14 cm.

Interest to Fisheries : Minor. Used as food by the natives and collected at night with torches.

Local Names : GAMBIER IS.: Akamaru, Opapa; TAHITI: Tianée.

Literature : Holthuis, 1985:98-102, figs 24,25B.

Parribacus japonicus Holthuis, 1960

Fig. 407

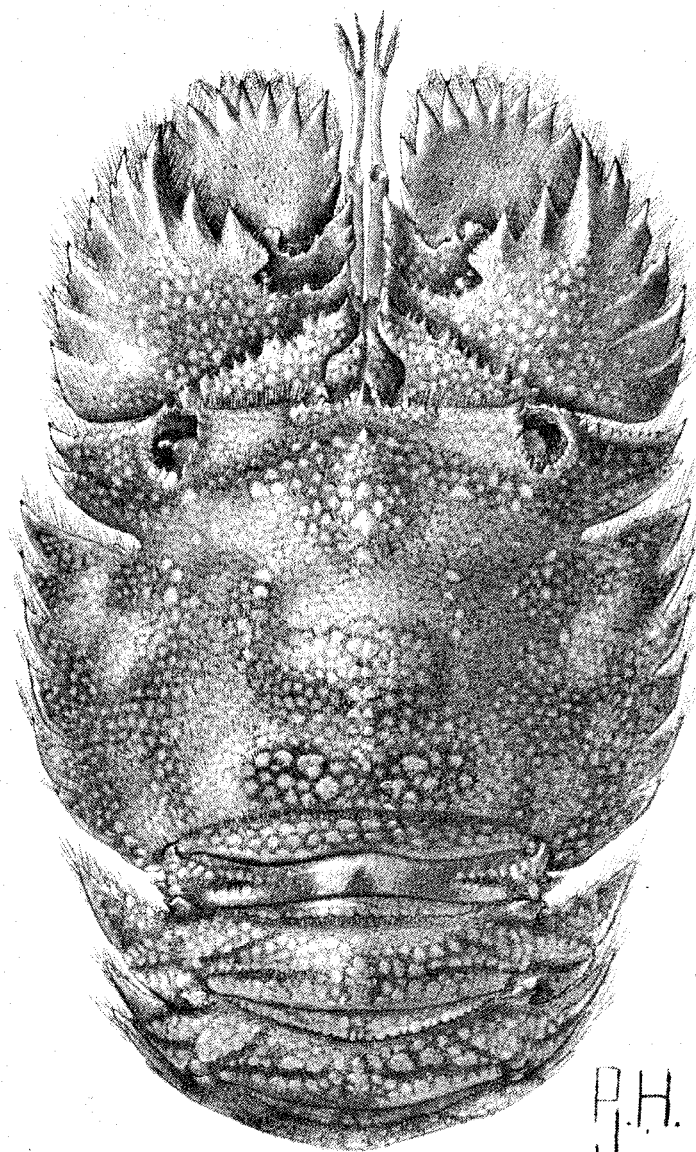
Parribacus japonicus Holthuis, 1960, *Proceedings Biological Society Washinoton*, 73: 148.

Synonyms: Formerly often confused with *P. antarcticus*.

FAO Names : En - Japanese mitten lobster

Type : Type locality: "Ku'ruri District, Tokyo Bay", Honshu, Japan. Holotype male in USNM, no. 18883. Paratypes in RMNH, USNM.

Geographical Distribution : Japan (north-west coast, west of Maizuru, 135°15'E; Pacific coast from Tokyo Bay, 140°E, south-westward to Ryukyu Islands) (Fig. 408).



(from Holthuis, 1985)

Fig. 407

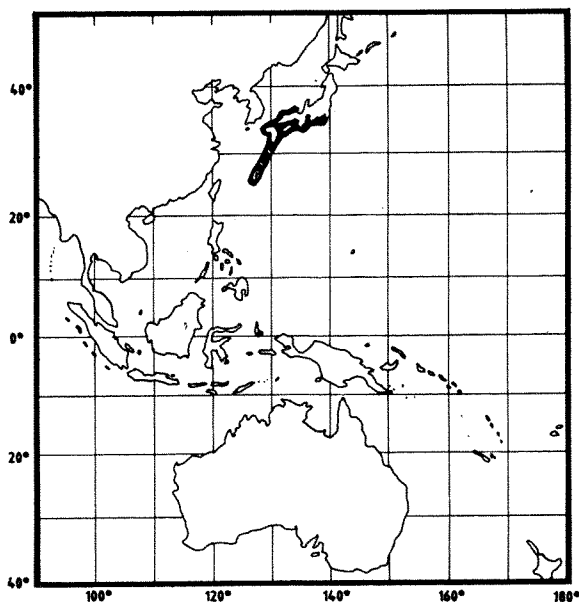


Fig. 408

Habitat and Biology : In shallow waters up to 20 m depth; the animals live on shore reefs

Size : Carapace lengths from 4 to 7.4 cm; maximum total body length about 16 cm.

Interest to Fisheries : Minor. The species is caught in gill nets and is sold fresh. Very little information is available.

Local Names : JAPAN: Zori ebi.

Literature : Holthuis, 1985: 106-111, fig. 27

Parribacus perlatus Holthuis, 1967

Fig. 409

SCYL Par 5

Parribacus perlatus Holthuis, 1967, *Proceedings Koninklijke Nederlandse Akademie Wetenschappen*, (C)70:305.

FAO Names : **En** - Easter Island mitten lobster.

Type : Type locality: "Easter Island" Holotype female in RMNH, no. D 21257, in alcohol, condition excellent.

Geographical Distribution : So far only known from Easter Island, Pacific Ocean (Fig. 410).

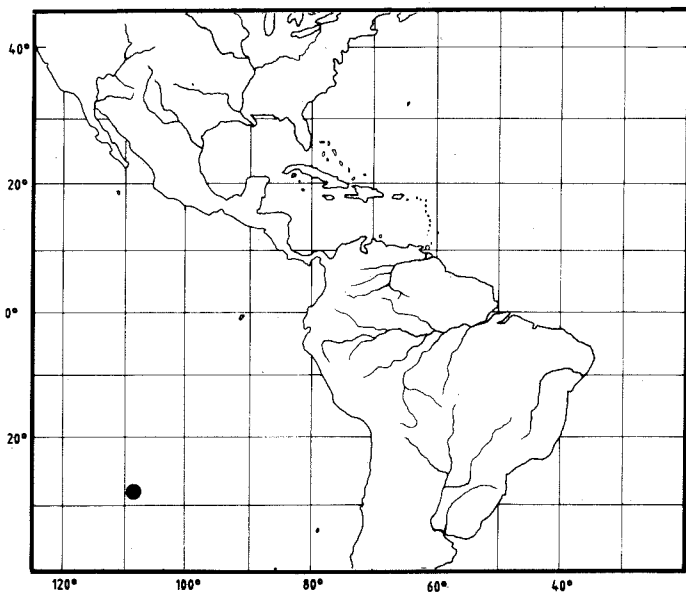
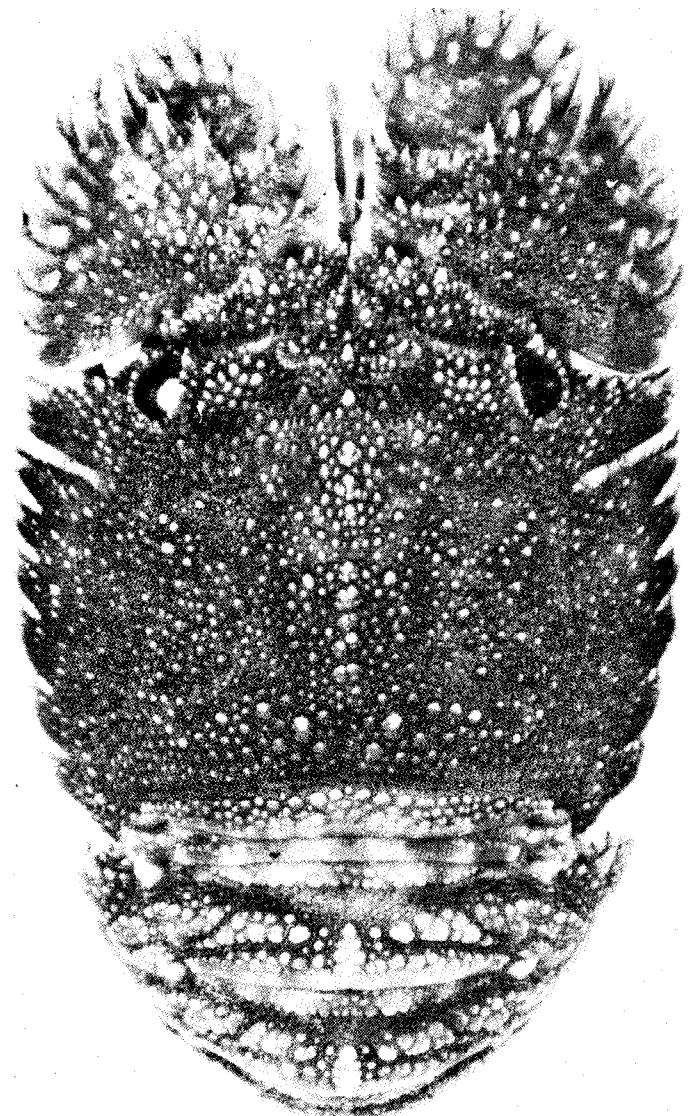


Fig. 410



(from Holthuis, 1985)

Fig. 409

Habitat and Biology : In shallow water among the rocks, the animals hide in the daytime in marine caves and crevices.

Size : Carapace length 4 to 5 cm. Maximum total body length about 11 cm.

Interest to Fisheries : The species is fished by the population of Easter Island by wading in the water both at night and in the daytime. The lobsters are stepped upon and then picked up by hand; divers enter the caves and crevices and pick them up there. At night the fishery takes place with torches.

Local Names : CHILE: Raperape, Ura, Ura raperape, Crayfish, Langosta, Easter Island lobster (Easter Island).

Literature : Holthuis, 1972:44, pl. 1; Holthuis, 1985:93-98, fig 23.

Parribacus scarlatinus Holthuis, 1960

Parribacus scarlatinus Holthuis, 1960, *Proceedings Biological Society Washington*, 73: 148.

FAO Names : En - Marbled mitten lobster

Type : Type locality: "Enderbury Island, Phoenix Archipelago, 3°08'29.7"S, 171°05'34.4"W". Holotype male in USNM. no. 100826.

Geographical Distribution : Central Pacific Ocean from Kapingamarangi through the Marshall, Gilbert and Phoenix Islands to the Marquesas (Fig 412).

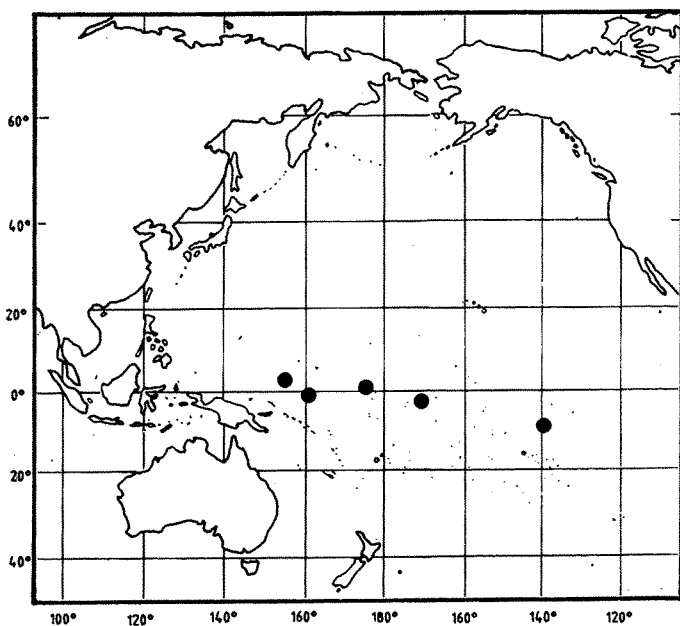
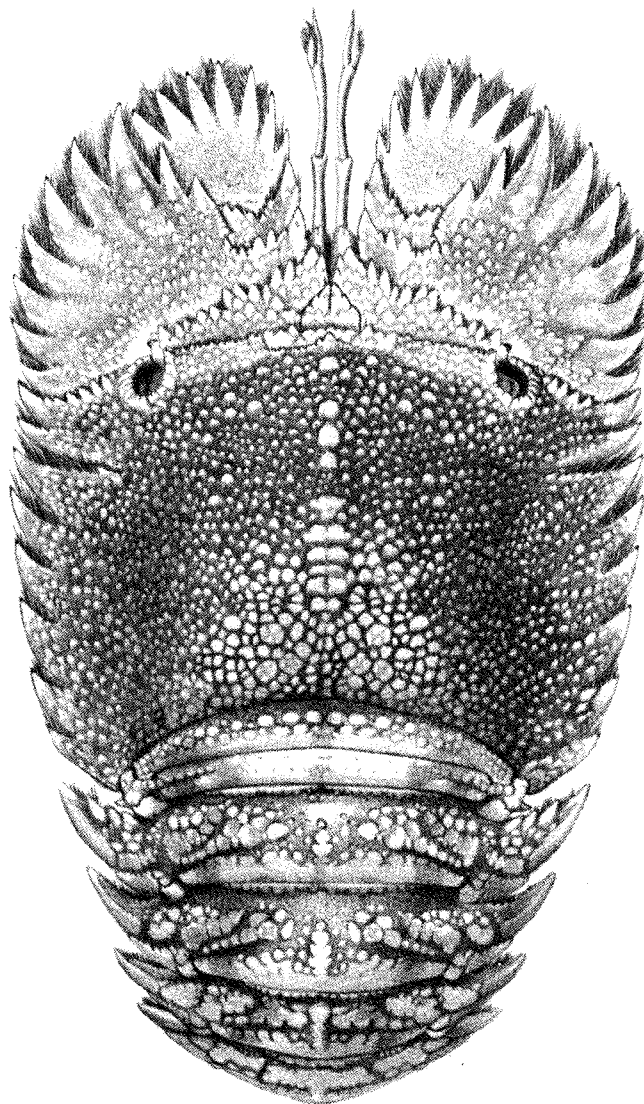


Fig. 412

Fig. 411

SCYL Par 6



(from Holthuis, 1985)

Fig. 411

Habitat and Biology : In shallow waters, in or near reefs.

Size : Known carapace lengths vary between 2.5 and 7 cm Maximum total body length about 15 cm.

Interest to Fisheries : No information available, but judging by the fact that all other species of the genus are used as food, the same is expected for the present one.

Literature : Holthuis, 1985: 102-106, fig. 26.

SUBFAMILY **SCYLLARINAE** Latreille, 1825

Scyllarides Latreille, 1825, *Familles naturelles du Règne Animal* :278.

The subfamily Scyllarinae is monotypic, i.e., it contains only the type genus **Scyllarus**; so far no other genera of Scyllarinae have been described.

Scyllarus Fabricius 1775

SCYL Scylr

Scyllarus Fabricius 1775, *Systema Entomologiae*:413. Gender masculine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in their Opinion 519 (published in 1958).

Type Species: by monotypy: **Cancer arctus** Linnaeus, 1758.

Synonyms: **Syllarus** Rafinesque, 1815, *Analyse de la Nature*:98. Substitute name for **Scyllarus** Fabricius, 1775. Gender masculine.

Chrysoma Risso, 1827, *Histoire naturelle de l'Europe méridionale*, 5:88. Type species, by monotypy: **Chrysoma mediterraneum** Risso, 1827 (a junior subjective synonym of **Cancer arctus** L., 1758). Gender neuter.

Arctus De Haan, 1849, in P.F. von Siebold, *Fauna Japonica, Crustacea* (6,7):xx, 238. Type species, by absolute tautonymy: **Cancer arctus** L., 1758. Gender masculine.

Arctus Dana, 1852, *Proceedings Academy Natural Sciences Philadelphia*, 6: 14. Type species by monotypy (and absolute tautonymy): **Arctus ursus** Dana, 1852, (= a replacement name for **Cancer arctus** L., 1758). Gender masculine.

Nisto Sarato, 1885, *Moniteur des étrangers de Nice*, 9 (216):3. Type species, by present selection: **Nisto laevis** Sarato, 1885 (a junior subjective synonym of **Cancer arctus** L., 1758). Gender masculine.

Yalomus Rafinesque in Holthuis, 1985, *Zoologische Mededelingen, Leiden*, 59(13):141. Type species, by monotypy: **Yalomus depressus** Rafinesque in Holthuis, 1985 (a junior subjective synonym of **Cancer arctus** L., 1758). Gender masculine.

More than 40 species are known in this genus, they are listed below. Most species are small and of no economic value. A few (only 7 are known to me) have been reported from fish markets, but even those can only be considered as accidental bycatch of other species. Hence, a key to species is not presented here, but short diagnoses are provided for the 7 species reported from fish markets as an aid for their recognition.

List of Species* :

- S. aesopius** Holthuis, 1960 - Philippines
- S. amabilis** Holthuis, 1963 - Western Australia
- S. americanus** (S.I. Smith, 1869) Syn: **Arctus americanus** S.I. Smith, 1869; **Scyllarus gundlachi** (Von Martens, 1872) - West Central Atlantic
- S. aoteanus** Powell, 1949 - New Zealand
- S. arctus** (Linnaeus, 1758) Syn: see p. 217 - East Central Atlantic
 - S. aureus** Holthuis, 1963 - Indo-West Pacific
 - S. aurora** Holthuis, 1982 - Indo-West Pacific
 - S. batei** Holthuis, 1946 Syn: see p. 219 - Indo-West Pacific
 - S. bertholdii** Paulson, 1875 Syn: see p. 221 - Indo-West Pacific
 - S. bicuspidatus** (De Man, 1905) Syn: **Arctus bicuspidatus** De Man, 1905 - Indo-West Pacific
 - S. brevicornis** Holthuis, 1946 Syn: see p. 222 - Japan, China
- S. caparti** Holthuis, 1952 - West Africa
- S. chacei** Holthuis, 1960 - West Central Atlantic
- S. crenatus** (Whitelegge, 1900) Syn: **Arctus crenatus** Whitelegge, 1900 - Eastern Australia
- S. cultrifer** (Ortmann, 1897), Syn: subs. **S.c. meridionalis** Holthuis, 1960 - Indo-West Pacific
- S. delfini** (Bouvier, 1909) Syn: **Arctus delfini** Bouvier, 1909 - Juan Fernandez, Chile
- S. demani** Holthuis, 1946 - Indo-West Pacific
- S. depressus** (S.I. Smith, 1881) Syn: **Arctus depressus** S.I. Smith, 1881; **S. nearctus** Holthuis, 1960 - West Central Atlantic
- S. dubius** Holthuis, 1963 - Australia
- S. faxoni** Bouvier, 1917 - West Central Atlantic

* This list is still tentative, more new species will be described in the near future.

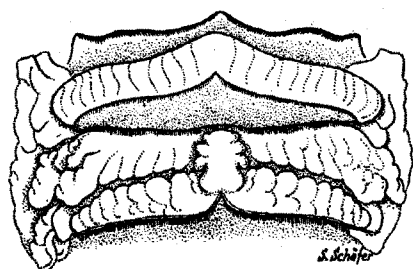
- S. gibberosus* (De Man, 1905) Syn: *S. sordidus* Nobili, 1905 (not Stimpson, 1860); *Arctus gibberosus* De Man, 1905; *Arctus nobilii* De Man, 1905; *Scyllarus paulsoni* Nobili, 1906; *Scyllarus nitidus* Nobili, 1906; *Scyllarus nobilii* - Nobili, 1906 - Indo-West Pacific
- S. kitanoviriosus* Harada, 1962 - Japan, Korea
- S. lewinsohni* Holthuis, 1967 - Red Sea
- S. longidactylus* Harada, 1962 - Japan
- S. martensii* Pfeffer, 1881 Syn.: see p. 223 - Indo-West Pacific
- S. mawsoni* (Bage, 1938) Syn: *Arctus mawsoni* Bage, 1938 - Australia
- S. modestus* Holthuis, 1960 - Hawaiian Islands
- S. ornatu*s Holthuis, 1960 - Indo-West Pacific
- S. paradoxus* Miers, 1881 Syn: *S. (Arctus) arctus paradoxus* (Miers, 1881) - West Africa
- S. planorbis* Holthuis, 1969 - Caribbean Sea
- S. posteli* Forest, 1963 - East Central Atlantic
- S. pumilus* Nobili, 1905 Syn: *S. thiriouxi* Bouvier, 1914 - Red Sea, Western Indian Ocean
- S. pygmaeus* (Bate, 1888) Syn.: see p. 224 - East Central Atlantic
- S. rubens* (Alcock & Anderson, 1894) Syn: *Arctus rubens* Alcock & Anderson, 1894 - Western Indian Ocean
- S. rugosus* H. Milne Edwards, 1837 Syn.: see p. 225 - Indo-West Pacific
- S. sordidus* (Stimpson, 1860) Syn: *Arctus sordidus* Stimpson, 1860 - Indo-West Pacific
- S. subarctus* Crosnier, 1970 - West Africa
- S. timidus* Holthuis, 1960 - Indo-West Pacific
- S. umbilicatus* Holthuis, 1977 - Eastern Australia
- S. vitiensis* (Dana, 1852) Syn: *Arctus vitiensis* Dana, 1852 - Indo-West Pacific

***Scyllarus arctus* (Linnaeus, 1758)**

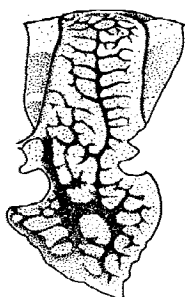
Cancer arctus Linnaeus, 1758, *Systema Naturae*, (ed. 10) 1:633. Name placed on the Official List of Specific Names in Zoology, in Opinion 519 (published in 1958).

Fig. 413

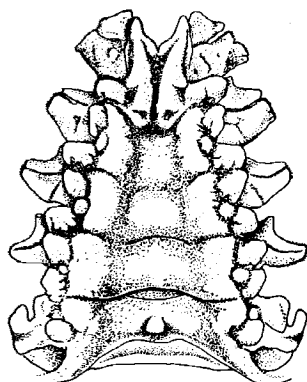
SCYL Scylr 1



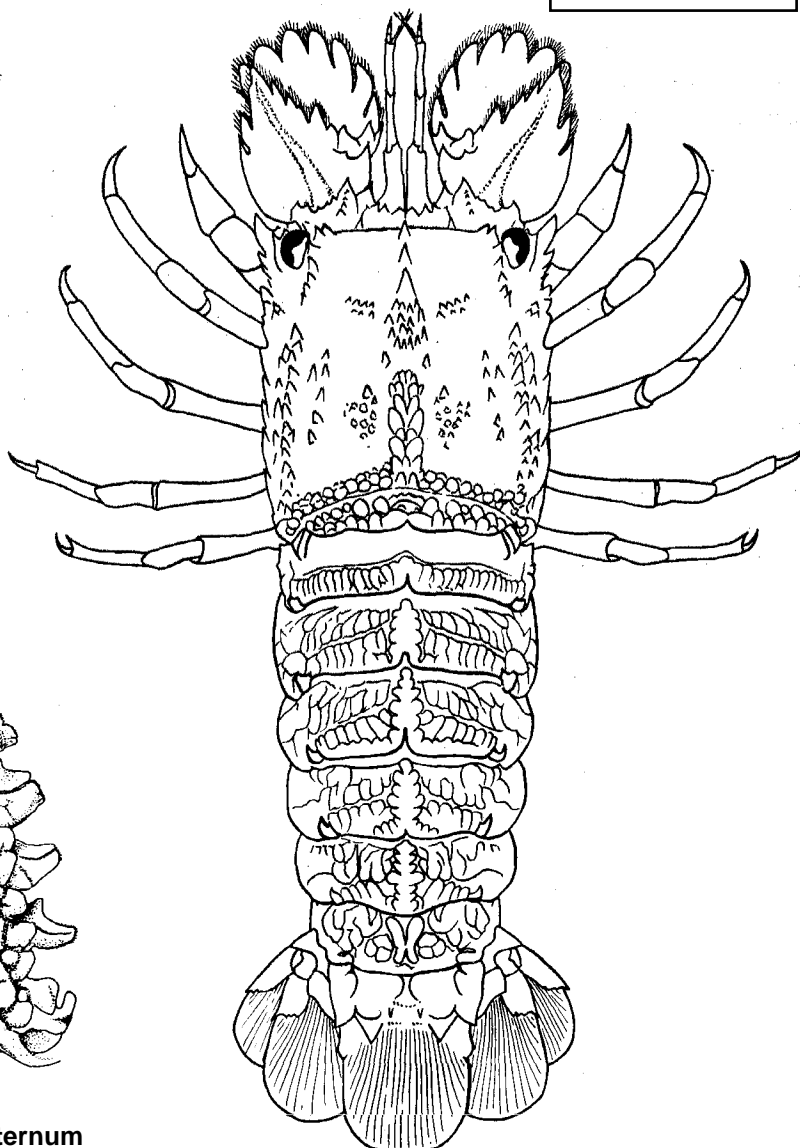
first and second abdominal somites
(dorsal view)



second abdominal somite
(lateral view)



thoracic sternum
(ventral view)



dorsal view

Fig. 413

Synonyms: *Astacus arctus* - Pennant, 1777; *Cancer (Astacus) ursus minor* Herbst, 1793; *Scyllarus tridentatus* Leach, 1814; *Scyllarus cicada* Risso, 1816; *Chrysoma mediterraneum* Risso, 1827; *Phyllosoma sarniense* Lukis, 1835; *Phyllosoma parthenopaeum* Costa, 1840; *Arctus arctus* - De Haan, 1849; *Phyllosoma mediterraneum* - Hope, 1851; *Arctus ursus* Dana, 1852; *Nisto laevis* Sarato, 1885; *Nisto asper* Sarato, 1885; *Arctus crenulatus* Bouvier, 1905; *Scyllarus (Arctus) crenulatus* - Bouvier, 1915; *Scyllarus arctus lutea* Risso MS in Holthuis, 1977; *Yalomus depressus* Rafinesque MS in Holthuis, 1985.

FAO Names : **En** - Small European locust lobster; **Fr** - Petite cigale; **Sp** - Santiaguíño.

Type : Type locality of *Cancer Arctus* and *Arctus ursus* (the latter is a replacement name for the former): "Habitat in M [ari]. Europae, Asiae, Africae, Americae". As lectotype of the species is now selected the specimen figured by Barrelier (1714:131, fig. 1288 II) as "Squilla Ursa minor altera remipes", the only specimen of the present species cited by Linnaeus (1758). Barrelier's specimen was collected and figured by him during his travels in "Galliam, Hispaniam et Italiam", no exact locality is given, but the type locality may be arbitrarily restricted to Ostia, the port of Rome, as in the second page of Barrelier's biography in the introduction to his 1714 book, it is said that in Ostia he figured marine insects (= Crustacea): "Portum Ostiensem ... Plantas investigandi causâ perlustravit, Marinasque plurimas, Insecta simul & Conchylia depinxit". On p. xxvi of the chapter "Index Iconum Barrelieri" of his book, all the Crustacea, Mollusca and Echinodermata that he figured are listed as "Insecta marina". The lectotype is almost certainly no longer extant, but the figure is so exact that there cannot be any doubt as to the identity of the specimen.

Type locality of *Cancer (Astacus) ursus minor*: "Man findet diesen Krebs im Mittelländischem Meere". Type material in ZMB, no longer extant.

Type locality of *Scyllarus tridentatus*: "Its habitat is unknown". The specimen was observed by Leach "in the collection of William Comyns, Esq. of Mount Pleasant, near Dawlish, Devonshire" and thus may have come from the south coast of England. Whereabouts of the type material unknown.

Type locality of *Scyllarus cicada*: "Environs de Nice", "dans les rochers du litoral". Depository of type material unknown.

Type locality of *Chrysoma mediterraneum*: "dans nos mers [= seas near Nice, dépt. Alpes Maritimes, S. France]. Depository of types unknown.

Type locality of *Phyllosoma sarniense*: "on the Coast of Guernsey", Channel Islands, Great Britain. Depository of type unknown.

Type locality of *Phyllosoma parthenopaeum*: "Trovato a galleggiare nella marina di Capri", near Naples, Italy. Depository of larval holotype unknown.

Type locality of both *Nisto laevis* and *Nisto asper*: "Les deux Nisto ont été découverts . dans les eaux de Saint-Jean, près de Nice", dépt. Alpes Maritimes, S. France. Depository of syntypes of either species unknown.

Type locality of *Arctus crenulatus*: "Porto-Santo (Madère)", later (Bouvier, 1905:2) given more detailed as "de la baie de Porto-Santo . . . par 100 mètres de profondeur". Holotype in MOM.

Type locality of *Scyllarus arctus lutea*: Nice, S. France. Depository of type unknown.

Type locality of *Yalomus depressus*: "in the Sicilian Seas", Italy. Types lost.

Diagnostic Features: Carapace with 3 distinct acute teeth in the median line before the cervical groove (the gastric, pregastric and rostral teeth). Region between the postrostral and branchial carinae with only a few tubercles, and with extensive smooth areas. Abdomen without a sharp median ridge, but each of somites 2 to 5 with an elongate lobulate figure in the middle. The exposed part of somites 2 to 5 with an arborescent arrangement of very narrow grooves. Somite 1 with a complete transverse groove, behind which there are numerous short longitudinal grooves that are rather irregular in shape, may divide and sometimes are interconnected by transverse grooves; this posterior half of somite 1 of equal length throughout its width, not longer in the middle than at the sides. The smooth anterior half of abdominal somites 2 to 6 (i.e., the part of the somite that disappears under the previous somite when the abdomen is fully stretched) without any indication of grooves or rows of hairs. Fourth segment of antenna with a single oblique median carina. Outer margin of the segment with 2 teeth, the inner margin with 3 or 4 (not including the apical tooth). Thoracic sternum anteriorly V-shapedly incised in the middle. A blunt and low median tubercle on the last thoracic sternite; this tubercle somewhat flattened posteriorly, not conical as in *S. pygmaeus*. Dactyli of legs without fringes of hair. Colour: reddish brown with a dark brown pubescence. A dark brown, not sharply delimited spot in the central part of abdominal somite 1. Segments of the pereopods with a dark blue band each.

Geographical Distribution : Eastern Atlantic region from the south coast of the British Islands to the Azores, Madeira and the Canary Islands, as well as the entire Mediterranean (Fig. 414)

Habitat and Biology : Depth range from 4 to 50 m; on rocky or muddy substrates, and also in *Posidonia* prairies. Oviparous females from February to April.

Size : Total body length usually between 5 and 10 cm, maximum body length about 16 cm.

Interest to Fisheries : Minor. The species is edible and used as food, but there is no special fishery for it, being usually taken as a by-catch in other fisheries. It has been taken with gill nets, trawls, dredges, traps and seines. It is also taken by hand by divers, who at places seem to have decimated the populations, especially after the introduction of Scuba gear. The animals are offered for sale at local markets, usually fresh. The relatively small size and the fact that it is never abundant make the species economically not very attractive.

Local Names : FRANCE: Petite cigale, Cigale de mer, Petit Scyllare, Chambre (Provence); GERMANY: Kleiner Barenkrebs, Grillenkrebs; GREECE: Astakoudaki; ISRAEL: Kapavit dubit; ITALY: Cicala di mare, Magnosella; PORTUGAL: Lagosta da pedra, Lameiro; SPAIN: Santiaguño, Toribio, Cigala; Bujias, Llagosta lluisa, Xuius (Cataluña); Cigarra (Andalucía); TUNISIA: Chkal, Ziz il bahr, Cigale blanche, Petite cigale de mer; UK: Broad lobster; YUGOSLAVIA: Zezavac.

Literature : Palombi & Santarelli, 1961:372 (local names); Fischer, Bianchi & Scott (eds), 1981 :Vol. 5; Fischer, Bauchot & Schneider (eds), 1987:317-318.

Remarks: The name "*Phyllosoma sarniense*" is not mentioned in Lukis' (1835:459-464) article, the editor even put in this article on p. 462 a bracketed remark "Will Mr Lukis please to take an early opportunity of adding a specific epithet". The name is provided in the index to the volume (8) of *The Magazine of Natural History* in which Lukis' article appeared; on p. 685 of the index is cited "*Phyllosoma sarniense* Lukis, and other species, 461".

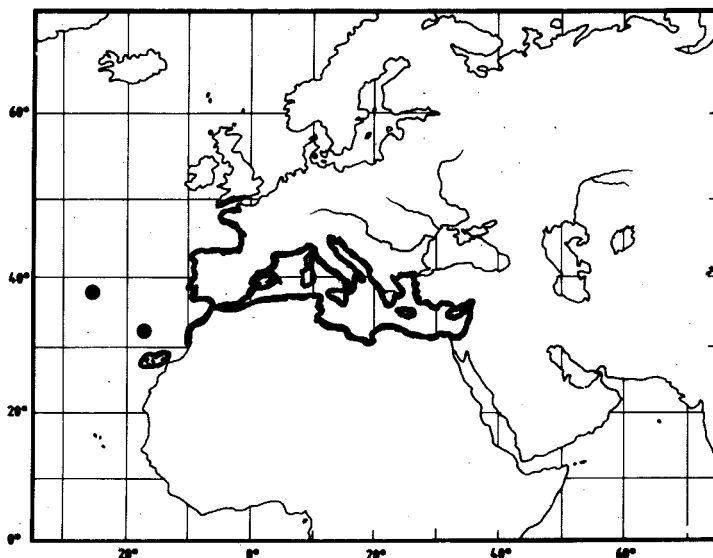


Fig. 414

Scyllarus batei Holthuis, 1946

Fig. 415

SCYL Scylr 3

Scyllarus batei Holthuis, 1946, *Temminckia. Leiden*, 7:94.

Synonyms: *Arctus orientalis* Bate, 1888 (not *Scyllarus orientalis* Lund, 1793); *Scyllarus orientalis* - De Man, 1916; *Scyllarus batei arabicus* Holthuis, 1960.

FAO Names : **En** - Soft locust lobster; **Fr** - Cigale douce; **Sp** - Cigarra blanducha.

Type : Type locality of *Arctus orientalis* and *S. batei* (the latter name being a replacement name for the former): "Challenger" "Station 209, between Bohol and Zebu [= Cebu], ... lat. 10°14'N., long. 123°54'E.; depth, 95 fathoms [= 174 m]; bottom, blue mud". Two syntypes in BM.

Type locality of *S. batei arabicus*: "Gulf of Aden (13°16' - 13°16'36"N 46°20'24" - 46°14'E, depth 220 m, "John Murray" Expedition Sta. 194". Holotype in BM, no. 88.22, in alcohol, condition good.

Diagnostic Features : Carapace with 2 distinct teeth in the median line before the cervical groove (the gastric and pregastric teeth), the rostral tooth is absent. The region between the postrostral and branchial carinae with only very few tubercles and extensive smooth areas. Abdomen with a distinct Sharp median carina on somites 1 to 5, all these ridges of approximately the same height. Somite 1 with the transverse groove interrupted in the middle by the median carina; behind the groove there are no longitudinal grooves, but a transverse row of tubercles. The exposed part of somites 2 to 5 without an arborescent pattern, but with a wide transverse groove (interrupted in the middle) behind which there is a transverse row of tubercles, and before which there are some tubercles and wide short side grooves. The fourth segment of the antenna has a single, distinct oblique median carina; the Upper surface has no additional carina or tubercles. The outer margin of the segment has 2 to 4 larger, the inner margin 4 to 7 smaller teeth (not including the apical tooth). The thoracic sternum with the anterior median end gutter-like sunken, not incised in the middle. No median tubercles on the sternites. Dactyli of legs 3 to 5 with dorsal fringes of hair. Colour: body pale brown with the ridges and tubercles pale purple or reddish. First abdominal somite brick red in the anteromedian area (see Chan & Yu, 1986, pls 4,9A,B).

Geographical Distribution : Indo-West Pacific region: Gulf of Aden and East Africa to the South China Sea, Taiwan, the Philippines and Indonesia. It is possible that the western form is a separate subspecies *S.b. arabicus* (Fig. 416).

Habitat and Biology : Depth range from 160 to 484 m, usually between 170 and 210 m; on sandy and muddy substrates.

Size : Maximum total body length about 7 cm, carapace length to 3 cm (males 1.4 to 2.9 cm; females 1.5 to 3.3 cm; ovigerous females 2.3 to 3.1 cm).

Interest to Fisheries : Sometimes taken by trawlers in small quantities (George, 1969:433), the species is not considered to be of potential commercial interest. Chan & Yu (1986: 149) reported the species, from local fish markets in Taiwan; the animals were caught with "baby shrimp trawls"

Literature : Fischer & Bianchi (eds), 1984:vol 5; Chan & Yu, 1986: 155, pl. 4fig. A-C, pl 9 fig. A,B.

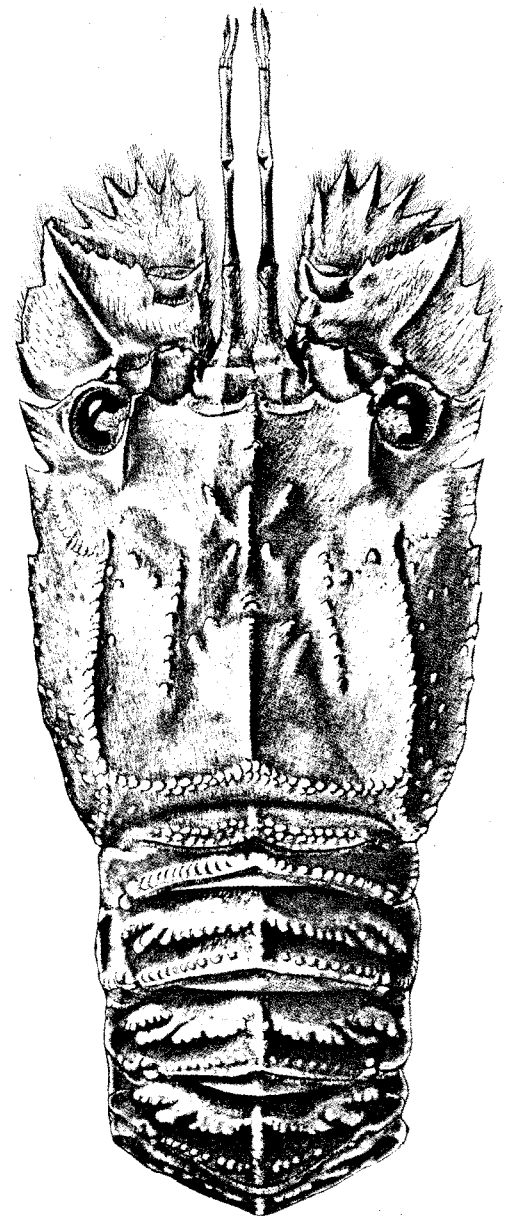


Fig. 415

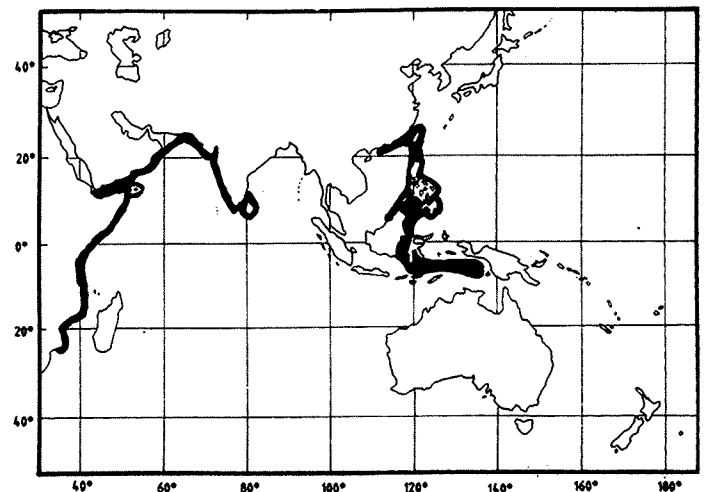


Fig. 416

Scyllarus bertholdii Paulson, 1875

Fig. 417

SCYL Scylr 4

Scyllarus bertholdii Paulson, 1875, *Izledovaniya Rakoobraznykh Krasnogo Morya*:97.

Synonyms: *Scyllarus haanii* Berthold, 1845 (not *S. haanii* De Haan, 1841); *Scyllarus sinensis* White, 1847 (nomen nudum).

FAO Names : En - Two-spot locust lobster.

Type : Type locality of *S. bertholdii* and *S. haanii* Berthold (the former being a replacement name for the latter): China. Lectotype female RMNH, no. 5518, dry, condition rather poor. A possible paralectotype in SMF, under no. 7 MG 233. The specimen, a dry female labelled "Mare Indicum", is the only specimen of this species from the collection of the Göttingen Museum now on permanent loan in the Senckenberg Museum. It was not labelled as being a type.

Type locality of *S. sinensis*: "China". Syntypes in BM.

Diagnostic Features : The teeth in the median line of the carapace low and obscure: the rostral tooth is usually reduced to a mere tubercle, the pregastric tooth is distinct, but low, the gastric tooth is absent; the cardiac tooth (behind the cervical groove) is replaced by 2 low blunt and flattened submedian tubercles. The region between the post-rostral and branchial carinae shows few tubercles and rather large smooth areas. Abdomen without median carina, the median area of the somites is low and flat. The exposed part of the abdominal somites shows an arborescent pattern of narrow grooves. Somite 1 has a complete transverse groove behind which there are numerous parallel oblique grooves, which in the middle of the segment form a triangular figure. Fourth segment of the antenna with a single straight and obliquely directed median carina; no additional carinae or tubercles on the dorsal surface. Outer margin of the segment with two distinct sharp teeth, inner margin with a large single sharp tooth (apical tooth of segment not included). Thoracic sternum with the anterior margin straight and transverse, with a very narrow median incision. The anterior margin forms a broad ridge behind which there is a sunken triangular area. No median tubercles on the sternites. Dactylus of pereopods 1, 2, 4 and 5 without hairy fringes. Colour: the body is reddish brown. Most conspicuous and characteristic are two large dark spots on the first abdominal somite, one on each side slightly above the base of the pleuron. The legs are pale with a few dark bands (see Chan & Yu, 1986, pls. 2, 8B).

Geographical Distribution : Indo-West Pacific region: S. China, Hong Kong, Taiwan, South China Sea, Gulf of Thailand, Philippines, Indonesia, W. and N. Australia (Fig. 418).

Habitat and Biology: Reported from depths between 15 and 150 m, but most common between 40 and 75 m. Found on a soft substrate (mud, sandy mud, muddy sand, sand, coralline algae, etc.).

Size : Maximum total body length 4.2 cm (males), 5.8 cm (females). Carapace length 0.4 to 1.5 cm (males), 0.5 to 2 cm (females, including ovigerous ones)

Interest to Fisheries : The species is caught by trawlers (with "baby shrimp trawls") as a by-catch and SO may reach fish markets, e.g. in Taiwan (see Chan & Yu, 1986:149). It is not known whether the animals are sold as food.

Literature : Chan & Yu, 1986: 152, pl. 2 Fig A-C, pl 8 fig. B.

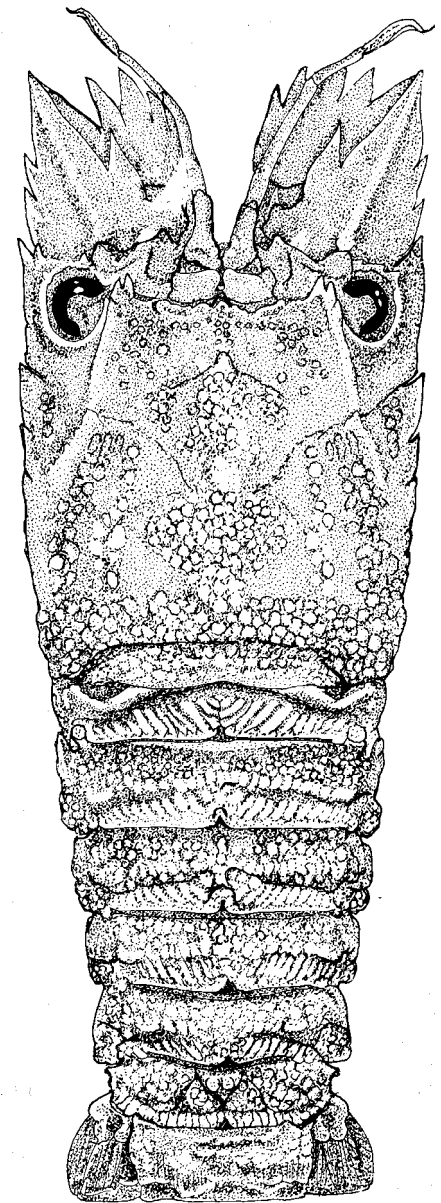


Fig. 417

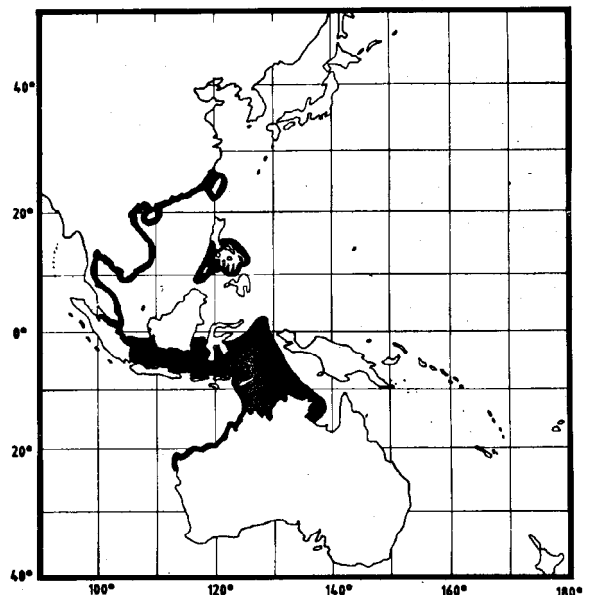


Fig. 418

Scyllarus brevicornis Holthuis, 1946

Fig. 419

SCYL Scylr 5

Scyllarus brevicornis Holthuis, 1946, Temminckia, Leiden, 7:92.

Synonyms : *Arctus rugosus* Yokoya, 1933 (not *Scyllarus rugosus* H. Milne Edwards, 1837).

FAO Names : En - Blue-back locust lobster.

Type : Type locality: "southern Bungo Strait [between Shikoku and Kyushu Islands, Japan], 110 m deep". Holo-type male in Fishery Institute, College of Agriculture, Tokyo University, Tokyo, Japan (dried and in poor condition). As *S. brevicornis* is a new name for *A. rugosus*, the type locality is the same for both.

Diagnostic Features : Carapace with 2 distinct teeth in the median line before the cervical groove (the gastric and rostral teeth), the pregastric tooth is absent. The region between the postrostral and branchial carinae with only a few tubercles and extensive smooth areas. Abdominal somites 2 to 5 with distinct elevated median longitudinal carina; the carina of the third somite is distinctly higher than that of the other somites. The exposed part of the somites without arborescent pattern, but with a wide transverse groove over the middle; behind this groove a transverse ridge extends along the posterior margin of the somite; before the groove there are tubercles and some wide side grooves. Somite 1 dorsally smooth with only an indication of a transverse groove in the extreme lateral part. Posterior margin of somites 5 and 6 not tuberculate. Fourth segment of antenna with the median oblique carina distinct but not quite straight; a row of tubercles is present on the outer half of the Upper surface of the segment, tubercles are also present in the basal part of the median carina. The outer margin of the fourth segment has 3 or 4 teeth, the distal largest, the inner margin with 4 or 5 teeth, the basal of which is largest (the apical tooth not included in these counts). The thoracic sternum is widely U-shapedly incised anteriorly; the last 4 sternites show an inconspicuous median tubercle. A dorsal fringe of hairs is present on the dactyli of pereopods 3 to 5. Colour: dark brown above, tubercles slightly paler, sometimes with whitish areas in the branchial region and along the central part of the cervical groove. A dark blue spot in the median part of the first abdominal somite (see Chan & Yu, 1986, pl. 5,9 fig. C,D).

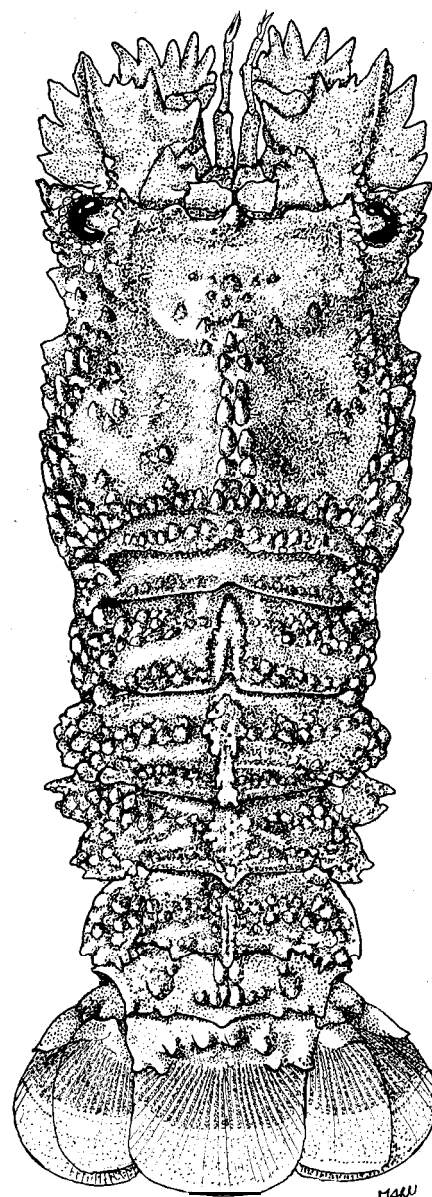
Geographical Distribution : East China Sea (west of the Tokara Islands), Japan (Tosa Bay, Bungo Strait), Taiwan (Fig. 420).

Habitat and Biology : Depth range from 60 to 150 m; substrates: sand or mud.

Size : Total body length 4 to 5.5 cm. Carapace length of 1.3 to 1.8 cm; in ovigerous females 1.6 to 1.8 cm.

Interest to Fisheries : None so far as known. The specimens enter trawls by accident and then are found at fish markets, more likely as trash than as saleable products. Chan & Yu (1986:149) reported the species from local fish markets in Taiwan, these specimens were taken by "baby" shrimp trawlers.

Literature : Chan & Yu, 1986:156, pl. 5 fig. A-D, pl. 9 fig. C,D.



(after Chan & Yu, 1986)

Fig. 419

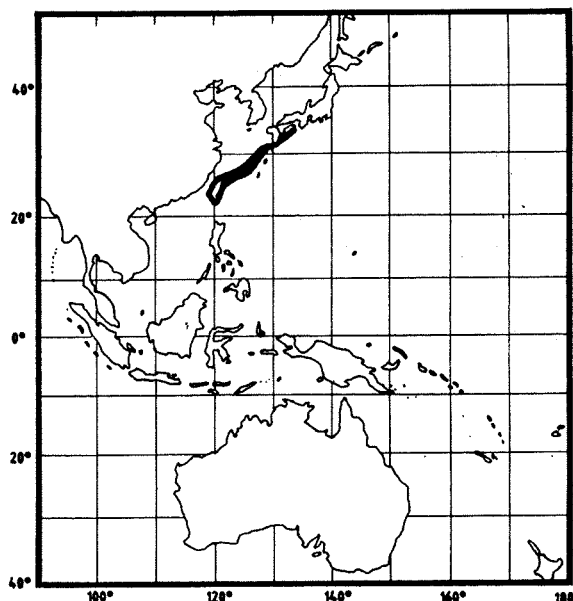


Fig. 420

Scyllarus martensii, Pfeffer, 1881, Verhandlungen naturwissenschaftlichen Vereins Hamburg-Altona, (2)5:48.

FAO Names : En - Striated locust lobster.

Type : Type locality: not mentioned in the original description. The two female syntypes are in the collection of ZMH under no. K 7955 and are labelled "Amur Mus Godeffroy". The locality indication evidently is incorrect as the mouth of the Amur River lies far to the north of the northern limit of the range of *S. martensii*. The Museum Godeffroy was founded around 1860 as the private collection of Johann Cesar VI Godeffroy, the director of the shipping company J.C. Godeffroy & Sohn in Hamburg. The ships of this company visited East and South Asia, Australia, and the Central and Eastern Pacific. Their captains were asked to collect for the Museum and brought important collections home for that purpose; also private persons were sent out by Godeffroy to collect. When in 1879 the firm Godeffroy collapsed, most of the zoological collections were acquired by the Hamburg Museum. The types of *S. martensii* were most likely collected in S.E. Asia, but nothing definite can be said in this respect.

Diagnostic Features: Carapace with two distinct teeth in the median line before the cervical groove (the gastric and pregastric teeth), the rostral tooth is absent, and replaced by an inconspicuous tubercle. The region between the postrostral and branchial carinae shows many tubercles, especially in the posterior half of the carapace. The abdomen has a conspicuously elevated longitudinal median carina on somites 2 to 5, that of somite 2 shows as an inverted V-shaped ridge when looked at dorsally. The carina of somite 3 is somewhat higher than the others. Somite 1 shows a complete transverse groove behind which there are about 16 straight, parallel longitudinal unbranched grooves, which are quite characteristic for the species. The other somites show a somewhat arborescent pattern on the exposed part. The fourth segment of the antenna has, apart from the distinct and sharp oblique median carina, an additional short curved carina formed by a row of tubercles; this additional carina is on the outer half of the segment. The outer margin of the segment has 3 to 5 (mostly 3) distinct teeth (apical tooth not included), the inner margin has 5 to 9 teeth, the basal of which is largest. The anterior margin of the thoracic sternum is very shallowly concave, narrowly incised in the middle and with a small tubercle either side of that

incision. Sternites 2 to 4 show a faint median tubercle each. The pereopods show no hairy fringes on the dactyli. Colour: the body is yellowish or reddish brown, somewhat irregularly marbled. A darker brown transverse band may be present on the third abdominal somite. The legs show a darker band on some of the segments (see Chan & Yu, 1986, pls. 3, 8C, D).

Geographical Distribution : Indo-West Pacific region from East Africa (Zanzibar, Mozambique) and the western Indian Ocean to Japan, Vietnam, Thailand, Malaysia, Singapore, Taiwan, the Philippines, Indonesia, N.W., N. and N.E. Australia and New Caledonia (Fig. 422).

Habitat and Biology : The species has been found in depths between 6 and 79 m, mostly between 10 and 50 m. The substrate that it inhabits is soft and smooth, consisting of sand and/or mud, sometimes with shells, pumice, foraminiferans or bryozoans.

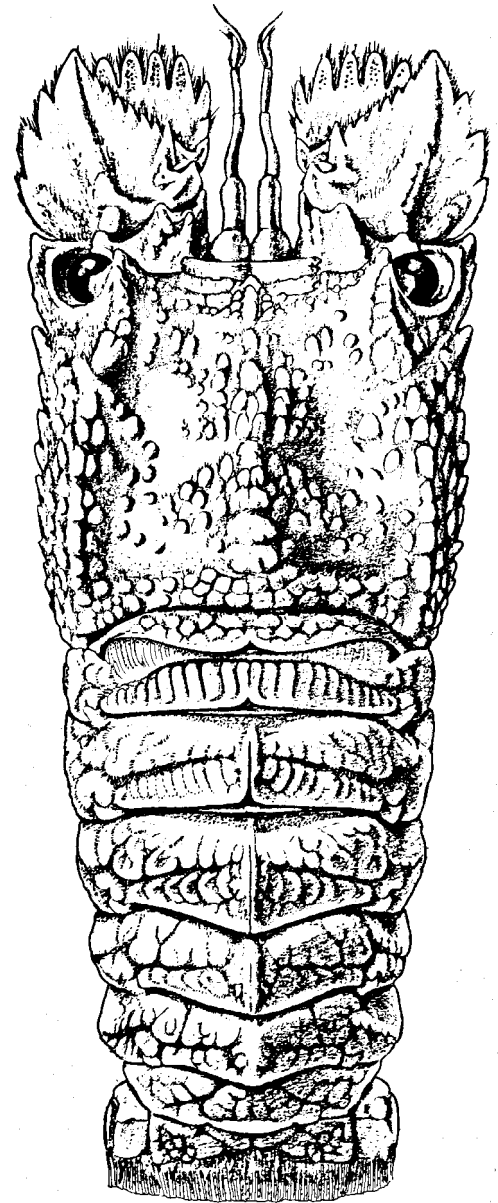


Fig. 421

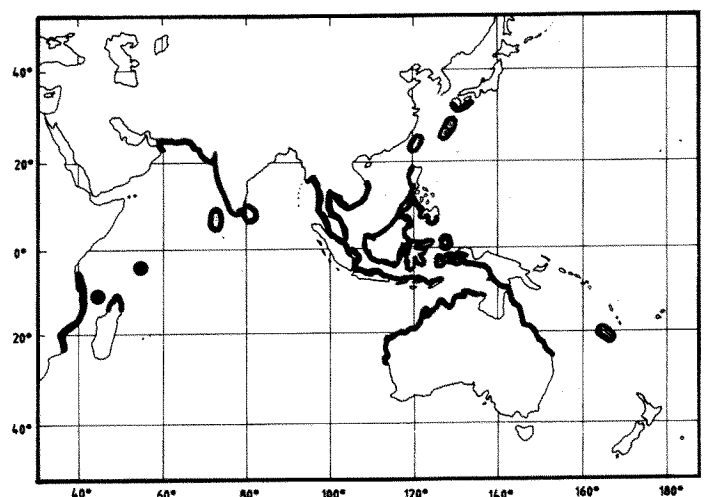


Fig. 422

Size : The total body length in this species is 2 to 4 cm (males), 2 to 6 cm (females), 2.5 to 4 cm (ovigerous females); the respective carapace lengths being 0.4 to 1.3 cm (males), 0.7 to 2 cm (females), 0.5 to 1.5 cm (ovigerous females).

Interest to Fisheries : None. The species is too small to be of any commercial interest and is not found in great quantities. It is sometimes caught accidentally by trawlers fishing for other species; in this way the specimens may reach the fish markets. So far as is known the specimens are not sold per se. Chan & Yu (1986: 149) report the species from fish markets in Taiwan being caught there by "baby" shrimp trawlers.

Literature : Chan & Yu, 1986:153, pl. 3 figs A-C, pl. 8 figs C,D.

***Scyllarus pygmaeus* (Bate, 1888)**

Fig. 423

SCYL Scylr 2

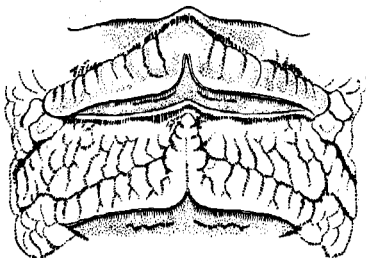
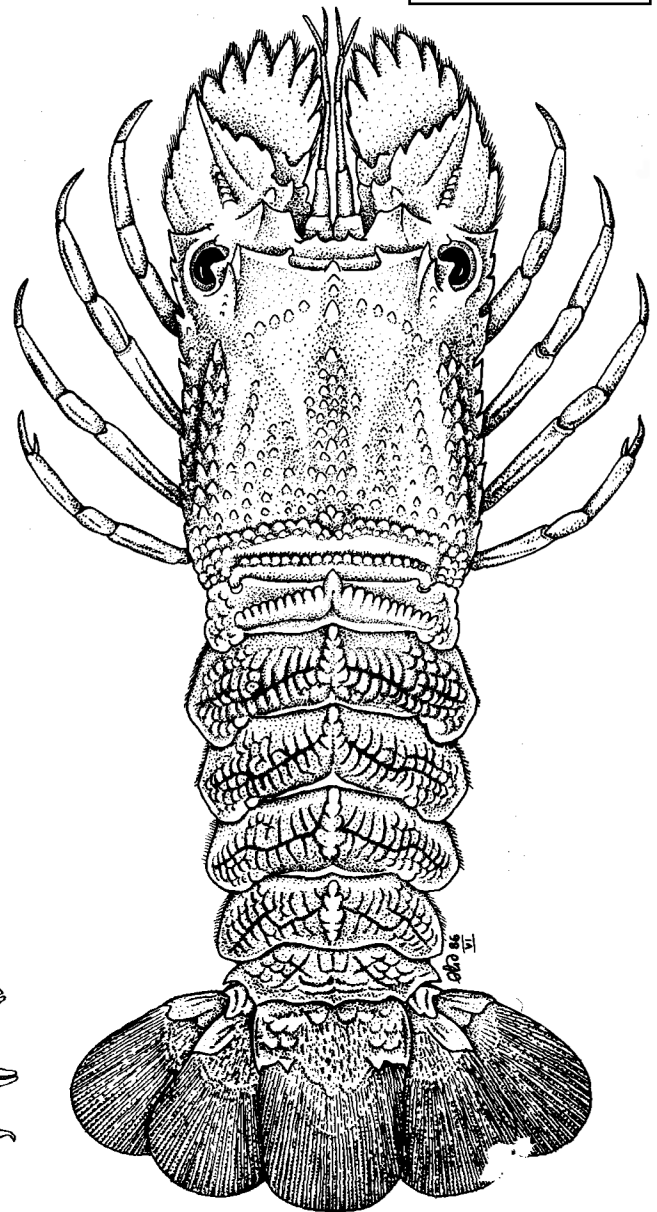
Arctus pygmaeus Bate, 1888, Report Voyage Challenger, Zool 24:73, pl 10 fig. 4.

Synonyms: *Arctus immaturus* Bate, 1888; *Scyllarus immaturus* - Bouvier, 1912.

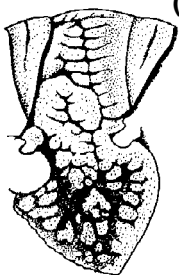
FAO Names : **En** - Pygmy locust lobster; **Fr** - Cigale naine; **Sp** Cigarra enana.

Type : Type locality of *Arctus pygmaeus*: "off Gomera, one of the Canary Islands, ... lat. 28°N., long. 16°5'W.; depth 78 fathoms [= 143 m]; bottom, volcanic Sand". Ovigerous female holotype in BM.

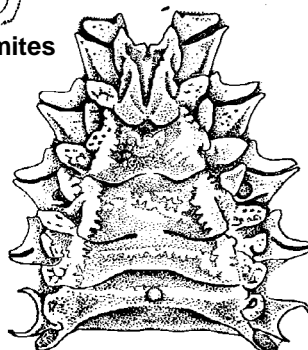
Type locality of *Arctus immaturus*: "dredged off Cape Verde [Sénégal], but neither station nor depth are recorded". Leatype in BM.



**first and second abdominal somites
(dorsal view)**



**second abdominal somite
(lateral view)**



**thoracic sternum
(ventral view)**

dorsal view

Fig. 423

Diagnostic Features: Carapace with three distinct acute teeth in the median line before the cervical groove (the gastric, pregastric and rostral teeth). Region between the postrostral and branchial carinae with only few tubercles and with extensive smooth areas. Abdomen without a sharp elevated median longitudinal carina, but each of abdominal somites 2 to 5 with an elongate lobulate figure in the middle. The exposed part of abdominal somites 2 to 5 with an arborescent arrangement of very narrow grooves. Somite 1 with a complete transverse groove, behind which there are numerous short longitudinal grooves that may be rather irregular in shape and sometimes are interconnected by transverse grooves; this posterior part of somite 1 is longer in the middle than laterally. The smooth anterior half of abdominal somites 2 to 6 (i.e., the part that disappears under the tergum of the previous somite when the abdomen is fully stretched) on either side with a short transverse groove in which hairs are implanted. Fourth segment of antenna with a single oblique median carina. Outer margin of the segment with 2, the inner margin with 3 or 4 teeth (not

including the apical tooth). Thoracic sternum anteriorly U-shapedly incised in the middle. A blunt and low but conical tubercle on the last thoracic sternite. Dactyli of legs without fringes of hair. Colour: pale brownish or pinkish with patches of darker hairs. Two dark spots on the dorsal surface of the first abdominal somite in the submedian region.

Geographical Distribution : The entire Mediterranean (but not yet reported from the North African coast east of Morocco), and Atlantic islands (Madeira, Canary Islands, Cape Verde Islands) (Fig. 424).

Habitat and Biology : Depth range from 5 to 100 m. Ovigerous females in June and August.

Size : Maximum total length 5.5 cm, usually not more than 4 cm. Carapace length to 1 cm (males) and 1.15 cm (females).

Interest to Fisheries : Probably nil. The report in Fiches FAO d'Identification, Méditerranée et Mer Noire, vol. 1:319, that the species is fished for in Sardinia with trammel nets and lobster pots and is regularly present at the markets, where it is sold fresh, needs to be considered with much reserve. It is possible that this information is based, not on *S. pygmaeus*, but on *S. arctus*.

The small size of *S. pygmaeus* does not make it an attractive fisheries object. In N.E. Spain, the fishermen, when they got *S. pygmaeus* in their nets, threw it back in the sea, in the conviction that these were juvenile *Scyllarus arctus*, which needed still some time to grow up to acceptable size.

Literature : Fischer, Bauchot & Schneider (eds), 1987:3 19.

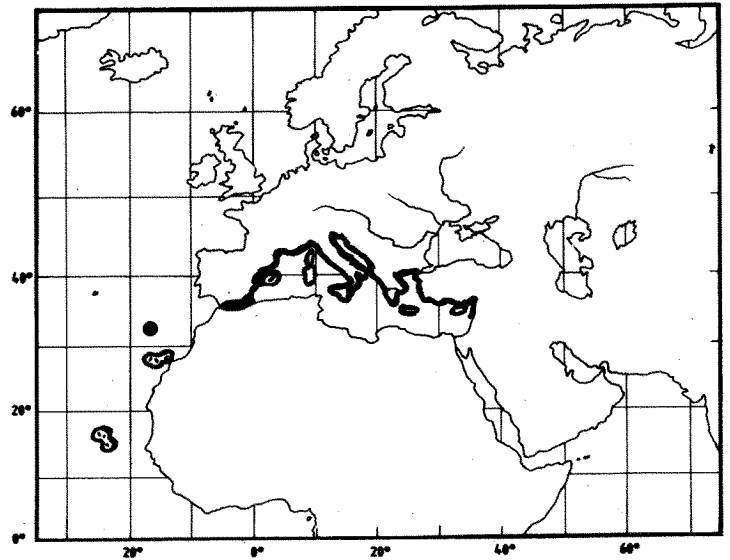


Fig. 424

Scyllarus rugosus H. Milne Edwards, 1837

Fig. 425

SCYL Scylr 7

Scyllarus rugosus H. Milne Edwards, 1837, *Histoire naturelle des Crustacés*, 2:283.

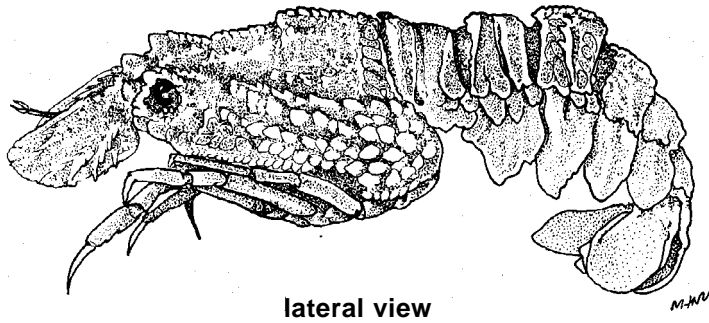
Synonyms: *Arctus tuberculatus* Bate, 1888; *Scyllarus tuberculatus* - Nobili, 1903

FAO Names : En - Hunchback locust lobster.

Type : Type locality of *Scyllarus rugosus*: "Habite la cote de Pondichéry" (= Pondicherry, S.E. India, 11°59'N 79°50'E). Holotype in MP, no longer extant.

Type locality of *Arctus tuberculatus*: "Challenger" "Station 190, between New Guinea and Australia ... lat. 8°56'S., long. 136°5'E.; depth, 49 fathoms [= 90 m]; bottom, green mud". Syntypes in BM.

Diagnostic Features : The carapace has the median teeth before the cervical groove blunt and inconspicuous: the rostral tooth is reduced to a tubercle, the pregastric tooth is replaced by a double row of 1 or 2 tubercles and a few inconspicuous median tubercles. The gastric tooth is the most conspicuous, it is broad and blunt and bears a double row of tubercles. The surface of the carapace is very uneven and the tubercles are high. Between the postrostral and branchial carinae there are a few tubercles and many smooth areas. The abdomen shows a distinct median longitudinal carina on somites 2 to 5, that of somite 3 is by far the highest, and (like the one of somite 4) bears numerous tubercles laterally. Somite 1 is quite smooth, and has the transverse groove only slightly noticeable in the extreme lateral parts. The exposed part of the following somites shows no arborescent pattern, but in each somite there is a wide transverse groove there. In somite 2, both before and behind this groove there is a perfectly smooth broad ridge, a character in which the species differs from most others. In the following somites these ridges are tuberculate.



lateral view

In somites 4 to 6 the posterior margin is tuberculate. The fourth antennal segment has a sharp and high oblique median carina. Outside the carina the upper surface of the segment shows a row of tubercles. The outer margin of the segment bears 4 or 5 teeth (apical tooth of the segment not included), the inner margin has 5 to 7 teeth of irregular size. The anterior margin of the thoracic sternum is deeply U-shapedly incised. Each of the thoracic sternites bears a rounded median tubercle. The dactyli of pereiopods 3 to 5 show two short fringes of hair each. Colour: the dorsal surface of the body is greyish or purplish brown with darker spots. The distal segment of the antenna is often lighter. The first abdominal somite shows dorsally often a dark blue colour (see Chan & Yu, 1986, pls 1, 8A, 10C).

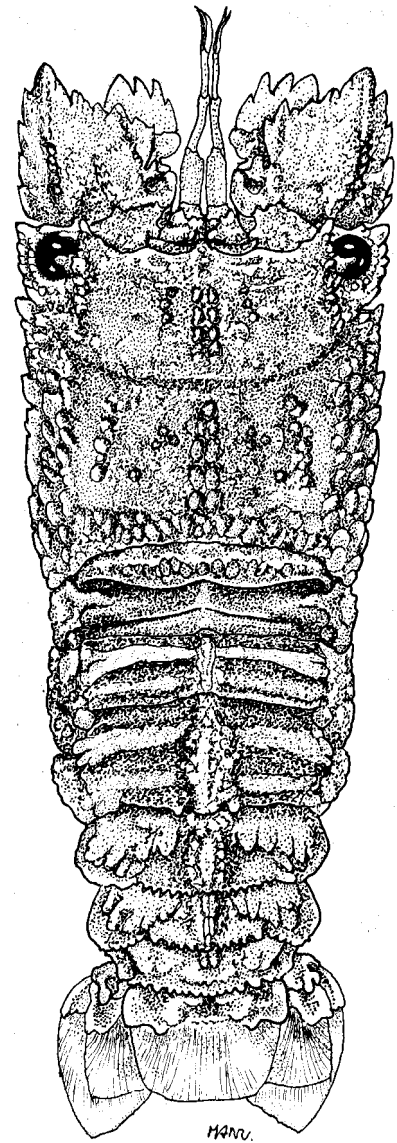
Geographical Distribution : Indo-West Pacific region from Red Sea, East Africa and Madagascar to Japan, Taiwan, the Philippines, Indonesia and N.E. Australia (Fig. 426).

Habitat and Biology : Inhabits depths from 20 to 60 m, rarely reported from 100 or 200 m. Bottom usually sand and mud, sometimes with coral, shelly grit or rubble.

Size : Total body lengths reported are 2.5 to 6 cm (males), 2.5 to 6 cm (females), 3 to 6 cm (ovigerous females) and carapace lengths of 0.8 to 2.1 cm (males), 0.8 to 2.2 cm (females), 1 to 2.2 cm (ovigerous females).

Interest to Fisheries : Like the other Indo-West Pacific species of the genus, *S. rugosus* is hardly of any commercial importance, if at all. It is taken accidentally by trawlers fishing for other species and so get to the fish markets. Chan & Yu (1986:149) reported it from fish markets in Taiwan, brought in by "baby" shrimp trawlers, but Chang (1965) does not list any *Scyllarus* among the "Edible Crustacea of Taiwan".

Literature : Chan & Yu, 1986: 150-152, pl. 1 figs A-E, pl. 8 fig. A, pl. 9 fig. C.



dorsal view

(after Chan & Yu, 1986)

Fig. 425

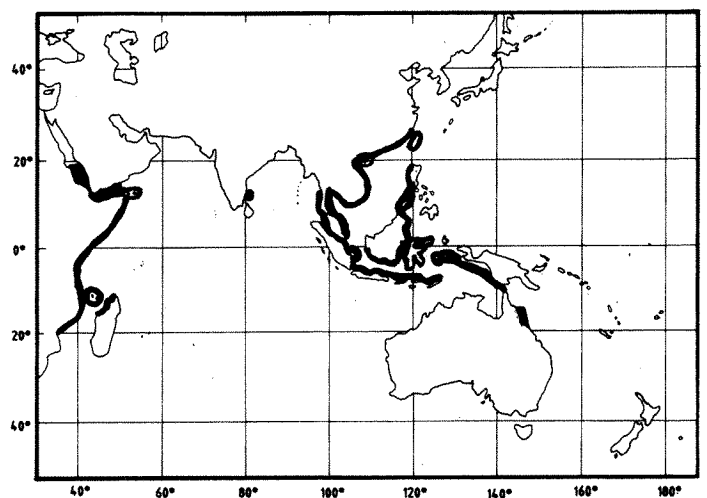


Fig. 426

SUBFAMILY **THENINAE** Holthuis, 1985

Theninae Holthuis, 1985, Zoologische Verhandelingen, Leiden, 2 18: 10,12

The subfamily is monotypic, the genus *Thenus* Leach, 1815, is its type and only genus.

Thenus Leach, 1815

SCYL Then

Thenus Leach, 1815, Transactions of the Linnean Society, London, 11:335, 338. Gender masculine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in Opinion 519 (published in 1958).

Type Species: by monotypy: *Thenus indicus* Leach, 1815 (= junior subjective synonym of *Scyllarus orientalis* Lund, 1793).

Synonyms: *Sagaritis* Billberg, 1820, Enumeratio Insectorum in Museo Gust.Joh.Billberg:134. Type species by monotypy *Scyllarus orientalis* Lund, 1793. Gender feminine.

Scyllibacus Desjardins, 1831, Proceedings of the Committee of Science and Correspondence of the Zoological Society of London, 1(4):46. Type species by monotypy: *Scyllibacus orientalis* Desjardins, 1831. Gender masculine. If *Scyllibacus orientalis* Desjardins is a new combination of *Scyllarus orientalis* Lund, 1793, *Scyllibacus* falls as a junior objective synonym of *Thenus* Leach, 1815; if it is a new species, *Scyllibacus* is a nomen nudum.

At present only a single species is recognized within the genus *Thenus*, but recent studies, indicate the possibility that more than one species may have been confused under the name *Thenus orientalis*.

Thenus orientalis (Lund, 1793)

Fig. 427

SCYL Then 1

Scyllarus orientalis Lund, 1793, K.Danske Videnskabers Selskab Skrifter, (n.ser.)2(2):22. Name placed on the Official List of Specific Names in Zoology, in Opinion 519 (published in 1958).

Synonyms: *Thenus indicus* Leach, 1815; *Sagaritis orientalis* - Billberg, 1820; *Scyllibacus orientalis* - Desjardins, 1831.

FAO Names : **En** - Flathead lobster; **Fr** - Cigale raquette; **Sp** - Cigarra chata.

Type : Type locality of *S. orientalis*: "Fra Ostindien og China". Lund's material consisted of a specimen from Tranquebar, India, and one from China, so that both are syntypes; also a syntype is the specimen figured on pl. 2 fig. D in Rumphius' (1705) Amboinsche Rariteitkamer, this specimen not necessarily comes from Amboina, as the figure was made in Holland after a specimen of unknown locality and subsequently added to Rumphius' manuscript, it most likely originated from Indonesia. One of Lund's two specimens is in UZM, it is preserved in alcohol, its condition is reasonable; the second specimen is lost. The third syntype specimen formed part of the collection of Henricus d'Acquet, burgomaster of Delft, The Netherlands, this collection was sold publicly in 1708, the fate of the specimen of *Thenus* is unknown.

Type locality of *Thenus indicus*: "Habitat in mari Indico". Holotype in BM, no. 107 a 54, dry, condition fair (it is not fully certain that this is the holotype).

Geographical Distribution : Indo-West Pacific region: from the east coast of Africa (southern Red Sea to Natal) to China, southern Japan, the Philippines and tropical Australia (Western Australia to Queensland) (Fig. 428).

Habitat and Biology : Depth range from 8 to 70 m (exceptionally in 100 m), usually between 10 and 50 m; on soft substrate: sand or mud, or a mixture of the two, sometimes with shells or gravel.

Size : Maximum total body length about 25 cm; maximum carapace length about 8 cm.

Interest to Fisheries : The species often appears as a bycatch in the nets of trawlers and is edible. It is also reportedly taken by divers although there is no specialized fishery for it. Specimens caught in the sixties in the southern Red Sea by Israeli trawlers were frozen and sold in Israel. Experimental fishing undertaken in 1975 to 1976' off the coast of East Africa (Kenya to Mozambique) and elsewhere in the Western Indian Ocean was not promising for this species (up to 30 specimens per hour). Longhurst (1970:1286) mentioned that it is "caught in the Gulf of Thailand, and on a small scale off Malaysia and Singapore". In Queensland, the shrimp fishery lands *Thenus* as a bycatch where it ranks above *Ibacus* as a food item (Grant, 1978:685). It is also offered for sale in Sydney markets. In Taiwan, this species is found in markets year-round but is most abundant from March to August, and is marketed together with *Ibacus ciliatus* and *I. novemdentatus* (Chang, 1965:47) In the Philippines it is priced lower than spiny lobsters (Motoh & Kuronuma, 1980:58). Davidson (1977: 141) remarked of this species: "The meat of the slipper lobster is not quite up to the standard of good prawns or spiny lobsters, but is nonetheless well worth eating". Marketed locally either fresh or frozen.

Local Names : AUSTRALIA: Bay lobster (official name), Moreton Bay bug, Bug, Gulf lobster, Northern bay lobster, Shovel-nosed lobster; BURMA: Kyauk-pa-zun; HONG KONG: Pei pa ha; INDONESIA: Udang pasir; JAPAN: Uchiwa-ebi-modoki; KAMPUCHEA: Bangkang pak; MALAYSIA: Udang lobok; MAURITIUS: Homard sans cornes; MOZAMBIQUE: Cava-cava triangular; PAKISTAN: Kikat (Sindhi), Kikka (Baluchistan); PHILIPPINES: Pitik-pitik, Bay lobster, Cupapa, Sand crayfish, Sand lobster, Shovel-nosed lobster, Slipper lobster; SINGAPORE: Common flapjack lobster; TANZANIA: Kamba; THAILAND: Kung kradan, Kung hin.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986: 26, figs 61 (fig 61 and 62 have been interchanged), 80 g.

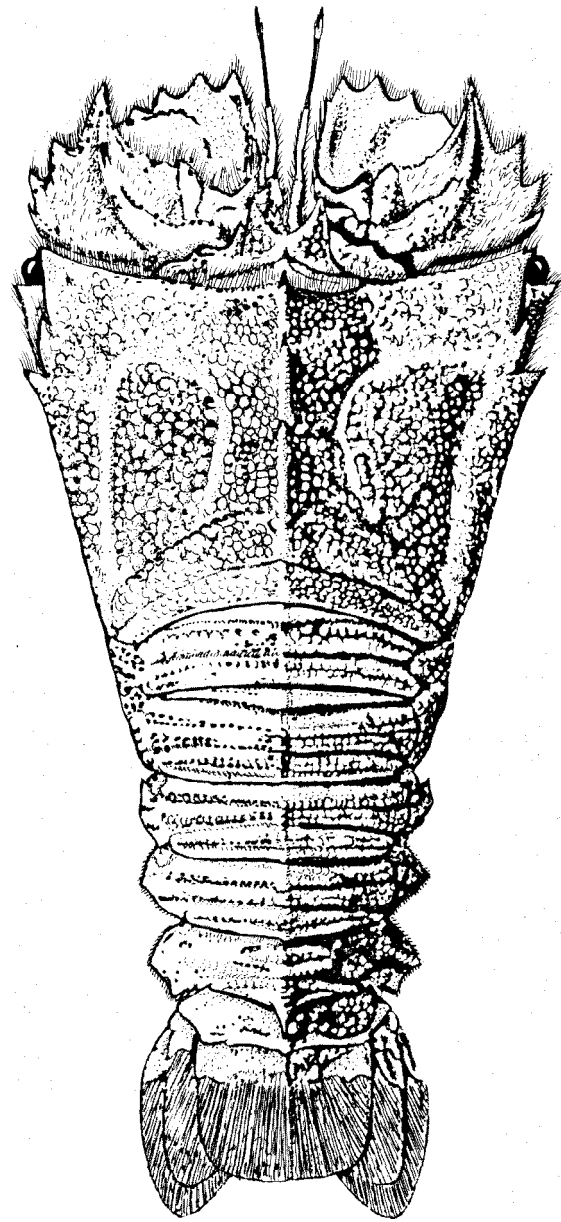


Fig.427

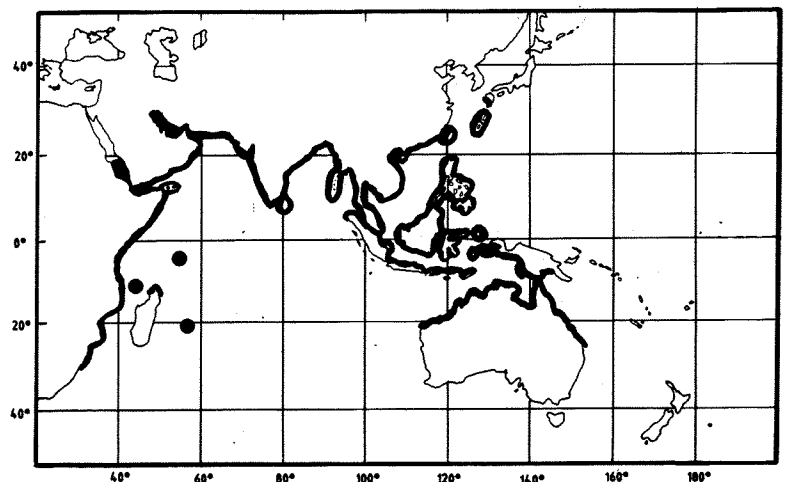


Fig. 428

2.3 INFRAORDER THALASSINIDEA Latreille, 1831

Thalassinides Latreille, 1831, Cours d'Entomologie:377.

The infraorder contains a single superfamily Thalassinioidea Latreille, 1831, with 7 families, viz., Axianassidae, Axiidae, Callianassidae, Callianideidae, Laomediidae, Thalassinidae and Upogebiidae with all together more than 350 known species. Of these 7 families only 3 are dealt with here as the other do not have species of which it is known that they are of interest to fisheries. Of these three families, Thalassinidae, Callianassidae and Upogebiidae, perhaps two or three species are used for human consumption, a number of others is used as bait for fishing.

2.3.1

FAMILY THALASSINIDAE Latreille, 1831

THAL

Thalassinides Latreille, 1831, Cours d'Entomologie:377. Name placed on the Official List of Family Names in Zoology, in Opinion 434 (published in 1956).

Synonyms: Scorpionoidae Haworth, 1825, Philosophical Magazine, London, 65: 184 (not based on an included genus and thus unavailable).

The family consists of a single genus.

Thalassina Latreille, 1806

THAL Thal

Thalassina Latreille, 1806, Genera Crustaceorum et Insectorum; 1:51. Gender feminine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in their Opinion 434 (published in 1956)

Type species: by monotypy: *Thalassina scorpionides* Latreille, 1806 (= junior subjective synonym of *Cancer (Astacus) anomalus* Herbst, 1804).

Until recently this genus was generally considered to have a single species, but recent investigations make it likely that more than one have to be recognized. A revision of the taxonomy of *Thalassina* is badly needed.

Thalassina anomala (Herbst, 1804)

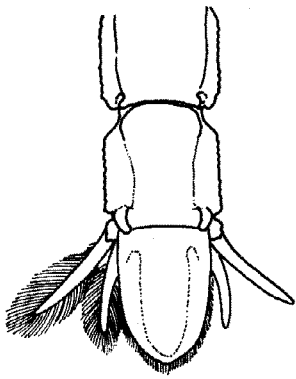
Fig. 429

THAL Thal 1

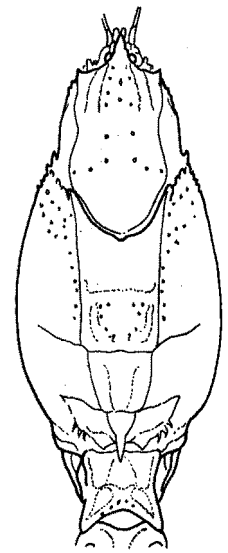
Cancer (Astacus) anomalus Herbst, 1804, Versuch einer Naturgeschichte der Krabben und Krebse, 3(4):45, pl. 62. Name placed on the Official List of Specific Names in Zoology, in Opinion 434 (published in 1956).

Synonyms: *Thalassina scorpionides* Latreille, 1806; *Thalassina scabra* Leach, 1814; *Thalassina talpa* White, 1847 (nom. nud.); ? *Thalassina gracilis* Dana, 1852; *Thalassina chilensis* Steenstrup & Lütken, 1862; *Thalassina maxima* Hess, 1865.

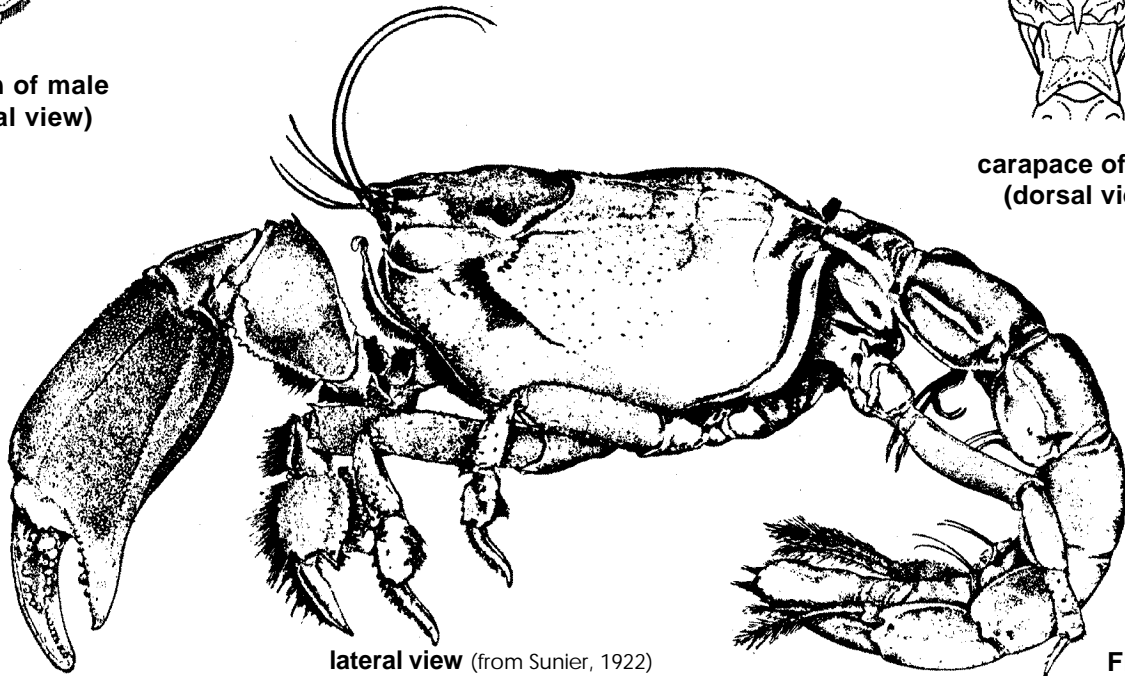
FAO Names : En - Scorpion mud lobster.



tail fan of male
(dorsal view)



carapace of male
(dorsal view)



lateral view (from Sunier, 1922)

Fig. 429

Type : Type locality of *Cancer anomalus*: "Das Vaterland dieses Krebses ist völlig unbekannt"; holotype in ZMB, no. 1256, dry, condition reasonable.

Type locality of *Thalassina scorpionides* not indicated in the original description, evidently likewise unknown; type material in MP, now absent.

Type locality of *T. scabra* not mentioned either, probably unknown; type material "in the Hunterian Museum", present whereabouts unknown.

Type locality of *T. talpa*: "Philippine Islands"; holotype in BM, no. 43.6 (in alcohol, condition poor)

Type locality of *T. gracilis*: "from shores of Telegraph Island, near Singapore"; holotype in USNM.

Type locality of *T. chilensis*: "Mare Chilense"; holotype in MP, no Th 537, in alcohol, condition mediocre. As pointed out by Holthuis (1952:85-86) the locality label probably is incorrect, as the species since has never been found in Chile.

Type locality of *T. maxima*: "Sydney", New South Wales, Australia; holotype in SMF, no. ZMG 227, in alcohol, broken, but condition otherwise fair. This locality indication likewise is highly dubious as the species does not occur near Sydney.

Diagnostic Features : The integument of the body is very firm. The carapace is high; in dorsal view it is elongate oval in outline. In adults the carapace measures less than 1/3 of the total body length. The rostrum is narrowly triangular and short; it is depressed and its lateral margins continue for some distance on the carapace as short divergent ridges. The rostrum has no teeth. The carapace ends posteriorly in a distinct posteriorly directed median tooth that overhangs the articulation with the first abdominal somite. The abdomen is long and narrow, more than 5 times as long as wide in the males, about 4 times as long as wide in the females. The somites are of about equal width throughout their length, they have a longitudinal carina over the base of the pleura. The telson is about as long as the previous somite, but slightly narrower, the posterior margin is broadly rounded. The uropods are styliform. The eye are small. The first pair of pereopods is very strong and asymmetrical, both chelae are subchelate, the larger less conspicuously so than the smaller. The second legs are smaller, also subchelate; the other legs are simple. Epipods are present on the pereopods. Colour: the whole body is rather uniformly yellowish or reddish brown.

Geographical Distribution : Indo-West Pacific region, from the west coast of India to S. Japan (Ryukyu Islands), Vietnam, the Philippines, Indonesia, New Guinea, New Britain Island, N. and N.E. Australia, Fiji, Samoa (Fig. 430).

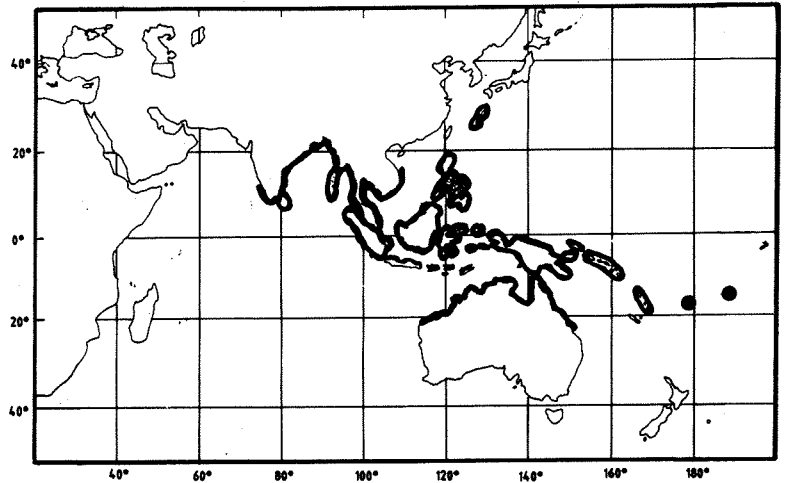


Fig. 430

Habitat and Biology : The species lives in the littoral and supralittoral zones, where it digs its burrows. These can be found in mangrove areas and estuaries. The excavated mud forms a kind of chimney or mound over the openings of the burrows, and because of their height form a most conspicuous feature in the landscape. The chimneys can be 75 cm high, but sometimes several chimneys together can form complex hills of mud up to 1.5 m high. The burrows go down vertically or obliquely to the water level after which they may make zigzags and side branches; the depths of the burrows has been estimated to be up to 2.5 m.

The animals are rarely seen out of their burrows, not even at night, but it seems that after heavy rainfall they may venture outside. They are sluggish and are definitely mud feeders, reports that they also are vegetarian have been doubted. Their burrowing activities take usually place during the night.

Size : Usually up to 16 to 20 cm in total body length, although there are records of up to 30 cm.

Interest to Fisheries : Minor. Already Rumphius (1705:6), when dealing with this species from Amboina, Moluccas, Indonesia, remarked on its poor culinary qualities: "Hy heeft weinig ja schier geen vleesch, want het geheele lyf en de staert steeken vol groenachtige modder, en slechts in de scheeren vindmen een weinig wit brokkelig vleesch, van geen byzonderen smaak.... De Inlanders van Celebes eeten het vleesch van de scheeren, 't welk ik hun willende nadoen, hebbe my niet wel daar op bevonden; dies ik hem voor eenen onnutten Kreeft houde, of hy most in andere Landen beter zyn" (It has little, or almost no meat, as the entire body and the tail are full of a greenish mud, and only in the pincers there is a small amount of white, crumbly meat, without a particular taste. The natives of Celebes eat the meat of the pincers, but when : myself tried this, the meat did not agree with me, therefore : consider this a useless lobster, unless it is of a better quality in other countries). Motoh & Kuronuma (1980:64) remarked that there is no special fishery for this species in the Philippines and that it is only occasionally picked up by fish pond workers. It appears only rarely on the Philippine fish markets. Ward (1943, Army, 2(4):30, fig.) in his paper "New Guinea menu" listed *Thalassina anomala* among the edible crustaceans. Tan & Ng (1988:85), remarked that in Singapore the animals are considered edible, but are "not popular locally". On a wall chart, issued recently by the Fisheries Division of the Ministry of Primary Industries of Fiji, the present species figures among the "aquatic foods of Fiji". In Thailand, as I was informed by Prof. Phaibul Naiyanetr of Chulalongkorn University, Bangkok, the species is not eaten but used as medicine against asthma; it is then either dried, ground to powder, and the powder drunk with water, or the specimen is placed in a kind of alcoholic liquor and left there for a couple of days, after which the liquor with the beneficial substances dissolved in it is drunk.

The positive qualities of the species from the point of human interest thus are rather small, and its negative qualities seem to be more important. In many areas the species is considered a pest. "The animal is notorious for causing severe damage to bunds [of prawn ponds] by its burrowing activities. The paddy fields and backyards of houses in the proximity of the creeks are also subject to this sort of damage" (Sankolli, 1963:604). Also earth roads can suffer from the burrowing of the species. Dammerman (1929:120) reported that "the species has been noticed as destructive to nipa seedlings, which may be protected by surrounding them with small bamboo fences", but the correctness of this observation has later been doubted by Kalshoven & Van der Vecht (1950:63); the fact that *Thalassina* is not a vegetarian but mainly a mud feeder supports the view of the latter authors. All in all it seems that Rumphius indeed was right in considering this as a "useless lobster" from an economic viewpoint.

Local Names : AUSTRALIA: Mud lobster; FIJI: Maná Tola. INDONESIA: Udang katak, Udang tanah; Udang petsje (Amboina); JAPAN: Okinawa-ana-jyako; MALAYSIA: Udang ketak; PHILIPPINES: Kolokoy, Kulokoy, Palatak (Tagalog language), Oson, Uson (Ilongo language); Manla (Cebu language); THAILAND: Mae hop.

2.3.2

FAMILY UPOGEBIIDAE Borradaile, 1903

UPOG

Upogebiinae Borradaile, 1903, Annals Magazine Natural History, (7)12:542. Name placed on the Official List of Family Names in Zoology, in Opinion 434 (published in 1956). Type genus **Upogebia** Leach, 1814.

Synonyms: Gebiadae Haworth, 1825, Philosophical Magazine, London, 65: 184. Type genus **Gebia** Leach, 1815.

The taxonomy of this family is still in a state of uncertainty. Until recently only a single genus, **Upogebia**, was recognized in it, being divided into several subgenera. In 1982, Sakai added two more Upogebiid genera, while some recent authors have elevated some of the subgenera to full generic status (an action not recognized here).

Of the many (about 100) species of Upogebiidae known at present, this catalogue deals only with the five species that have been reported to be of fisheries interest. All five of these species belong in the nominotypical subgenus **Upogebia**.

As the number of species treated here is so small compared to the total number of Upogebiids, no effort has been made to provide a key, but of each species the most important morphological features are presented.

Upogebia Leach, 1814

UPOG Upog

Upogebia Leach, 1814, Brewster's Edinburgh Encyclopaedia, 7:400. Gender feminine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in their Opinion 434 (published in 1956).

Type Species: by monotypy: **Cancer (Astacus) stellatus** Montagu, 1808.

Synonyms: **Gerbios** Bosc, 1813, Bulletin Société philomatique, Paris,3(66):233. Type species, selected by Holthuis, 1954, Bulletin zoological Nomenclature, 9(11):335: **Thalassina littoralis** Risso, 1816 (= junior subjective synonym of **Astacus pusillus** Petagna, 1792). Gender feminine. Name suppressed under the plenary power of the International Commission on Zoological Nomenclature and placed on the Official Index of Rejected and Invalid Generic Names in Zoology in their Opinion 434 (published in 1956).

Gebia Leach, 1815, Transactions Linnean Society, London, 11:335, 342. Type species, selected by Lucas, 1835, Dictionnaire pittoresque d'Histoire naturelle, 3:353: **Cancer (Astacus) stellatus** Montagu, 1808. Gender feminine.

Bigea Nardo, 1847, Sinonimia moderna delle specie registrata nell'opera intitolata.: Descrizione de' Crostacei, de Testacei e de' Pesci che abitano le lagune e Golfo Veneto dall'Abate Stefano Chiereghini: 8. Type species, by monotypy: **Bigea tipica** Nardo, 1847. Gender feminine.

Calladne Strahl, 1862, Monatsberichte Königlichem Akademie Wissenschaften Berlin, 1861: 1064. Type species, by monotypy: **Calladne savignii** Strahl, 1862. Gender feminine.

Gebiopsis A. Milne Edwards, 1868, Nouvelles Archives Muséum Histoire naturelle, Paris, 4:63. Type species, by monotypy: **Gebiopsis nitidus** A. Milne Edwards, 1868. Gender feminine.

Gebicula Alcock, 1901, A Descriptive Catalogue of the Indian Deep-Sea Crustacea Decapoda Macrura and Anomala in the Indian Museum: 201. Type species by monotypy: **Gebicula exigua** Alcock, 1901. Gender feminine.

Neogebicula K. Sakai, 1982, Researches on Crustacea, Tokyo, spec. no. 1:8,72. Type species, by original designation: **Upogebia (Neogebicula) alaini** K. Sakai, 1982. Gender feminine.

Acutigebia K. Sakai, 1982, Researches on Crustacea, Tokyo, spec. no. 1:8, 69. Type species, by original designation: **Gebia danai** Miers, 1876. Gender feminine.

The species of this genus are burrowers in mud or sandy mud. All the species treated here are used as bait for fishing. Only one of them, **U. pusilla** is said to be used for human consumption. For most **Upogebia** species, very little or no information on use as food or bait is available. Therefore, it is well possible that many more species than those included in the catalogue are actually consumed and most likely all species inhabiting accessible places in sufficiently great numbers qualify for use as bait.

Remarks: The species of **Upogebia** can easily be distinguished from those of **Callianassa** enumerated here, by the following features: the shape of the carapace, which in the present genus ends in a broad, flat rostrum, sometimes tridentate anteriorly and reaching beyond the eyes; the dorsal surface of the rostrum, which continues onto the anterior part of the carapace, is elongate, flat and wide, and densely packed with tubercles and tufts of short hair. In **Callianassa**, the carapace is smooth and naked and ends in a short conical or 3- to 5-pronged rostrum. The pereopods of the first pair are equal in **Upogebia**, unequal in **Callianassa**.

The five species of *Upogebia* enumerated here all belong to the nominotypical subgenus *Upogebia*, which is characterized by the presence of one or more spine(s) on the anterolateral margin of the carapace, just behind the eye, and by the pereiopods of the first pair that are subchelate. There are no epipods on the pereiopods.

***Upogebia capensis* (Krauss, 1843)**

Fig. 431

UPOG Upog 1

Gebia major capensis Krauss, 1843, *Die Südafrikanischen Crustaceen* :54.

Synonyms: *Gebia africana* Ortmann, 1894; *Upogebia africana* - Barnard, 1947. Until 1947 usually only a single species of the subgenus *Upogebia* was recognized in South African waters, the names *Gebia major capensis* Krauss, 1843, *Gebia subspinosa* Stimpson, 1860, and *Gebia africana* Ortmann, 1894, were considered synonyms. Barnard (1947:380-381; 1950: 519) then showed that two species are involved and used for them the names *Upogebia africana* (Ortmann, 1894) and *U. capensis* (Krauss, 1843). Considering *U. subspinosa* (Stimpson, 1860) a synonym of *U. capensis*. The original description of *Gebia major capensis* is short and to modern standards very incomplete and does not unequivocally point to be based on one or the other of the South African species; there are arguments for the identity of the type material with both *U. subspinosa* and *U. africana*, while furthermore the type material is no longer extant. K Sakai (1982:43-46) definitely decided the problem by selecting a neotype for Krauss' species. Unfortunately Sakai chose as the neotype a specimen of *U. africana*, upsetting thereby the nomenclature for the two species that was rather consistently used since Barnard in 1947 recognized their distinctness. Sakai's action switched the name *capensis* from one species to the other. As Sakai's decision is perfectly legal, his nomenclature has to be followed. It is good to realize, however, that in most papers since 1948 the present species is indicated as *U. africana* (Ortmann) and that the name *U. capensis* during that period was mostly used for *U. subspinosa* (Stimpson).

FAO Names : En - Cape mud shrimp

Type : Type locality of *Gebia major capensis*: "Tafelbai" (= Table Bay, Cape Province, South Africa). Type material in Staatliches Museum für Naturkunde, Stuttgart, Germany, now lost; neotype locality: "Knysna, South Africa"; neotype male in ZMH, no. 29852.

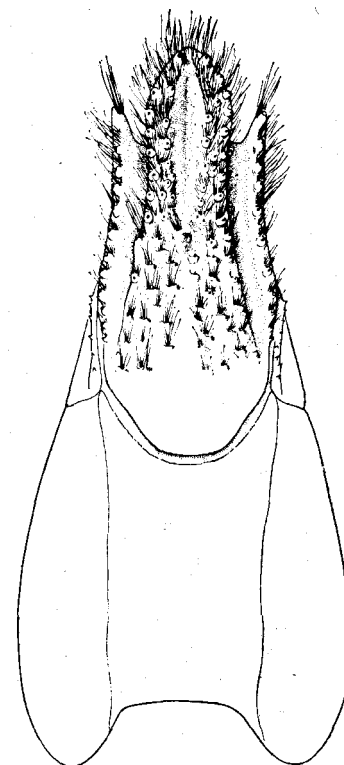
Type locality of *Gebia africana* : "Port Elisabeth" (= Port Elizabeth, Cape Province, South Africa). Holotype in MZS, preserved dry, condition very poor.

Diagnostic Features: Rostrum ending in three teeth; the lateral teeth are placed at the end of a ridge that is separated from the central part of the dorsal surface of the rostrum by a deep groove. On the central part itself a very shallow median groove is present. There are no ventral teeth on the rostrum. The anterolateral border of the carapace with a single spine behind the eye. First pereiopods subchelate. Dactylus of adult male with a longitudinal groove on either lateral surface, and without a tooth on the cutting edge. Palm with 2 dorsal denticulate carinae. Merus without an anterodorsal spine. Coxae of first three pereiopods without spines.

Geographical Distribution : Southern Africa from Olifants River estuary (Atlantic coast of Cape Province, South Africa) to Delagoa Bay (= Bay of Lourenço Marques, Mozambique) (Fig. 432).

Habitat. and Biology : "Burrows in the sandy mud of estuaries from mid-tide to LWS [= Low water spring tide]. A detritus feeder" (Day, 1969: 108)

Size : Total body length 1.5 to 1.6 cm, ovigerous females 2.7 to 6.5 cm.



carapace (dorsal view)

(from Sakai, 1982) **Fig. 431**

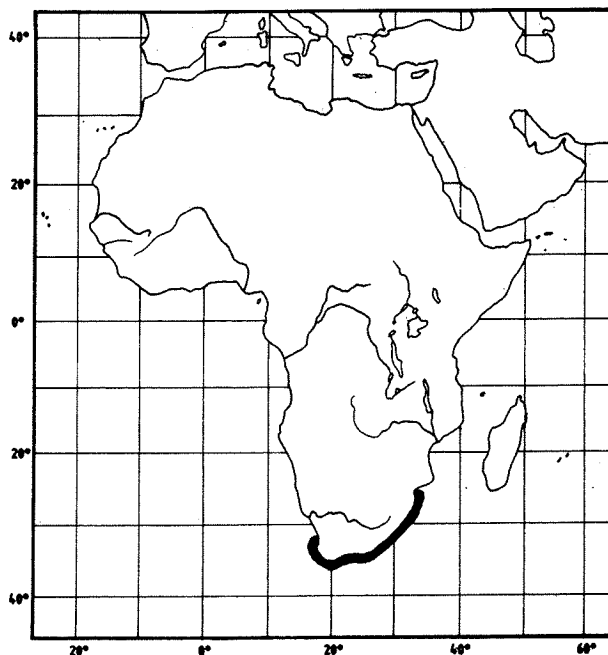


Fig. 432

Interest to Fisheries : In South Africa the species is "used extensively as bait" (Day, 1969: 108), but there are restrictions to its collecting, as according to the law each person may collect "not more than fifty per day and the prawns may not be disturbed or removed by means of a shovel, fork or spade" (Tietz & Robinson, 1974:88).

Local Names : SOUTH AFRICA: Moddergarnaal, Mud prawn.

Literature : Barnard, 1950:519 Sakai, 1982:43, text-fig. 9c, pl. A fig. 6, pl. D figs 5.6.

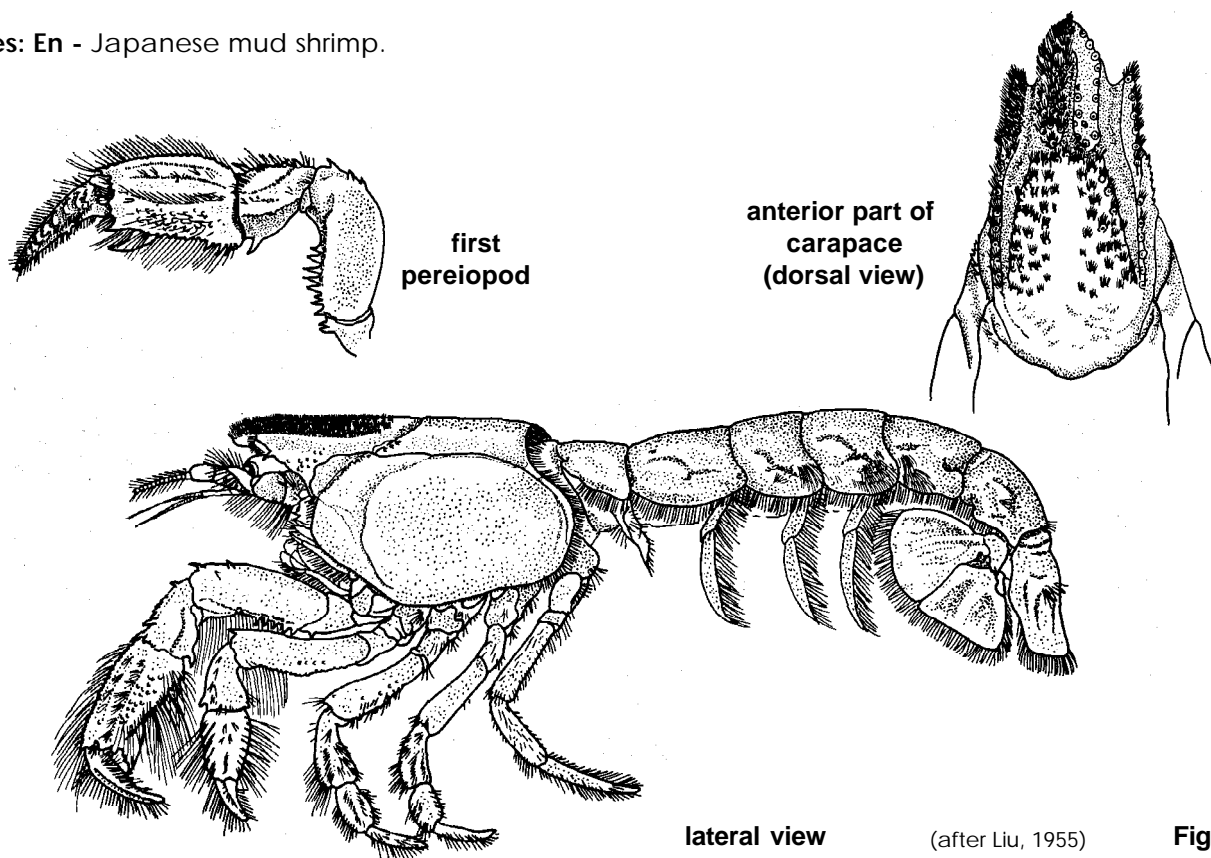
Upogebia major (De Haan, 1841)

Fig. 433

UPOG Upog 2

Gebia major De Haan, 1841, in P.F. von Siebold, *Fauna Japonica, Crustacea*, (5):pl.35 fig. 7. The description, p. 165, appeared in part 6, published in 1849.

FAO Names: En - Japanese mud shrimp.



lateral view

(after Liu, 1955)

Fig. 433

Type : Type locality: "Japonia", probably near Nagasaki, Kyushu, Japan. Type material in RMNH, now lost.

Diagnostic Features: Rostrum ending in 3 teeth, the lateral at the end of a ridge that is separated from the central part of the rostrum by a deep groove; a shallow median longitudinal groove is present in the central part. The lower surface of the rostrum has no spines. Anterolateral border of carapace with a single spine at the level of the eye. First pereopods subchelate. Dactylus of adult male with 9 to 11 oblique ridges on the outer surface, and with a low tooth in the proximal half of the cutting edge. Two denticulate ridges on the Upper surface of the Palm. Merus of first pereopod with a distinct subdistal anterodorsal spine; coxa of that leg with a spine.

Geographical Distribution : Northwest Pacific region: S.E. coast of Siberia, USSR, from Olga Bay (about 44°N) southward, Korea, N. China, Kuril Islands, Japan (Fig. 434).

Habitat and Biology : In tidal mud flats. The animals make Y-shaped burrows in the mud and are filter feeders.

Size : Maximum total body length 9.5 cm.

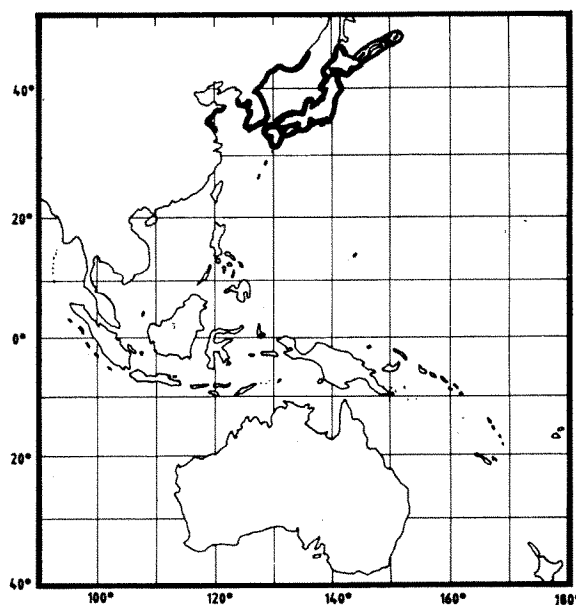


Fig. 434

Interest to Fisheries : Probably used as bait for fishing. Listed by Liu (1955:66, pl. 24 figs I-6) among the "Economic Shrimps and Prawns of North China". Parisi (1917:23) mentioned 3 specimens obtained at the market of Yokohama, Japan.

Local Names : JAPAN: Ana-jyako.

Upogebia pugettensis (Dana, 1852)

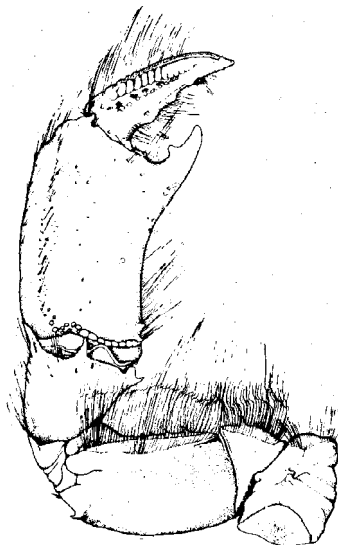
Fig. 435

UPOG Upog 3

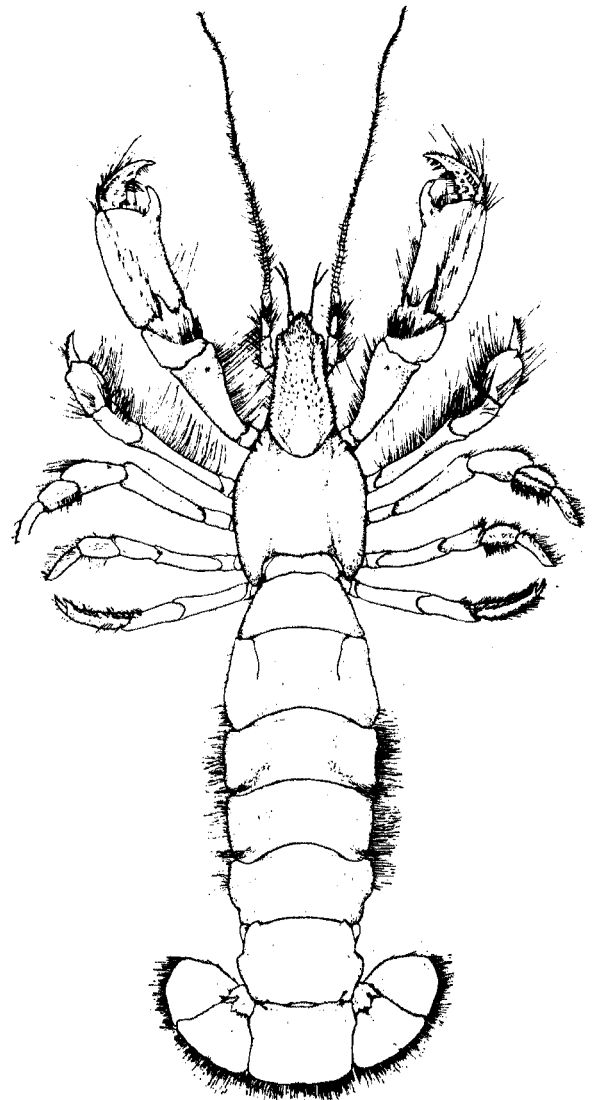
Gebia pugettensis Dana, 1852, *Proceedings Academy Natural Sciences, Philadelphia*, 6: 19.

Synonyms: *Gebia californica* Stimpson, 1856.

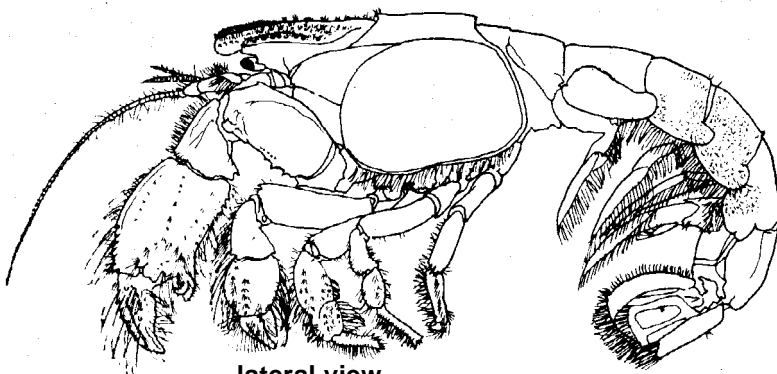
FAO Names : En - Blue mudshrimp.



first pereopod
(from Stevenr. 1928)



dorsal view
(from Stevens, 1928)



lateral view
(from Hart 1982)

Fig. 435

Type : Type locality of *Gebia pugettensis*: "in freto Pugettensi, Oregoniae" (= Puget Sound, Washington State, USA). Type material in USNM, now lost.

Type locality of *Gebia californica*: "from the coast near Monterey", California, USA. Type material probably lost.

Diagnostic Features: Rostrum ending in three teeth, the median tooth broad and triangular, the lateral teeth much shorter. A groove between the median and lateral teeth, also a very shallow median longitudinal groove. Lower surface of rostrum without spines. Anterolateral border of carapace with a very small tooth at the level of the eye. First pereopods subchelate. Dactylus of adult male on inner surface with a longitudinal row of 6-12 tubercles, that are placed close together. Carpus with some anterior spines. Merus with a subdistal anterodorsal spine. Coxae without spines.

Geographical Distribution : N.E. Pacific region from Valdez Narrows, Alaska, USA (about 60°N) to Morro Bay, California, USA (about 35°N) (Fig. 436).

Habitat and Biology : Burrowing in muddy sand of the intertidal zone, sometimes under rocks. Burrows Y-shaped, and about 0.6 to 1.0 m deep.

Size : Total body length up to 11 cm (Williams, 1986a. who stated the males to be smaller than females). Hart (1982:53), on the contrary gave the total length as up to 15 cm (males), 10.5 cm (females).

Interest to Fisheries : The species is dug for bait in California (Frey, 1971:9, 10), perhaps also in other areas. Williams (1986a:36) listed a specimen obtained in 1876 on the "San Francisco Market". According to Hart (1982:53) the species is "of some economic importance due to burrowing activities. On certain types of oyster beds, Young oysters can be smothered by the mud displaced by these animals. Also dykes designed to retain a layer of sea water may be riddled with burrows through which water drains at low tide".

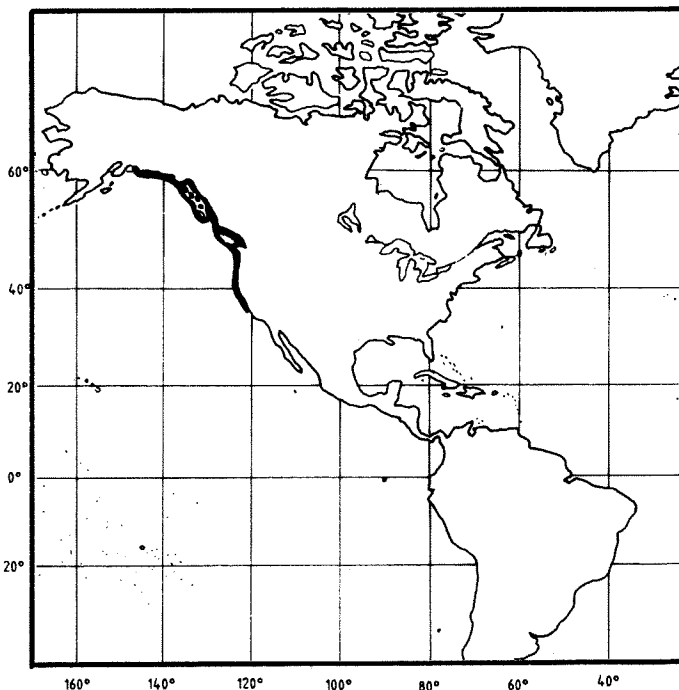


Fig. 436

Local Names : CANADA: Mud shrimp; USA: Elue mud shrimp, Marine crayfish, Puget Sound ghost crab (Washington State); Blue mud shrimp (California State).

Literature : Stevens, 1928: 318-324, figs 1-5, 20-37; Williams, 1986a: 35, fig. 13.

Upogebia pusilla (Petagna, 1792)

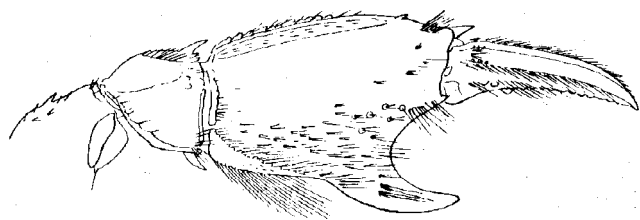
Fig. 437

UPOG Upog 4

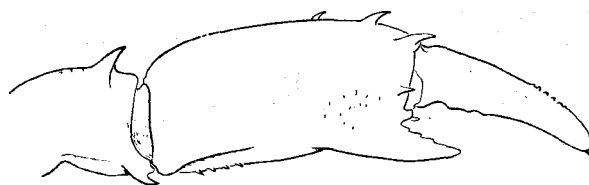
Astacus pusillus Petagna, 1792, *Institutiones Entomologicae*, 1:418, pl. 5 fig. 5.

Synonyms: *Thalassina littoralis* Risso, 1816; *Gebia littoralis* - Desmarest, 1823; *Gebios littoralis* - Risso, 1827; *Gebia lacustris* Costa, 1840; *Gebia venetiarum* Nardo, 1869; *Upogebia littoralis* - Thompson, 1901.

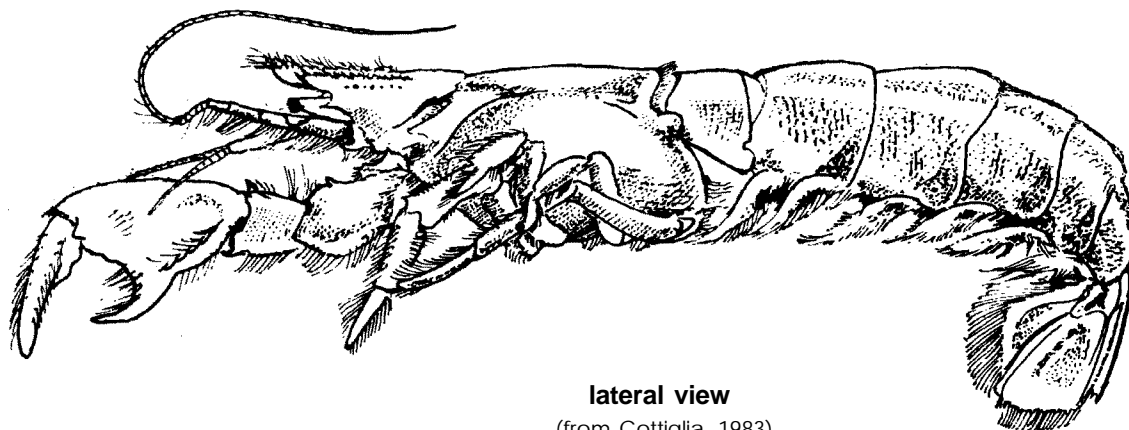
FAO Names : En - Mediterranean mud shrimp.



first pereopod of male
(from De Man, 1927)



first pereopod of female
(from De Saint Laurent & Le Loeuff, 1979)



lateral view
(from Cottiglia, 1983)

Fig. 437

Type : Type locality of *Astacus pusillus* : "Habitat in nostri maris arena, sed rarior". In nostri maris obviously stands for the seas near Naples, where Petagna lived. The whereabouts of the type material is unknown, it must be considered lost.

Type locality of *Thalassinia littoralis*: "environs de Nice", dépt. Alpes Maritimes, S. France. Depository of type material unknown.

Type locality of *Gebia lacustris*: "Vive nel fango del lago Lucrino", west of Naples, Italy. Whereabouts of type material unknown.

Type locality of *Gebia venetiarum*: "del Veneto Estuario" "nelle nostre lagune" [= lagoon of Venice, Italy]. Depository of types unknown.

Diagnostic Features : Rostrum ending in 3 teeth, the median long with a rounded apex ending in two spines; lateral teeth short, much shorter than half the median tooth, and separated from it by a deep groove. The median groove of the median tooth shallow. No spines on the ventral surface of the rostrum. Anterolateral margin of the carapace with a small but distinct tooth at the level of the eye. First pereopods subchelate. In the adult male the palm is distinctly widened at the base of the fixed finger, so that the height of the chela is only slightly less than the length. Movable finger with blunt tubercles on the cutting edge, but otherwise without tubercles, spines or ridges. Palm with 2 dorsal rows of spinules. Merus with a subdistal anterodorsal spine.

Geographical Distribution : Eastern Atlantic region from Bretagne (Atlantic coast of France) to Mauritania (N.W. Africa), also in the entire Mediterranean and in the Black Sea (Fig. 438).

Habitat and Biology : Intertidal and subtidal zones down to about 45 m; sometimes in estuarine areas. The species makes simple Y-shaped burrows with 2 or more entrances in the mud or sandy mud.

Size : Total body length about 4 to 6.5 cm.

Interest to Fisheries : I found only a single reference indicating that the species is used for human consumption: Pesta (1918: 199) after reporting that the animals are used for fish bait in the Adriatic sea, remarked in parentheses "(Auch gegessen!) [= it is eaten!]." On the other hand there are numerous observations that the species is used as bait for fishing. So Chaud (1984: 169) remarked that on the coast of Cantabria (north coast of Spain) "la capture de ces

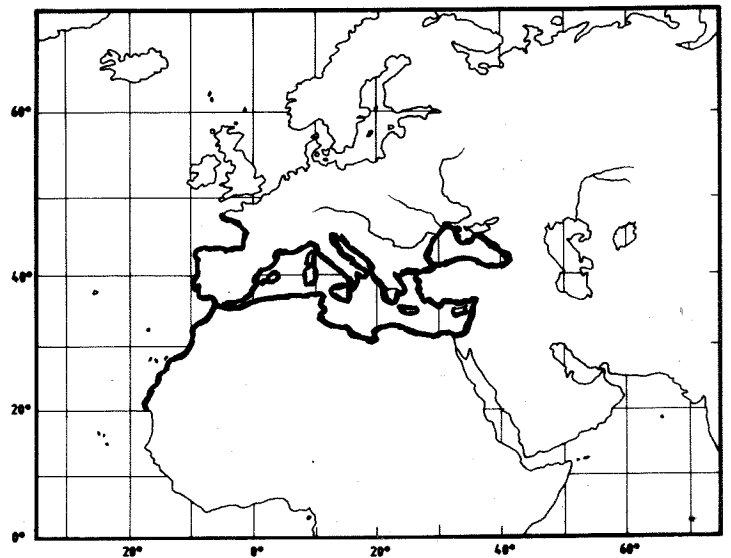


Fig. 438

crustacés comme excellents appâts naturels pour la pêche assure la totalité des revenus pour quelques centaines de famille", and he also suggested that the species could well be used in the laboratory as a test animal for experiments. Cottiglia (1983:79) stated that in Italy the species "viene esclusivamente usata come esca e come tale é molto ricercata" (= it is only used as bait), more or less contradicting Pesta's statement that the animals are also used for human consumption. To obtain the animals, they are usually dug out of their burrows with spades. But when the mud is very soft, the water and the mud may be stirred with the feet so that the burrows become exposed or damaged and the animals flee and are easily picked up in the murky water. The most modern and efficient method, however, is that with a suction pump (the so-called yabbie pump; see under *Callinassa australiensis*), with which the contents of the burrow, including the shrimp is pumped out in a quick and sudden movement. Finally there is a method by which through the application of a certain pressure the contents of the burrow is forced out; this so-called "casserole" method is described by Chaud (1984:22) and used in Arcachon (S.W. France).

Local Names : FRANCE: Crevette fousseuse; GERMANY: Maulwurfskrebs, Strandkreb; ITALY: Corbola, Cicalleda, Rufola, Scardobola; SPAIN Grillo real marino; Cadell de mar (Cataluña); TURKEY: Mamun; YUGOSLAVIA: Karlic.

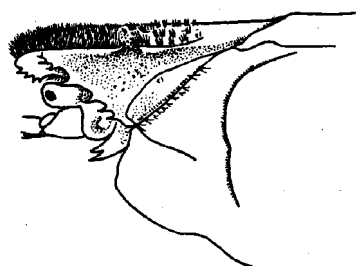
Upogebia wuh sienweni, Yu, 1931

Fig. 439

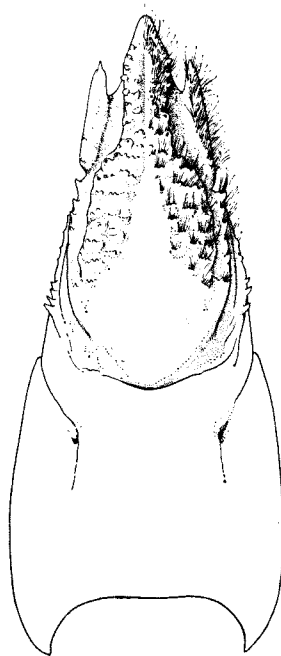
UPOG Upog 5

Upogebia wuh sienweni Yu, 1931, *Bulletin Fan Memorial Institute Biology*, 2(6):89, fig. 2.

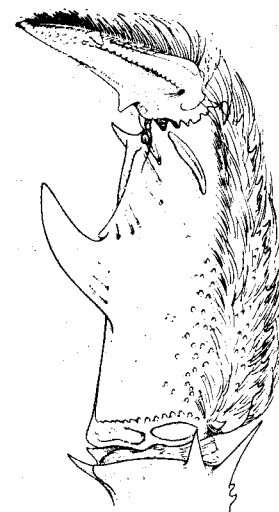
FAO Names : En - Chinese mud shrimp.



anterior part of carapace
(lateral view)
(from Liu, 1955)



carapace (dorsal view)
(from Sakai, 1982)



first pereopod
(from Sakai, 1982)

Fig. 439

Type: Type locality: "Kiaochow bay" (= Jiaozhou Wan, near Qingdao, Shandong Province, N. China) syntypes in Fan Memorial institute of Biology, Beijing, China; present whereabouts unknown.

Diagnostic Features : Rostrum ending in 3 teeth, the lateral about half as long as the median. The carina behind the lateral teeth interrupted in the male. The grooves between central and lateral teeth wide and deep. Lower surface of the rostrum with a median row of 3 to 5 spines. Anterolateral border of the carapace with several small teeth behind the eye. The first pereopods are subchelate. The dactylus in the adult male has a longitudinal row of tubercles on either surface. The palm shows an oblique carina in the anterior part of the inner surface near the base of the dactylus. The dorsal margin of the palm has a row of 9 or 10 small teeth. The merus has a subdistal anterodorsal spine. A spine is present on the coxa

Geographical Distribution : China: from Shandong Province (Shantung) to Fujian Province (Fukien); Taiwan Island (Fig. 440).

Habitat and Biology : Probably burrowing in the mud like the other economically important species of this genus.

Size : The types measured 3.1 and 4.6 cm and were described as being Young.

Interest to Fisheries : Liu (1955:68, pl. 24 figs 7-12) included this species in his "Economic shrimps and prawns of North China", and for that reason it is mentioned here.

Literature : Sakai, 1982:59, text-figs 1 1d, 12f, g, 13 g, h, pl. G figs 1,2.

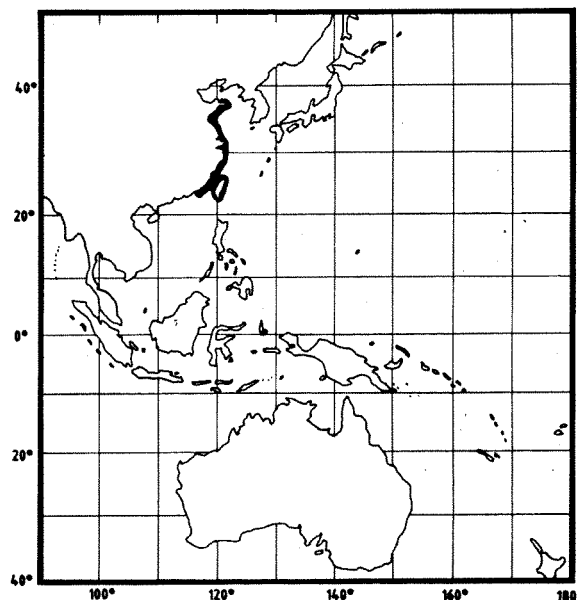


Fig. 440

2.3.3

FAMILY CALLIANASSIDAE Dana, 1852

CALL

Callianassidae Dana, 1852 Proceedings Academy Natural Sciences, Philadelphia, 6:12, 14. Name placed on the Official List of Family Names in Zoology, in Opinion 434 (published in 1956).

Recent studies of the family do not agree on the number of genera to be recognized. De Saint Laurent (1973, 1979) divided the family into 9 genera, while Poore & Griffin (1979) only recognized three, as several of their species of *Callianassa* S.l. could not be assigned with confidence to any of De Saint Laurent's genera. Poore & Griffin therefore only recognized the genera *Callianassa* Leach, 1814, *Ctenocheles* Kishinouye, 1926, and *Gouretia* De Saint Laurent, 1973, and placed all the other genera recognized by De Saint Laurent in the synonymy of *Callianassa*. Recently, Manning & Felder (1986:437-443) redefined the genus *Callichirus* Stimpson, 1866, placing in it 4 species formerly assigned to *Callianassa*; they convincingly showed *Callichirus* to be distinct from *Callianassa* s.l. None of the four species at present known to belong to *Callichirus* has been reported to be of economic importance.

Without taking a definite stand on the generic taxonomy of the Callianassidae, I recognize here, for purely practical reasons, only the genera *Callianassa*, *Callichirus*, *Ctenocheles* and *Gouretia*. All species reported to be of interest to fisheries belong to the genus *Callianassa* s.l. as accepted here.

Callianassa Leach, 1814

CALL Call

Callianassa Leach, 1814, Brewster's Edinburgh Encyclopaedia, 7:400. Gender feminine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in their Opinion 434 (published in 1956).

Type Species: by monotypy: *Cancer (Astacus) subterraneus* Montagu, 1808. Gender feminine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in their Opinion 434 (published in 1956).

Synonyms: *Montagua* Leach, 1814, Brewster's Edinburgh Encyclopaedia, 7:436. Type species, by monotypy: *Cancer (Astacus) subterraneus* Montagu, 1808. Gender feminine.

Gebios Risso, 1822, Journal de Physique, de Chimie, d'Histoire naturelle et des Arts, 95:243. Type species, by monotypy: *Gebios davianus* Risso, 1822 (= junior subjective synonym of *Cancer candidus* Olivi, 1792). Gender masculine.

Gebius Agassiz, 1846, Nomenclator Zoologicus Index universalis:160. Emendation of *Gebios* Risso, 1822. Gender masculine.

Trypaea Dana, 1852, Proceedings Academy Natural Sciences, Philadelphia, 6:14,19. Type species, by monotypy: *Trypaea australiensis* Dana, 1852. Gender feminine.

Mesostylus Bronn & Roemer, 1852, Lethaea oecognostica (ed.3) 2 (5):353. Type species, by monotypy: *Pagurus faujasi* Desmarest, 1822. Gender masculine.

Glypturus Stimpson, 1866, Proceedings Chicago Academy Sciences, 1:46. Type species, by monotypy: *Glypturus acanthochirus* Stimpson, 1866. Gender masculine.

Cheramus Bate, 1888, Report Voyage Challenger (Zool.), 24:x, xi, xlvi, lxxv, 7, 10,26,28,30,36. Type species, by present designation: *Cheramus orientalis* Bate, 1888. Gender masculine.

Scallasis Bate, 1888, Reportt Voyage Challenger (Zool.), 24:xi. lxxv, 7,10,28,34,36. Typespecies, by monotypy: *Scallasis amboinae* Bate, 1888. Gender feminine.

Calliactites Borradaile, 1903, Annals Magazine Natural History, (7)12:54. Type species, by original designation: *Callianassa securo* Lanchester, 1902. Gender masculine.

Lepidophthalmus Holmes, 1904, Proceedings California Academy Sciences, (3)3:311. Type species, by monotypy: *Lepidophthalmus eiseni* Holmes, 1904 (= a subjective junior synonym of *Callianassa bocourti* A. Milne Edwards, 1870). Gender masculine.

Calliax De Saint Laurent, 1973, Comptes Rendus hebdomadaires séances Académie Sciences, Paris, (D) 277:514. Type species, by original designation and monotypy: *Callianassa lobata* De Gaillarde & Lagardère, 1966. Gender feminine.

Callianopsis De Saint Laurent, 1973, Comptes Rendus hebdomadaires séances Académie Sciences, Paris, (D) 277:515. Type species, by original designation and monotypy: *Callianassa goniophthalma* Rathbun, 1901. Gender feminine.

Anacalliax De Saint Laurent, 1973, Comptes Rendus hebdomadaires séances Académie Sciences, Paris, (D)277:515. Type species, by original designation and monotypy: *Callianassa argentinensis* Biffar, 1971. Gender feminine.

Calliapagurops De Saint Laurent, 1973, Comptes Rendus hebdomadaires séances Académie Sciences, Paris, (D)277:515. Type species, by original designation and monotypy: *Calliapagurops charcoti* De Saint Laurent, 1973. Gender masculine

Paracalliax De Saint Laurent, 1979, Comptes Rendus hebdomadaires séances Académie Sciences, Paris, (D)288: 1396. Type species, by original designation and monotypy: *Paracalliax bollorei* De Saint Laurent, 1979. Gender feminine.

Of the many (about 150) species of Callianassidae known at present, only 9 have, to my knowledge, been reported as being of interest to fisheries (either as bait or for human consumption). These 9 species are the only ones dealt with in this catalogue. Of each, a short morphological account of the most salient diagnostic features is given.

Eight of these nine species seem to be used exclusively as bait, while the ninth, *Callianassa turnerana*, is used as food for humans in W. Africa. However, since most publications on Callianassids do not provide information on utilization, it seems likely that many more species actually are used as bait. Scylr It seems obvious that any species occurring in dense populations in the littoral or sublittoral zones and can easily be taken by digging or by suction pumps, is hence a likely candidate for bait. The present catalogue therefore may be quite incomplete and any additional information Will be welcome.

The species of *Callianassa* are burrowers in mud or in muddy Sand. They are characterized by their elongate, soft body covered by a thin integument. The carapace is smooth and glabrous, on the abdominal pleura a tuft of hairs may be present, but otherwise the abdomen is also smooth and naked. The rostrum usually is small and does not reach beyond the eyes, it is triangular, or conical and sometimes reduced to a low central angle of the anterior margin of the carapace; in some species, however, it ends in 3 or 5 large teeth. The eyes are small, placed close to each other, sometimes with the inner margins touching. The pereopods of the first pair are large and asymmetrical, and have well developed chelae. The legs of the second pair are small, also chelate. The following legs are simple. The abdomen is longer than the carapace

Callianassa australiensis (Dana, 1852)

Fig. 441

CALL Call 1

Trypaea australiensis Dana, 1852, *Proceedings Academy Natural Sciences, Philadelphia*, 6: 19.

Synonyms: *Trypaea porcellana* Kinahan, 1856.

FAO Names : En - Australian ahost shrimp.

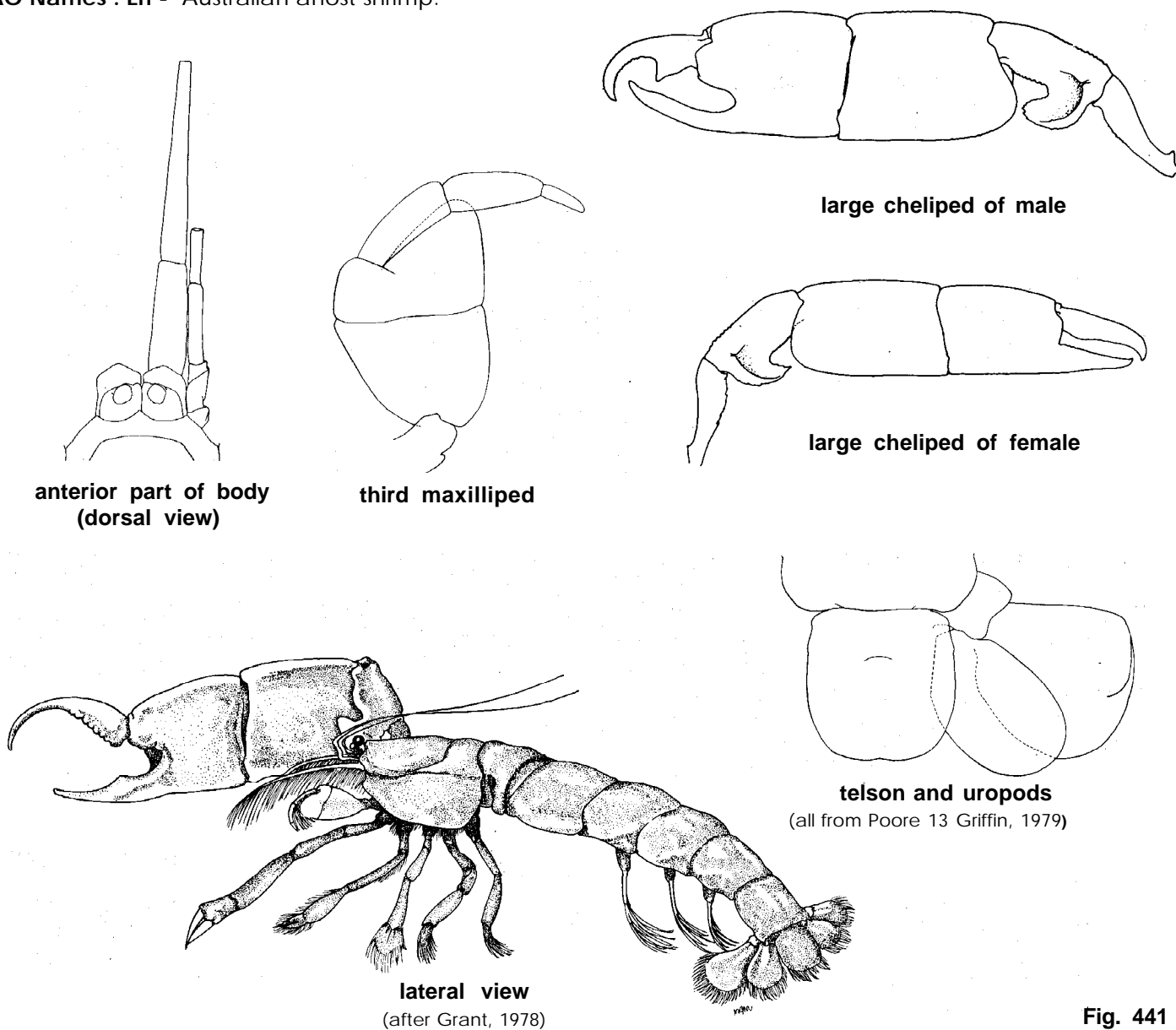


Fig. 441

Type : Type locality of *Trypaea australiensis*: "in oris Illawarrae Australiae orientalis" (= mouth of Illawarra Lake, S. of Sydney, New South Wales, Australia) Types in USNM, now lost.

Type locality of *Trypaea porcellana*: "washed up at St Kilda" (= St. Kilda, 37°52'S 144°59'E, at present a district of Melbourne, Victoria, Australia). Two syntypes in NMI.

Diagnostic Features: Rostrum a short, blunt and wide triangle, far overreached by the squarish eyes (almost with their full length). No antennal spine, but antennal angle low, broad and rounded. Antennular peduncle reaching with more than half the length of the third segment beyond the antennal peduncle. Third maxilliped with merus and ischium strongly widened, forming an operculum; distal three segments all narrow, each three times or more longer than wide. Large chela in adult male with a deep concavity in the anterior margin of the palm just above the base of the fixed finger. Carpus about as long as the palm and slightly longer than high. Merus with a large, curved, bluntly rounded lobe in the basal part of the lower margin. Telson quadrangular, longer than wide with broadly rounded posterolateral angles, without spines. Endopod of uropod broadly oval, only slightly longer than telson.

Geographical Distribution : E. and S.E. Australia, from Townsville (N. Queensland) to Port Phillip Bay (Victoria). The most abundant Callianassid in E. Australia (Fig. 442).

Habitat and Biology : On intertidal Sand- or mud-flats, often in or near estuaries. The animals burrow in the soft substratum.

Size : Total body length 1.5 to 6 cm.

Interest to Fisheries : In E. Australia the species is extensively used as bait for fishing. The so-called yabbie-pumps received their name from the Australia bait collectors, who were the first to use this suction pump for collecting these burrowing animals. As described by Hailstone (1962:29-30) there are 3 types of yabbie-pumps (also called slurpguns). Two of these types are

manual and are "essentially coring tubes, which, when pushed into the sand and extracted, remove a core of about 2 ft. [= about 60 cm] in length and from 2 in. to 4 in. [=5 to 10 cm] in diameter. Either pump is then reinserted in the hole So formed and suction is applied (with the aid of a plunger in one model or 'by closing off all air outlets and withdrawal of the pump in the other model). As a results of this suction, water, Sand and yabbies are drawn into the hole and removed '' (Hailstone, 1962:30). The third type is motor-driven and "works on the reverse principle, i.e., water under pressure is driven deeply into the Sand and yabbies are flooded to the surface". The pump with the plunger is now used extensively in many parts of the world for collecting burrowing Crustacea from sandy or muddy substrates in the intertidal and subtidal Zones asdescribed by Manning (1975:318-319).

Local Names : AUSTRALIA: Marine yabbie, Burrowing shrimp, Ghost nippers.

Literature : Hailstone & Stephenson, 1961:259-285; Poore & Griffin, 1979:250-256, figs 18-20.

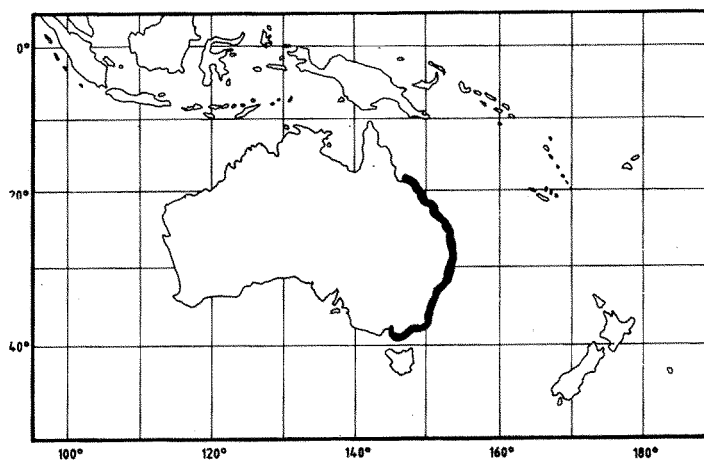


Fig. 442

Callianassa biffari nom. nov.

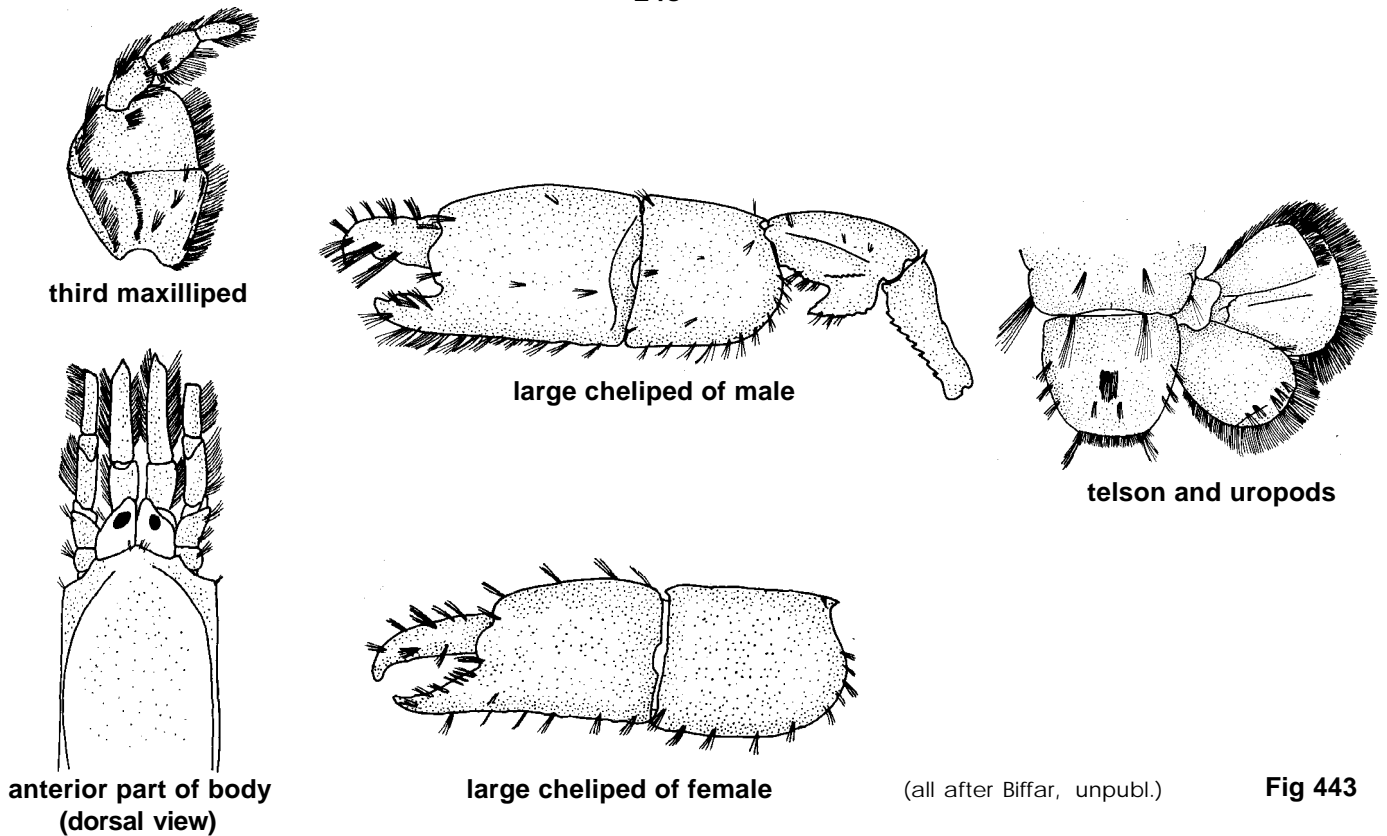
Fig. 443

CALL Call 2

Callianassa biffari new name for **Callianassa affinis** Holmes, 1900, *Occasional Papers California Academy Sciences*, 7:162 (a junior primary homonym of **Callianassa affinis** A. Milne Edwards, 1860, *Annales Sciences Naturelles, Paris, (Zool.)* (4)14: 188).

Synonyms : Biffar (unpubl. Ph.D. thesis, 1972, University of Miami) pointed out that the well known name **Callianassa affinis** Holmes, 1900 for a species from California is a junior primary homonym of **Callianassa affinis** A. Milne Edwards, 1860, for a fossil species from the Lutetian of Central France (Parnes). Biffar indicated the species as "**Callianassa** sp. A, new name". So far as is known to me no subsequent author has proposed a replacement name for the species (most continued to use the name **affinis** for it). As Dr Biffar informed me, circumstances beyond his control forced him to end his carcinological researches, and he Will not be able to propose a new name himself. Therefore I believe it best to propose such a name here. It gives me great pleasure to dedicate this species to Dr Biffar, who was the first to discover the homonymy, and who has done so much useful work in Decapod taxonomy.

FAO Names : En - Beach ghost shrimp.



Type : Type locality (for *C. affinis* and thus also for *C. biffari*): "Point Loma, Calif." (= Point Loma near San Diego, southern California, USA). Lectotype male in USNM, no. 86810; 2 paralectotypes, probably lost.

Diagnostic Features : The rostrum is a low blunt angle in the median part of the anterior margin of the carapace, being overreached by the eyes with practically their full length. The eyes are triangular with a blunt top. The antennal angles are low, rounded, without tooth. Antennular peduncle only slightly longer than antennal peduncle. Third maxilliped with ischium and merus strongly widened to form a kind of operculum; the distal three segments much narrower, each about twice as long as wide. Large chela in adult male with a small concavity above the base of the fixed finger. Carpus slightly shorter than Palm, about as high as long. Lower margin of merus with a broad forward directed hook-shaped process, which ends in a triangular top. Telson about as long as wide, gradually narrowing posteriorly: the convex lateral margins merge evenly with the posterior margin. Each posterolateral angle bears two very small denticles, no median denticle present. Endopod of uropod broadly oval, slightly longer than telson.

Geographical Distribution : Eastern Pacific region: Santa Monica Bay (California, USA) to San Quintin Bay (N.W. Baja California, Mexico) (Fig. 444).

Habitat and Biology : On open beaches with a rocky boulder-covered shore (Frey, 1971:9). The species thus has a preference for a different habitat from those chosen by *C. californiensis* and *C. gigas* (see there). The species constructs rather complicated burrows in the soft sandy substratum.

Site : Total body length 2.5 to 6 cm.

Interest to Fisheries : In California the species is used as bait together with *C. californiensis* and *C. gigas*, and in the accounts of the bait fishery the three are usually treated together. *C. californiensis* is the most important of the three (see there for further details). The burrows of *C. biffari* are often among rocks, which first have to be removed before digging can start

Local Names : USA: Beach ghost shrimp, Ghost shrimp (California).

Literature : Haig & Abbott, 1980:580, fig. 24.3.

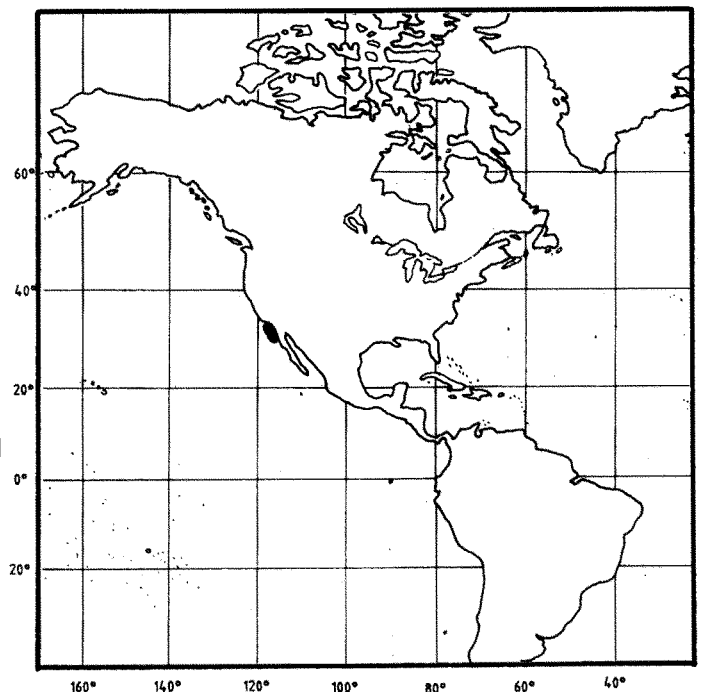


Fig. 444

Callianassa californiensis Dana, 1854 *Proceedings Academy Natural Sciences, Philadelphia*, 7:175.

Synonyms : *Callianassa occidentalis* Stimpson, 1856.

FAO Names : En - Bay ghost shrimp.

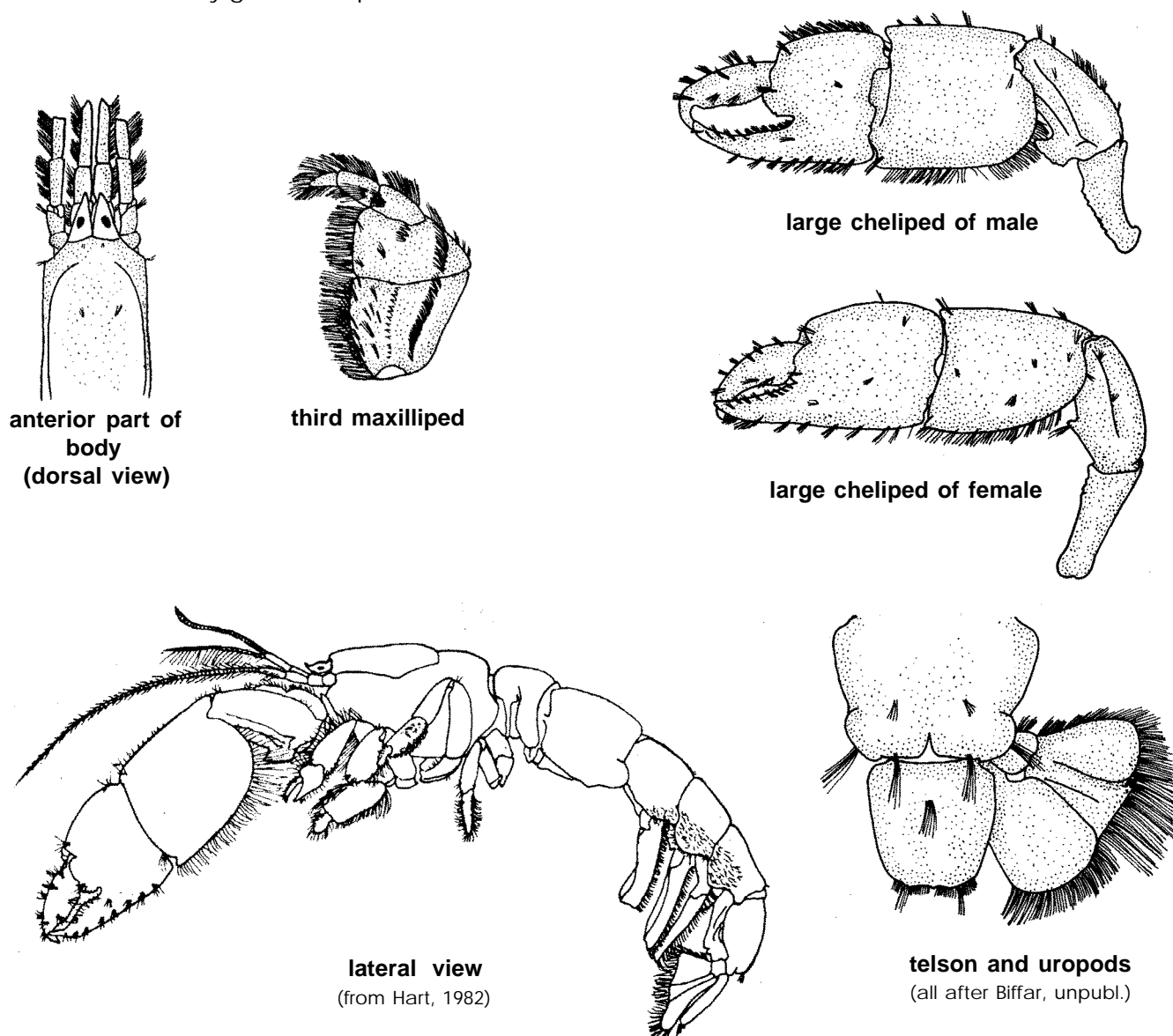


Fig. 445

Type : Type locality of *C. californiensis*: "California". Type material in USNM, now lost.

Type locality of *C. occidentalis*: "This species lives in the holes which are seen in such numbers at low water on the smooth sandy beaches near the entrance of San Francisco Bay", California USA. Type material now lost.

Diagnostic Features : Rostrum hardly noticeable, a slight angle in the anterior margin of the carapace. Eyes triangular, reaching with their full length beyond the rostrum. Antennal angles rounded, without spine. Antennal peduncle somewhat shorter than antennular. Third maxilliped with merus and ischium strongly widened to an operculum; last three segments far narrower, each about twice as long as wide. Large chela of adult male with a distinct concavity in the anterior margin of the palm above the base of the fixed finger; this concavity absent or inconspicuous in females and juvenile males. Carpus about as long as the Palm, and about as high as long. Merus with a distinct broad and bluntly truncated process in the basal part of the lower margin; in the female this process is more in the shape of a triangular tooth. Telson about quadrangular, longer than wide and slightly and gradually narrowing posteriorly; the posterolateral angles are broadly rounded; the posterior margin shows a small triangular tooth in the middle; no other teeth or spines are present. Endopod of uropod squarish with rounded angles, slightly longer than the telson.

Geographical Distribution : Eastern Pacific from Alaska (USA) to northwestern Baja California, Mexico (Fig. 446).

Habitat and Biology : In tidal flats of Sand and mud on the sea coasts and in estuarine areas. The animals make their burrows in the soft substrate.

Size : Total body length up to about 11.5 cm.

Interest to Fisheries : The species (together with *C. biffari* and *C. gigas*) is collected as bait for fishing along the California coast, and sold as such in bait shops. The animals are dug out with spades and forks, or by "stomping the mud over the burrow entrance which puddles the mud, seals off the burrow, and forces the shrimp to swim to the surface where it can be easily picked up" (Turner & Sexsmith, 1964:37).

Local Names : USA: Bay ghost shrimp, Ghost shrimp, Saltwater crayfish (California).

Literature : Stevens, 1928:333-340, figs 10-13, 16-17, 55-71; Frey, 1971:9-10.

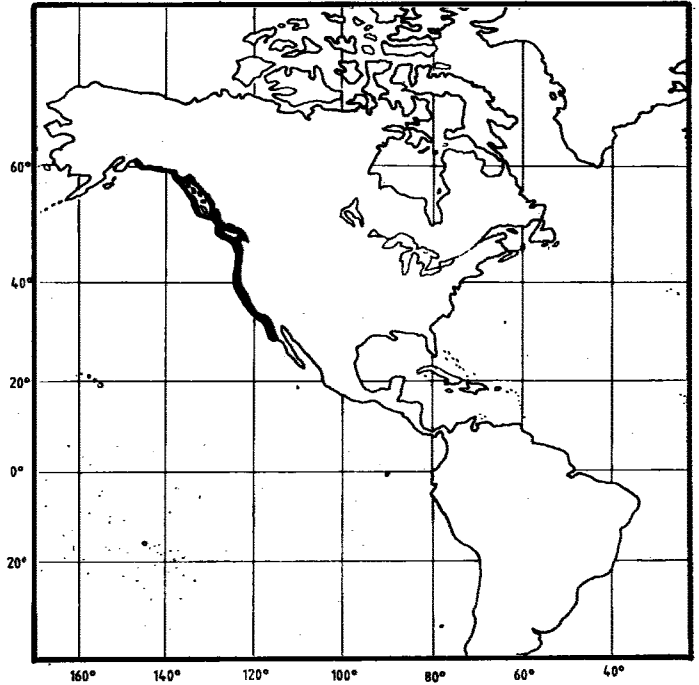


Fig. 446

Callinassa gigas Dana, 1852

Fig. 447

CALL Call 4

Callinassa gigas Dana 1852, *Proceedings Academy Natural Sciences, Philadelphia* , 6:19.

Synonyms: *Callinassa longimana* Stimpson, 1857; *Callinassa (Trypaea) gigas* - Borradaile, 1903; *Callinassa (Trypaea) longimana* - Borradaile, 1903

FAO Names : En - Giant ghost shrimp.

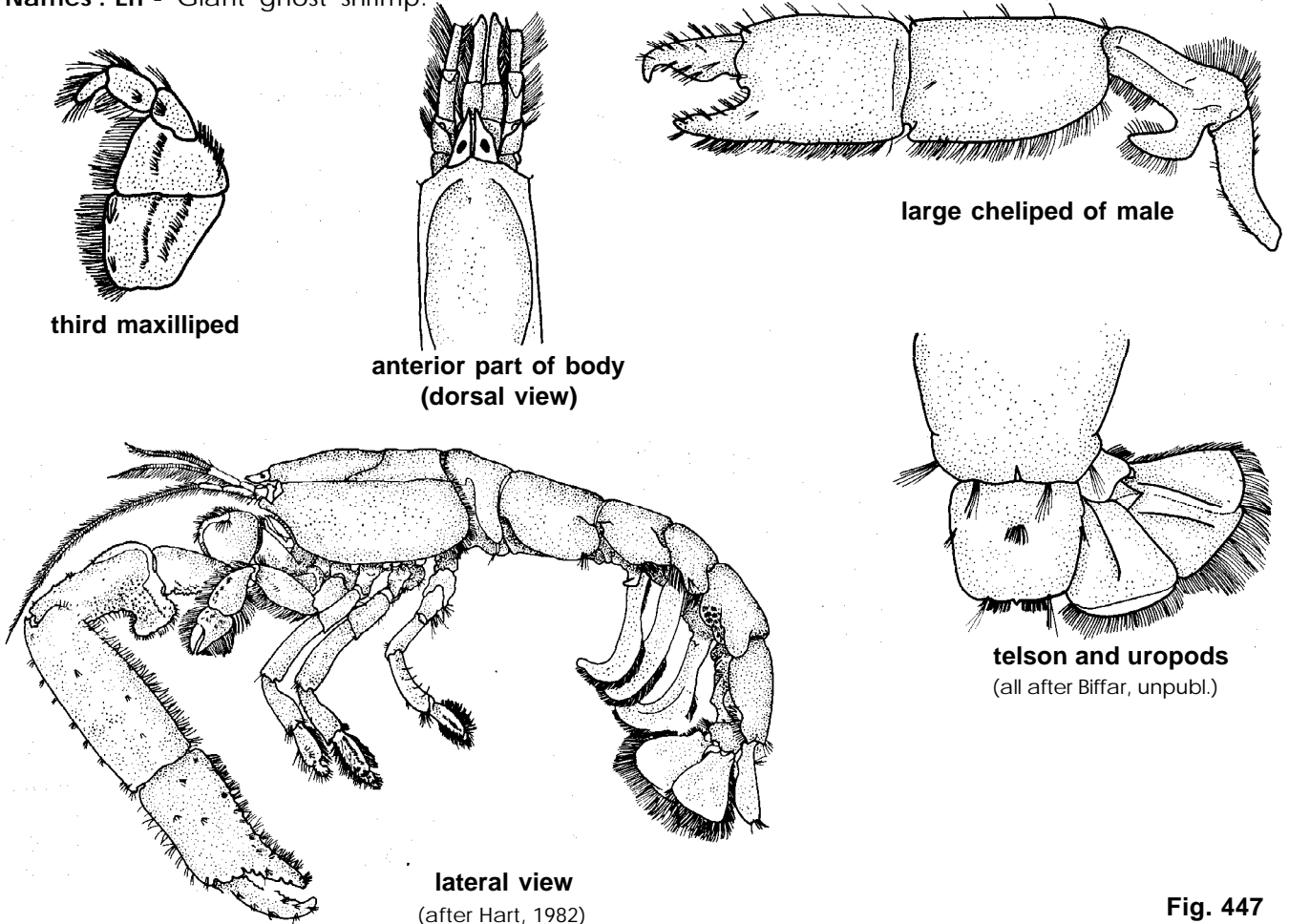


Fig. 447

Type : Type locality of *C. gigas*: "in freto Pugettensi, Oregoniae" (= Puget Sound, Washington State, USA). Type in USNM, now lost.

Type locality of *C. longimana*: "Puget Sound" (= Steilacoom on Puget Sound between Tacoma and Olympia, Washington State, USA). Type material in the Museum of the Boston Society of Natural History, in ANSP (not located in 1989). and in USNM (lost).

Diagnostic Features : Rostrum a low median angle on the anterior margin of the carapace. Eyes elongate triangular, pointed, reaching with their full length beyond the rostrum. Antennal angles blunt, without spine. Antennal peduncle practically as long as the antennular peduncle. Third maxilliped with merus and ischium strongly expanded forming an operculum; the last three segments of the maxilliped less than half as wide as the merus, but not very slender, twice or less than twice as long as wide. Large chela of adult male with the concave part of the anterior margin of the palm above the base of the fixed finger absent or hardly noticeable. Carpus distinctly longer than Palm. Merus with a large and rather wide hook-shaped process in the basal part of the lower margin; in the females this process is reduced to a small triangular tooth. Telson quadrangular, longer than wide and slightly narrowing posteriorly; posterolateral angles rounded. Posterior margin with a small triangular median denticle; no other spines or teeth on telson. Endopod of uropod broad, quadrangular or slightly triangular, with rounded angles and slightly longer than telson.

Geographical Distribution : Eastern Pacific region from Vancouver Island (British Columbia, Canada) to San Quintin Bay (N.W. Baja California, Mexico) (Fig. 448).

Habitat and Biology : Lower intertidal zone of tidal flats on the sea coast and in estuaries. Burrowing in soft substrate of sand and mud. The species is less frequent than *C. californiensis*, which lives in the same habitat.

Size : Total body length about 12.5 to 15 cm; a larger species than *C. californiensis*.

Interest to Fisheries : Like *C. californiensis* and *C. bifari*, the present species is taken as fish bait on the California coast and sold in bait shops. The animals are caught in the same way as *C. californiensis*.

Local Names : USA: Ghost shrimp, Long-handed ghost shrimp.

Literature : Stevens, 1928:325-333, figs 6-9, 14-15, 38-54.

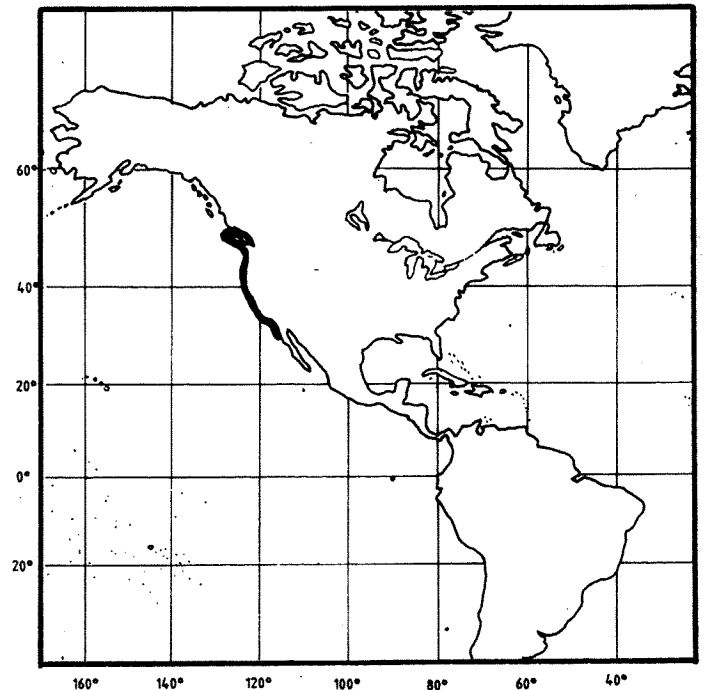


Fig. 448

Callinassa japonica Ortmann, 1891

Fig. 449

CALL Call 5

Callinassa subterranea japonica Ortmann, 1891, *Zoologische Jahrbücher (Systematik, Geographie und Biologie)*, 6: 56.

Synonyms: *Callinassa harmandi* Bouvier, 1901; *Callinassa californiensis japonica* Bouvier, 1901; *Callinassa (Trypaea) harmandi* - Borradaile, 1903; *Callinassa (Trypaea) japonica* - Borradaile, 1903; *Callinassa californiensis bouvieri* Makarov, 1938.

FAO Names : En - Japanese ghortshrimp.

Type : Type locality of *C. subterranea japonica*: "Japan, Tokiobai"; holotype female, in MZS, preserved in alcohol, condition very poor.

Type locality of *C. harmandi*: "Japon"; syntypes (1 male, 3 females) in MP, no. Th 80, in alcohol, condition mediocre.

Type locality of *C. californiensis japonica* (and *C. c. bouvieri*, which is its replacement name): "Japon"; holotype female in MP, no. Th 70, in alcohol, condition rather good.

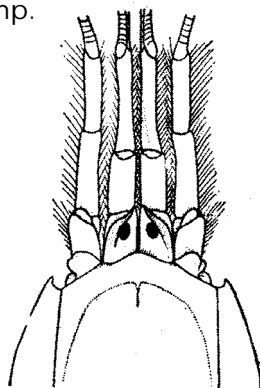
Diagnostic Features: Rostrum a low blunt angle of anterior margin of carapace. Eyes triangular, overreaching rostrum with their full length. Antennal spine absent, antennal angle inconspicuous and blunt. Peduncles of antennula and of antenna of about same length. Third maxilliped with merus and ischium considerably widened, forming an operculum; the last three segments narrow, about twice as long as wide. Large chela of adult male with a distinct concavity in the anterior margin above the base of the fixed finger; in females and Young males this concavity is absent or insignificant. Carpus about as long as palm and about as long as high. Merus of adult males with a distinct rounded,

forwards produced lobe in basal half of lower margin, Upper margin of merus serrate; in females and young males the lobe is much smaller, more triangular, upper margin of merus smooth or indistinctly serrate. Telson longer than wide at base, quadrangular in outline, narrowing slightly posteriorly; posterolateral angles rounded. A small denticle present in the middle of the posterior margin, otherwise telson unarmed. Endopod of uropod broadly quadrangular with rounded corners, slightly longer than telson.

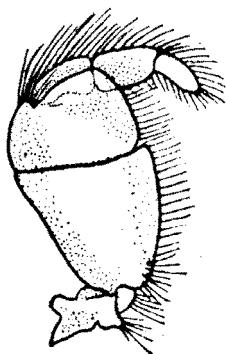
Geographical Distribution : Western Pacific region: S.E. Siberia, Korea, N. China and Japan (Fig. 450) Also found in fossil state in Japan.

Habitat and Biology : On intertidal mud flats in protected habitats. The animal makes its burrows in the soft substrate.

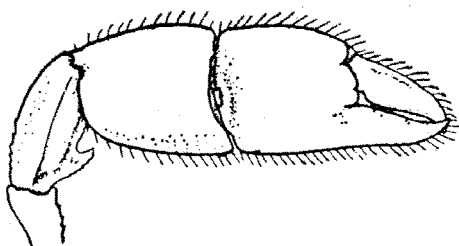
Size : Total body length 1.2 to 6 cm, rarely 7 cm. Oviparous females with a body length of 2.5 to at least 5 cm.



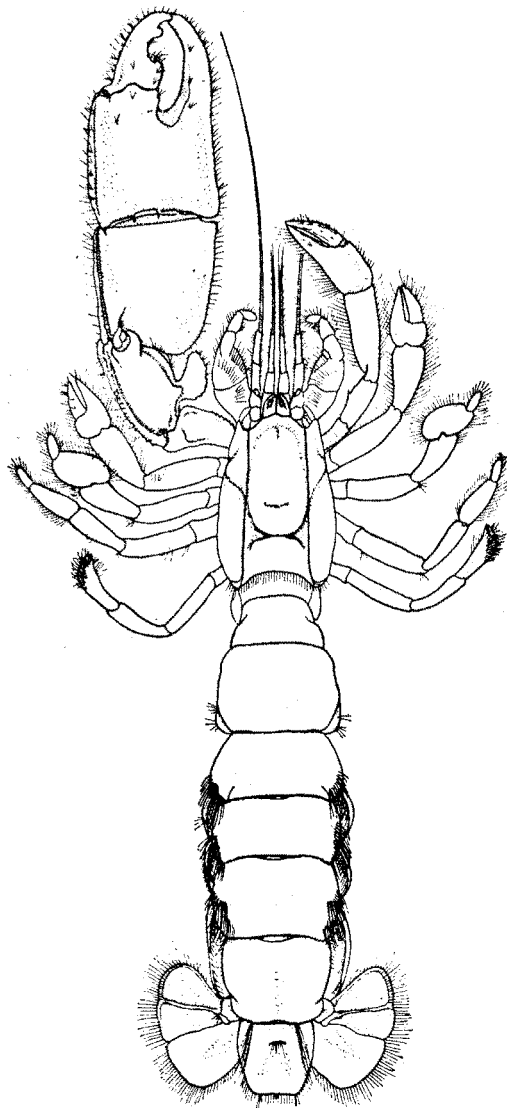
anterior part of
body
(dorsal view)



third maxilliped



large cheliped of female



dorsal view

(all from Liu, 1955)

Fig. 449

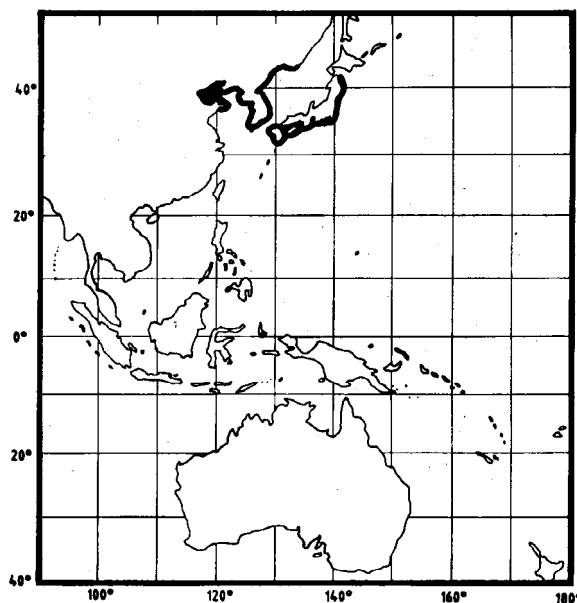


Fig. 450

Interest to Fisheries : Supposedly this species, like most other *Callianassa* listed here, is used as bait for fishing. The only mention of its economic importance known to me is that by Liu (1955:63, pl. 23 figs 1-5) who included the species (under the name *Callianassa harmandi*) in his "Economie Shrimps and Prawns of North China".

local Names : JAPAN: Nihon-suna-moguri.

Callianassa kraussi Stebbing, 1900

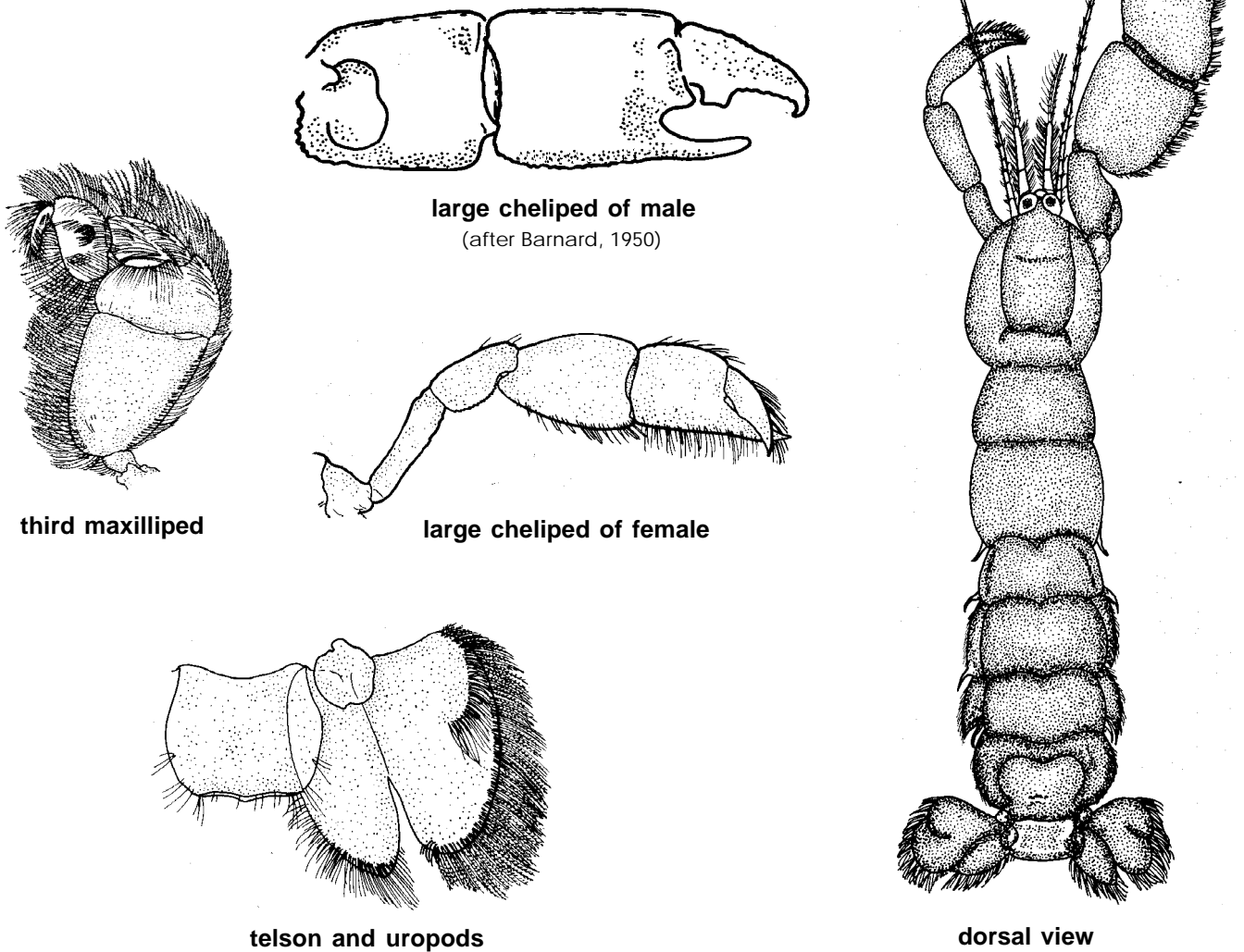
Fig. 451

CALL Call 6

Callianassa kraussi Stebbing, 1900, *Marine Investigations in South Africa*, 1:39, pls 2,3.

Synonyms: *Callichirus kraussi* - Stebbing, 1910

FAO Names : En - Pink ghost shrimp.



(all after Stebbing, 1900) **Fig. 451**

Type : Type locality: "Cape of Good Hope, Gordon's Bay, a little below high water mark". Syntypes in SAM.

Diagnostic Features : Rostrum broadly triangular, far overreached by the eyes that are oval. Antennal angle low and blunt, without spine. Antennular peduncle much longer than antennal peduncle, which it overreaches with more than half the length of the last segment. Third maxilliped with merus and ischium strongly widened to form an operculum. Carpus somewhat widened, being less than twice as long as wide; propodus strongly widened, being wider than long; dactylus slender. Large chela of adult male with a deep, but rather wide concavity in the anterior margin of the palm above the fixed finger. Carpus about as long as Palm, and as long as high. Merus with a rounded lobe in basal part of lower margin. Surface of larger cheliped with numerous tubercles. Telson distinctly wider than long and much shorter than uropods, being only somewhat more than half as long as endopod. Lateral margins of telson convex, posterolateral corners rounded, posterior margin almost straight, without a spine. Endopod of uropod elongate oval.

Geographical Distribution : Southern Africa from Lambert's Bay (west coast of Cape Province, South Africa) to Delagoa Bay (= Bay of Lourenço Marques, Mozambique) (Fig. 452).

Habitat and Biology : Littoral zone to 0.5 m deep, in sheltered bays and estuaries. Substrate sand, in which it digs its burrows, the populations usually are very dense.-

Size : Total body length up to 7 cm.

Interest to Fisheries : Day (1969: 108) mentioned that in South Africa the species is considered as forming "good bait" and it is partially protected in so far, that only 50 specimens can be taken per person per day, while the use of spades and forks is prohibited (but yabbie pumps are not). The importance of the species as bait in southern Africa also is demonstrated by the fact that when in 1984 Ciskei issued a series of 4 stamps figuring bait animals, the 11 c stamp showed the present species.

Local Names : SOUTH AFRICA: Pienkgarnaal, Pink prawn, Sand prawn.

Literature : Barnard, 1950: 506-509, fig. 94.

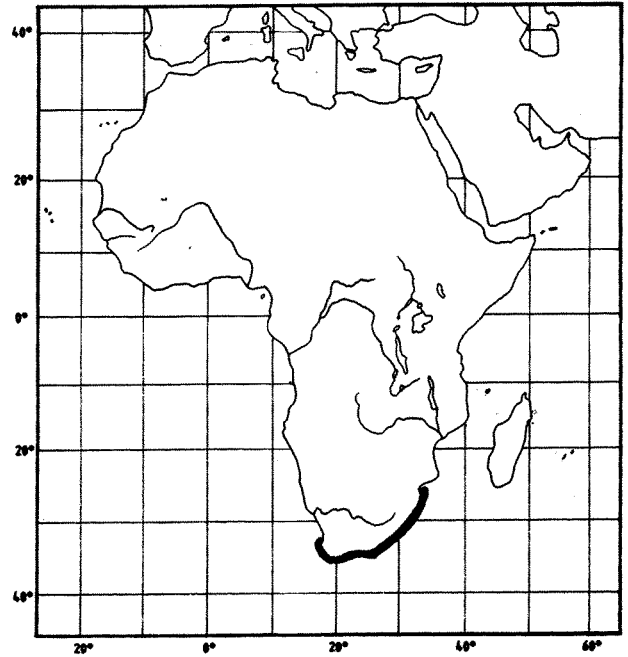


Fig. 452

Callianassa petalura Stimpson, 1860

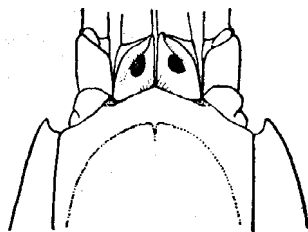
Fig. 453

CALL Call 7

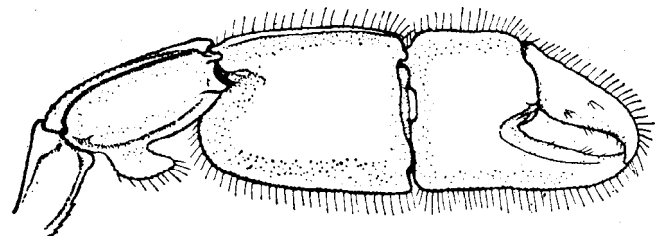
Callianassa petalura Stimpson, 1860, *Proceedings Academy Natural Sciences, Philadelphia*, 1860:23.

Synonyms: *Callianassa (Trypaea) petalura* - Borradaile, 1903; *Callianassa gigas japonica* Makarov, 1935; *Callianassa gigas eoa* Makarov, 1938.

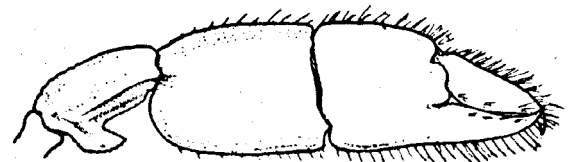
FAO Names : En - Flower ghost shrimp



anterior part of body
(dorsal view)

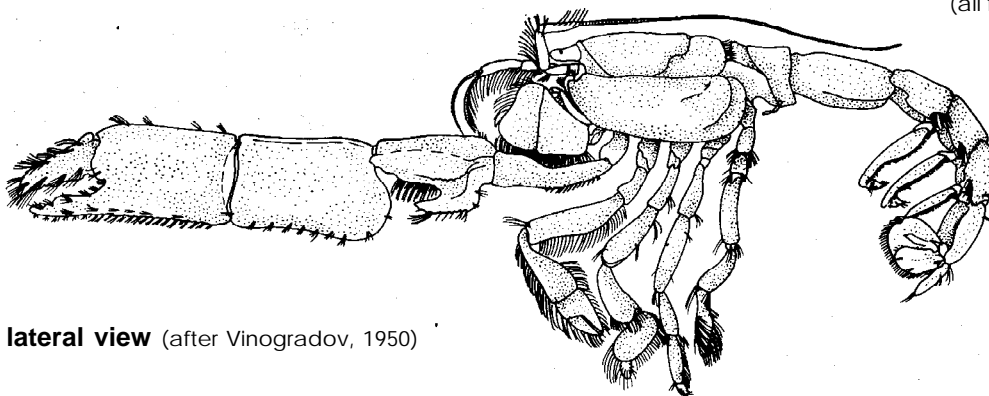


large cheliped of male



large cheliped of female

(all from Liu, 1955)



lateral view (after Vinogradov, 1950)

Fig. 453

Type : Type locality of *C. petalura*: "In portu "Simoda" Japoniae" (= Shimoda, Izu peninsula, Shizuoka prefecture, Honshu, Japan). Type material probably lost in the 1871 Chicago fire.

Type locality of *C. gigas japonica* and *C. g. eoa* (the latter being a replacement name for the preoccupied former): "Japanisches Meer, Meerbusen Peter der Grosse, Bucht Patrokl" (= Patrokol Bight (Bukhta Patrokl) in Peter the Great Bay (Zaliv Petra Velikogo)), S.E. Siberian coast of Sea of Japan. Holotype male in Hydrology Institute, Leningrad, USSR.

Diagnostic Features: Rostrum very inconspicuous, a wide angle in the anterior margin of the carapace, overreached by the full length of the eyes. The eyes bluntly triangular or quadrangular. Antennal angle likewise inconspicuously triangular, without antennal spine. Antennular peduncle distinctly longer than the antennal peduncle, reaching beyond it with more than half the last segment. Third maxilliped with the ischium and merus expanded to form a distinct operculum. Large chela of adult male with a small concavity in the anterior margin of the palm above the fixed finger. Carpus somewhat longer than the palm and longer than high. Merus with a distinct process in the basal half of the lower margin; this process produced forward, ending in a narrowing rounded top. In the females this process is reduced to a small triangular tooth. Telson quadrangular slightly shorter than the uropods. The endopod of the uropod broadly triangular with rounded corners.

Geographical Distribution : S.E. Siberia, N. China, Japan (Fig. 454).

Habitat and Biology : On sand or mud flats of coasts that are more exposed than those where *C. japonica* is found. The species makes its burrows in the soft substrate.

Site : The total body length is 1.5 to 5 cm (males), 1 to 5 cm (females), 2.8 to 5 cm (ovigerous females).

Interest to Fisheries : The only reference known to me, concerning this aspect of the species, is its inclusion in Liu's (1955:65, pl. 23 fig. 6-9) "Economic shrimps and prawns of North China". It is most likely used as fish bait.

Local Names : JAPAN: Suna-moguri.

Citerature : Sakai, 1969:233.

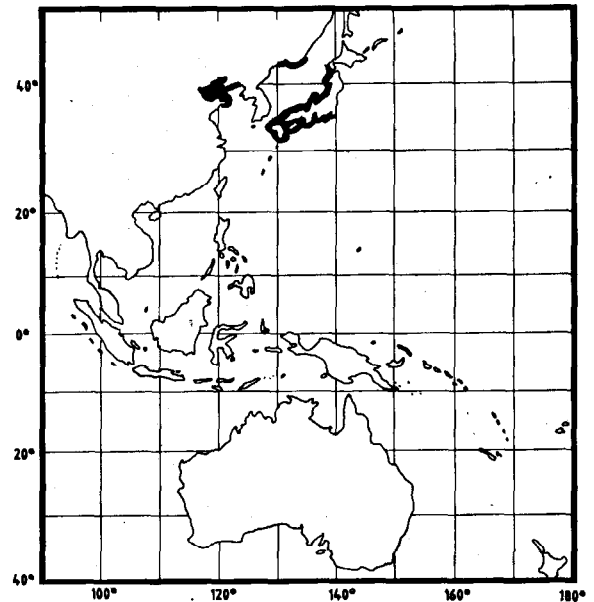


Fig. 454

Callinassa turnerana White, 1861

Fig. 455

CALL Call 8

Callinassa turnerana White, 1861, *Proceedings Zoological Society London*, 1861:42, pl. 6.

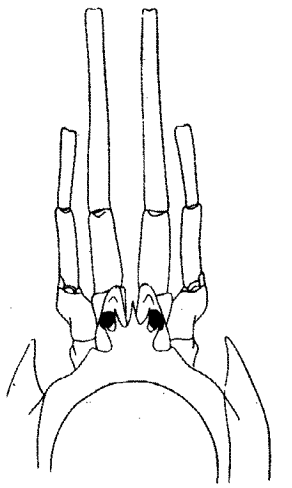
Synonyms: *Callinassa krukbergi* Neumann, 1878; *Callinassa diademata* Ortmann, 1891; *Callinassa (Callichirus) turnerana* - Borradaile, 1903; *Callinassa (Callichirus) krukbergi* - Borradaile, 1903; *Callinassa (Callichirus) diademata* - Borradaile, 1903.

FAO Names : En - Cameroon ghost shrimp.

Type : Type locality of *C. turnerana*: "Africa occ. (Cameroon)"; holotype in BM, no 58.36, in alcohol, condition fair.

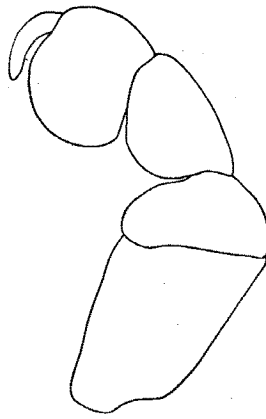
Type locality of *C. krukbergi*: "Central-Amerika" (this evidently is an incorrect statement of the type locality, as the species, before or since, has never been found outside West Africa); type material in SMF (not located in 1989) where it should be on permanent loan from the Zoological Museum Heidelberg University, Germany.

Type locality of *C. diademata*: "Afrika. Vielleicht aus Westafrika"; holotype male in MZS, preserved in alcohol, condition fair.

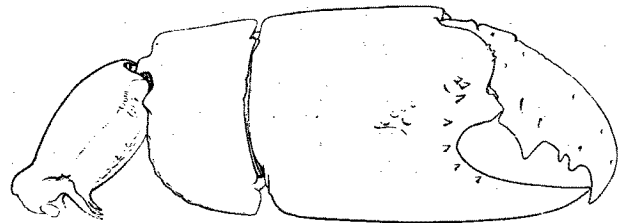


anterior part of body
(dorsal view)

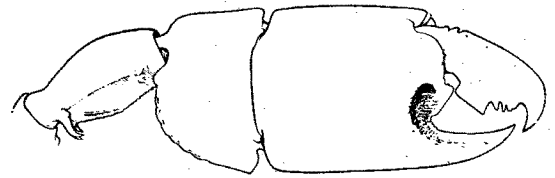
(from Le Loeuff & Intes, 1974)



third maxilliped

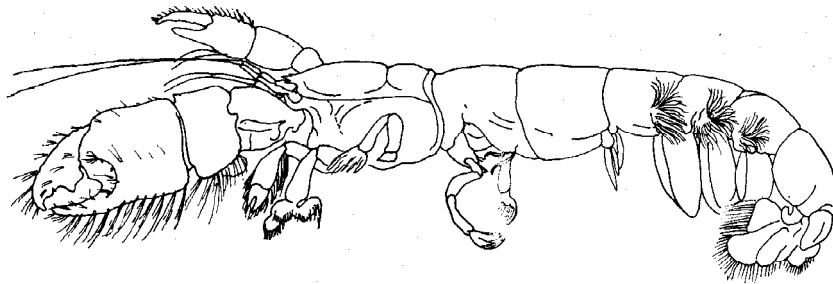


large cheliped of male



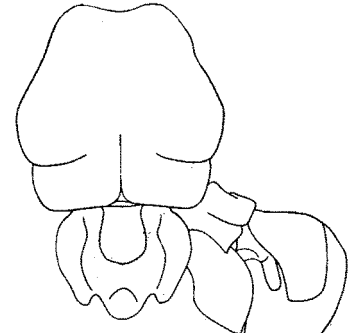
large cheliped of female

(from De Saint Laurent & Le Loeuff, 1979)



lateral view

(after Vanhöffen, 1911)



telson and uropods

(from Le Loeuff & Intes 1974)

Fig. 455

Diagnostic Features: Rostrum very distinct and reaching beyond the cornea of the eyes; in adult specimens the rostrum ends in three or five large teeth of equal size. In juveniles the rostrum is a simple elongate narrowly triangular tooth which reaches beyond the middle of the eyes. The antennal angles are bluntly rounded and unarmed. The antennular peduncle reaches with about half of the third segment beyond the antennal peduncle. The third maxilliped has the merus and ischium widely expanded to form an operculum. Also the carpus (which is only slightly longer than wide) and especially the propodus (which is much wider than long) are distinctly widened. The dactylus is very slender. The large first pereopod of the female shows on the outer surface of the palm near the base of the fixed finger, a deep crescent-shaped depression with tubercles and spinules; this depression is not present in the males, where the anterior

margin of the palm shows a rather wide not too deep concavity. In both sexes the carpus of the larger leg is shorter than the Palm. The merus has a short process in the basal part of the lower margin, which ends in a few small Sharp teeth. The telson is slightly broader than long and is distinctly shorter than the elongate, roughly diamond-shaped endopod of the uropod. The lateral margins of the telson are convex. In adult specimens the posterior margin of the telson consists of three bluntly rounded lobes; in the Young the posterior margin of the telson is about straight but for a median concavity. No spines are found on the telson.

Geographical Distribution : West Africa from the Ivory Coast to Congo (Fig. 456).

Habitat and Biology : Like most, if not all *Callianassa* species, *C. turnerana* lives in burrows in the mud. It is found in estuarine areas, sometimes in practically fresh water. Every few (3 to 5) years the species swarms in enormous numbers in the slightly brackish or almost fresh waters of the estuaries.

Size : Total body length 5.5 to 14.5 cm.

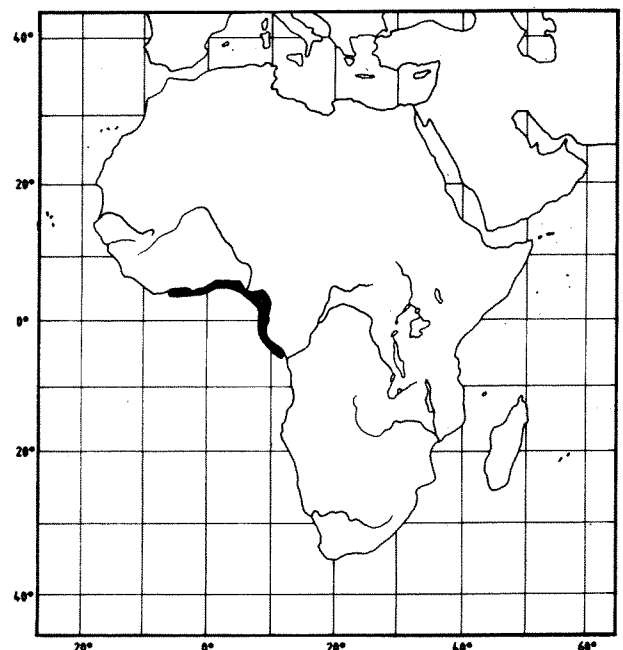


Fig. 456

Interest to Fisheries : The swarming of *C. turnerana* is the sign for the native population for large scale fishing activities. With baskets and with their bare hands the people from Cameroon catch enormous quantities while wading out into the river. Monod (1927:595-601; 1928:117-121) gave a vivid account of the fishery for these Callianassids in the Cameroon River near Douala. The female shrimps are eaten whole; the males are said to contain a substance that irritates the throat. The male abdomina are pressed and produce a kind of oil. The females are eaten and are highly esteemed as food. Part of the catch is eaten fresh, part is dried for later use in sauces and Soups. A little known account of the fishery is given by Mary H. Kingsley (1897:402): "This swarming of the crayfish occurs about every five years, and for days the river-water is crowded with them, So that you can bale them out by basketfuls. This the native does, accompanying his operations with songs and tom-toms, and he then eats any quantity of them; another quantity he smokes and preserves, in what he pleases to regard as a dried state, for sauce making; and the greatest quantity of all he chucks in heaps to fester round his dwellings".

local Names : CAMEROON: Mbéatoé, Mbotoré.

Literature : De Saint Laurent & Le Loeuff, 1979:64, figs 14c, 19e, 20a-d, 23 a-e.

Remarks: This species is probably the only crustacean (and certainly the only Thalassinid) for which a country is named. As reported by Vanhoffen (1911) and Monod (1927, 1928), when the Portuguese in the 15th Century discovered the Cameroon River, they arrived at a time that *C. turnerana* was swarming; greatly impressed by this phenomenon they named the river Rio dos Camarões (shrimp river) and a nearby cape Cabo dos Camarões. The English transliterated this to Cameroons River, and the name Cameroons was used for the country and also adopted in other languages (Cameroun in French, Kamerun in German, Kameroen in Dutch, etc.).

Callianassa tyrhena (Petagna, 1792)

Fig. 457

CALL Call 9

Astacus tyrhenus Petagna, 1792, *Institutiones Entomologicae*, 1:418, pl. 5 fig. 3.

Synonyms: *Callianassa laticauda* Otto, 1828; *Callianassa (Callichirus) stebbingi* Borradaile, 1903; *Callianassa (Callichirus) laticauda* - Borradaile, 1903.

FAO Names : En - Sand ghost shrimp.

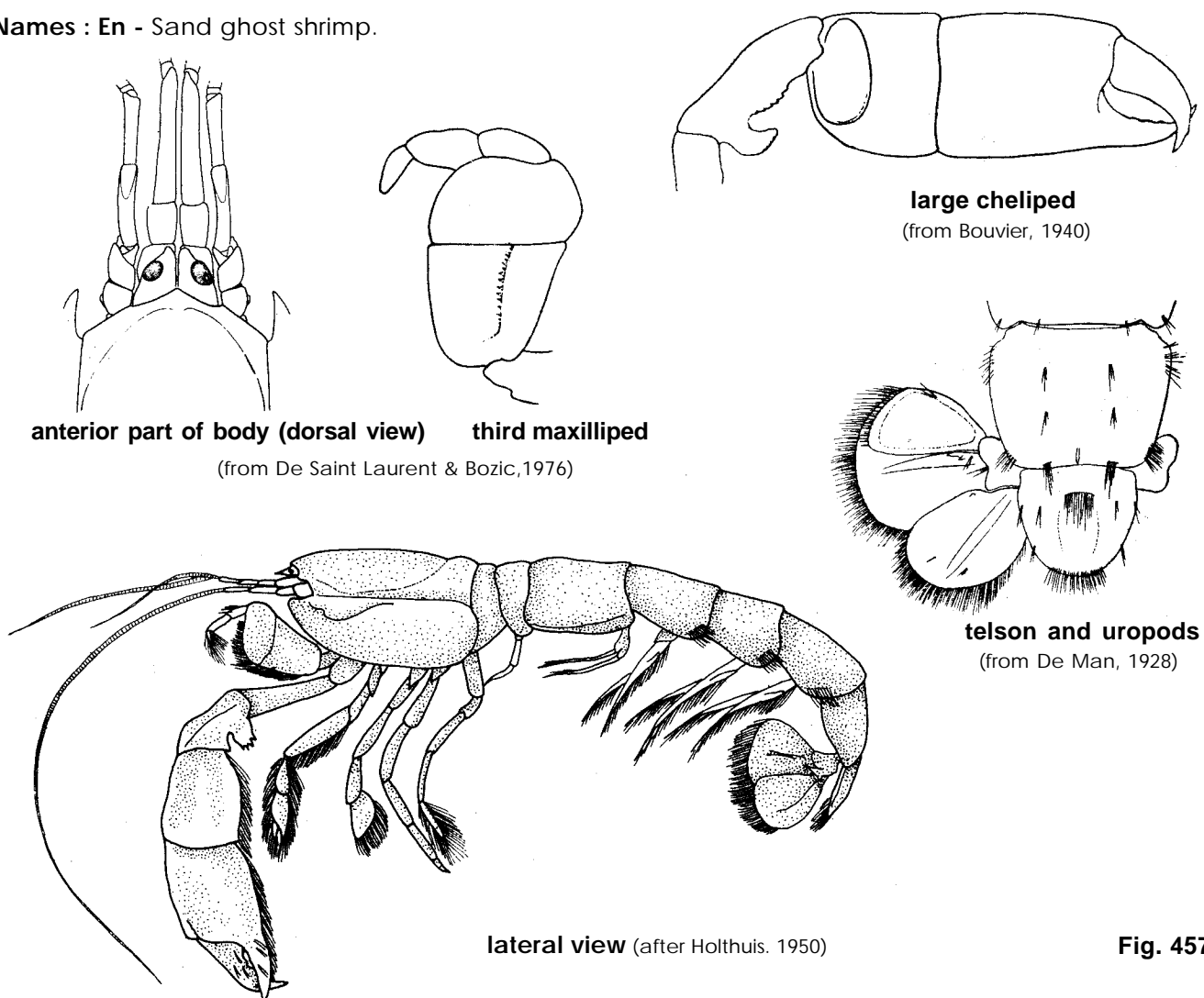


Fig. 457

Type : Type locality of *C. tyrrhena*: "In nostri maris arena habitat", i.e. the sea near Naples, Italy, where Petagna was a teacher. Whereabouts of type material unknown.

Typé locality of *Callianassa laticauda*: "Ich fand diesen Krebs in ziemlicher Anzahl zu Nizza" (= Nice, dépt. Alpes Maritimes, S. France). Depository of syntypes unknown.

Type locality of *C. stebbingi*: Jersey, Channel Islands, UK. Two syntypes in BM, no. 84.18, alcohol, condition fair.

Diagnostic Features: Rostrum short and broadly triangular with tip blunt. Eyes bluntly triangular, reaching beyond rostrum with practically their full length. Antennal angles also bluntly angular, without spine. Antennular peduncle slightly longer than antennal peduncle. Third maxilliped with merus and ischium expanded to form an operculum; last three segments not widened, much narrower and slenderer than operculum. Large chela without deep concavity in anterior margin of palm. Carpus as long as or slightly shorter than palm, and about as long as high. Merus with a rounded lobe in the basal part of lower margin; this lobe crenulate and not ending in a sharp point. Telson about as long as wide. Lateral margins convex, forming a regular curve with posterior margin. No spines present on telson. Endopod of uropod broadly oval or quadrangular with rounded corners, slightly longer than telson. Colour pale pink.

Geographical Distribution : Eastern Atlanlic region from the North Sea and the Kattegat to Mauritania (N.W. Africa), also in the entire Mediterranean (Fig. 458). Previous records from the Black Sea may pertain to *C. candida* (Olivi, 1792) a species also known as *C. pontica* Czerniavsky, 1884 or *C. pestae* De Man, 1928.

Habitat and Biology : The species is found from the mesolittoral zone to a depth of a few meters (there are records of depths of 70 m). It burrows in the sand or muddy sand. The burrows may be 40 cm deep or more and have several exits. Water with low salinity is avoided

Size : Total body length up to 7 cm.

Interest to Fisheries : Already Petagna (1792:418) in the original description remarked : "piscium esca praestantissima". Cottiglia (1983:85) also observed that the species and especially the large specimens are used as bait by sport fishermen, although it does not show the same resistance to the fish hook as does *Upogebia pusilla*.

Local Names : GERMANY: Maulwurfkreb, Sandkreb; ITALY: Corbola selvatica falsa, Scardobola; Corbola salvadega (Veneto); SPAIN: Topo de mar; Talp de mar (Cataluña).

Literature : Cottiglia, 1983:80-85, fig. 27a, 30, 31.

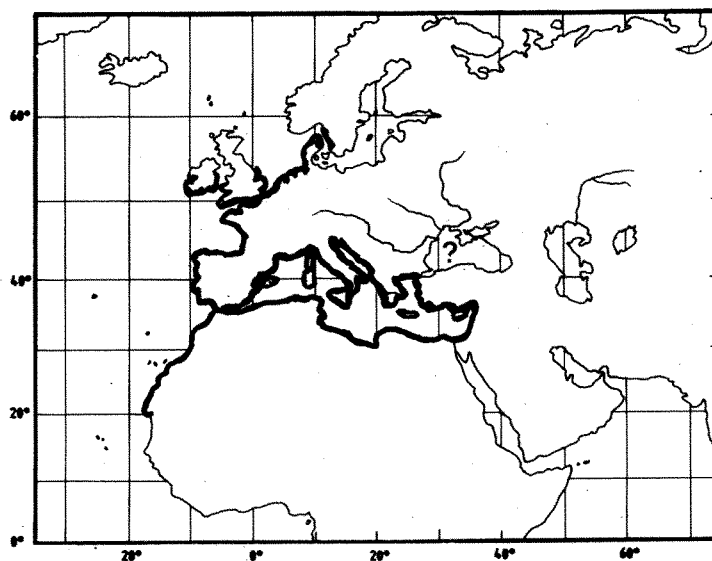


Fig. 458

3. LIST OF SPECIES BY MAJOR MARINE FISHING AREAS

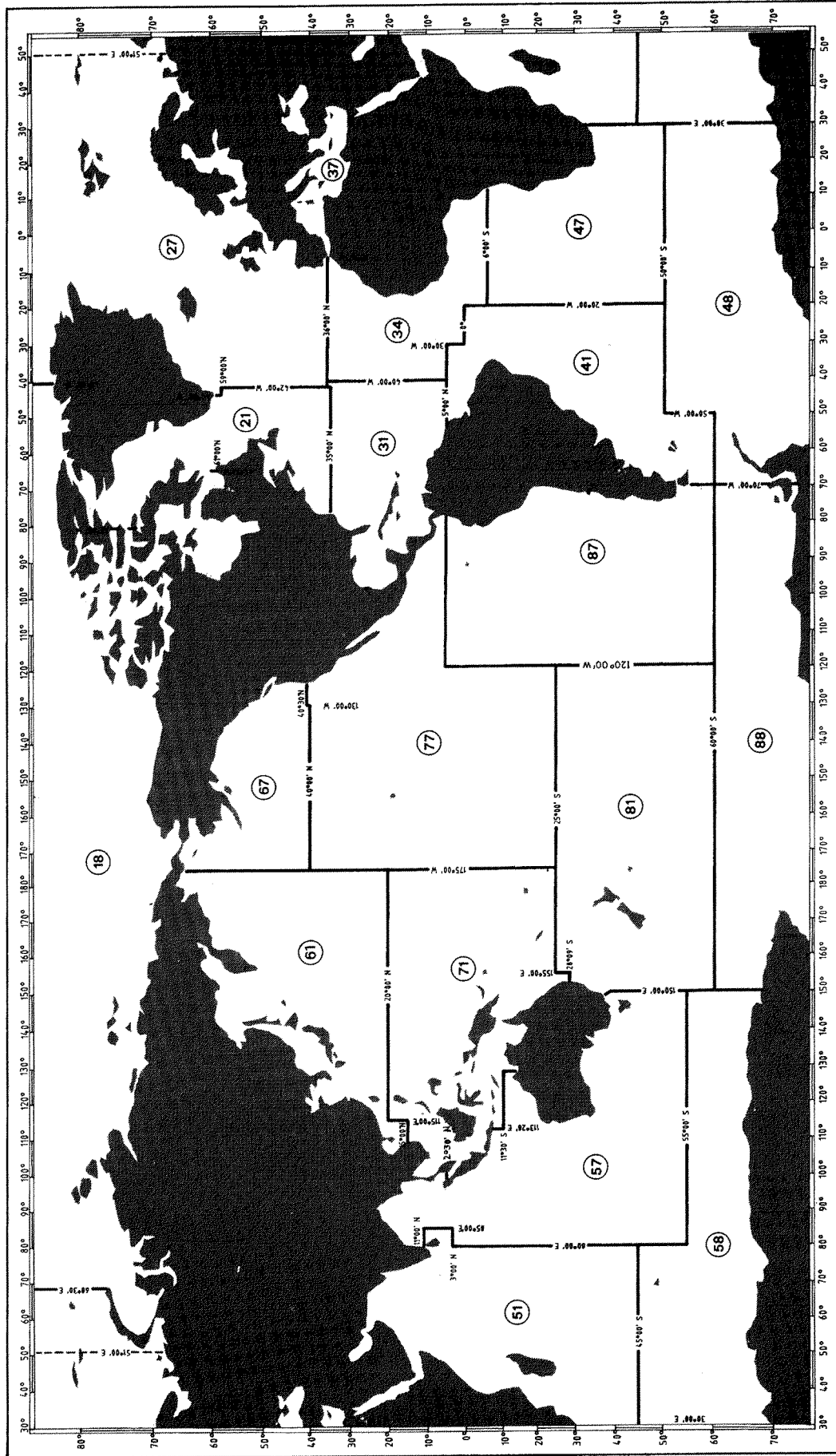


Fig. 459 Major fishing areas for statistical purposes

SPECIES		GEOGRAPHICAL DISTRIBUTION																		
		PAGE	MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																	
			18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87
<i>Scyllarides elisabethae</i>	188							●												
<i>Scyllarides haani</i>	189									●	●			●		●			●	
<i>Scyllarides herklotsii</i>	190					●			●											
<i>Scyllarides latus</i>	191			●		●														
<i>Scyllarides nodifer</i>	192				●															
<i>Scyllarides roggeveeni</i>	193																			●
<i>Scyllarides squamosus</i>	194										●	●		●		●		●		
<i>Scyllarides tridacnophaga</i>	195									●										
<i>Evibacus princeps</i>	196																	●		●
<i>Ibacus alticrenatus</i>	200											●							●	
<i>Ibacus brevipes</i>	201															●				
<i>Ibacus brucei</i>	202															●		●		
<i>Ibacus ciliatus</i>	203											●				●				
<i>Ibacus novemdentatus</i>	204										●	●		●		●				
<i>Ibacus peronii</i>	205											●				●			●	

SPECIES		GEOGRAPHICAL DISTRIBUTION																		
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
PAGE		18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
209	<i>Parribacus antarcticus</i>			●	●		●	●			●	●		●		●	●			
211	<i>Parribacus caledonicus</i>															●	●			
212	<i>Parribacus holthuisi</i>																●			
213	<i>Parribacus japonicus</i>													●						
214	<i>Parribacus perlatus</i>																		●	
215	<i>Parribacus scarlatinus</i>															●	●			
217	<i>Scyllarus arctus</i>			●		●														
219	<i>Scyllarus batei</i>										●	●		●		●				
221	<i>Scyllarus bertholdii</i>											●		●		●				
222	<i>Scyllarus brevicornis</i>													●						
223	<i>Scyllarus martensii</i>										●	●		●		●				
224	<i>Scyllarus pygmaeus</i>					●														
225	<i>Scyllarus rugosus</i>										●	●		●		●				
227	<i>Thenus orientalis</i>										●	●		●		●				
229	THALASSINIDAE <i>Thalassinia anomala</i>										●	●		●		●				●