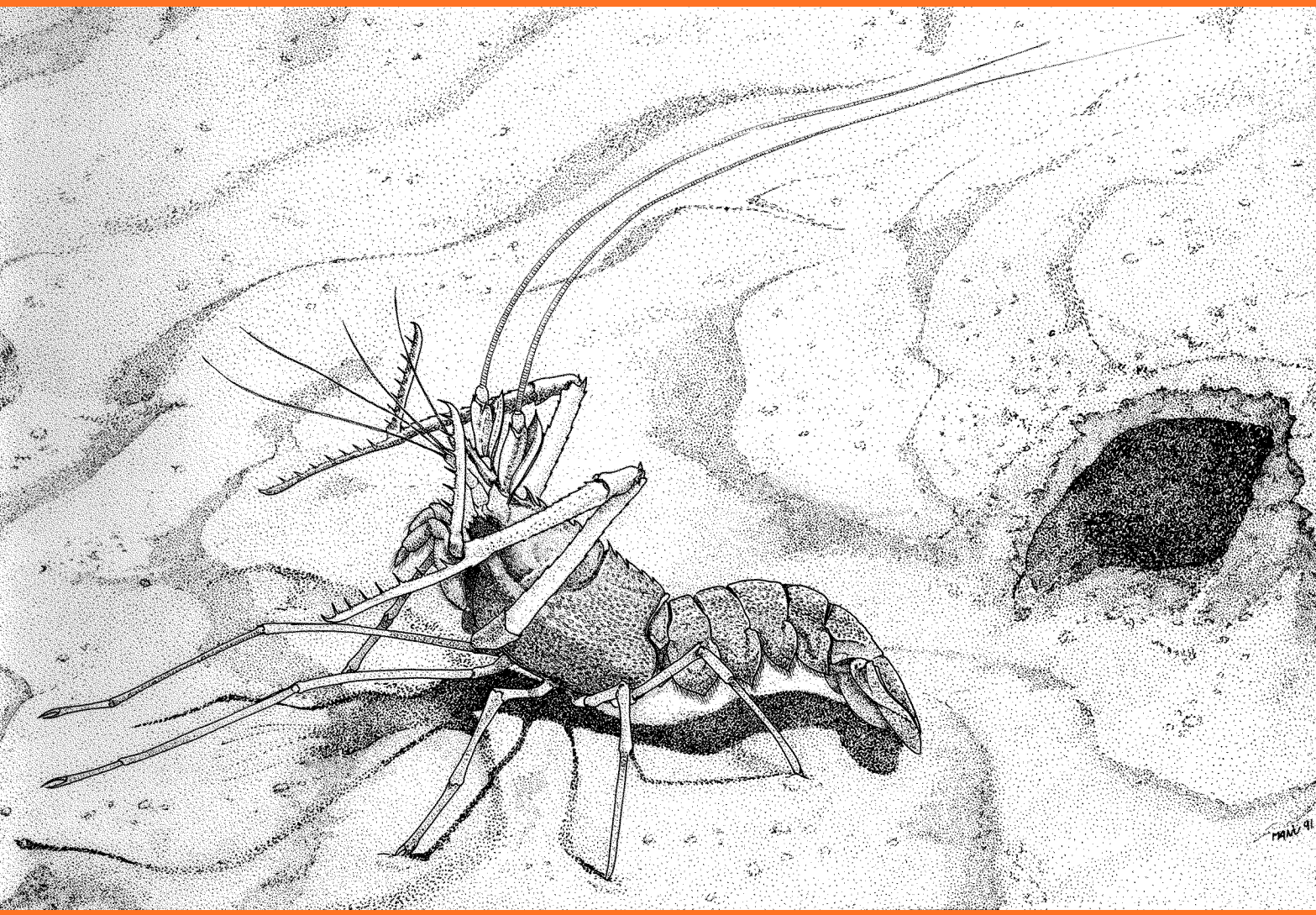
FAO Fisheries Synopsis No. 125, Volume 13

FIR/S125 Vol. 13

FAO SPECIES CATALOGUE

VOL. 13 MARINE LOBSTERS OF THE WORLD

An Annotated and illustrated Catalogue of Species of Interest to Fisheries Known to Date



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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Cover illustration: the Atlantic deep-sea lobster ***(Acantacharis caeca)*** in aggressive posture outside its burrow. Drawing by M. D'Antoni.

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An Annotated and Illustrated Catalogue

of Species of Interest to Fisheries Known to date

prepared by

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 1991

PREPARATION OF THIS DOCUMENT

Lobsters are among the most prized of fisheries resources and of significant commercial interest in many countries. Because of their high value and esteemed culinary worth, much attention has been paid to lobsters in biological, fisheries, and systematic literature. The present volume represents a comprehensive treatment of the identification, taxonomy, distribution, biology and ecology of the world's lobsters that are of interest to fisheries.

The author of this catalogue, Dr L.B. Holthuis, is one of the world's foremost authorities on crustaceans. He prepared the first volume in the FAO species catalogue series,"Shrimps and Prawns of the World" published in 1980. He also has collaborated with FAO in the preparation of crustacean species identification sheets for the eastern central Atlantic, the western Indian Ocean, and the Mediterranean/Black Seas, and by revising the information on crustaceans for most of FAO's national field guides to commercial marine resources in Africa and Asia. One of his areas of specialization is lobsters and since 1946 he has been the sole or senior author for over 25 taxonomic articles concerning this group; more than any other author, past or present. His work on lobsters has included the examination of specimens from the major museums of the world and extensive travels to examine and collect them firsthand.

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ABSTRACT

This is the thirteenth issue in the FAO series of world-wide annotated and illustrated catalogues of major groups of organisms that enter marine fisheries. The present volume on marine lobsters includes 149 species in 3 infraorders, 10 families and 33 genera. There is an introductory section that supplies general remarks on the biology and fisheries of lobsters, a glossary of technical terms, illustrated keys to infraorders, superfamilies, families, subfamilies and species, and detailed accounts on species. Species accounts include illustrations of the species and their distributions, and information on scientific and vernacular names, types, distribution, habitat, biology, size, interest to fisheries, and relevant literature. Following the species accounts is a table of species by major fishing area, an index, and a bibliography. Two original contributions to nomenclature are presented in this volume. A new subgenus, ***Sagmariasus,*** is erected under the palinurid genus ***Jasus.*** In addition, the new name, ***Callianassa biffari,*** is proposed to replace the junior primary homonym ***C. affinis*** Holmes, 1900.

Distribution

Authors
FAO fisheries Officers
Regional Fisheries Councils
and Commissions
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1. INTRODUCTION

This catalogue intends to include all those species of marine lobsters that are of interest to fisheries, according to the following three criteria: (i) all species known to be used for food, (ii) species known to be sold for bait and as subproducts, (iii) species not exploited at present but considered by experts to be of potential commercial value. The last category includes deep-sea forms which during exploratory fishing cruises were found to be sufficiently abundant, large enough in size, and sufficiently accessible to fishing gear so that a fishery for them might be profitable.Edible species found in markets as an admixture to the main catch are included, even if they only make up a negligible percentage of the catch.

The classification adopted here is a traditional one. The marine lobsters are considered to form part of the suborder Macrura Reptantia Bouvier, 1917, which is recognized here as one of the four suborders of the order Decapoda Latreille, 1802. The Decapoda form one of the many orders of the Class Crustacea, Brunnich, 1772*. Aside from the Macrura Reptantia, there are the following three suborders in the Decapoda: Macrura Natantia (shrimps), Anomura (hermit crabs, etc.) and Brachyura (crabs). In several modern handbooks (e.g. Bowman & Abele, 1982, in Bliss, Biology of Crustacea,1:21-25) the Decapoda are divided into two suborders, the Dendrobranchiata (containing the Penaeidea) and the Pleocyemata (containing all the other Decapoda). The suborder Macrura Reptantia is discarded in this modern classification, but the infraorders Astacidea, Palinuridea and Thalassinidea are kept as such;the former suborders Anomura and Brachyura are demoted to infraorders and are on the same level as the Astacidea, Palinuridea and Thalassinidea. The closer link between these last 3 infraorders as indicated in the traditional classification is ignored in the modern classification. From the infraorders down, the classification of the Macrura Reptantia is the same in the two systems.

The present catalogue is largely based on data obtained from the literature and often it is difficult to evaluate the reliability of published data. Sometimes authors working far from adequate library facilities have difficulty in correctly identifying the species they encounter in the field. Moreover, the discovery of new species, the more correct delimitation of known species, or even the introduction of nomenclatural changes, may cause confusion and lead to the use of scientific names that are incorrect by modern standards, or apply to more than one species. For instance, recent taxonomic investigations showed that the name ***Panulirus japonicus*** had long been used for specimens which now prove to belong to five distinct species ***(P. japonicus, P. marginatus, P. pascuensis, P. cygnus*** and ***P. longipes),*** and the subspecies ***P. longipes femoristriga.*** Some authors used the name ***longipes*** for what is now recognized as ***P. cygnus*** and ***P. longipes,*** considering them distinct from ***P. japonicus.*** Therefore old records of ***P. japonicus*** and ***P. longipes*** have to be treated with some reserve, although several of these species have a quite restricted distribution, and their provenance may give a clue to their true identity. A similar situation involves the species of the subgenus ***Jasus (Jasus),*** which in the older literature were considered to be a single species, or at the most two, but which now are recognized as six distinct species ***(J. lalandii, J. frontalis, J. edwardsii, J. paulensis, J. tristani, and J. novaehollandiae).*** Quite recently all but one of the species of ***Nephrops*** were transferred to the genus ***Metanephrops,*** with the result that the names of those species had to be changed accordingly. All such name changes, due to changing taxonomic views, are unavoidable and will also occur in the future. Name changes due to purely nomenclatural reasons have become quite rare in Macrura Reptantia.

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* It proved not very easy to establish who has to be cited as the author of the name Crustacea. This name actually dates from the earliest published books dealing wrth these animals. Belon (1553. De aquatilibus Libri duo: 343) used the name Crustata for lobsters, shrimps and crabs One year later G Rondelet (1554, Libri de Piscibus Marinis: 534) used the actual spelling Crustacea for the group ("De Piscibus Liber XVIII. Quae drcantur Crustacea") Many subsequent authors adopted this name However, Linnaeus (1758, Systema Naturae (ed. 10)1) Ignored the term Crustacea and placed the crustaceous animals together with the spiders, millepeds, etc. in his "Insecta Aptera". The name Crustacea can be found in some early post-Irnnean non-brnomrnal works like those by Roesel von Rosenhof (1755-1759. Monatlrche Insektenbelustrgungen, 3:305; and its 1764-1768 Dutch translation, De Natuurlijke Historie der Insecten, 3 (2):267), and the one by Brisson (1762, Regnum Animale rn Classes IX:6) The first nomenclaturally available work to use the term Crustacea IS. to my knowledge, that by Brünnich (1772, Zoolograe Fundamenta Prdelectronrbus Academicis Accomodata. Grunde I Dyrelaeren: 174, 184). who separated the Crustacea (in which he included Chelicerata and Crustacea in the modern sense) from the Insecta Aptera (in which he left true insects like ***Lepisma, Podura, Termes, Pediculus*** and ***Pulex***) Pennant (1777, British Zoology (ed.4)4) listed the groups dealt wrth in this fourth volume as "Crustacea Mollusca Testacea",and carried the term again on the title page preceding p. 1 of the text of Class V "Crustacea Crustaceous Animals" In the same year also Scopoli In his 1777 book "Introductio ad Historiam Naturalem" on p 404 used the term Crustacea namely for his Gens I of Tribus IV "Crustacea Brunnich".

The question whether the generic name of the common lobster should be ***Homarus*** or ***Astacus*** was a controversial topic in the end of last century, but has since been definitely decided. Some well known specific names have been changed for reasons of priority, e.g., ***Palinurus vulgaris*** Latreille, 1804, to ***Palinurus elephas*** (Fabricius, 1787), and ***Homarus vulgaris*** H. Milne Edwards, 1837, to ***Homarus gammarus*** (Linnaeus, 1758), but most of these problems have been straightened out long ago and no longer cause any difficulties.

In the nomenclature of the spiny lobsters, there is a curious source of considerable confusion. This is the similarity of the two generic names ***Palinurus*** Fabricius, 1798, and ***Panulirus*** White, 1847, for two closely related genera. White (1847), when splitting the genus ***Palinurus*** into three genera, chose two new taxa names that are anagrams of ***Palinurus,*** viz., ***Panulirus*** and ***Linuparus. Linuparus*** is sufficiently different from either of the other names that it caused no difficulties, but ***Panulirus*** and ***Palinurus*** were frequently confused. Pfeffer (1881) tried to solve the problem by replacing ***Panulirus*** by a new generic name ***Senex,*** but this action is against the rules of nomenclature and ***Senex*** lapsed. ***Panulirus,*** being the valid name, has to be used, and at present it is generally accepted and has become firmly entrenched in carcinological nomenclature.

In taxonomic literature (with which I am best acquainted) information on the economic importance of species is rather scarce and of a very general nature. Relevant fisheries literature, being less familiar to me, was often difficult to locate. Notwithstanding the great help that I received in obtaining literature and information from Dr W. Fischer, FAO, Rome and from fishery authorities all over the world, I may have overlooked important sources.

ACKNOWLEDGEMENTS

Thanks are due to Dr Walter Fischer, Fishery Resources and Environment Division, FAO, Rome, for his enormous help with the composition of this catalogue.It was through his insistence that keys and illustrations were added, against my strong objections; the result shows how right he was. Ms M. D'Antoni and Mr P. Lastrico had the thankless task of supervising and producing the illustrative work, often an almost impossible undertaking when they had to work from published photographs in which details could hardly or not at all be discerned;it is due to their capability and patience that most of the figures came out so well. The outlay, editing and word processing of the catalogue was done by Dr Luca Garibaldi and Ms Giulia Sciarappa-Demuro and I am most indebted to their expertise and for their patience with me.

A serious attempt has been made in this catalogue to ascertain the location and condition of the type specimens of the species treated, including those of their synonyms. For this project I received the most valuable help from the following persons, whose names are followed by the abbreviations used for the names of their institutes (see p. 4): Dr Maya Deb (ZSI), Prof. Jacques Forest (MP), Dr D.J.G. Griffin (AMS), Dr H.-E. Gruner (ZMB), Dr J.M.C. Holmes (NMI), Dr R.W. Ingle (BM), Mme E. Lang (MZS), Dr E.A. Lazo-Wasem (YPM), Dr Raymond B. Manning (USNM), Mrs M.G. van der Merwe (SAM), Mr D. Platvoet (ZMA), Dr Earle E. Spamer (ANSP), Dr R.J. Symonds (ZMC), Dr Ludwig Tiefenbacher (ZSM), Dr Michael Türkay (SMF), Dr Torben Wolff (UZM), Dr John C. Yaldwyn (DWM); I am very grateful to all for giving so much of their time to find the required information.

From various persons I received information about lobsters, both oral and written, published and unpublished, which I have used in this catalogue. I am most grateful to all, and should like to mention especially Mr J.D. Booth, Fisheries Research Centre, Wellington, New Zealand (information on ***Jasus*** and ***Projasus***), Prof. Phaibul Naiyanetr, Chulalongkorn University, Bangkok, Thailand (occurrence, use and vernacular names of Thai lobsters), Mr T.J. Ward, CSIRO, Hobart, Tasmania, Australia (unpublished information on ***Linuparus***) and Dr Takao Yamaguchi, Aitsu Marine Biological Station, Kumamoto University, Japan (Japanese names of the Japanese lobsters).

1.1 Plan of the Catalogue

The presentation of each systematic category always includes the valid scientific name, reference to the original 'description, synonyms, and keys to, or lists of, the lower categories concerned. A brief diagnosis is given for Infraorders. The information by species is arranged under the following paragraphs:

(1) **Scientific Name :** The heading for each species gives the valid name followed by the reference to its original description.

(2) **Synonyms :** All known synonyms of the valid name are listed, as well as the new combinations made with the valid and synonymous specific names. In the new combinations, the scientific name and the name of the author who first used the combination are separated by a dash (-) while in the synonyms no such interpunction is present.incorrect identifications of the species are not listed as a rule, but, in cases where the incorrect name has frequently been used for the species, it is briefly discussed.

(3) **FAO Names :** English, French and Spanish names for each species, to be used primarily within FAO, were selected on the basis of the following criteria: (i) each name must apply to one species only, in a worldwide context; (ii) the name must conform to FAO spelling nomenclature; (iii) the name should not lead to confusion with crustaceans other than lobsters; e.g., the word langostino is not used for Spanish FAO names, although in some Spanish speaking countries it is employed for some lobster species; the reason for this is that in Spain and Venezuela the word langostino is used for some species of shrimp. Wherever possible, the denominations selected were based on vernacular names (or parts of names) already in existence within the areas where the species is fished. FAO names are of course not intended to replace local species names, but they are considered by FAO necessary to overcome the considerable confusion caused by the use of a single name for many different species, or several names for one species.

In some cases previous FAO names have been changed in this catalogue. In most instances this was done to obtain more consistency at the generic level. In the present catalogue, all species of one genus have the same name provided with an appropriate prefix for each: e.g., all species of the genus ***Jasus*** are named "rock lobster", ***Jasus edwardsii*** having the name red rock lobster. These "generic" FAO names as used in this catalogue are the following (in systematic sequence): pincer lobster (the genera of Thaumastochelidae: ***Thaumastocheles*** and ***Thaumastochelopsis***), deep-sea lobster (***Acanthacaris***), lobsterette (all genera of Thymopinae: ***Nephropides, Nephropsis, Thymops, Thymopsis***), lobster (all genera of Nephropinae: Eunephrops, Homarus, ***Metanephrops, Nephrops, Thymopides***), fenix lobster (***Neoglyphea***), rock lobster (***Jasus***), furrow lobster (***Justitia***), spear lobster (***Linuparus***), spiny lobster (***Palinurus*** and ***Panulirus***), blunthorn lobster (***Palinustus***), jagged lobster (***Projasus***), whip lobster (***Puerulus***), furry lobster (the genera of Synaxidae: ***Palibythus*** and ***Palinurellus***), Spanish lobster (***Arctides***), slipper lobster (***Scyllarides***), fan lobster (***Evibacus*** and ***ibacus***), mitten lobster (***Parribacus***), locust lobster (***Scyllarus***), flat lobster (***Thenus***), mud lobster (***Thalassina***), mud shrimp (***Upogebia***), ghost shrimp (***Callianassa***).

(4) **Type :** The type locality of the species (and of its synonyms) is provided. As a rule the indication of the type locality as given in the original publication is verbally quoted; if necessary, to this quotation explanatory or corrective details are added. The depository of the primary types is listed;if possible the present depository is given, but if that is unknown the depository at the time of the original description is indicated.

(5) **Diagnostic Features :** This topic is omitted for almost all the species presented in this catalogue because the key is considered sufficient for identification. For species of the genus ***Scyllarus, Thalassina, Upogebia,*** and ***Callianassa*** however, where no key is included, diagnostic features are included to aid in Identification.

(6) **Geographical Distribution :** The entire known geographic range of the species is given, including areas where it is not of commercial importance. Of each species, the known range is illustrated on a map. These maps are only meant to give a general impression of the distribution of the species.

(7) **Habitat and Biology :** The known depth range of the species, and information on types of substrate and salinity of its habitat are given here. In most instances this information is rather incomplete. Also, if available, the most important data on the biology of thisspecies are mentioned.

(8) Size : The known total length (tl.), as well as the known carapace length (cl.) of both males and females, are provided where possible. Total length is measured from the tip of the rostrum to the extremity of the telson, but due to the curvature of the body this measurement usually is not very accurate. The carapace length generally includes the rostrum, but very often the actual extent of this length (whether measured from the tip of the rostrum, or from the posterior margin of the orbit to the posterior margin of ,the carapace) is not indicated in the literature. Where total and carapace lengths are both given, the respective figures do not necessarily pertain to the same specimens but may have been obtained from different sources. As often the available information on the size attained by some species is very meagre, the figure cited here may be well below the actual maximum size, or may be a size rarely attained.

(9) **Interest to Fisheries :** This paragraph gives an account of the areas where the species is fished and of the nature of the fishery; its importance is either estimated (minor, moderate, major, or potential) or actual figures of annual landings are provided. Data on utilization (fresh, dried, cooked, frozen, canned, etc.) are also given where available.Here too, the quality and quantity of the available information vary considerably with the species.

(10) **Local Names :** These are the names used locally for the various species. The local species denomination is preceded by the name of the country concerned (in capital letters), and, where necessary, followed (in parentheses) by the geographical specification or by the language of the transcribed vernacular names. When known, the most commonly used vernacular name is listed first after each country, otherwise the names are in alphabetical order. The catalogue was compiled from many sources, but where vernacular names are concerned it doubtlessly is incomplete. Where a large number of local names are used for one species in a restricted area, only the most common are included.

(11) **Literature :** Reference is made to those papers giving good descriptions and illustrations of the species or treating it extensively (e.g., Species Synopses published by FAO and CSIRO, FAO Species Identification Sheets, etc.), or giving a helpful account of it.

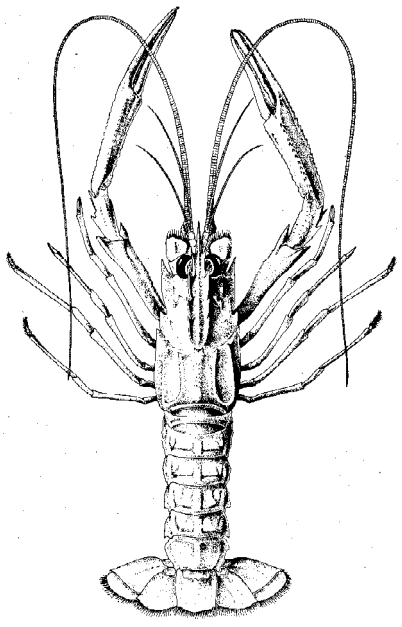
(12) **Remarks :** Important information concerning the species and not fitting in any of the previous paragraphs is given here.

Abbreviations used : The following abbreviations are used to indicate the depositories of type material: **AMS:** The Australian Museum, Sydney, Australia. **ANSP:** The Academy of Natural Sciences of Philadelphia, Philadelphia, Pennsylvania, USA. **BM:** British Museum (Natural History) (now: The Natural History Museum), London, England, UK. **DMW:** Dominion Museum (now: National Museum), Wellington, New Zealand. **MCZ:** Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA. **MNRJ:** Museu Nacional, Rio de Janeiro, Brazil. **MOM:** Institut Oceanographique, Monaco. **MP:** Museum National d'Histoire Naturelle, Paris, France **MT:** Det Kongelige Norske Videnskabers Selskabs Museum, Trondheim, Norway. **MZS:** Musée Zoologique de l'Université, Strasbourg, France. **MZT:** Museo ed Istituto di Zoologia Sistematica dell'Universitá di Torino, Italy. **NMI:** National Museum of Ireland, Natural History Division, Dublin, Ireland. **NMW:** Naturhistorisches Museum (formerly K.u.K. Naturhistorisches Hofmuseum), Wien, Austria. **NTOU:** National Taiwan Ocean University, Keelung, Taiwan **QM:** Queensland Museum, South Brisbane, Qld, Australia. **RMNH:** Rijksmuseum van Natuurlijke Historie (now: Nationaal Natuurhistorisch Museum), Leiden, The Netherlands. **SAM:** South African Museum, Capetown, South Africa. **SMF:** Natur-Museum Senckenberg, Frankfurt, Germany. **TFRI:** Taiwan Fisheries Research Institute, Keelung, Taiwan. **UMML:** University of Miami Marine Laboratory (now: Institute of Marine and Atmospheric Science, University of Miami), Miami, Florida, USA. USNM: United States National Museum (now: National Museum of Natural History), Smithsonian Institution, Washington, DC, USA. **UZM:** Universitetets Zoologiske Museum, Copenhagen, Denmark. **WAM:** Western Australian Museum, Perth, Western Australia, Australia. **YPM:** Peabody Museum of Natural History, Yale University, New Haven, Connecticut, USA. **ZMA:** Zoologisch Museum, Universiteit van Amsterdam, Amsterdam, The Netherlands. **ZMB:** Zoologisches Museum der Humboldt-Universitat, Berlin, Germany. **ZMC:** University Museum of Zoology, Cambridge, England, UK. ZMH: Zoologisches.Museum und Institut, Hamburg, Germany. ZML: Zoologisches Museum, Lübeck, Germany. ZMUG: Zoologisches Museum der Universität, Gottingen, Germany, at present on permanent loan to Natur-Museum Senckenberg, Frankfurt am Main, Germany. **ZSI:** Zoological Survey of India, Calcutta, India. **ZSM:** Zoologische Staatssammlung, München, Bavaria, Germany.

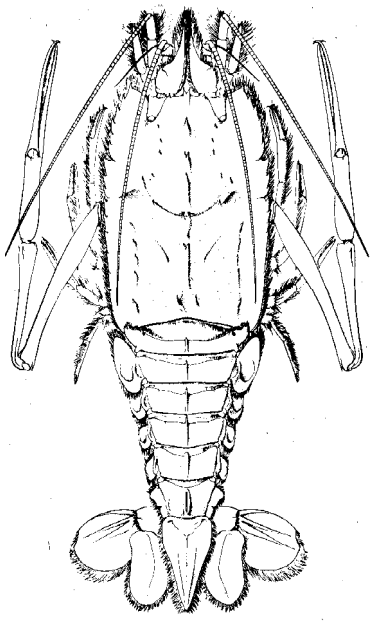
1.2 General Remarks on Lobsters

1.2.1 Morphology

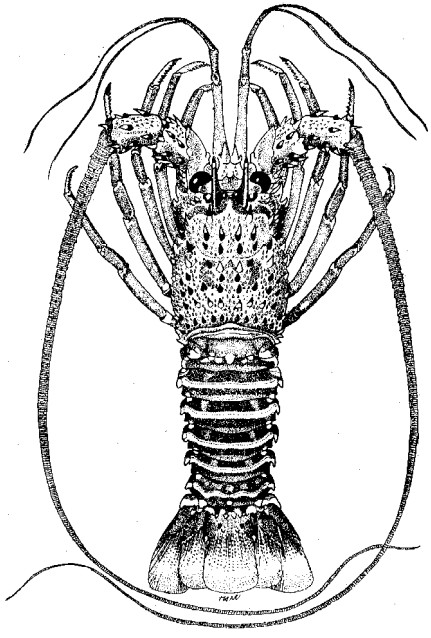
Even though the various major groups of lobsters show obvious differences in general appearance (see Fig. 1), their basic morphology is essentially the same



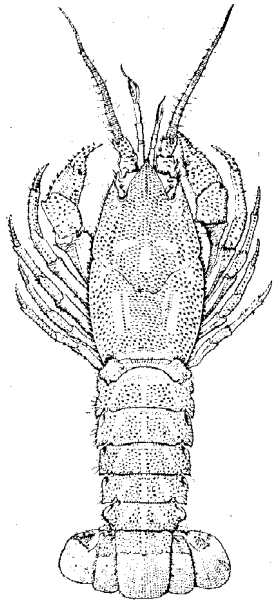
Nephropoidea
Nephropidae
Metanephrops andamanicus



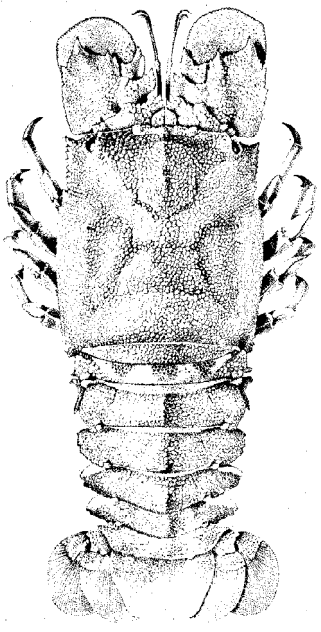
Eryonoidea
Polychelidae
Stereomastis sculpta



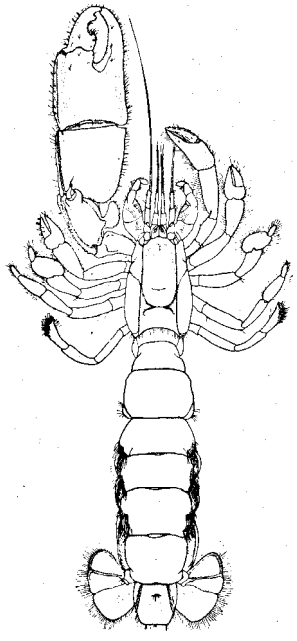
Palinuroidea
Palinuridae
Panulirus marginatus



Palinuroidea
Synaxidae
Palinurellus wieneckii



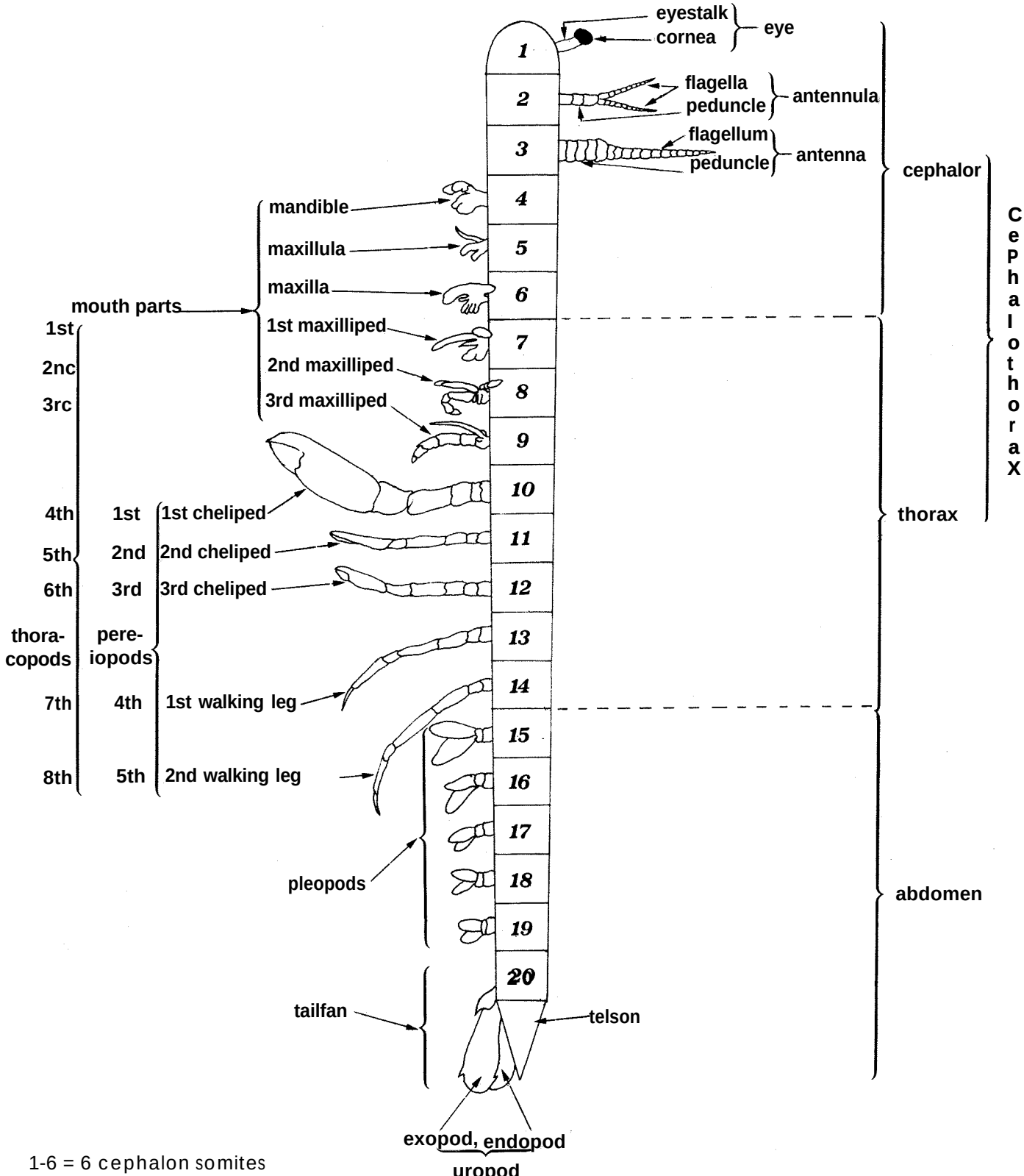
Palinuroidea
Scyllaridae
Scyllarides herklotsii



Thalassinidea
Callianassidae
Callianassa japonica

Fig. 1. Major types of lobsters, showing differences in shape

The body of a lobster consists of two recognizable parts: the cephalothorax (= the entity formed by the fusion of cephalon, or head, with the thorax) with its appendages, and the abdomen (= tail) with its appendages (Fig. 2).



1-6 = 6 cephalon somites
7-14 = 8 thorax somites
15-20 = 6 abdominal somites

Fig. 2 Schematic illustration of the body and appendages of a lobster (Nephropoidea)

The 14 somites (or body-segments) of the cephalothorax (the first 6 forming the cephalon, the last 8 the thorax) are fused and only in a few places there are visible indications of the lines between the somites. Each somite carries one pair of appendages. These appendages are the following: Somite 1 (= ophthalmic somite) carries the eyes, that are usually movable and consist of a stalk, formed by one or two segments, the distal of which carries the pigmented cornea with visual elements;the eyes sometimes are reduced, viz., the cornea may lack pigment or visual elements; such a reduced functionless eye may even be immovably fused with the body or be altogether absent. Somite 2 (= antennular somite) carries the antennulae, each of these consisting of a three-segmented peduncle carrying two flagella, the length of the flagella often is of taxonomic importance; the antennulae sometimes are called "first antenna",like the antennae or second antennae they are tactile organs. Somite 3 (= antennal somite) carries the antennae (or second antennae), which consist of a peduncle of 5 segments and a single flagellum. Through fusion of the segments with one another or with the body, the number of actually visible peduncular segments is smaller than 5. The flagellum may be supple or whip-like, or (e.g., in Palinuridae) may be very stiff and strong;in the Scyllaridae the flagellum is transformed to a single plate-like segment, which makes the antennae six-segmented. In some species there is a scaphocerite or antennal scale attached to the second segment of the peduncle. Somites 4 to 9 (i.e., the last 3 cephalon somites and the first 3 of the thorax) carry the mouth parts, appendages which have a function with the dissection and ingestion of food. Somite 4 carries the mandibles, strongly calcified, often molar-like organs that are used for breaking up the more solid food particles, and for chewing. Somites 5 and 6 carry the maxillulae (or first maxillae) and maxillae (or second maxillae) respectively, both are flat leaf-like organs. Somites 7 to 9 (= thoracic somites 1 to 3) carry the first to third maxillipeds, the first is leaf-like like the maxilla, the second and third are more leg-like, especially the third. Somites 10 to 14 (= thoracic somites 4 to 8) carry the five pairs of pereiopods or true legs. The first pereiopod, and sometimes also the second and the third, often (but not always) ends in a chela or pincer. The first leg usually is the largest of the true legs. The legs that do not have pincers are indicated as walking legs as they are mainly used for locomotion.

Dorsally the cephalothorax is encased by the carapace, a single shield-like cover, which extends all the way from the eyes to the last thoracic somite, and sometimes projects beyond the eyes as a narrow median rostrum. Laterally, the carapace extends to the bases of the legs, enclosing the branchial chamber which is a space between the body and the carapace housing the branchia or gills, and situated above the bases of all legs. In some groups, part of the antennular somite is visible dorsally as a triangular plate in front of the anterior margin of the carapace. In the Palinuridae, this so-called antennular plate may carry spines, the number and arrangement of which is of taxonomic importance. In some genera of Palinuridae, the lateral margins of the antennular plate are ridge-like, and swollen, forming a stridulating organ with a process on the inner margin of the antennal peduncle, which rubs over this ridge; when the animal moves its antennae in a certain way, a rasping sound is produced by this organ.

Ventrally, the cephalothorax shows, between the basal parts of the appendages, a central plate, the thoracic sternum, on which the lines between the thoracic somites are usually indicated as grooves. In the females, the sexual openings are visible on the basis (the sixth segment of the leg counting from the tip) of the third pereiopods, in the males these openings are on the basis of the fifth pereiopods. This difference usually is the character that most easily distinguishes male and female lobsters.

The abdomen consists of six separate somites (numbers 15 to 20 on Fig. 2), which are not fused, but movably connected with each other. Each somite is surrounded by a chitinous armour: the dorsal part is called tergite, the ventral part, sternite, and the two lateral parts, pleura (sing. pleuron). The combined abdominal sternites form the abdominal sternum, the combined abdominal tergites, the abdominal tergum. The pleura usually are downward-directed lateral plates, covering externally the pleopods. The shape and ornamentation of the pleura is of taxonomic interest. The appendages of the first 5 abdominal somites (numbers 15 to 19) are the pleopods or swimmerets; they are implanted on the borderline between the sternite and the pleuron. In the male, the first and second pair of pleopods may be transformed into copulation organs, the so-called copulatory stylets, which are often stiff and of characteristic shape. The other pleopods usually consist of a single-segmented peduncle carrying two leaf-like appendages at the top. The pleopods may be reduced or even entirely lacking on some somites. The sixth abdominal somite (= somite 20, being the last body segment) bears the tail fan, which consists of a pair of uropods and the unpaired telson. The uropods actually are the sixth pair of pleopods; they are rather wide and well calcified and usually about as long as the telson. The telson is a plate-like median appendage of the sixth abdominal somite, and sometimes it is considered to represent the seventh abdominal somite. The tail fan, when spread out, can be used for propulsion.

Important taxonomic characters are provided by the carapace (shape, surface sculpturation, spinatibn), eyes (absent, reduced or well developed, position of the orbits), antennulae (length of flagella), antennae (size, shape, dentition, and shape, length and structure of the flagellum), antennular plate (number and arrangement of spines, presence or absence of a stridulating organ), pereiopods (whether or not chelate, size and structure of chelae), thoracic sternum (general shape, shape of anterior margin, presence or absence of tubercles or spines), and abdomen (dorsal sculpturation, shape of the pleura, shape of the tail fan, number of pleopods). Also the colour, and especially the colour pattern of the species may be of great help in rapid identification in the field.

1.2.2 Size

The largest Crustaceans are found among the lobsters. The American lobster (***Homarus americanus***) has been reported to attain a total body length of 64 cm, while the Green rock lobster (***Jasus verreauxi***) may reach a total body length of 60 cm. Several other species of Palinuridae reach sizes between 40 and 50 cm. The smallest lobsters are found among the Scyllaridae: e.g., adult specimens of ***Scyllarus martensii,*** reach a total body length of 2.5 cm.

1.2.3 Habitat and Biology

Apart from the freshwater crayfishes (superfamilies Astacoidea and Parastacoidea, which are not treated in this catalogue), all lobsters are marine animals, only a few species enter brackish water. Marine lobsters are found in practically all temperate and tropical seas (between about 65ºN and 60ºS), being most numerous in the tropics. They occur from the intertidal zone all the way to the deep sea (the deepest record being from almost 3 000 m depth). Many species prefer a rocky substrate with cavities for shelter, but others are found on muddy or sandy bottoms in which they may dig their own burrows.Eelgrass meadows also form a habitat for some species.

The sexes in lobsters are mostly separate, although cases of hermaphroditism (both natural and abnormal) are known. The males impregnate the females (sometimes with the help of the copulatory stylets of the first abdominal somites), and in some species, spermatophores, visible as black or transparent flat masses, are deposited on the female's thoracic sternum. The females produce eggs, which are carried on the pleopods and which usually form a conspicuous mass under the abdomen. After hatching, the larvae pass through several, usually pelagic stages, before molting to the postlarva which is most often benthic. The larvae often bear very little resemblance to the adults, e.g., in the Palinuridea, where the larvae (phyllosoma) are small, flat and perfectly transparent. Larvae are sometimes found far offshore, but the importance of ocean currents in the zoogeography of the lobsters has often been grossly exaggerated.

The greater part of the lobsters seem to be omnivores and scavengers, but few detailed observations are available on feeding habits. Some species are attracted by dead fish put as bait in lobster traps, but others are hardly ever caught in such traps. The Thalassinidea are mostly detritus feeders. Some lobsters also eat live animals; e.g., ***Scyllarides tridacnophaga*** has been observed to attack, open and eat specimens of the giant clam ***Tridacna.***

1.2.4 Interest to Fisheries

Lobsters are among the most highly esteemed seafood delicacies. The world catch of lobsters recorded in 1988 (FAO Yearbook of Fishery Statistics, 1990) exceeded 205 000 tons, of which about 127 000 tons corresponded to true lobsters (Family Nephropidae), about 78 000 tons to spiny lobsters (Family Palinuridae) and about 2 100 tons to slipper lobsters (Family Scyllaridae). Although the greatest number of commercial species occurs in tropical waters, the largest lobster catches come from cold-temperate regions like the northwestern Atlantic (Fishing Area 21) with 62 000 tons, and the northeastern Atlantic (Fishing Area 27) with 58 000 tons. Species of genera like ***Homarus*** (about 64 000 tons in 1988), ***Jasus*** (about 14 000 tons) and ***Panulirus*** (about 56 000 tons) form the subject of specialized fisheries and are the basis for important industries. Other species (like ***Nephrops , Metanephrops*** and ***Palinurus***) often form an important part of mixed catches (e.g. with shrimps), and are sold separately on markets. Many species cannot be obtained in great quantities, but the size of the specimens makes the capture and sale of single individuals profitable locally; in tourist areas such specimens are often sold directly to restaurants, hotels, etc. Several of the deep-sea species need specially equipped ships for their capture, and at present most are not commercially exploitable because of the high operating costs, but better knowledge of their biology and ecology might make them of commercial interest in the future. The species occurring on flat (muddy or sandy) bottom can be obtained by trawls] but a high percentage of lobsters is taken with lobster pots or other traps. Diving and spearing of shallow-water species is mostly done for local consumption or as a sport; spearfishing of lobsters at night with the light of torches, is a traditional way of fishing throughout the tropics. Species burrowing in sand or mud of the intertidal zone can often be captured by digging, or with yabbie pumps or slurp guns (see p. 242).

Since in all lobsters the tail is well developed, the abdominal muscles form the main edible part of the animal. In some Nephropids, the large claws provide enough meat to justify the rather laborious job of cracking the usually very heavy shell of these appendages. The Nephropoid and Palinuroid lobsters are considered a delicacy almost everywhere. They are used almost exclusively for human consumption, seldom as bait. The Thalassinoidea, on the other hand, are only rarely used as food, but far more often as bait.

1.3 Illustrated Glossary of Technical Terms

Abdomen - The posterior part of the body (tail) of a lobster consisting of 6 well discernable somites with their appendages, and including the tail fan (Figs 2,3).

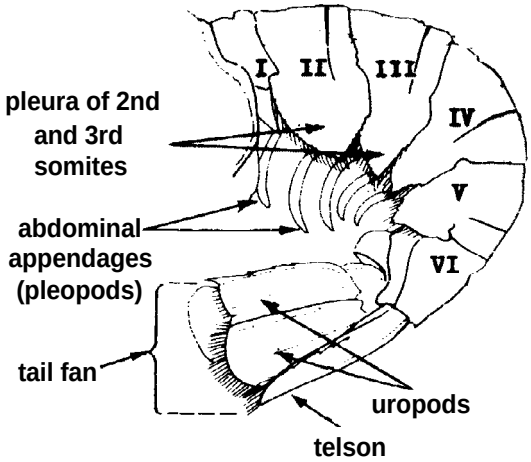


Fig. 3 Abdomen (tail) in lateral view

Antenna (pl. antennae) -The appendage of the third cephalon somite, consisting of a five-segmented peduncle and a flagellum (Figs 2,4,6,9,11,14). Through fusion of the segments with the body or with each other, the peduncle may seem to consist of fewer segments. The flagellum is usually multi-articulated, it may be supple or very stiff; in the Scyllaridae the flagellum is transformed into a single plate-like segment, similar to the peduncular segments. The antenna sometimes is named "second antenna",and the antennula, "first antenna". Both, the antenna and the antennula are tactile organs (feelers).

Antennal angle - An angular curve on the anterior margin of the carapace just below the orbit. On this place, the antennal spine (q.v.*), if present, is implanted.

Antennl flagellum, see antenna

Antennalplate - Sometimes used for antennular plate (q.v.).

Antennalsomite - The third somite of the body (Fig. 2) (at the same time the third cephalon somite). It carries the antennae.

Antennal spine - A spine on the anterior margin of the carapace just below the orbit (Fig. 5).

Antennula (pl. antennulae). - The appendage of the second cephalon somite, consisting of a three-segmented peduncle and two flagella (Figs 2,4,6,9, 11,14). The length of the flagella in some groups is of taxonomic importance. The antennula also is called first antenna; the antenna then is named second antenna.

Antennular plate, see antennular somite.

Antennular somite - The second somite of the body (Fig. 2) (at the same time the second cephalon somite). It carries the antennulae (Figs 4,6). Sometimes the dorsal surface of the antennular somite is visible in front of the carapace and between the bases of the antennae as a triangular plate, the so-called antennular plate, which in Palinuridae may be armed with dorsal spines or spinules, and which in some genera has the lateral margins swollen and forming part of a stridulating organ (q.v.) (Fig 4). The antennular plate sometimes is referred to as antennal plate or inter-antennal plate.

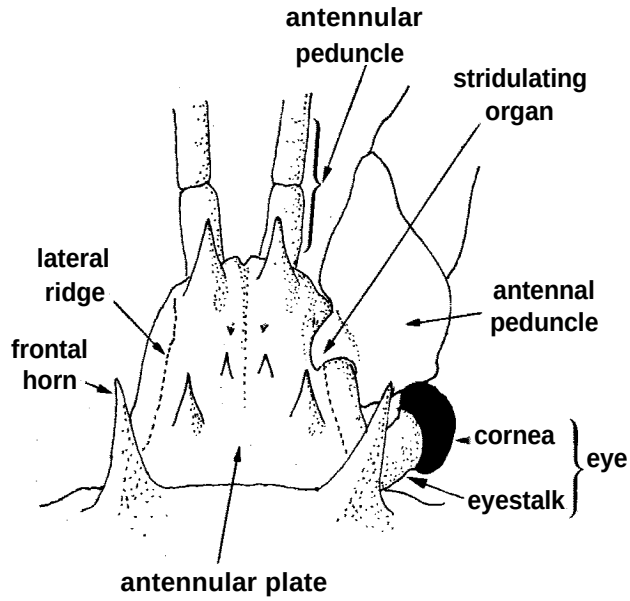


Fig. 4 Antennular somite of a palinurid lobster (left antenna and eye omitted)

Anterolateral teeth - In Scyllaridae, the teeth of the lateral margin of the carapace, in front of the cervical incision (Pig. 6).

Arthrobranch, see branchium.

Basis - The sixth segment of a pereiopod, counted from the tip of the leg; it is situated between the ischium and the coxa (Fig 7,12). See pereiopod.

Branchial carina - A longitudinal carina over each lateral half of the carapace, in Scyllaridae extending from the orbit backward and bisected by the cervical groove into an anterior and a posterior part (Fig. 6,29).

Branchial chamber - The space between the thorax and the lateral part of the carapace above the bases of the legs. The respiratory water current is pumped through the full length of the branchial chamber by action of some of the mouth parts.

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* The abbreviation q.v. (for "quod vide"= which see), placed after a term is a cross reference to that term in the glossary

Branchiostegal spine - A spine on the anterior margin of the carapace below the antennal spine (Fig. 5).

Branchium (pl. branchia) - Gill. The gills are found on and near the bases of the thoracopods in the branchial chamber. They are whitish, plumiform organs that are placed on the epipods (the podobranchia), at the articulation of the leg with the body (arthrobranchia), or on the body itself (pleurobranchia) (Fig. 12). Water is pumped through the branchial chamber and gas exchange takes place through the thin wall of the gill filaments.

Carapace, or dorsal shield (Figs 5,6) - A shield-like lateral extension of the thoracic somites, which covers the cephalothorax dorsally and extends from the eyes to the posterior margin of the last thoracic somite. It is cylindrical or angular, and laterally fits snugly against the bases of the pereiopods, enclosing the branchial chamber above the bases of the pereiopods. The carapace may end anterodorsally in a rostrum which is placed between the eyes. The structure, pubescence, sculpturation (grooves and spines) of the carapace are of taxonomic importance.

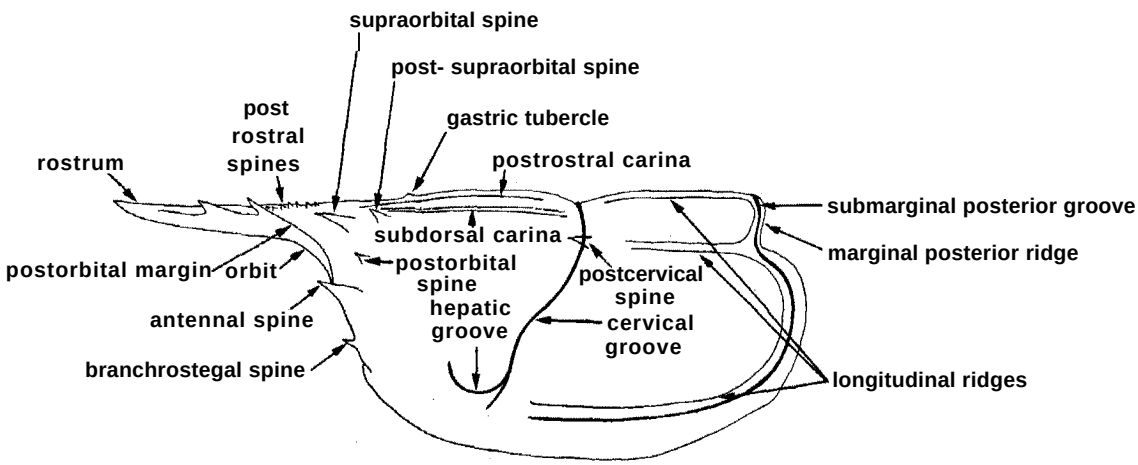

Fig. 5 Lateral view of a nephropid carapace

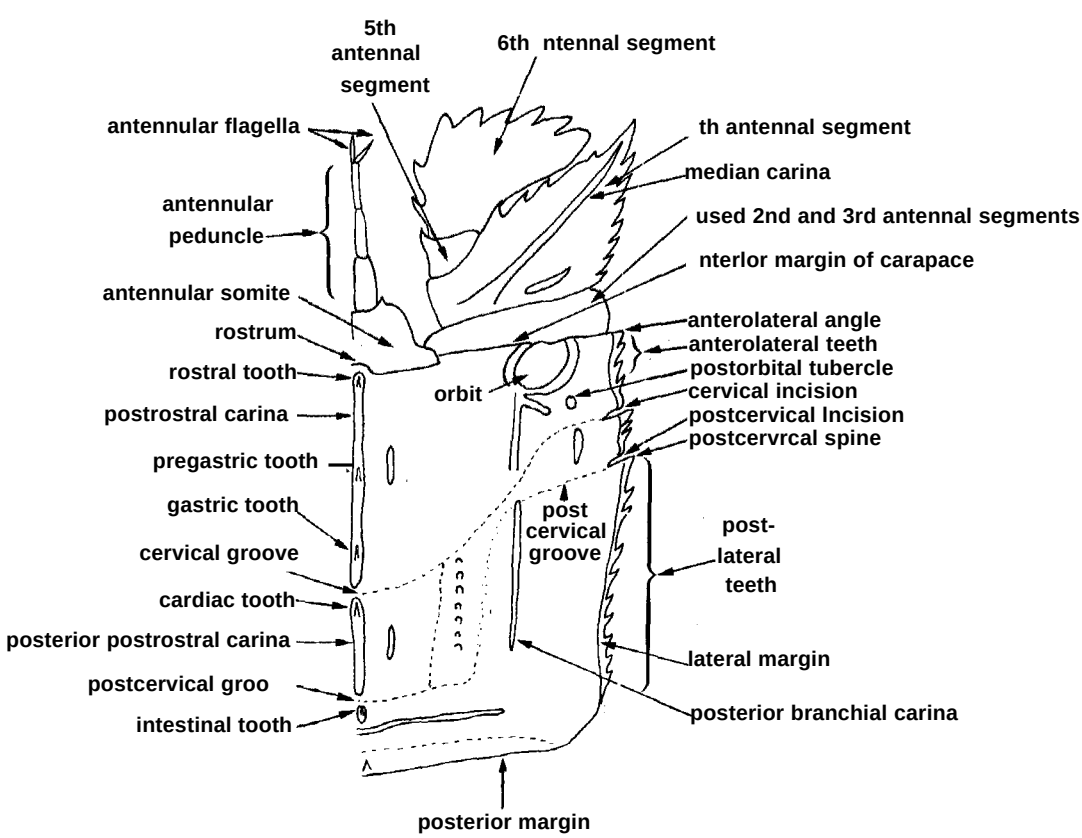

Fig. 6 Schematic dorsal view of right half of scyllarid carapace and cephalic appendages showing various regions, spines, grooves, teeth, etc.

Cardiac tooth - In Scyllaridae, the median tooth on the dorsal surface of the carapace immediately behind the cervical groove (Fig. 6). Sometimes the tooth is low and knob-like, and then may be indicated as cardiac knob.

Carina (pl. carinae) - Ridge or crest.

Carpus - The third segment of a pereiopod counted from the tip of the leg; it is situated between the propodus and merus (Figs 7,12). See pereiopod.

Cephalic - Belonging to the cephalon (q.v.)

Cephalon, or head - In the Decapoda, the cephalon is formed by the first 6 somites of the body, and is fused with the 8 thoracic somites to the cephalothorax. The first cephalic somite (= the ophthalmic somite) carries the eyes, the second (= antennular somite), the antennulae, the third (= antennal somite), the antennae, the fourth, the mandibles, the fifth, the maxillulae, and the sixth, the maxillae (Fig. 2).

Cephalothorax - The anterior 14 somites of the Decapod body, consisting of the 6 cephalon somites and the 8 thoracic somites (Figs 2,9,11,14). These 14 somites are fused to a single entity and the division between them can only rarely be observed (e.g., on the thoracic sternum). As each of the somites bears a single pair of appendages, the position of the fused somites can be ascertained by the position of these appendages. See also cephalon and thorax. Sometimes, but incorrectly so, the term cephalothorax is used instead of carapace.

Cervical groove - An often deep, transverse groove over the middle of the carapace, the lateral parts of which are usually curved forward (Figs 5,6).

Cervical incision - An incision on the lateral margin of the carapace in Scyllaridae at the point where the cervical groove would meet that margin (Fig. 6).

Chela (pl. chelae), or pincer (Figs 7,9) - A scissor-like organ carried by many lobsters on the first pereiopods, sometimes also found on some or all of the other pereiopods, sometimes entirely lacking. The chela is formed by the last two segments of the leg, viz., propodus and dactylus, and consists of a palm and two fingers. The upper or movable finger is formed by the dactylus, which articulates with the propodus at the end of the palm; it opposes the fixed finger, which is immovably connected with the palm and forms with it the propodus. The opposing edges of the two fingers, the cutting edges, may carry teeth. The presence or absence of chelae, as well as their shape, size and ornamentation, can be of great taxonomic value. The Nephropoidea have chelae on the first three pairs of pereiopods, the first of which usually is very large. In the Palinuroidea the first 4 legs have no true chelae, but the females of most species have a small chela on the fifth pereiopod. The Thalassinidea sometimes have a true chela on the first and second pereiopods, but often they only have a subchela (q.v.).

Chelate - Carrying a chela or pincer.

Cheliped - A leg carrying a pincer or chela (Figs 2,7); e.g., the first three pereiopods in Nephropidae are chelipeds.

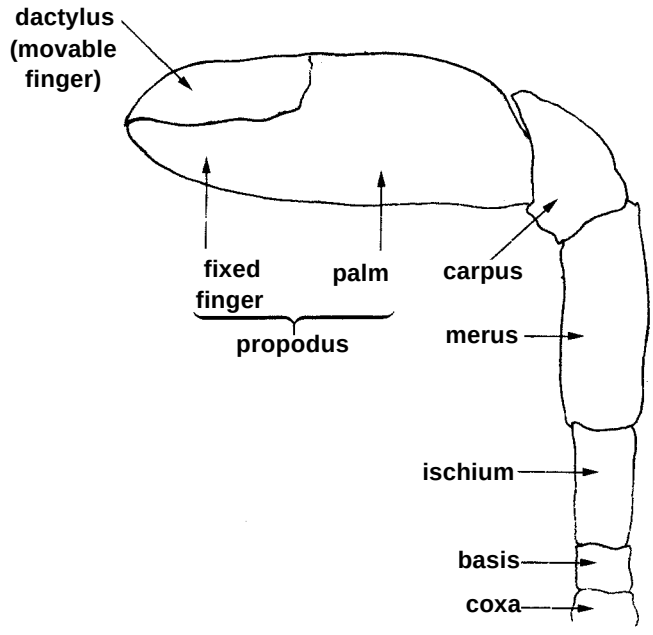

Fig. 7 Schematic illustration of a cheliped

Copulatory stylets - The first pleopod of the male in several Nephropoidea, which has been transformed into an often slender, rigid organ that plays a role in the copulation (Fig. 8).

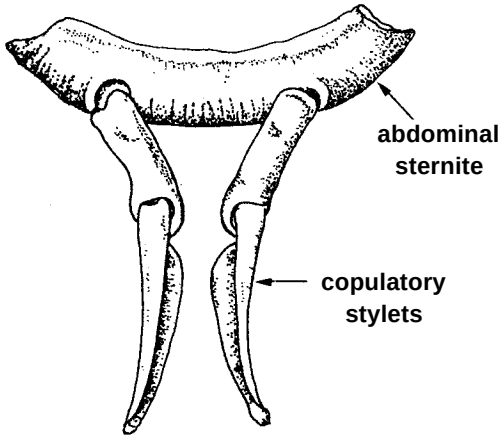

Fig. 8 First pair of pleopods of *Homarus* transformed into copulatory stylets

Cornea - The distal part of the eye that carries the visual elements and is usually pigmented (Figs 2,4).

Coxa -The basal segment of a pereiopod, the seventh counted from the tip of the leg; it is followed by the basis (Figs 7,12).

Crushing claw - The larger first chela of some Nephropidae, in which the teeth on the cutting edge are wide and molar-like (Fig. 9). The crushing claw is used to crack molluscs and other hard objects.

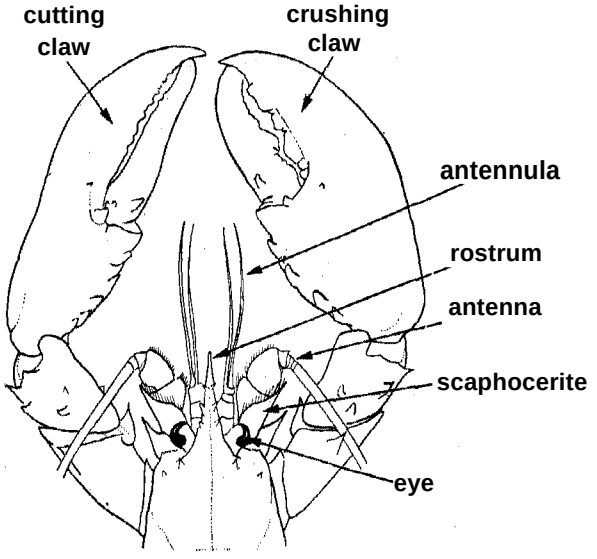

Fig. 9 Anterior part of cephalothorax of *Homarus* (dorsal view)

Cutting claw - The smaller first chela of some Nephropidae, in which the cutting edges are serrated, having a single row of narrow sharp teeth (Fig. 9). This claw is used for cutting and breaking. It usually forms a pair with the crushing claw (q.v.).

Dactylus - The ultimate segment of a pereiopod; in a chela the dactylus is the movable finger (Figs 7,10,12, 16).

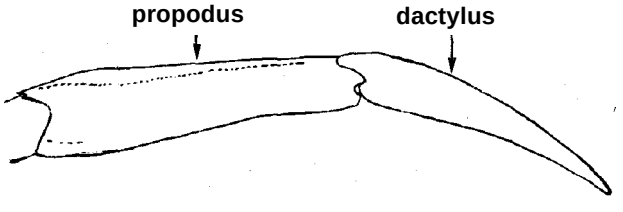

Fig. 10 Dactylus and propodus of a walking leg

Diaeresis - A transverse articulation in the distal part of the exopod of a uropod. The diaeresis is visible as a complete or incomplete line, sometimes with a row of small spinules along its anterior margin; the outer margin of the exopod of the uropod may have a spine or tooth at the spot where the'diaeresis joins it (Fig. 17). The presence or absence of a diaeresis is of taxonomic importance.

Distal - Farther away from the body (or centre of the body). The distal part of an appendage is its tip, i.e. the part farthest away from the articulation of the appendage with the body. The distal part of the abdomen is the tail fan, i.e. the part farthest away from centre of the body. Opposite term: proximal.

Endopod, or endopodite - The inner branch of a biramous leg (Figs 2,12,15,17). Most, or all appendages can be derived from a biramous leg, which consists of a peduncle of 2 or 3 segments, carrying two appendages, the endopod and the exopod. In the thoracic appendages of the lobsters, the exopod has disappeared or is present as a reduced flagellum-bearing organ, while the distal 5 segments of the pereiopods represent the endopod. In most pleopods and in the uropod the biramous construction of the appendage is still clearly apparent, and here the exo- and the endopod can be of about the same size. Opposite term: exopod.

Epipod - A usually small, oval or elongate leaf-like appendage on the outer margin of the first segment (coxa) of a thoracopod (Fig. 12). Sometimes the epipod carries a gill, the so-called podobranch.

Epistome - The median area on the ventral surface of the cephalothorax situated between the anterior margin of the oral field and the bases of the antennae and antennulae (Fig. 11).

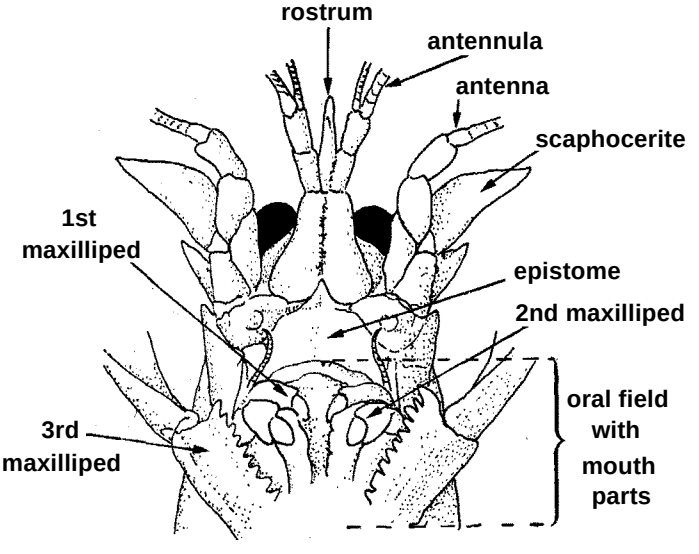

Fig. 11 Anterior part of cephalothorax of *Nephrops* (ventral view)

Exopod, or exopodite - The outer branch of a biramous appendage (see under endopod) (Figs 2,12,15,17). In the lobsters, the exopod is absent from the pereiopods, but still present in the maxillipeds where it forms an often flagellum-carrying appendage of the endopod. In most pleopods and the uropods the exopod is about as large as, or sometimes even larger than, the endopod. Opposite term: endopod.

Eye - Organ of vision. A pair of eyes is placed on the first somite (= first cephalon somite). In most cases the eye is movably connected with the body and consists of a stalk of one or two segments, the distal of which carries the cornea (Figs 2,4,9,1 1). The cornea (q.v.) consists of the optical elements and usually is pigmented. In some species the eye is reduced, the optical elements may be few or entirely absent, and also the pigment can be absent; the eye then usually becomes small and bullet-shaped and may even become immovably fused to the body.

Fixed finger, see chela.

Flagellum (pl. flagella) - A usually whip-like, multiarticulated appendage of the antennula or the antenna, implanted at the top of the peduncle (Figs 2,6). The antenriula carries two flagella, the antenna one. In most .Nephropoidea the antennal flagellum is flexible and whip-like, in most Palinuridae it is rather rigid and may be spinulate. In the Scyllaridae, the flagellum is reduced to a single large plate, which looks as if it were the 6th segment of the antenna (Fig. 6). Flagella are also found on some of the exopods of the mouth parts (Fig. 12).

Frontal horn - In Palinuridae, a large, and broad, often curved tooth, that is placed on the anterior margin of the carapace just behind and above the eyes. The frontal horns usually are the largest teeth on the carapace and are directed over the orbit (Figs 4,14).

Gastric tooth - In Scyllaridae, a tooth in the median line of the carapace before the cervical groove. It usually is placed rather close to the cervical groove and may be preceded by the pre-gastric tooth (q.v.) (Fig. 6).

Gastric tubercle - A tubercle on the dorso-median line of the carapace of some Nephropidae, situated between the base of the rostrum and the cervical groove (Fig. 5).

Gill, see branchium.

Head, see cephalon.

Hepatic groove - A groove in the anterolateral part of the carapace branching off from the lateral part of the cervical groove and directed forward (Fig. 5).

Interantennal plate, see antennular somite

Intermediate carina- A longitudinal carina over the posterior part of the carapace behind the cervical groove, placed between the median carina and the branchial carina (Fig. 29)

Intestinal teeth or tubercles - The median row of teeth (or tubercles) on the carapace between the post-cervical groove and the posterior margin of the carapace (Figs 6,14).

Ischium - The fifth segment of a pereiopod counted from the tip of the leg; it is situated between merus and basis (Figs 7,12). See pereiopod.

Lateral carina - A longitudinal carina over the posterior part of the carapace behind the cervical groove. The lateral carina is situated between the, branchial carina and the lateral margin of the carapace (Fig. 29).

Mandible - The first of of the mouth parts, located on the fourth somite (= cephalon somite 4), near the opening of the mouth (Fig. 2). It is a sturdy, heavily chitinized organ consisting of one piece that ends in a row of teeth and has a tubercular, molar-like area; it carries a usually three-segmented palp. It is used for breaking up and chewing the food.

Marginal posterior ridge of the carapace - The ridge that forms the extreme posterior margin of the carapace, often becoming lessdistinct laterally (Figs 5.14).

Maxilla, or second maxilla - The third of the mouth parts, placed on the sixth somite (this is the sixth, and last, cephalon somite) (Fig. 2): Like the maxillula, and in contrast to the mandible, the maxilla is a flat and flexible organ.

Maxilliped - The three maxillipeds (first, second, and third) are appendages of somites 7 to 9 (= thoracic somites 1 to 3) (Fig. 2) and are considered to belong to the mouth parts because of their role with the ingestion of food. The first maxilliped is flat and leaf-like, somewhat similar to the maxilla; the second and the third, especially the latter, are more leg-like in shape (Fig. 11).

Maxillula, or first maxilla - The second of the mouth parts, being the appendage of the fifth somite (= fifth cephalon somite) (Fig. 2). It is small, flat and flexible and placed close to the mandible.

Median carina - In Nephropidae the longitudinal dorso-median carina of the carapace behind the cervical groove (Fig. 29)

Merus - The middle segment of a pereiopod, the fourth counted from either end (see pereiopod) (Figs 7,12).

Mouth parts - A general term for the appendages of somites 4 to 9 (= cephalon somites 4 to 6 and thoracic somites 1 to 3) (Fig. 2). They are the, often small, appendages preceding the often large first pereiopods, and are placed around and behind the mouth opening on the ventral side of the body (Fig. 11). They include in backward sequence: the mandible, maxillula, maxilla and the first, second and third maxillipeds. They all play a role in the dissection and ingestion of food.

Ophthalmic somite - The first somite (= first cephalon somite) (Fig. 2). It carried the eyes.

Oral field - The usually sunken, median area on the anterior part of the ventral surface of the cephalothorax, containing the mouth parts (= oral parts) (Fig. 11).

Orbit - The cavity in which the eyes are implanted. In many species, the orbit is only defined by the postorbital margin, which forms part of the anterior margin of the carapace; in those cases, the orbit is open anteriorly (Fig. 5). In some Scyllaridae the anterior margin of the carapace practically surrounds the eye and the orbit is then closed or almost closed (Fig. 6).

Palm - The part of the chela, or pincer, that bears the fingers. It is part of the propodus, the rest of the propodus forms the fixed finger (Fig. 7).

Peduncle, see antenna, antennula, pleopod and'uropod.

Pereiopod, also written pereopod or peraeopod - The thoracic appendages behind the mouth parts, i.e. the appendages of somites 10 to 14 (= thoracic somites 4 to 8) (Figs 2,12). The pereiopods consist of seven segments, these are, from proximal to distal: coxa, basis, ischium, merus, carpus, propodus, and dactylus (Fig. 12). The pereiopods can be divided into chelipeds (those that carry a chela, Figs 2,7) and walking legs (those that do not, Figs 2,10).

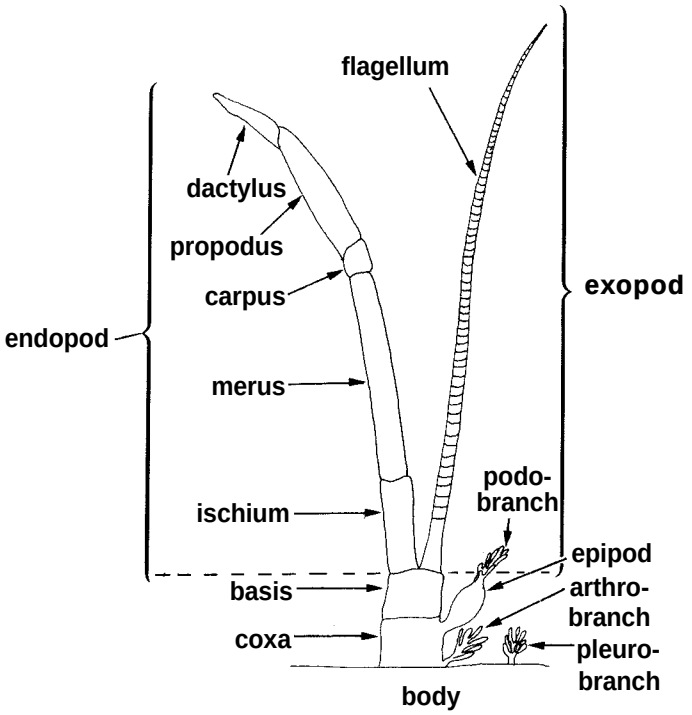

Fig. 12 Schematic illustration of a thoracopod

Phyllosoma or phyllosome - The pelagic larva of Palinuroidea, in which both the cephalothorax and the abdomen appear as glassy transparent, nearly circular, very thin and flat discs (Fig. 13). These larvae are so different from the adults that they originally were described under a separate genus without any connection with the Palinuroidea.

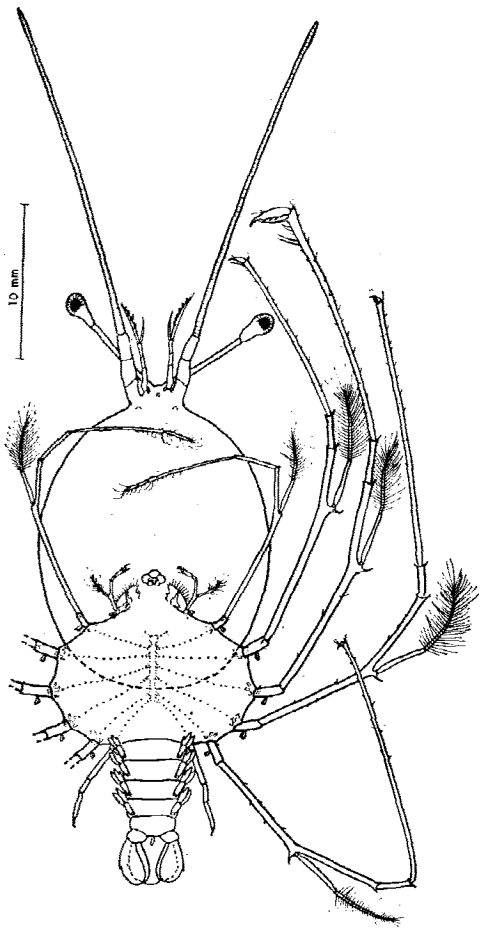

Fig. 13 Phyllosoma larva (*Panulirus gracilis*) (from Johnson, 1971)

Pleopod - Appendage of any of the first 5 abdominal somites, usually formed by ah unsegmented peduncle which carries two branches usually formed of a single flat, leaf-like and oval segment (Figs 2,3,15). The outer of these branches is the exopod, the inner the endopod. The pleopodr may be reduced or entirely absent from some somites, the endopod may have an appendix. In some species, the pleopods of the first or first two abdominal somites may be transformed into rigid copulatory stylets (Fig. 8), which play a role during copulation. In females the pleopods may be larger and wider than in males, especially when the females carry eggs. The eggs are fastened to the pleopods and are carried as a conspicuous mass under the abdomen, the mass being protected on the outer side by the pleopods.

Pleurobranch, see branchium.

Pleuron (pl. pleura)- The lateral part of the chitinous ring that surrounds each somite, the dorsal part being the tergite, the ventral the sternite (Figs 3,15). The pleura of the abdominal somites aie often well developed and show as lateral plates that are directed downward and protect the pleopods; together with the sternites they may form a gutter-like cavity on the lower surface of the abdomen, which holds the pleopods and the eggs. The pleura may be either large, rounded or triangular, or small and short. Their sculpturation, shape and spination are important taxonomic characters.

Podobranch, see branchium.

Postcervical groove - A roughly transverse groove on the carapace in Scyllaridae, some distance behind and roughly parallel to the cervical groove (Fig. 6).

Postcervical incision - An incision on the lateral margin of the carapace in Scyllaridae, behind the cervical incision and usually slightly closer to it than to the posterior end of the carapace (Fig. 6). The cervical and postcervical incisions may divide the lateral margin into 3 parts.

Postcervical spine -A spine on the dorsal surface of the carapace, placed immediately behind the cervical groove (Figs 5,6).

Postcervical teeth or tubercles - In ***Puerulus***,. the median row of teeth or tubercles on the carapace between the cervical and intestinal grooves (Fig. 14).

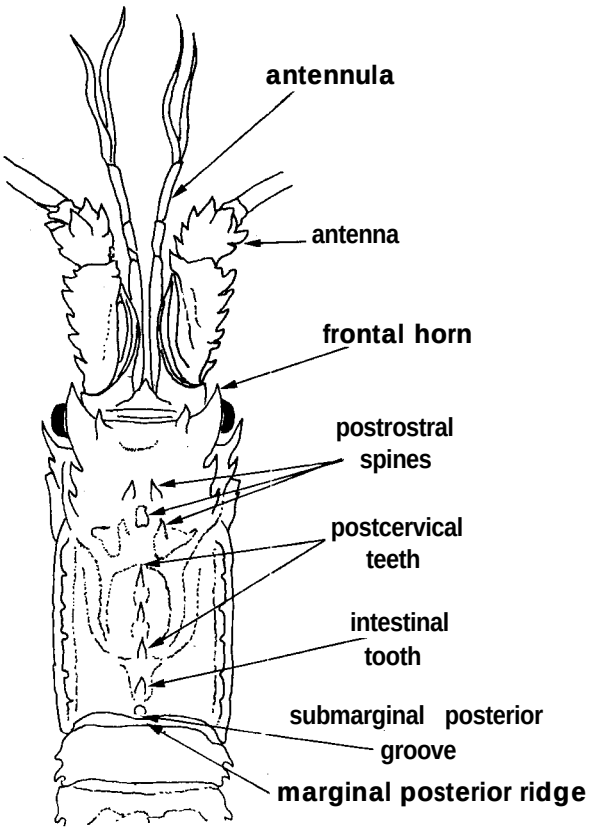

Fig. 14 Cephalothorax of *Puerulus* (dorsal view, pereiopods omitted)

Posterolateral teeth - In Scyllaridae, the teeth of the lateral margin of the carapace placed behind the postcervical incision (Fig. 6).

Postorbital margin - Part of the anterior carapace margin which defines the orbit (Fig. 5).

Postorbital spine - A spine on the carapace placed at some distance behind the orbital margin (Fig. 5).

Postrostral carina - A median ridge on the dorsal part of the carapace, which extends from the base of the rostrum backward, often to the posterior margin of the carapace (Figs 5,6).

Postrostral spines - Spines in the dorsomedian part of the carapace placed immediately behind the base of the rostrum, either in the median line or submedially (Figs 5,14).

Post-supraorbital spine - A spine placed at a short distance behind the supraorbital spine on the carapace (Fig. 5).

Pregastric tooth - In Scyllaridae, a tooth in the median line of the anterior part of the carapace (before the cervical groove). It is placed before the gastric tooth and behind the rostral tooth (Fig. 6).

Propodus - The one but last segment of a pereiopod (q.v.), situated between the dactylus and the carpus (Figs 7,10, 12,16). In a chela the propodus forms the palm and the fixed finger.

Proximal - Closer to the body (or centre of the body). The proximal part of an appendage is its base, i.e. the part closest to the body. The terms proximal and distal can be used regardless of the position in which the appendage is directed, while terms like ventral, dorsal, anterior and posterior in such a movable organ may be confusing.

Puerulus stage - The first postlarval stage of Palinurid lobsters. So named before the postlarval development of the Palinuridae was known; these animals were incorrectly considered to belong to the genus ***Puerulus.***

Rostral tooth, see rostrum.

Rostrum - A prolongation of the median part of the anterior carapace margin, which projects forward between and often beyond the eyes (Figs 5,6,9,11). The rostrum can be of various shapes; in lobsters it is usually dorsoventrally depressed and often bears teeth. In many species the rostrum is absent or reduced to a single spine or angle (e.g., in Palinuroidea); in most Nephropoidea it is well developed. In Scyllaridae it is hardly noticeable, but for the presence of a tooth (rostral tooth) or tubercle (Fig. 6).

Scaphocerite - A scale-like appendage of the antennal peduncle, which is inserted on the outer part of the distal margin of the second peduncular segment (Figs 9,11). The scaphocerite is generally considered to be the exopodite of the antenna. It usually is small and may be armed with teeth. In some species it lacks altogether.

Sculpturation - The presence of grooves, ridges, spines, teeth, tubercles or granules on the exposed parts of the body.

Segment - A single part of an articulated unit. In the present catalogue, the term "segment" is only used for the segments of the appendages, the body segments are always indicated as "somites" (q.v.). A pereiopod (q.v.) has seven segments.

Somite or body segment -Any of the 20 segments into which the body is divided (Fig. 2). Each somite is surrounded by a chitinous cover, the dorsal part of which is termed tergite (q.v.), the ventral part sternite (q.v.) and the lateral parts, pleura (singular: pleuron, q.v.) (Figs 3,15).

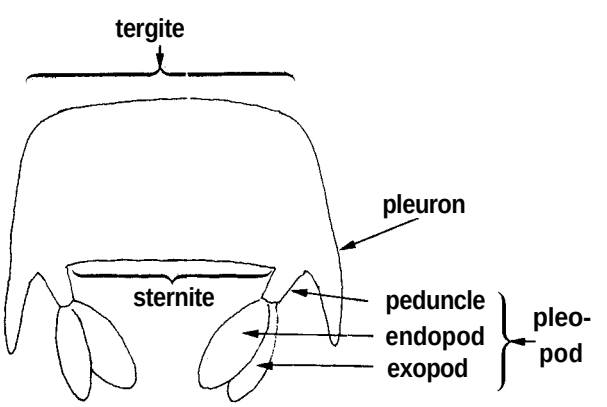

Fig. 15 Schematic cross-section through an abdominal somite

Spermatophore - A viscous mass, containing the spermatozoa embedded in a secretion from the sperm duct,'which during copulation is deposited by the male on the thoracic sternum of the female in some lobsters. In the Palinuroidea the spermatophores may be visible as black, tar-like or transparent gelatinous deposits covering the posterior part of the female sternum.

Stalk, or peduncle (q-v.), see eye.

Sternite - The ventral part of the chitinous ring that surrounds each somite (the other parts are the dorsal tergite and the two lateral pleura) (Figs 8,15). Together, the various sternites form the sternum, e.g., the thoracic sternum is the sum of the thoracic sternites.

Sternum, see sternite.

Stridulating organ - An organ formed by two parts of the body that produce a sound rubbing against each other (Fig. 4). In some Palinurid genera, the lateral margins of the antennular plate are ridge-like and thickened; a projection of the antennal peduncle rubs over this ridge when the antenna is moved in a special way,thereby producing a rasping sound, which evidently is a means of communication.

Stylet, copulatory, see copulatory stylet.

Subchela - An incomplete chela, in which the dactylus does not oppose a fixed finger, but, when the chela is closed, strikes against a broadened part of the propodus (Fig. 16).

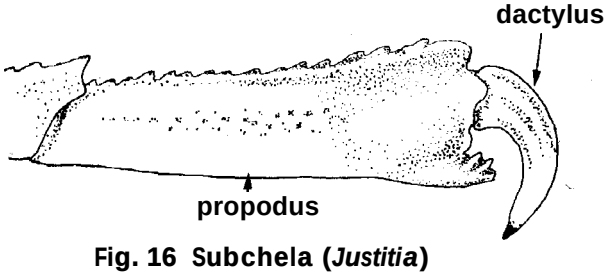

Fig. 16 Subchela (*Justitia*)

Subdorsal carina - A ridge at either side of the mid-dorsal line of the carapace, placed close to it and running parallel with it (Fig. 5). The subdorsal carinae are always paired.

Submarginal posterior groove of the carapace - An often deep groove parallel to the posterior margin of the carapace and separated from it by the marginal posterior ridge (Figs 5, 14).

Supraorbital spine - A spine on the carapace placed obliquely above and somewhat behind the orbit (Fig. 5).

Swimmeret, see pleopod.

Tail, see abdomen.

Tail fan - A fan-like organ at the end of the abdomen, consisting of the telson, flanked on either side by the uropods (Figs 3,17).

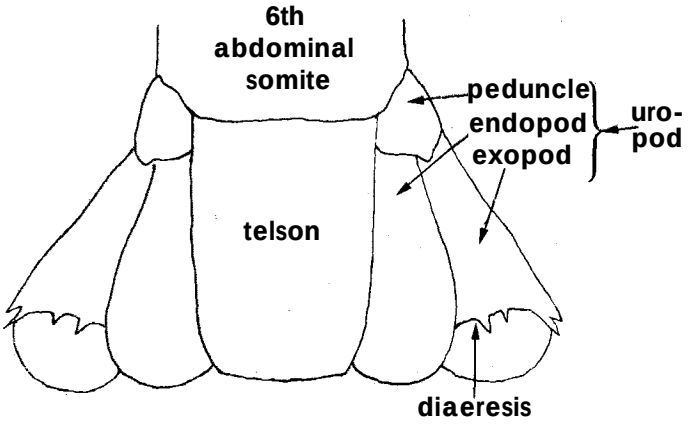

Fig. 17 Schematic illustration of tail fan

Telson - A median appendage at the end of the sixth abdominal somite, usually longer, at least not much shorter than the somite itself, and sometimes considered to be the seventh abdominal somite. The telson has no appendages (Figs 2,3,17).

Tergite - The dorsal part of the chitinous ring that surrounds each somite (the other parts are the ventral sternite and the two lateral pleura) (Fig. 15). Together the various tergites form the tergum, e.g., the abdominal tergum is the sum of the six abdominal tergites.

Tergum, see tergite.

Thoracic somite, see thorax.

Thoracopod - Any of the 8 appendages of the thorax. The thoracopods consist of 3 pairs of maxillipeds (appendages of thoracic somites 1 to 3) and 5 pairs of pereiopods (appendages of thoracic somites 4 to 8) (Figs 2,12).

Thorax - The middle of the three main parts of the body (cephalon, thorax, and abdomen). It is formed by the 7th to 14th somites (= thoracic somites 1 to 8) and bears the thoracopods (q.v.) (Fig. 2). The somites of the thorax are fused with those of the cephalon and so form the cephalothorax (q.v.). Dorsally and laterally, the lines between the thoracic somites are not noticeable; ventrally, however, they may show as transverse grooves on the sternum.

Uropod - One of the pair of pleopods of the sixth abdominal somite (Fig. 2). In contrast to the pleopods of the preceding somites, the uropods are stiff and heavily chitinized; they are well developed and form, together with the telson, the tail fan. They consist of an unsegmented peduncle, which bears at its distal end the usually blade-shaped exo- and endopods, these can be folded against each other and sometimes under the telson (hence the name tail fan) (Figs 3,17).

Walking leg - A pereiopod that does not carry a chela. In the Nephropidae, the first three pereiopods are chelipeds, the last two are walking legs (Figs 2,10). The main function of the walking legs is locomotion, while that of the chelipeds is feeding.

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2. SYSTEMATIC CATALOGUE OF SPECIES

SUBORDER **MACRURA REPTANTIA** Bouvier, 1917

Macrura Reptantia Bouvier, 1917, Résultats Campagnes scientifiques Prince Albert I Monaco, 50:7,8,9.

The suborder Macrura Reptantia consists of three infraorders: Astacidea (marine lobsters and freshwater craysfishes), Palinuridea (spiny lobsters and slipper lobsters) and Thalassinidea (mud lobsters). The infraorder Astacidea contains three superfamilies of which only one (the Nephropoidea) is considered here. The remaining two superfamilies (Astacoidea and Parastacoidea) contain the freshwater crayfishes. The superfamily Nephropoidea (40 species) consists, almost entirely of commercial or potentially commercial species, and their few non-commercial representatives are dealt with here also, so as to give a complete picture of this group.

The infraorder Palinuridea, also contains three superfamilies (Eryonoidea, Glypheoidea and Palinuroidea) all of which are marine. The Eryonoidea are deepwater species of insignificant commercial interest and are only treated superficially in this catalogue. The Glypheoidea, an almost exclusively fossil group, contains a single recent species, which is treated here. All species of the superfamily Palinuroidea (total about 120 species) are included in the catalogue. Members of the genus ***Scyllarus*** (over 40 species) are listed but only 7 species are treated in detail because they are the only ones known to be of (potential) interest to fisheries.

The third infraorder, the Thalassinidea, contains a single superfamily, the Thalassinoidea which contains around 100 species. Only a few representatives of this superfamily are known to be used as food and bait and hence only these few species are treated in detail in this catalogue.

Key to the three Infraorders and their Superfamilies

1a. First three pairs of pereiopodr with true chelae, the first pair the largest and most robust

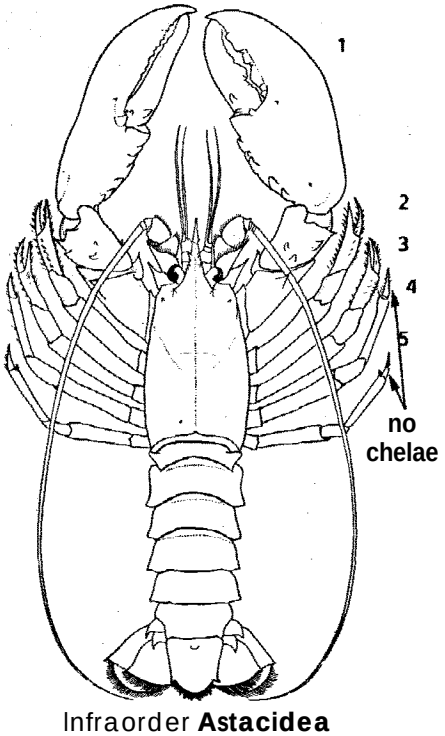
2a. Fourth pereiopod, and usually also the fifth, without true chelae.Carapace cylindrical, not flattened (Fig.18) **.....** Infraorder **Astacidea,** Superfamily **Nephropoidea**

2b. All pereiopods, or at least the first four, with true chelae. Carapace flattened (Fig. 19). Deep-sea specie **.....** Infraorder **Palinuridea,** Superfamily **Eryonoidea,** Family **Polychelidae**

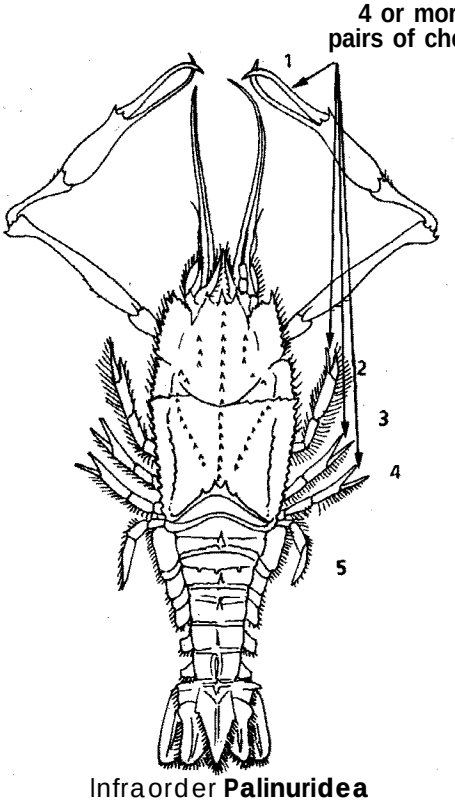
1b. Third pereiopod never with a true chela, in most groups chelae also absent from first and second pereiopods

3a. Antennal flagellum reduced to a single broad and flat segment, similar to the other antennal segments (Fig. 20) **.....** Infraorder **Palinuridea,** Superfamily **Palinuroidea,** Family **Scyilaridae**

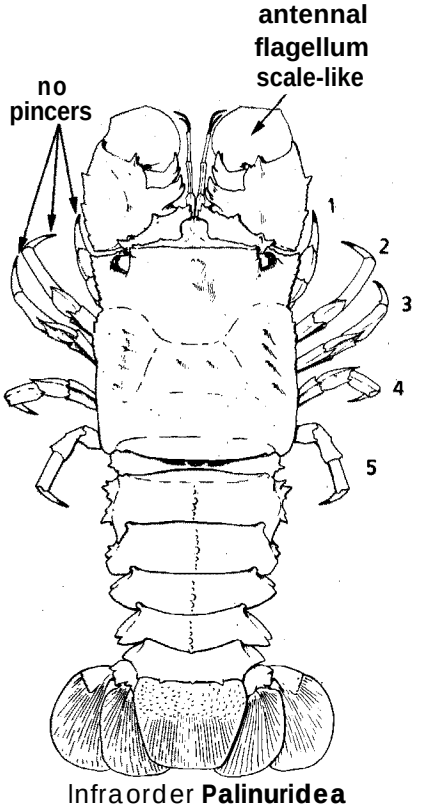
3b. Antennal flagellum long, multi-articulate, flexible, whip-like, or more rigid



Infraorder **Astacidea**
Superfamily **Nephropoidea**
Fig. 18



Infraorder **Palinuridea**
Superfamily **Eryonoidea**
Family **Polychelidae** **Fig. 19**



Infraorder **Palinuridea**
Superfamily **Palinuroidea**
Family **Scyllaridae** **Fig. 20**

4a. Epistome long, about 1/3 of carapace length. Eyes on a median elevation of the cephalon (Fig. 21) .... Infraorder **Palinuridea**
Superfamily **Glypheoidea**
Family **Glypheidae**

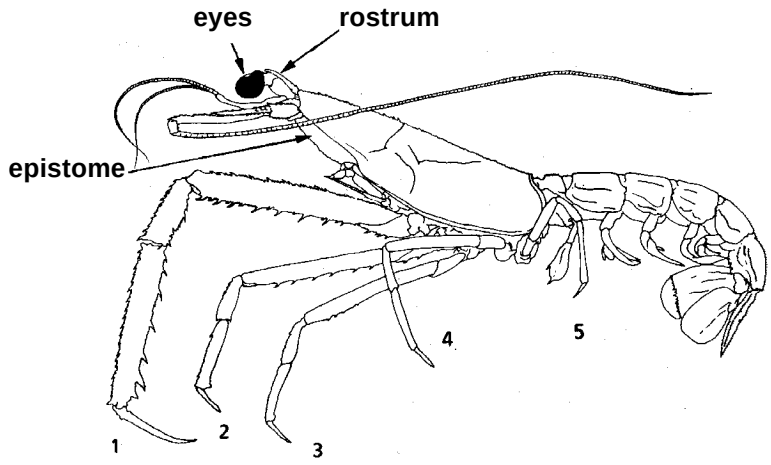
4b. Epistome short, far shorter than 1/3 of the carapace. Eyes not placed on an elevation of the cephalon

5a. Carapace with numerous strong and less strong spines and two frontal horns over the eyes. Rostrum absent or reduced to a single spine. Legs 2 to 4 (usually also 1) without chelae or subchelae (Fig. 22) . . Infraorder **Palinuridea**
Superfamily **Palinuroidea**
Family **Palinuridae**

5b. Carapace with at most a few spines; no frontal horns. Rostrum present, even though sometimes small. Legs 1 and 2 simple, chelate, or subchelate

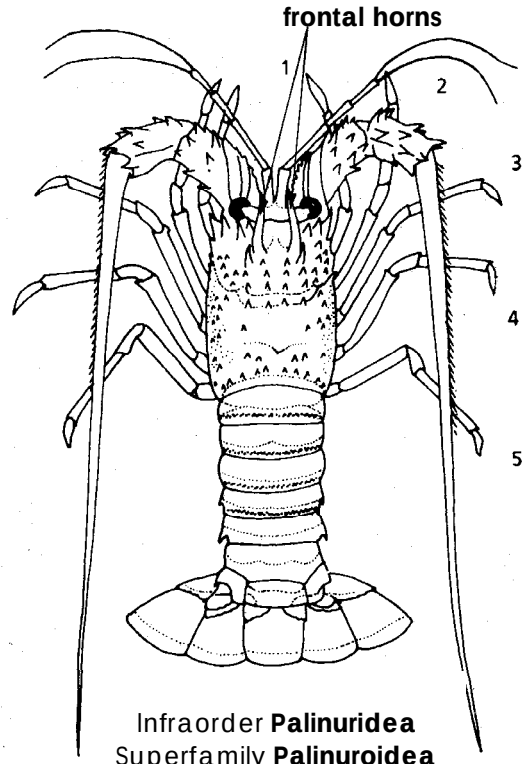
6a. First pereiopods simple, rostrum flat, broad and triangular or broadly oval (Fig. 23)..... Infraorder **Palinuridea**
Superfamily **Palinuroidea**
Family **Synaxidae**

6b. First pereiopod chelate or subchelate. Rostrum of diverse shapes (Fig. 24) . . Infraorder **Thalassinidea**



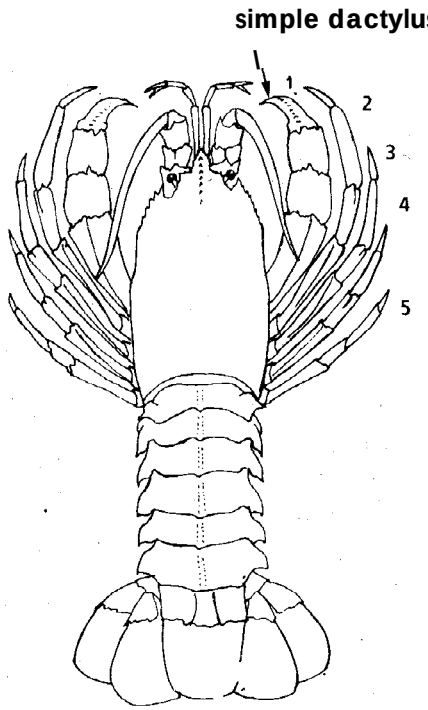
Infraorder **Palinuridea**
Superfamily **Glypheoidea**
Family **Glypheidae**

Fig. 21

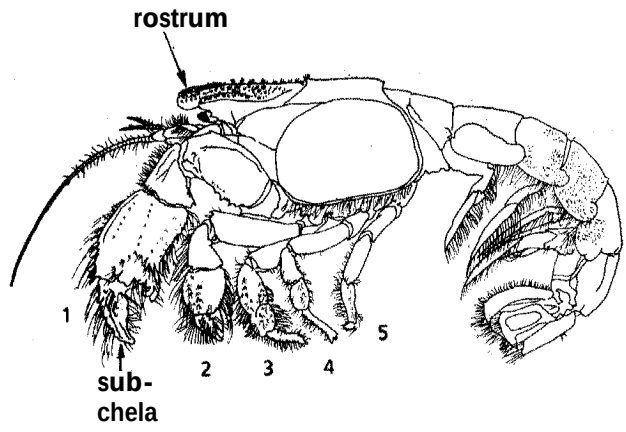


Infraorder **Palinuridea**
Superfamily **Palinuroidea**
Family **Palinuridae**

Fig. 22



Infraorder **Palinuridea**
Superfamily **Palinuroidea**
Family **Synaxidae**
Fig. 23



Infraorder **Thalassinidea**

Fig. 24

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2.1 INFRAORDER **ASTACIDEA** Latreille, 1802

Astacini Latreille, 1802, Histoire naturelle générale et particulière des Crustaces et des Insectes, 3:32.

This group includes the true lobsters and crayfishes. The Astacidea can be easily distinguished from the other lobsters by the presence of chelae (pincers) on the first three pairs of legs, and by the fact that the first pair is by far the largest and most robust. The last two pairs of legs end in a simple dactylus, except in ***Thaumastocheles,*** where the 5th leg may bear a minute pincer.

The infraorder consists of three superfamilies, two of these, the Astacoidea Latreille, 1802 (crayfishes of the northern Hemisphere) and the Parastacoidea (crayfishes of the southern Hemisphere), include only freshwater species and are not further considered here. The third superfamily, Nephropoidea, comprises the true lobsters, treated below.

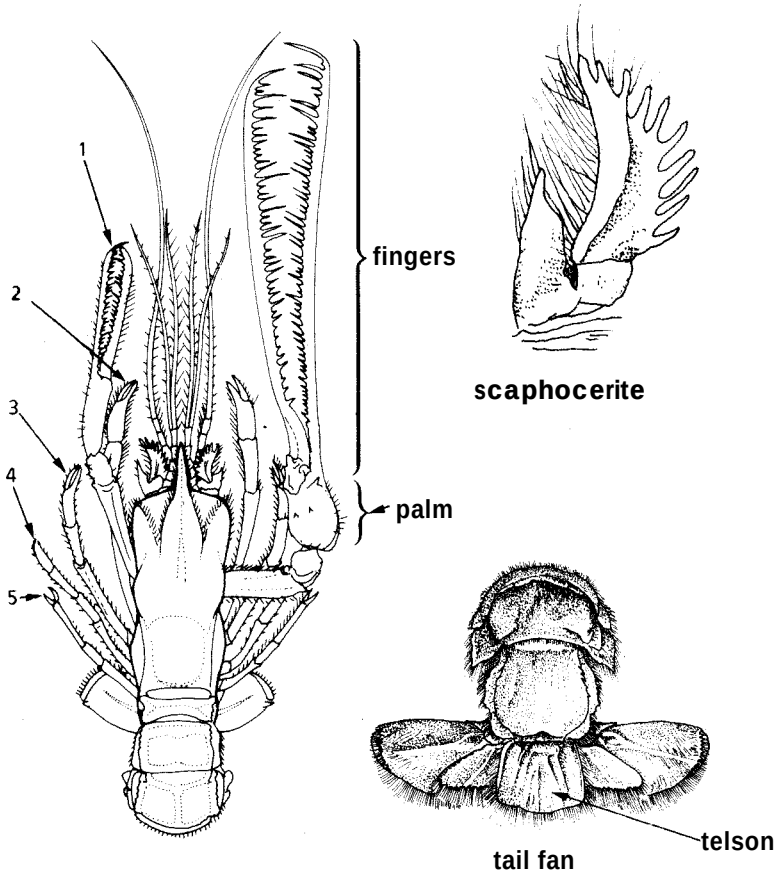
SUPERFAMILY **NEPHROPOIDEA** Dana, 1852

Nephropinae Dana, 1852, Proceedings Academy natural Sciences Philadelphia, 6: 15.

The Nephropoidea or true lobsters include two families, Thaumastochelidae and Nephropidae. The Nephropidae are commercially very important, while the Thaumastochelidae include only three species, none of which is of economic interest; they are only listed here for completeness' sake.

Key to the Families and Subfamilies of Nephropoidea

1a. Eyes entirely absent, or strongly reduced, without pigment. Telson unarmed. Chelipeds very unequal, the larger with fingers more than four times as long as the palm; cutting edges of the fingers of the larger cheliped with many slender spines. Fifth pereiopod (at least in the female) with a chela. Abdominal pleura short, quadrangular, lateral margin broad, truncate, not ending in a point. Scaphocerite with several very large teeth on the inner margin (Fig. 25) .... **Thaumastochelidae**

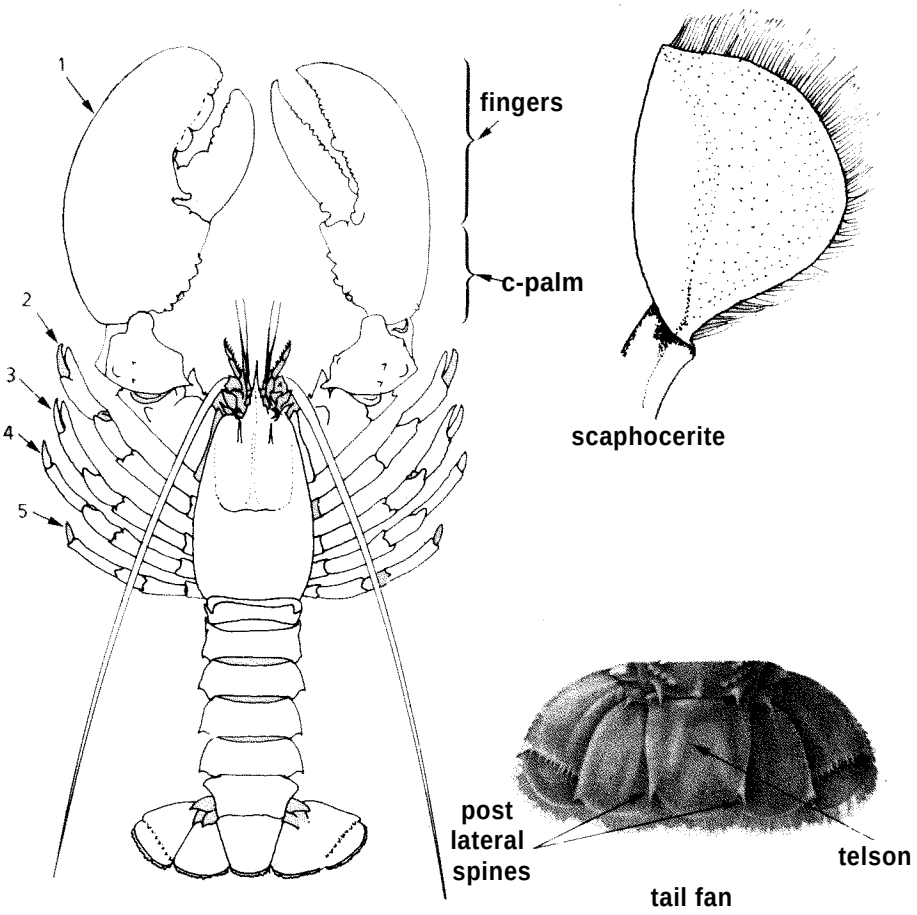


Thaumastochelidae **Fig. 25**

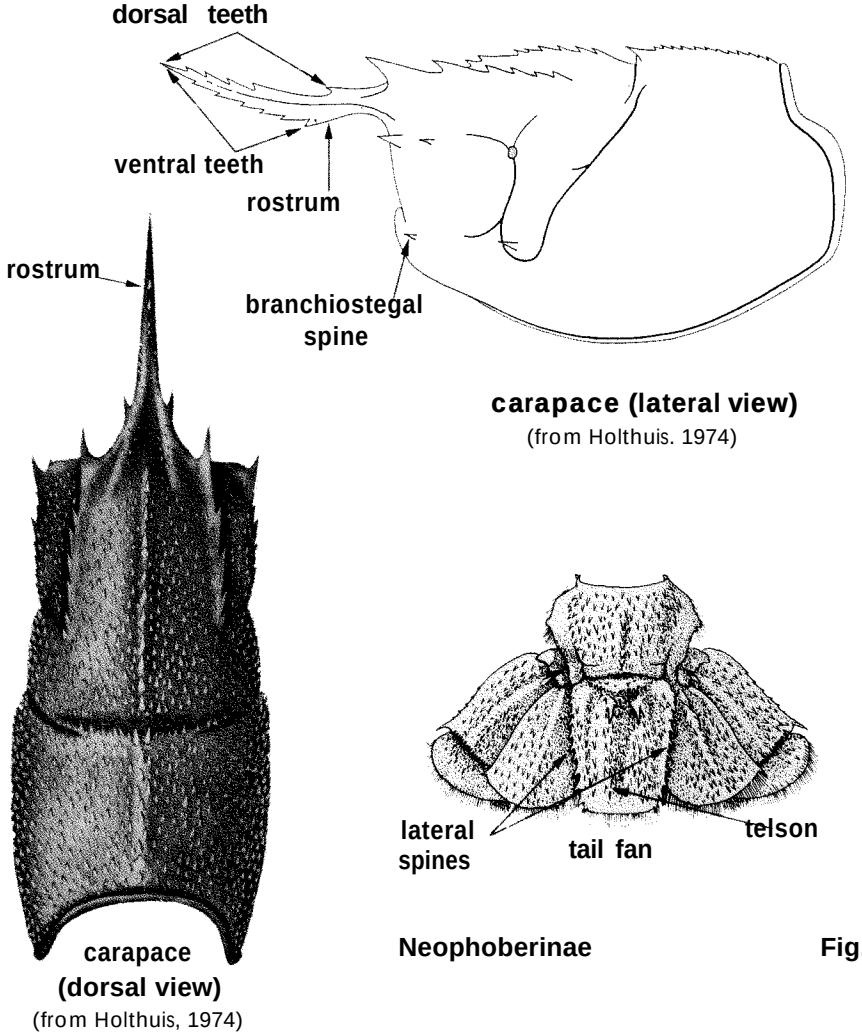
1b Eyes well develope dor reduced, always presentas movable appendages. Telson with lateral and/or postlateral spines. Chelipeds equal or unequal, but fingers always considerably less than twice as long as palm; teeth on the cutting edge placed in the same plane. Fifth pereiopod without a true chela. Abdominal pleura large, triangular or ovate, usually ending in a point. Scaphocerite, if present, with the inner margin evenly curved, unarmed (Fig. 26) **..... Nephropidae**

2a. Rostrum laterally compressed for the larger part of its length, with dorsal and ventral, but no lateral teeth. Carapace with branchiostegal spine. Body entirely covered by numerous closely placed and sharply pointed spinules. Lateral margin of the telson with 6 to 12 spines (Fig. 27) **.. Neophoberinae**

2b. Rostrum dorsoventrally depressed with lateral (and sometimes ventral), but without dorsal teeth; sometimes without any teeth. Carapace without a branchiostegal spine. Body never uniformly covered with spinules, although granules may be present all over, or spinules may be placed on the carapace. The lateral margin of the telson with at most three lateral spines, which if present, are usually small and irregular



Nephropidae **Fig. 26**



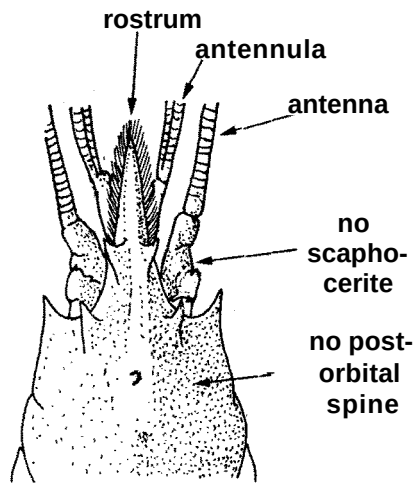
carapace (lateral view)
(from Holthuis. 1974)

Neophoberinae **Fig. 27**

(from Holthuis, 1974)

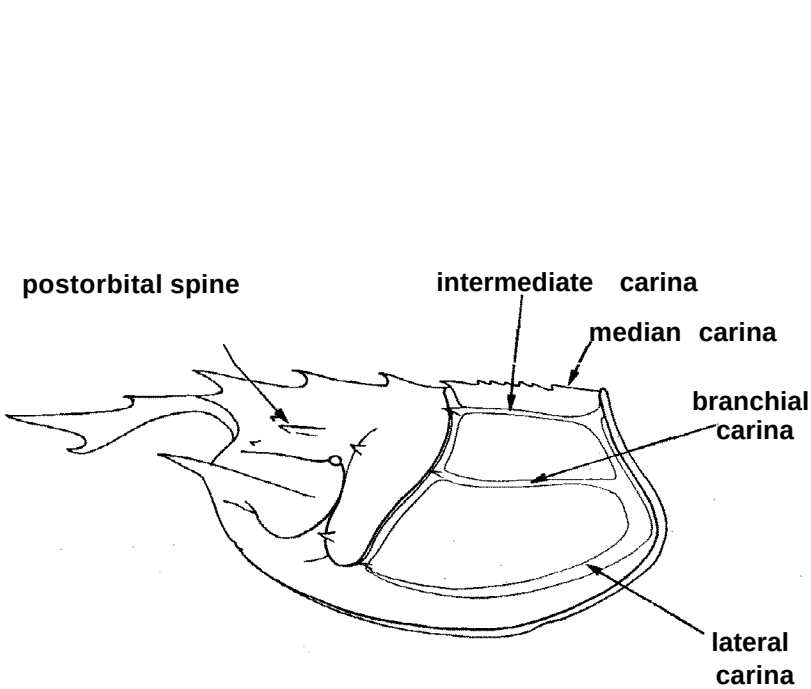
3a Scaphocerite absent. Carapace without post-orbital spine (Fig. 28). Abdominal sternites unarmed in both sexes. No podobranch on second maxilliped ..... **Thymopinae**

3b Scaphocerite present. Carapace with a distinct postorbital spine (Fig. 29). Sternites of second to fifth abdominal somites in the male with a sharp median spine each. Podobranch usually present on the second maxilliped ..... **Nephropinae**

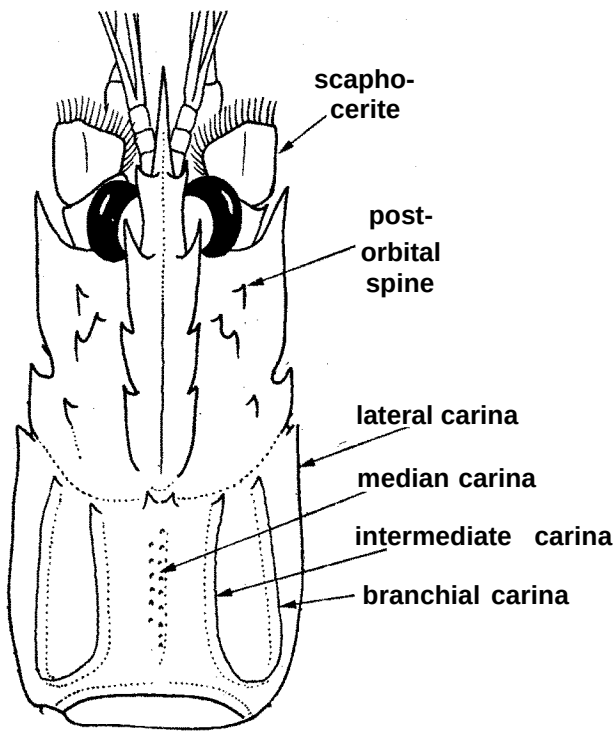


front part of carapace

Thymopinae **Fig. 28**



carapace (lateral view)



carapace (dorsal view)

Nephropinae **Fig. 29**

2.1.1 FAMILY THAUMASTOCHELIDAE Bate, 1888

THAU

Thaumastochelidae Bate, 1888, Report Voyage Challenger, Zool., 24:7,11,46.

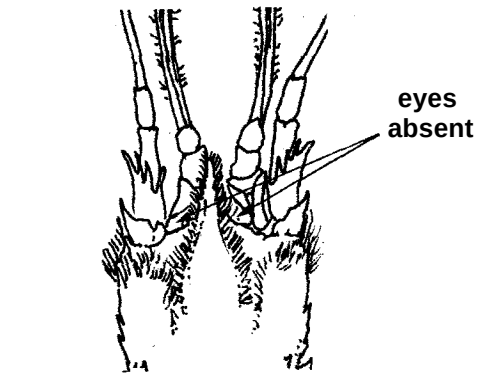
The family is easily recognized by the peculiar shape of the large cheliped with its swollen palm and the very elongate fingers (at least four times as long as the palm) that have very slender, alternating, large and small teeth.

Two genera with a total of three species known so far.

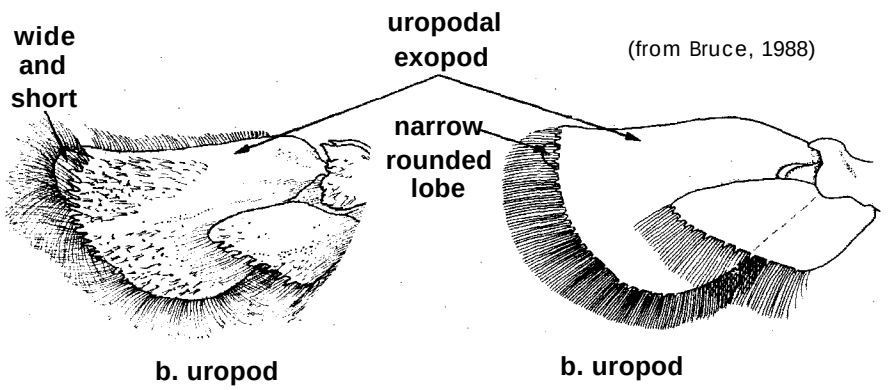
Key to Genera:

1a. Eyes totally absent, eventual remnants immovably fused to the ophthalmic somite (Fig. 30a). Second and third maxillipeds with well developed exopods. Distal part of uropodal. exopod behind the diaeresis wide and short (Fig. 30b) ..... ***Thaumastocheles***

1b. Eyes present, slender and slightly movable, without pigment (Fig. 31a). Exopods of second and third maxillipeds reduced to short scale-like rudiments. Distal part of uropodal exopod, behind diaeresis a narrow rounded lobe (Fig. 31b) ..... ***Thaumastochelopsis***

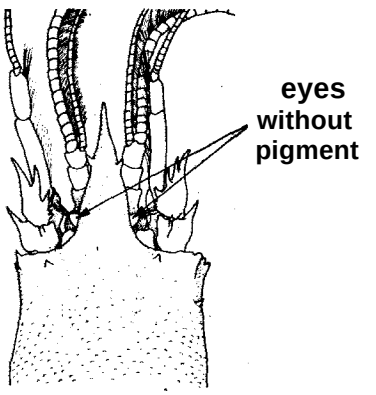


a. anterior part of carapace (dorsal view)



b. uropod

Thaumastocheles **Fig. 30**



a. anterior part of carapace (dorsal view)

(from Bruce, 1988)

b. uropod

Thaumastochelopsis **Fig. 31**

Thaumastocheles Wood-Mason, 1874

THAU Thau

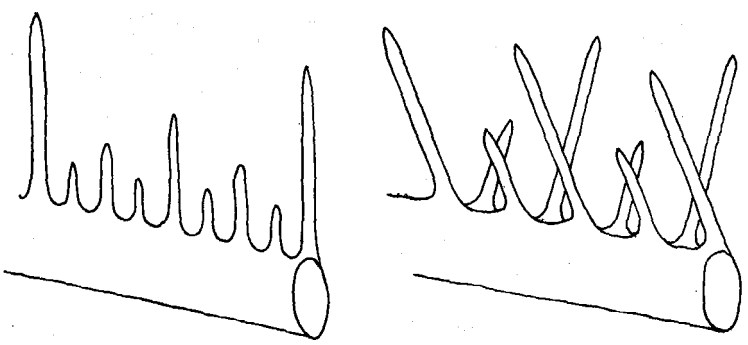
Thaumastocheles Wood-(Mason, 1874, Proceedings Asiatic Society Bengal. 1874: 181. Gender masculine. Name placed on the Official List of Generic Names in Zoology in Opinion 519 (published in 1958).

Type Species : by monotypy: ***Astacus zaleucus*** Thomson, 1873.

Key to Species:

1a. Teeth on fingers of large cheliped placed in a single row and oriented in the same plane as the fingers themselves (Fig. 32a). Indo-West Pacific ..... ***T. japonicus*** (Fig. 33).

1b. The teeth on fingers of large cheliped not in the same plane as the fingers themselves, pointing alternatingly obliquely inward and outward; the bases of the teeth are placed in a single line, but the teeth themselves form two diverging rows (Fig. 32b). Western Atlantic . . ***T. zaleucus*** **(Fig. 35)**



a. ***T. japonicus*** **b.** ***T. zaleucus***

Diagram (not drawn to scale) showing arrangement of teeth on finger of large cheliped (after Calman. 1913) **Fig. 32**

Thaumastocheles japonicus Calman, 1913 **Fig. 33**

THAU Thau 1

Thaumastocheles japonicus Calman, 1913, Annals Magazine Natural History, (7)12:230.

FAO Names : En - Pacific pincer lobster.

Type : Type locality: "Off Yenoshima, Odawara Bay [= off Enoshima near Odawara, Sagami Bay], Japan, 200 fms [= 366 m]" Type specimen in Zoological Museum of University of St. Andrews, Scotland, UK.

Geographical Distribution : East coast of Japan between Sagami and Tosa Bays. A single pincer collected near New Caledonia (22ºO2'S 165º57'E; 800 m deep) may belong to the present species (Monod, 1973: 126, figs 37-39) (fig. 34).

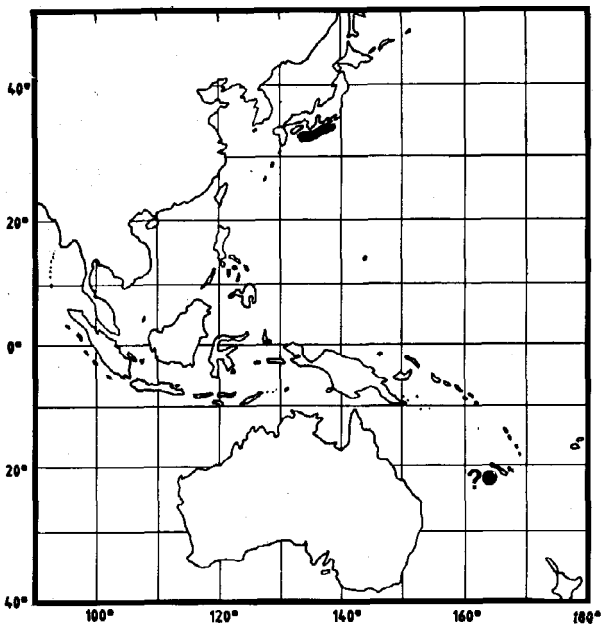
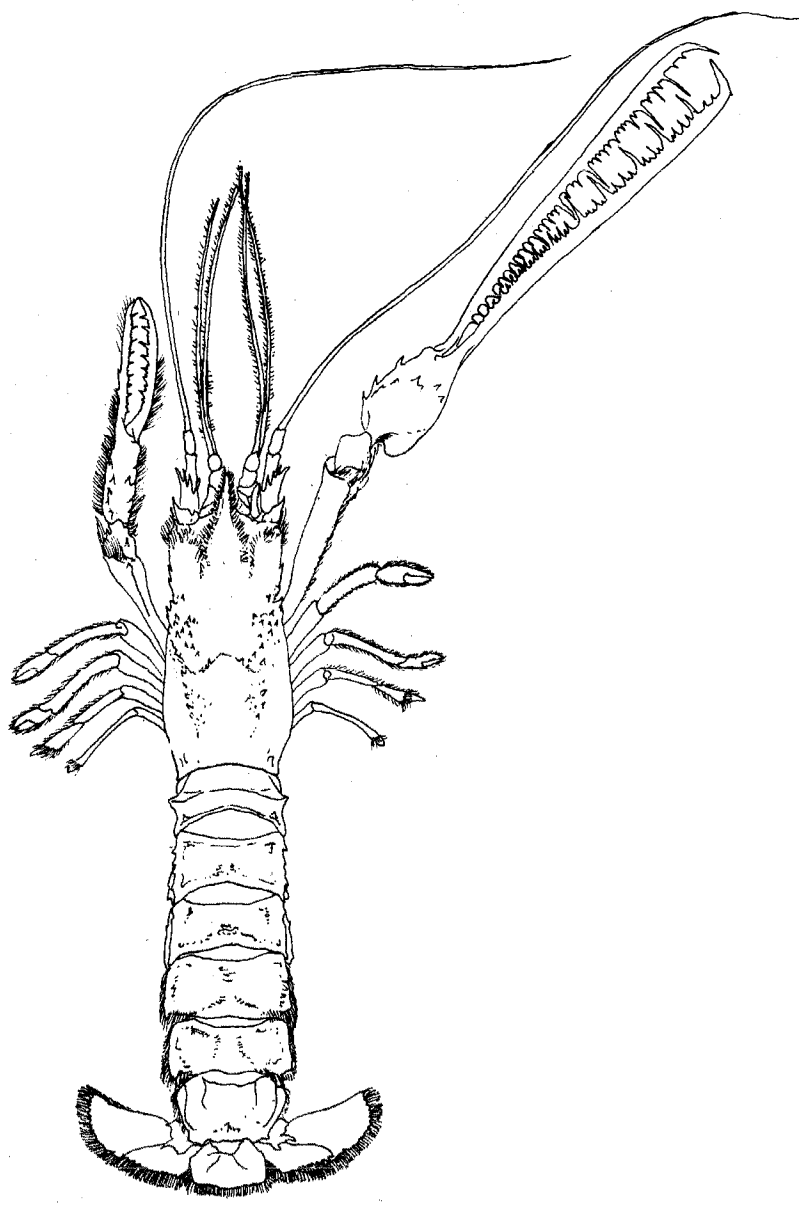


Fig. 34



(after Doflein, 1906) **Fig. 33**

Habitat and Biology : The species is known from depths between 366 and 700 m (the New Caledonian specimen from 800 m).

Size : Total length 9 to 17.5 cm, carapace length between 4 and 6 cm.

Interest to Fisheries : None so far. The species is rarely caught, and usually as single specimens. Also the great depths at which it occurs makes it less interesting for commercial exploitation.

Literature : Baba et al., 1986: 152, 153, 281, fig. 104.

Thaumastocheles zaleucus (Thomson, 1873)

Fig. 35

THAU Thau 2

Astacus zaleucus Thomson, 1873, Nature, London, 8:246, 247, fig. 1. Specific name placed on Official List of Specific Names in Zoology in Opinion 519 (published in 1958).

FAO Names : En Atlantic pincer lobster.

Type : Type locality:"Challenger" Station 23, off Sombrero Island, West Indies, 18º24'N 63º28'W, 450 fms [= 823 m], bottom pteropod ooze. Female holotype in BM, No. 88.22 (in alcohol, condition fair); paratype in BM (only fragments).

Geographical Distribution : West Indian region (Straits of Florida, off Yucatan, east of Nicaragua, off Sombrero Island. and off Grenada) (Fig. 36).

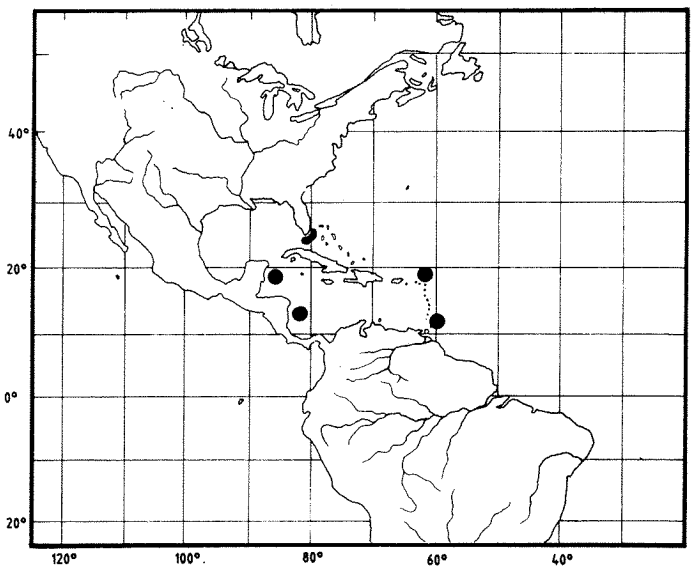
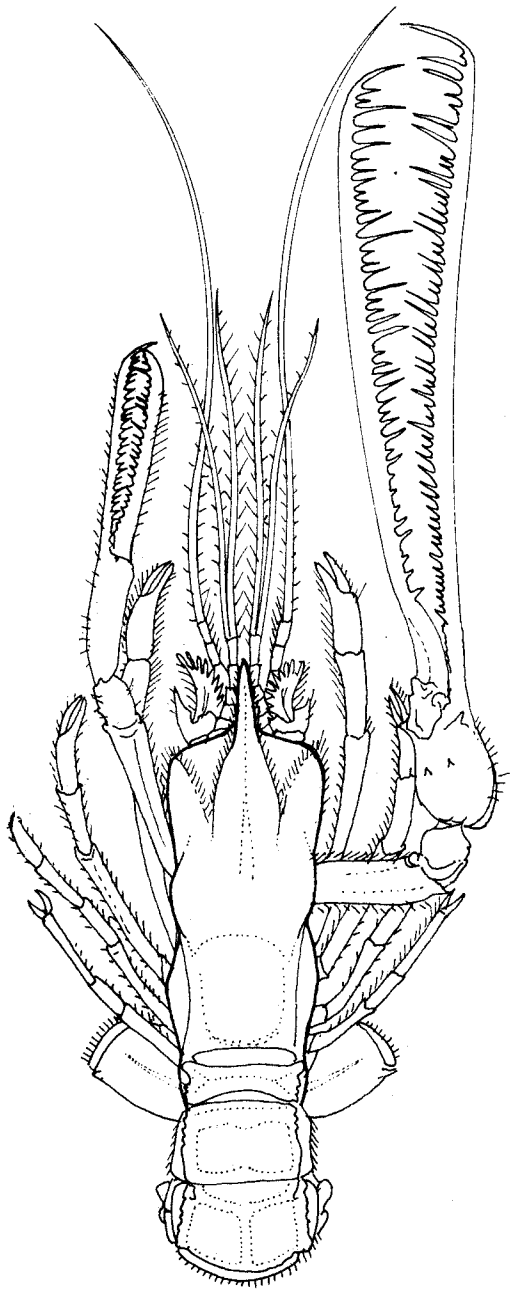


Fig. 36



(from Bouvier, 1925) **Fig. 35**

Habitat and Biology : Deep-sea species from 640 to 1054 m depth. Bottom very flat, of soft mud (ooze). Possibly a burrowing species.

Size : Total length 10 to 16 cm.

Interest to Fisheries : So far none. Only 7 specimens have so far been taken, there are no indications that they ever could be caught in commercially interesting quantities.

Literature : Bate, 1888:47, text fig. 40, pl. 6, pl. 7 fig 1; Holthuis, 1974:1729, fig. 1.

Thaumastochelopsis Bruce, 198

THAU Thaup

Thaumastochelopsis Bruce, 1988, Invertebrate Taxonomy, 2:903.

Type Specie : by original designation and monotypy: ***Thaumastochelopsis wardi*** Bruce, 1988. Gender feminine.

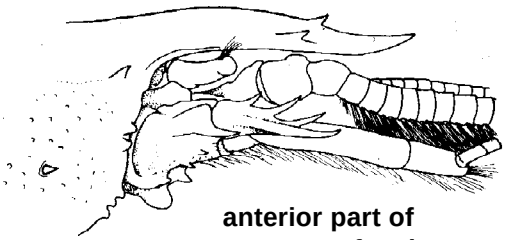
Genus with a single known species.

Thaumastochelopsis wardi Bruce, 1988 | **Fig. 37** | **THAU Thaup 1**

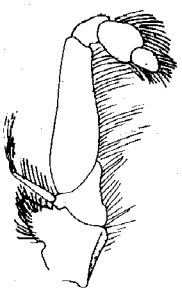
Thaumastochelopsis wardi Bruce, 1988, Invertebrate Taxonomy, 2:909, figs 1-7.

FAO Names : En - Australian pincer lobster.

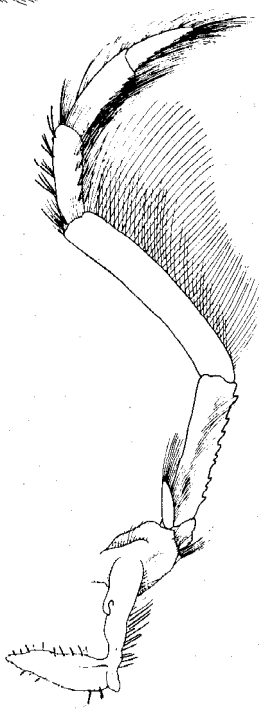
Type : Type locality:"Marian Plateau, off Townsville," Queensland, Australia,"59º05.00'S [error for 19º05.00'S], 149º26.75'E,425 m". Holotype female, and allotype male, Northern Territory Museum, Darwin, Australia, no. Cr. 004231.



anterior part of carapace of male (lateral view)
(from Bruce, 1988)

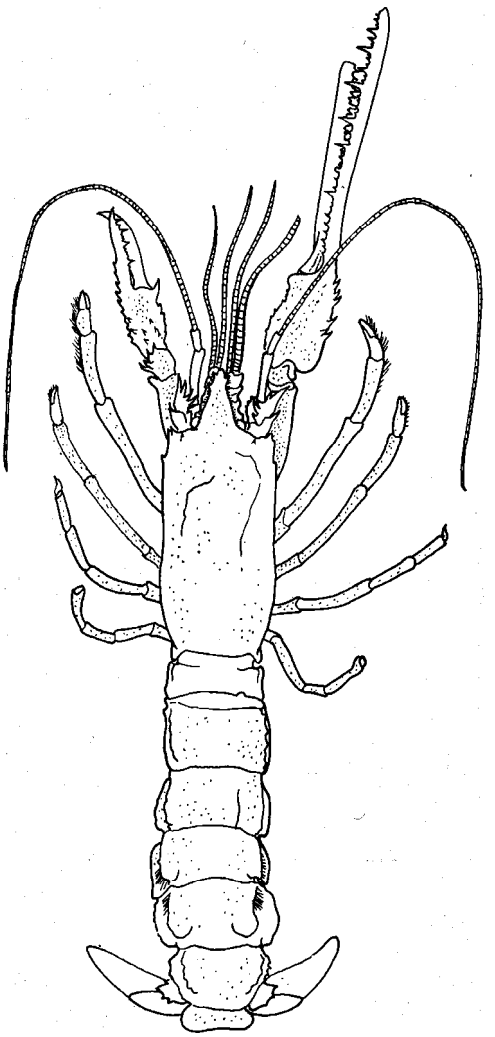


second maxilliped (male)



third maxilliped (male)

(after Bruce, 1988)



dorsal view (female)

Fig. 37

Geographical Distribution : NE Australia (Fig. 38). Only known from the type locality.

Habitat and Biology : Taken at a depth of 425 m.

Size : Total length approximately 7.7 cm (female), 5.7 cm (male); carapace legnth 2.5 cm (female), 1.9 cm (male).

Interest to Fisheries : Inasmuch as only two specimens are known of this species nothing can be stated on this aspect, but it is not likely that the species ever will become of commercial interest.

Literature : Original description.

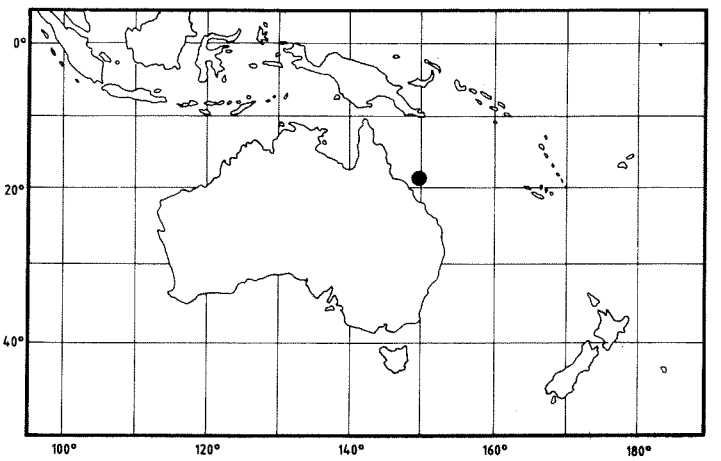


Fig. 38

click for next page

2.1.2 FAMILY NEPHROPIDAE Dana, 1852

NEPH

Nephropinae Dana, 1852, Proceedings Academy Natural Sciences, Philadelphia,6: 15.

Synonyms : Homaridae Huxley, 1879. The grammatically incorrect spelling Nephropsidae has frequently been used for the present family name.

The family Nephropidae is divided into three subfamilies: Neophoberinae, Nephropinae and Thymopinae. A key to these subfamilies is provided on pages 20 and 21.

SUBFAMILY **NEOPHOBERINAE** Glaessner, 1969

Neophoberinae Glaessner, 1969, in R.C. Moore, Treatise of Invertebrate Paleontoloay, R(2):459.

Synonyms : Phoberinae Mertin, 1941.

The subfamily contains only a single genus.

Acanthacaris Bate, 1888

NEPH Acant

Acanthacaris Bate,1888, Report VoyaaeChallenger,Zool. 24:171,929,pl.21.Genderfeminine.

Type Species: by monotypy: ***Acanthacaris tenuimana*** Bate, 1888.

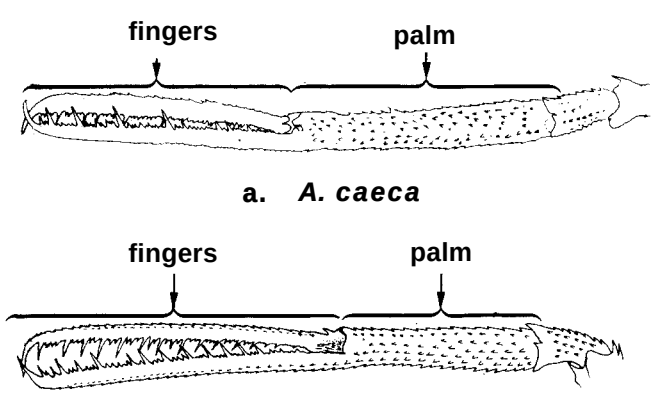
Synonyms : Phoberus A. Milne Edwards, 1881, Annales Sciences Naturelles, Paris, (Zool.), (6)1 l(4): 1 (not ***Phoberus*** MacLeay, 1818); type species, by monotypy: Phoberus caecus A. Milne Edwards, 1881; gender masculine.

Neophoberus Glaessner, 1969, in R.C. Moore, Treatise of Invertebrate Paleontoloay, R(2):460, replacement name for ***Phoberus*** A. Milne Edwards, 1881; gender masculine.

Key to Species:

1a. Fingers of first cheliped about as long as palm (Fig. 39a).Atlantic ..... ***A. caeca*** (Fig. 40)

1b. Fingers of first cheliped distinctly longer than palm (Fig. 39b). Indo-West Pacific ..... ***A. tenuimana*** (Fig. 42)



a. ***A. caeca***

b. ***A. tenuimana***

Fig. 39

Acanthacaris caeca A. Milne Edwards,1881

Fig. 40

NEPH Acant 1

Phoberus caecus A. Milne Edwards, 1881, Annales Sciences Naturelles , Paris,(Zool.), (6)1 1(4):1.

Synonyms : ***Neophoberus caecus*** - Glaessner, 1969.

FAO Names : En - Atlantic deep-sea lobster; **Fr -** Langoustine arganelle; **Sp -** Cigala de fondo.

Type : Type locality: "Blake" Station 264, off Grenada, West Indies, 12º03'15"N 61º48'30"W, 761 m deep, bottom grey ooze. Holotype in MCZ.

Geographical Distribution : Gulf of Mexico, Caribbean Sea, Straits of Florida (Fig. 41).

Habitat and Biology : A deepsea species from 293 to 878 m depth (mostly between 550 and 825 m). Lives on soft mud bottoms in burrows.

Size : Maximum total length 40 cm; carapace length 2 to 17 cm.

Interest to Fisheries : Not actually fished for at present, Exploratory deep-sea trawling showed the species to be present in quantities that might be of commercial interest; also interesting because of its relatively large size.

Local Names: USA: Blind deep sea lobster (Florida).

literature : Holthuis, 1974:741, fig. 4-8; Fischer (ed.), 1978:vol.6.

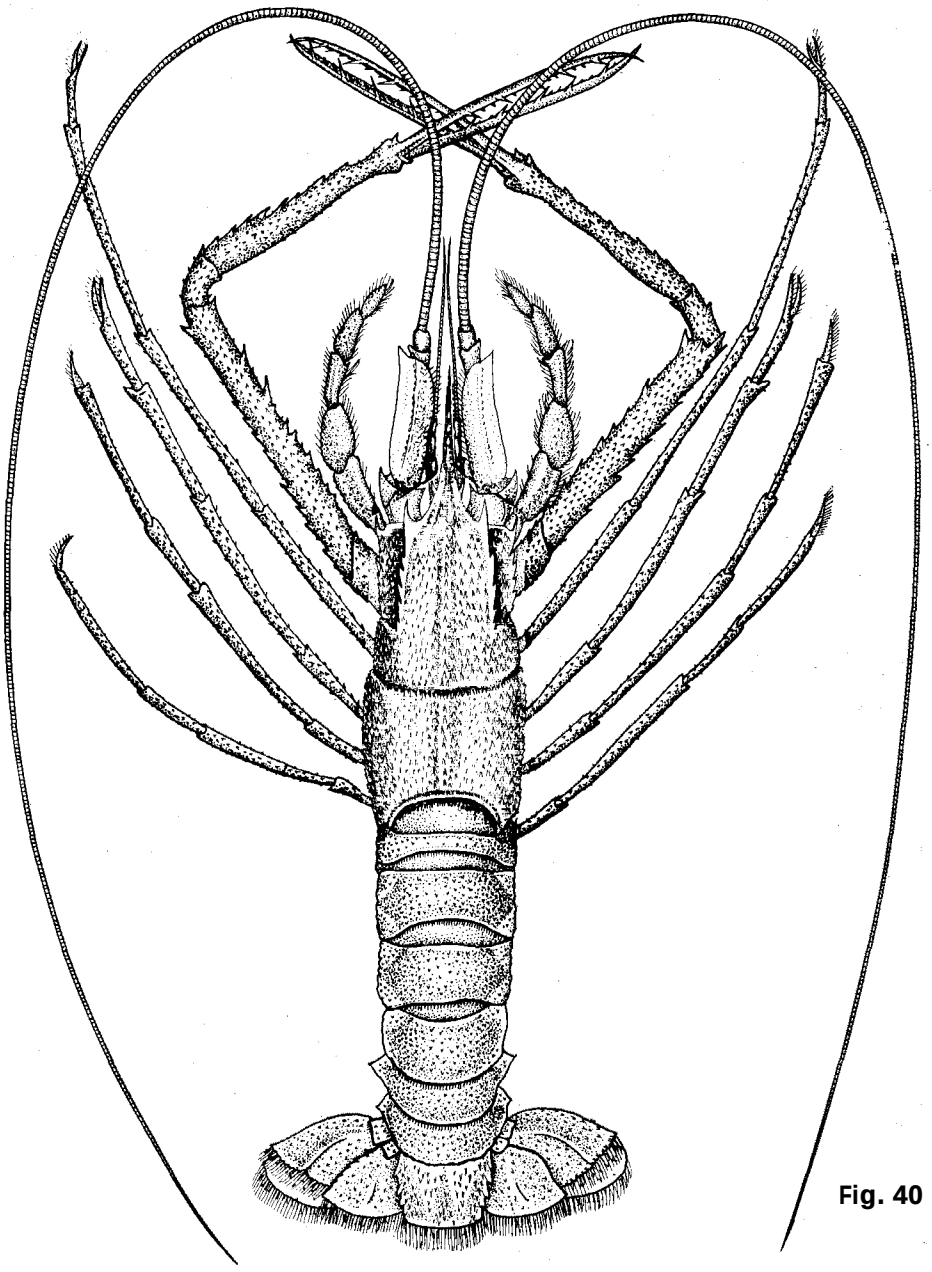


Fig. 40

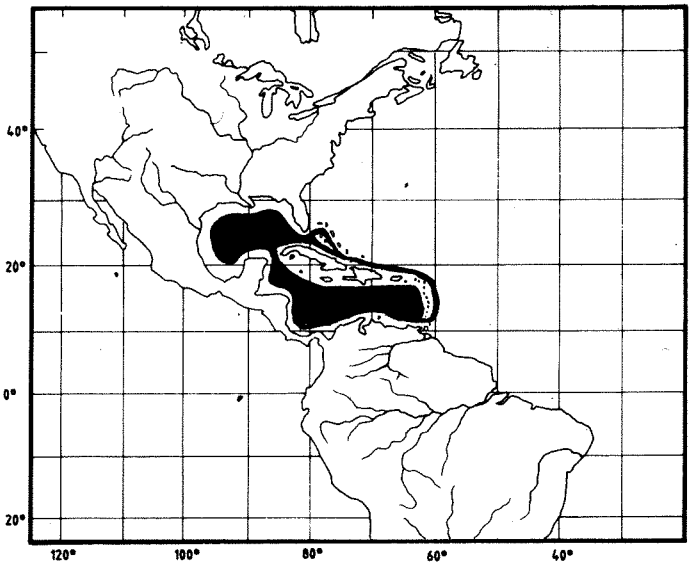


Fig. 41

Acanthacaris tenuimana Bate, 1888

Fig. 42

NEPH Acant 1

Acanthacaris tenuimana, Bate, 1888, Report Voyage Challenger , Zool.,24:171,929,pl. 21.

Synonyms : ***Phoberus tenuimanus*** Bate, 1888; ***Phoberus caecus sublevis*** Wood-Mason & Alcock, 1891; ***Acanthacaris opipara*** Burukovsky & Musy, 1976; ***Phoberus brevirostris*** Thung &Wang, 1985.

FAO Names : En - Prickly deep-sea lobster; **Fr -** Langoustine spinuleuse; **Sp -** Cigala raspa.

Type : Type locality of ***Acanthacaris tenuimana:*** "Challenger" Station 191, "lat. 5º41'S., long. 134º4'30" E., south of New Guinea; depth, 800 fathoms [= 1463 m]; bottom, green mud". Holotype in BM, no. 88.22 (in alcohol, condition fair).

Type locality of ***Phoberus caecus sublevis:*** "Investigator""Station 105, 740 fathoms" (= "Laccadive Sea, off Goa coast, lat. 15º02'N, long. 72º34'E., 740 fms [= 1353 m]. Grey ooze, coral mud, and 12.5 per cent Foraminifera"). Holotype in ZSI, preserved in alcohol, condition poor.

Type locality of ***Acanthacaris opipara:*** "South-west part of the Indian Ocean" near "Durban; 29º57'6"-29º52'5"S., 31º46'2"-31º52'5"E, depth 830-850 m". Depository of holotype unknown.

Type locality of ***Phoberus brevirostris:*** " 29º00'-30' N, 127º00'-30'E, 300-900 m deep, East China Sea". Holotype male (no. 81015) and 2 paratype males (nos. 81016 and 81006) in Donghai Fisheries Research Institute, Shanghai, and Biological Department of Hangzhou University, Hangzhou, China.

Geographical Distribution : Indo-West Pacific area (Natal, Mozambique, Madagascar, Laccadive Islands, Japan, Philippines, South China Sea, Indonesia, New Caledonia) (Fig 43)

Habitat and Biology : Deep sea, from 600 to 1670 m. Muddy bottom.

Size : Maximum known total length 40 cm, carapace length 2-21 cm; ovigerous females, cl. 1 1-19cm.

Interest to Fisheries : So far none. The species is taken incidentally in trawls, but so far too rarely and in too small quantities to be of commercial interest. The large size of the specimens might make fishing economically attractive, once the appropriate gear and proper localities where sufficient quantities occur have been found.

Local Names : MOZAMBIQUE: Lagosti m espinhoso.

Literature : Fischer & Bianchi (eds), 1984:vol: 5; Macpherson, 1990:293.

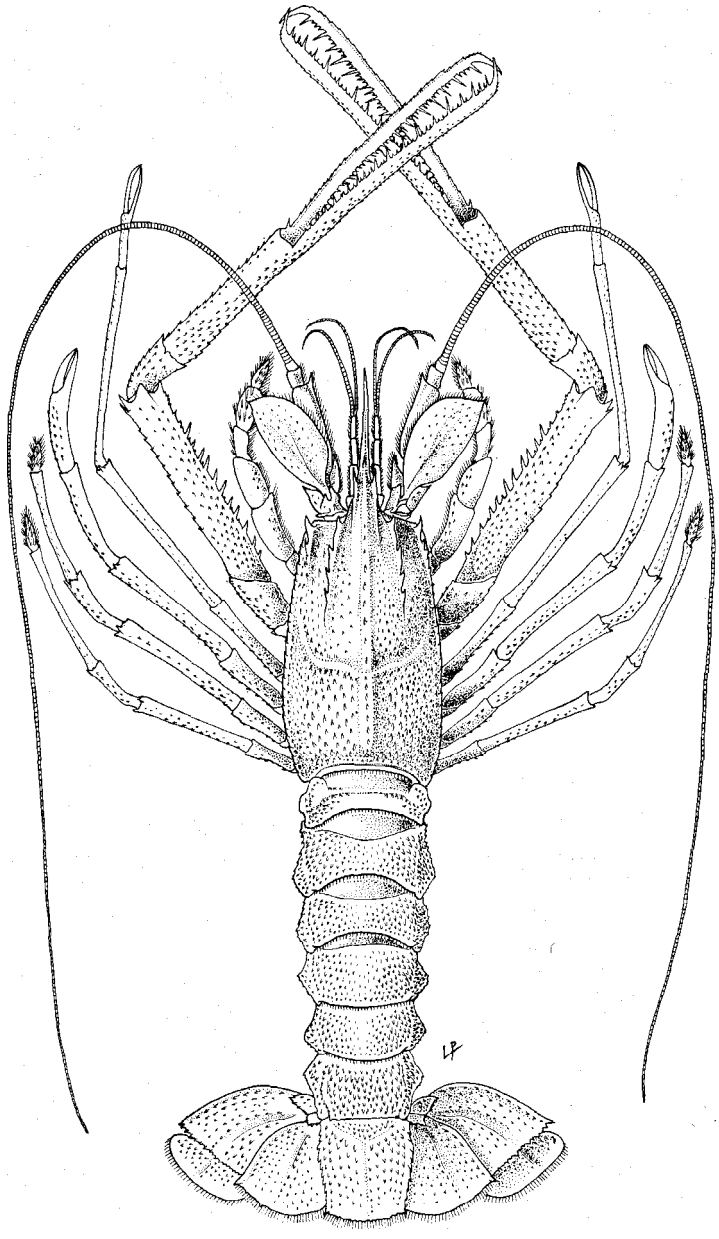


Fig. 42

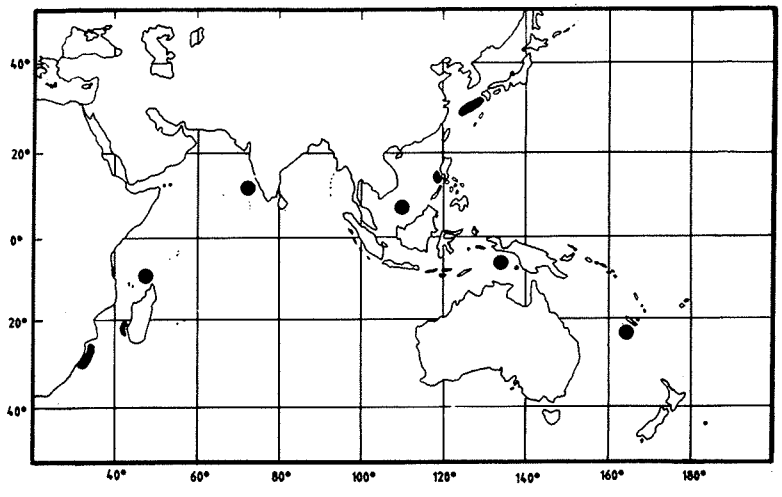


Fig. 43

click for next page

Remarks : The taxonomy of the species is not clear. It is possible that 2 forms may have to be distinguished: ***A. sublevis*** Wood-Mason, 1891 (with a synonym ***A. opipara*** Burukovsky & Musy, 1976) from the Indian Ocean, and ***A. tenuimana*** s.s from the eastern part of the present range. More material will have to decide this question.

SUBFAMILY **THYMOPINAE** Holthuis, 1974

Thymopinae Holthuis, 1974, Bulletin Marine Science, University Miami, 24(4):753.

This subfamily consists of four genera, viz., ***Nephropides, Nephropsis, Thymops*** and ***Thymopsis.*** Three of these genera include a single species, namely all, except ***Nephropsis.*** None of them has any commercial value at present, but some may be of potential interest to fisheries.

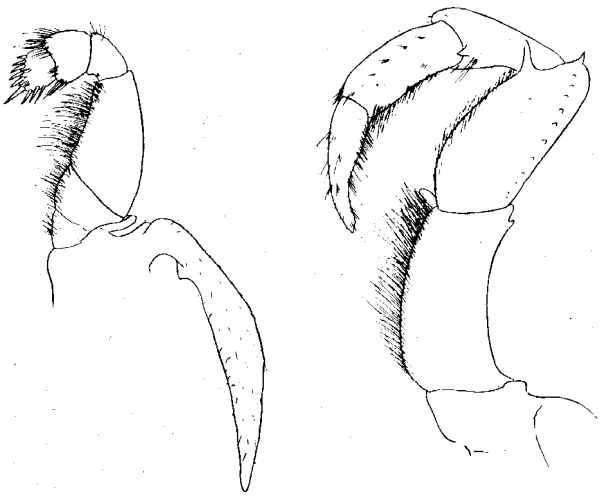
Key to Genera

1a. Second and third maxillipeds without exopods (Fig. 44a). Pleura of second abdominal somite wide and overlapping both the pleura of the first and third somites (Fig. 44b). Lower margin of rostrum with teeth ..... ***Thymopsis***

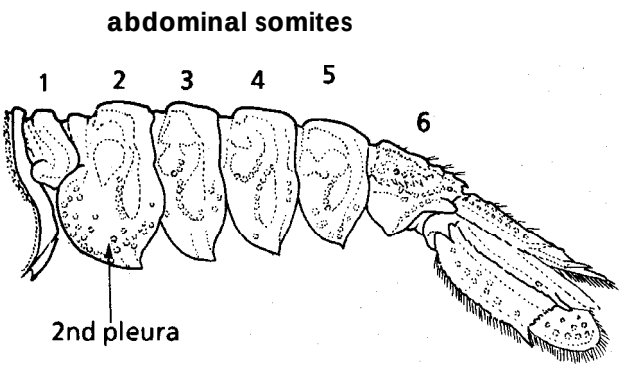
1b. Second and third maxillipeds with exopods (Fig. 45a). Lower margin of rostrum without teeth

2a. Pleura of abdominal somites broadly overlapping (Fig. 45b). Exopod of second maxilliped without flagellum ..... ***Thymops***

2b. Pleura of abdominal somites narrow, hardly if at all overlapping. Lateral margin of telson unarmed, but for the posterolateral spine. Exopod of second maxilliped with a distinct flagellum

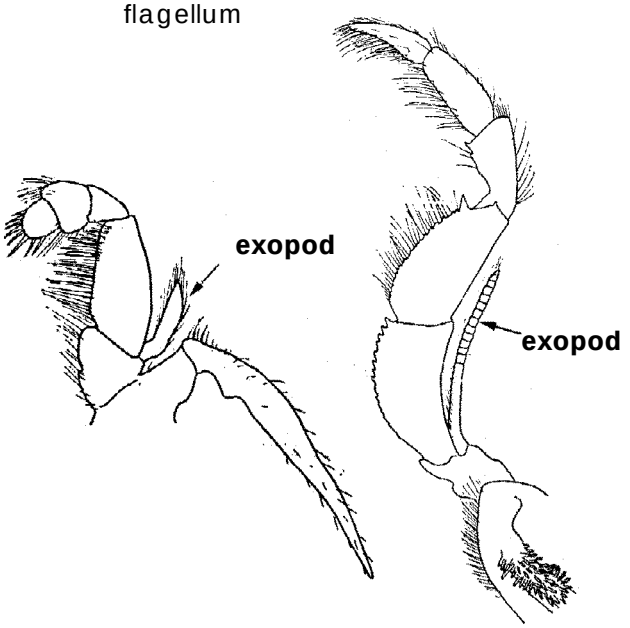


a. second and third maxilliped
(from Holthuis. 1974)

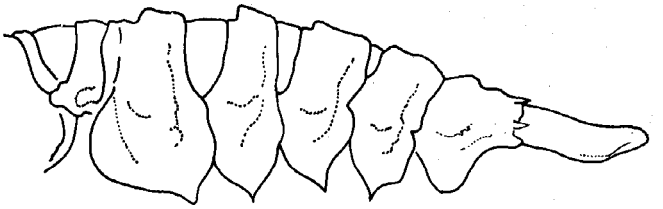


b. abdomen (lateral view)

Thymopsis **Fig.44**



a. second and third maxilliped
(from Holthuis, 1974)

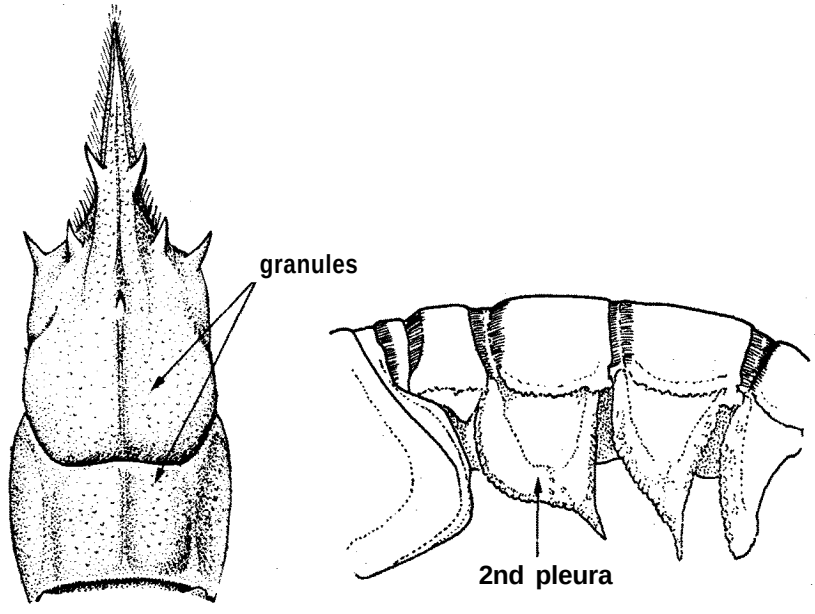


b. abdomen (lateral view)
(after Zarenkov & Semenov, 1972)

Thymops **Fig. 45**

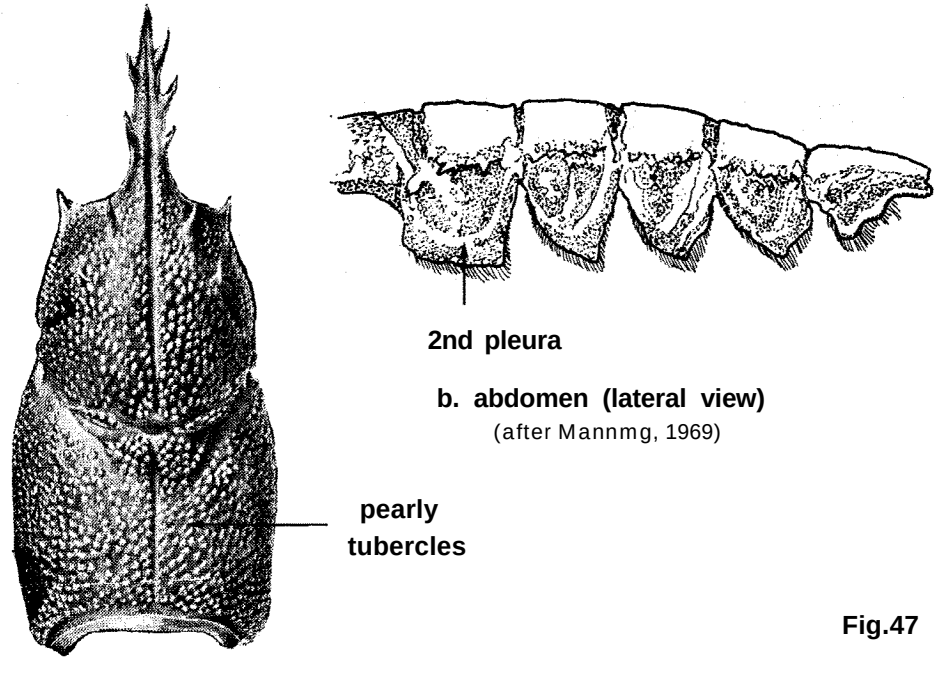
3a Eye not pigmented. Body granular and hairy, but not covered with evenly placed large pearly tubercles (Fig. 46a). Pleura of second abdominal somite ending in a long sharp point (Fig. 46b) **..... *Nephropsis***

3b. Eye with pigmented, although small, cornea. Body entirely covered by conspicuous rounded pearly tubercles (Fig. 47a). Pleura of second abdominal somite broadly trapezoid, distal margin obliquely truncate, ending in a blunt posterior tooth (Fig. 47b) **..... *Nephropides***



a. carapace (dorsal view) **b. abdomen (lateral view)**

Nephropsis **Fig.46**



b. abdomen (lateral view)
(after Mannmg, 1969)

Fig.47

a. carapace (dorsal view) ***Nephropides***

(from Mannmg, 1969)

Nephropides Manning, 1969

NEPH Nephid

Nephropides Manning, 1969, Crustaceana, 17:303. Gender masculine.

Type Species: by original designation and monotypy: Nephropides caribaeus Manning, 1969.

A single species known so far.

Nephropides caribaeus Manning, 1969

Fig. 48

NEPH Nephid 1

Nephropides caribaeus Manning, 1969, Crustaceana, 17:304, text-fig. 1 pt. 1

FAO Names : En - Mitten lobsterette.

Type : Type locality: Off Caribbean coast of "Nicaragua, 12º25'N 82º15'W; depth 546-582 m". Holo-type in USNM, no. 113741; paratypes in USNM, RMNH.

Geographical Distribution : Extreme western Caribbean Sea off the coasts of Central Americaand northern South America, from Belize to Colombia, 16º58' to 9º24'N, 76º3 1.5' to 87º53'W (Fig. 49).

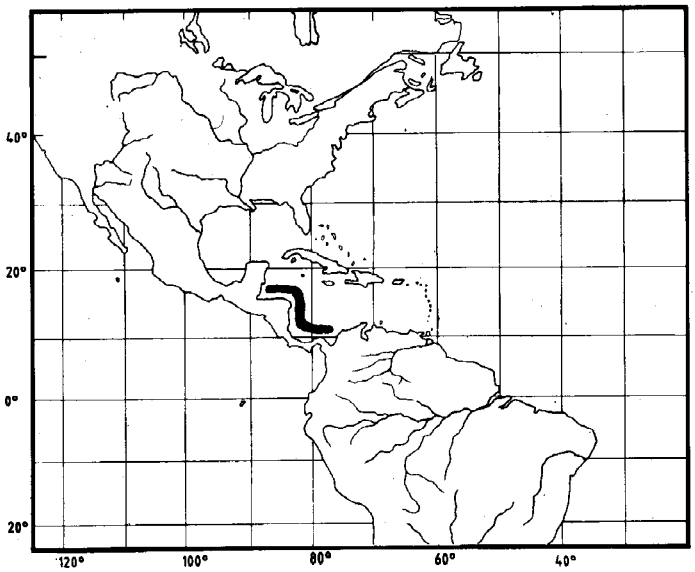
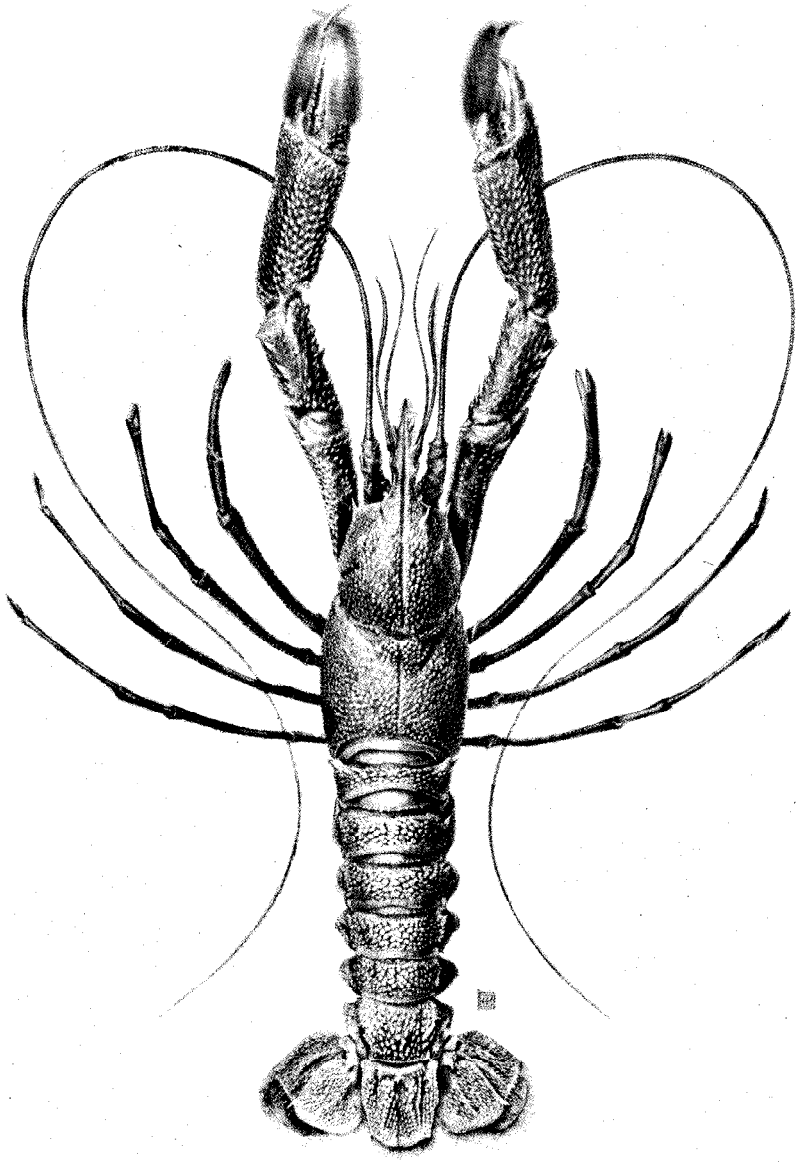


Fig. 49



(from Manning, 1969) Fig. 48

Habitat and Biology : Deep sea, 511 to 728 m; .on mud bottom.

Size : Total length 15.6 to 17 cm, carapace length 5 to 6cm.

Interest to Fisheries : So far none, but the size of the specimens might make the exploitation profitable if good fishing grounds are found.

Literature : Manning,. 1969:304, text-fig. 1 pl. 1; Holthuis, 1974:806-l 0, figs 22,23.

Nephropsis Wood-Mason, 1873

NEPH Nephps

Nephropsis Wood-Mason, 1873, Annals Maaazine natural Historv, (4)12:60. Gender feminine. Name placed on the Official List of Generic Namesin Zoology in Opinion 559 (published in 1959).

Type Species : by monotypy : ***Nephropsis steward*** Wood-Mason, 1873.

At present, 13 species of the genus ***Nephropsis*** are known, 5 from the Atlantic, 7 from the Indo-West Pacific, and one from the eastern Pacific region. None of these species are currently being fished on a commercial scale, but some are of potential interest.

The taxonomic status of several species is not clear, and therefore the following key to species must be considered as provisional; several new species can be expected.

Key to Species:

1a Rostrum without lateral teeth. A strong post-supraorbital spine present behind the supraorbital spine (Fig. 50a). Abdominal somites 3 to 6 with a median dorsal carina (Fig. 50b). Anterior margin of pleura of second abdominal somite without spines (Fig. 51a). Telson without media-dorsal spine (Fig. 52a). Indo-West Pacific ..... ***N. ensirostris*** (Fig. 71)

1b. Rostrum with lateral teeth: Other characters mentioned under la present or absent

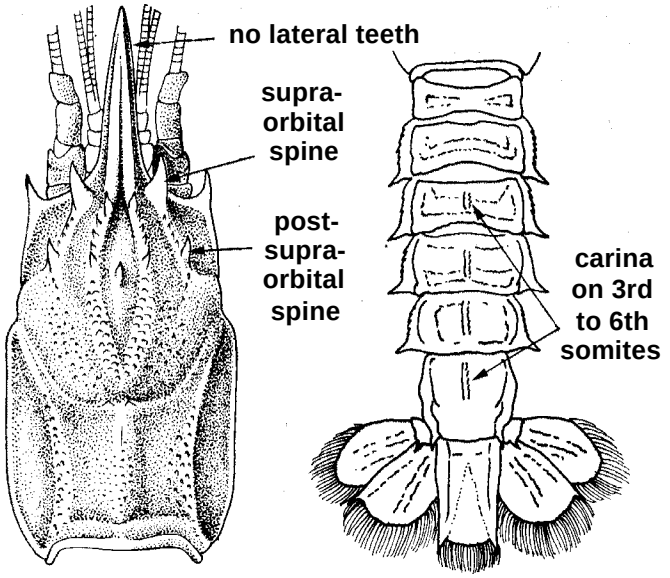
2a Rostrum with one pair of lateral teeth (one tooth on either margin) (Fig. 53). Anterior margin of pleuron of second abdominal somite without a spine, although the pleuron itself may end in a sharp, spine-like tip (Fig. 51a)

3a. An erect dorsal spine placed in the middle of the basal part of the telson (Fig. 52b). Post-supraorbital spine absent or replaced by one or more spinules. Abdominal somites 2 to 6 with a median dorsal carina. Exopod of uropod with a diaeresis (Fig. 60a)

4a Carapace smooth. Rostrum less than half as long as the rest of the carapace. Anterior margin of pleuron of second abdominal somite strongly convex. Eastern Pacific ..... ***N. occidentalis*** (Fig. 76)

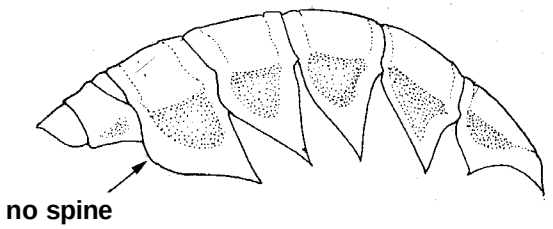
4b Carapace with numerous small granules. Rostrum more than half as long as the rest of the carapace. Anterior margin of pleuron of second abdominal somite only slightly convex. Indo-West Pacific ..... ***N. acanthura*** (Fig. 61)

3b. Telson without an erect dorsal spine on its basal part (Fig. 52a)

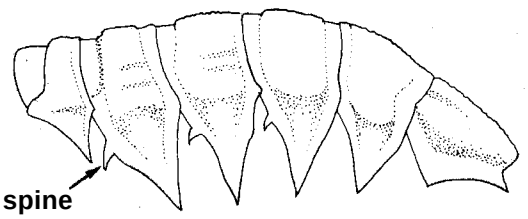


a. carapace (dorsal view) b. abdomen (lateral view)

N. ensirostris **Fig. 50**

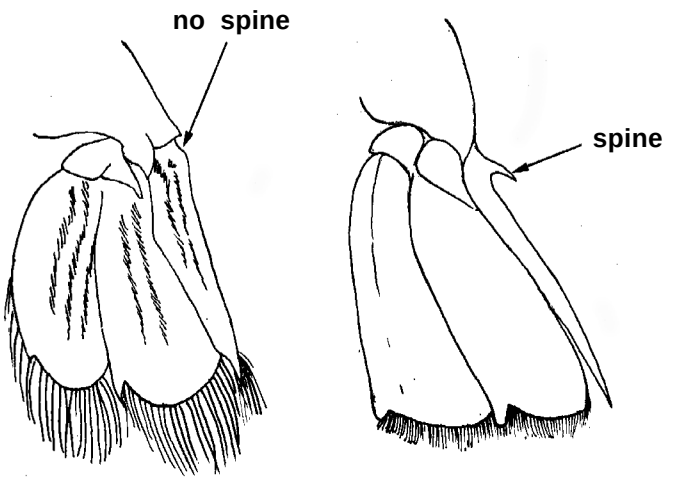


a. *N. ensirostris*



b *N. agassizii*

abdomen (lateral view) **Fig. 51**



a. *Nephropsis* sp. **b. *N. occidentalis***

tail fan (lateral view) **Fig. 52**

5a. Abdominal somites without any trace of a mid-dorsal carina. No post supraorbital spine on carapace. The distance between the supraorbital spines and the gastric tubercle is less than half the distance between the gastric tubercle and the cervical groove (Fig. 53). Exopod of uropod with a diaeresis (Fig. 60a). Indo-West Pacific ..... ***N. stewarti*** (Fig. 80)

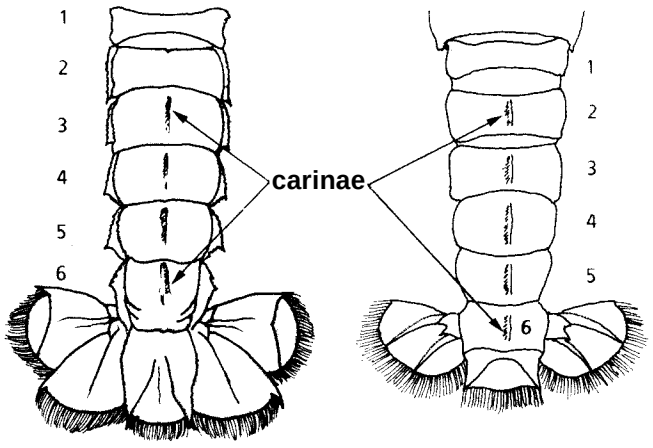
5b. Abdominal somites 2 (or 3) to 6 with a median longitudinal carina

6a. A post supraorbital spinule is present. The distance between the supraorbital spines and the gastric tubercle is about 2/3 of the distance between the gastric tubercle and the cervical groove (Fig. 54). Exopod of uropod with a diaeresis (Fig. 60a). Western Atlantic . . ***N. rosea*** (Fig. 78)

6b. No post supraorbital spinule behind the supraorbital spine. The distance between the supraorbital spines and the gastric tubercle is about half or less than half the distance between the gastric tubercle and the cervical groove (Fig. 55)

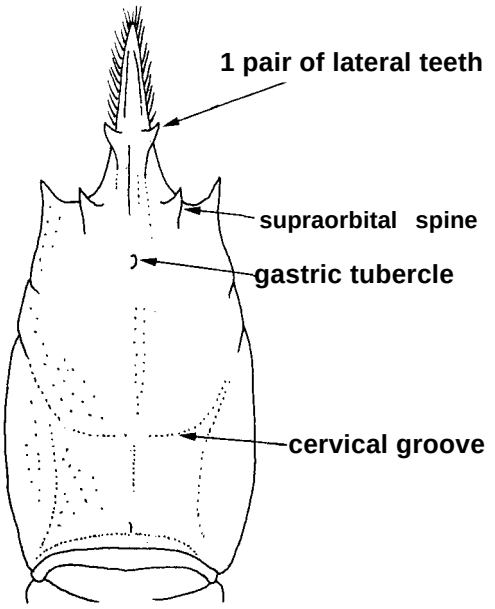
7a. Median dorsal carinae on third to sixth abdominal somites, but not on second (Fig. 56a).Indo-West Pacific N. carpenteri (Fig. 69)

7b. Median dorsal carinae on second to sixth abdominal somites (Fig. 56b). Western Atlantic ..... ***N. aculeata*** (Fig. 63)



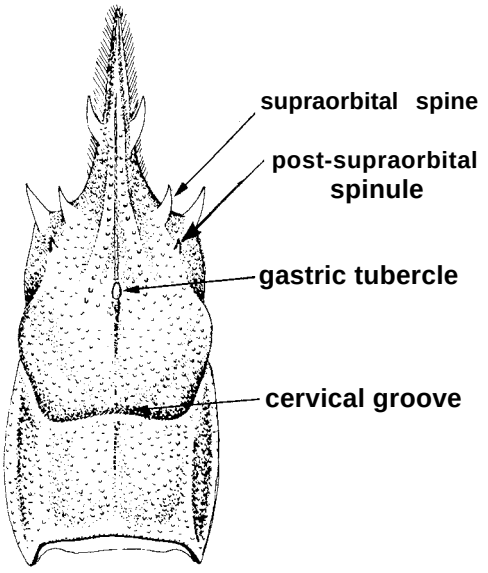
a. *N. carpenteri* **b. *N. aculeata***

abdomen (dorsal view) **Fig. 56**



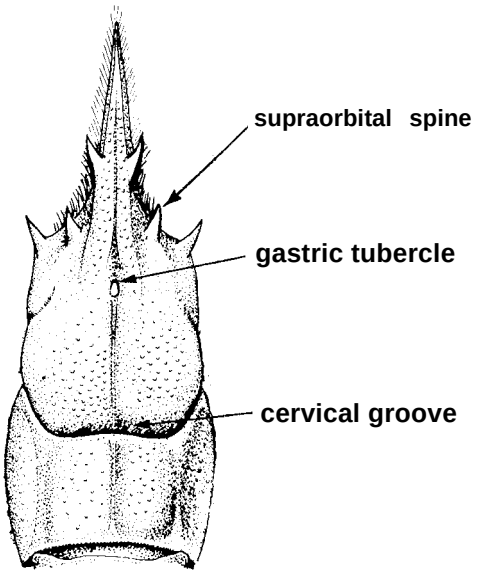
N. stewarti

carapace (dorsal view) **Fig. 53**



N. rosea

carapace (dorsal view) **Fig. 54**



N. aculeata

carapace (dorsal view) **Fig. 55**

2b. Rostrum with two pairs of lateral teeth (Fig. 57a). Anterior margin of second abdominal somite with or without spines

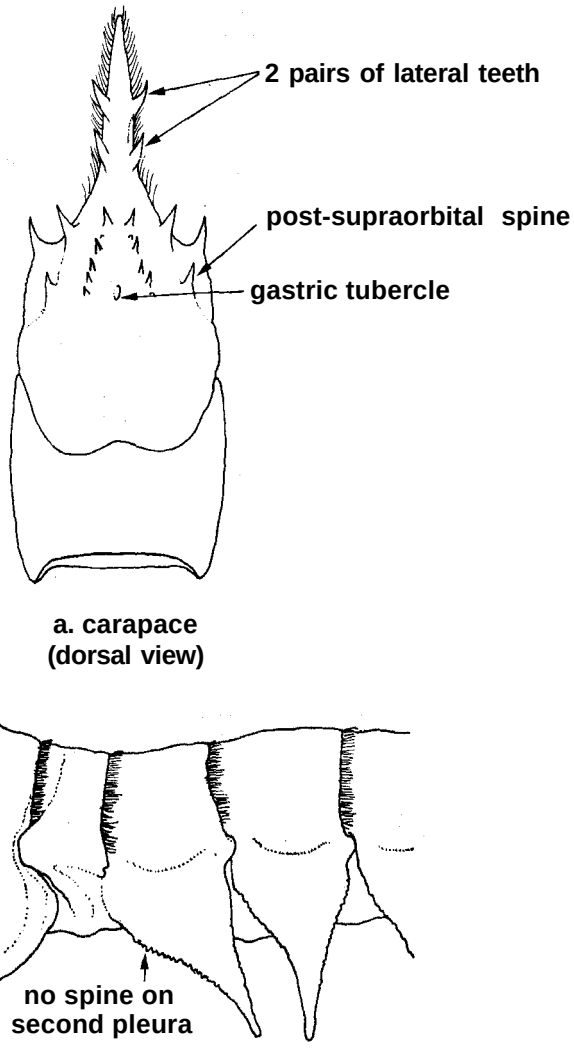
8a. Pleura of second abdominal somite without any spine on the anterior margin (Fig. 57b). A strong post supraorbital spine present on carapace. Gastric tubercle situated slightly behind the post-supraorbital spines (Fig. 57a). A median carina on the second to sixth abdominal somites. Exopod or uropod with a diaeresis (Fig. 60a). Telson without dorsal erect spine in the basal part. Western Atlantic ..... ***N. neglecta*** (Fig. 74)

8b. Pleura of second abdominal somite with one or more spines on the anterior margin (Fig. 51b,)

9a. Abdomen with a dorsomedian carina on the second to sixth somites. Exopod of uropod with a diaeresis (Fig. 60a). Rostrum with two pairs of lateral teeth in the basal part. The supraorbital spine is followed by a post supraorbital spine. Anterior margin of pleura of second abdominal somite with one or two spines in the basal half. Telson without mediodorsal spine in the basal part

10a. Median groove of rostrum reaching distinctly beyond anterior pair of lateral rostral teeth. Distance between supraorbital spine and gastric tubercle is half the distance between gastric tubercle and postcervical groove (Fig. 58). Indo-West Pacific ..... ***N. sulcata*** (Fig. 84)

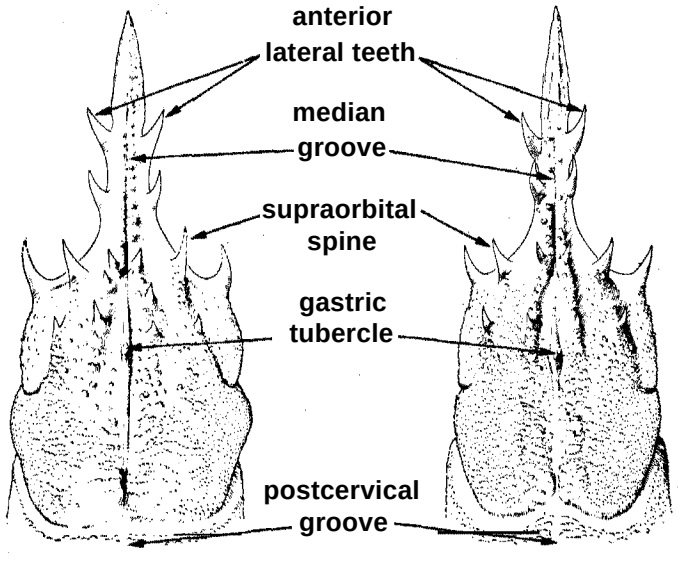
10b. Median groove of rostrum failing to reach the anterior pair of lateral rostral teeth. Distance between supraorbital spine and gastric tubercle about two thirds the distance between gastric tubercle and postcervical groove (Fig. 59) Eastern Atlantic ..... ***N. Atlantica*** (Fig. 67)



a. carapace (dorsal view)

b. abdomen (lateral view)

N. neglecta **Fig. 57**



anterior part of carapace (dorsal view) ***N. sulcata*** **Fig. 58**

anterior part of carapace (dorsal view) ***N. atlantica*** **Fig. 59**

(from Macpherson, 1990)

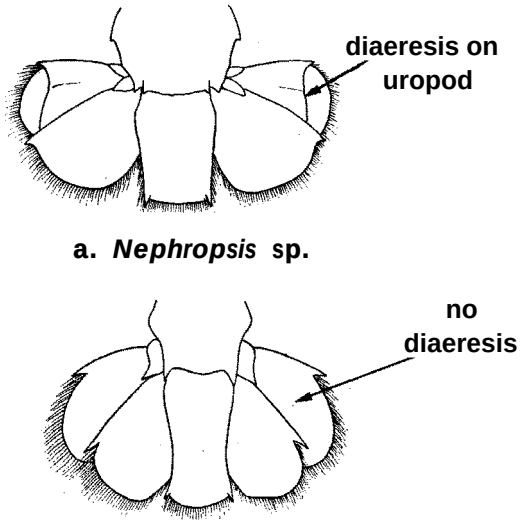
9b. Abdomen without mediodorsal carina

11a. Exopod of uropod with a diaeresis (Fig.60a). Indo-West Pacific ..... ***N. malhaensis***

11b Exopod of uropod without diaeresis (Fig. 60b)

12a. Atlantic species ..... ***N. agassizii*** (Fig. 65)

12b. Indo-West Pacific species ..... ***N. suhmi*** (Fig. 82)



a. *Nephropsis* sp.

b. N. suhmi

tail fan **Fig. 60**

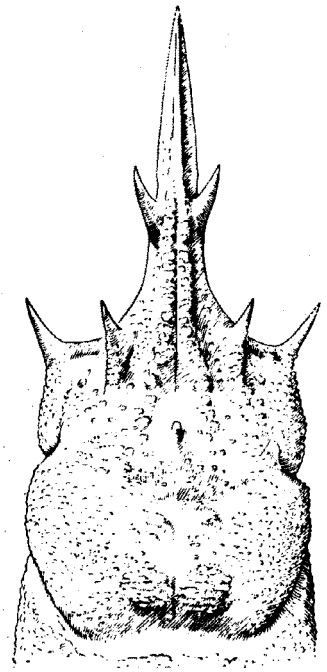
Nephropsis acanthura Macpherson, 1990 **Fig. 61**

NEPH Nephps 12

Nephropsis acanthura Macpherson, 1990, Mémoires Muséum National d'Histoire naturelle, Paris, (A) 145:311, figs. 5d, 9d-f, 11 a,b, 16d

FAO Names : En - Spinetail lobsterette.

Type : Type locality: Philippines, 13º53.7'N 119º56.3'E, 970 m. Holotype male, MP no AS 546.



anterior part of carapace (dorsal view)
(from Macpherson. 1990)

Fig. 61

Geographical Distribution : Indo-West Pacific region: Madagascar, Philippines, Australia (E. of Queensland), Chesterfield Islands, New Caledonia (Fig. 62).

Habitat and Biology : Deep sea between 850 and 1250 m.

Size : Carapace length, including rostrum: 1.6 to 3 cm (male), 1.5 to 3 cm (female).

Interest to Fisheries : None so far.

Literature : Macpherson, 1990:311-312.

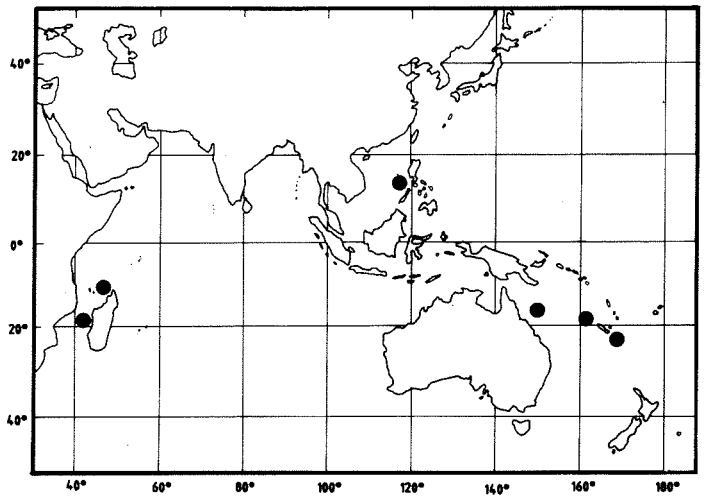


Fig. 62

Nephropsis aculeata S.I. Smith, 1881

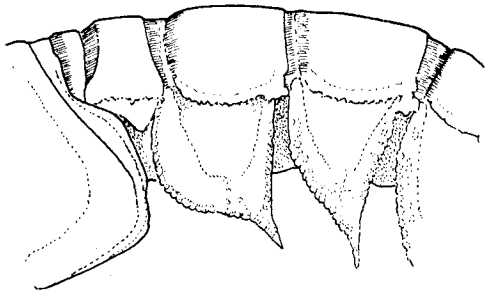
Fig. 63

NEPH Nephps 1

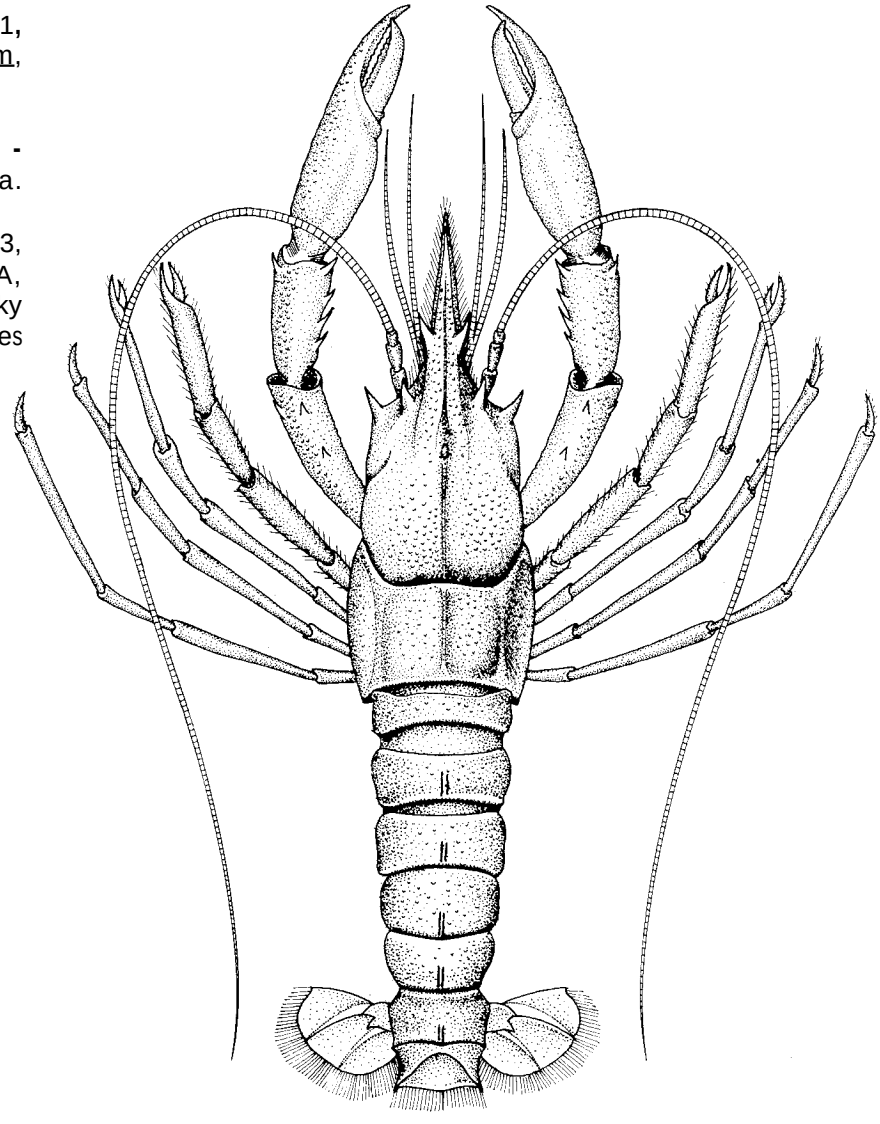
Nephropsis aculeatus S.I. Smith, 1881, Proceedings United States National Museum, 3:431.

FAO Names : En - Florida lobsterette; **Fr -** Langoustine de Floride; **Sp -** Cigala de Florida.

Type : Type locality:"Fish Hawk" Station 873, off Martha's Vineyard, Massachusetts, USA, 40º02'N 70º57'W, depth 182 m, bottom soft sticky mud. Lectotype (no. 20923) and 3 paralectotypes in USNM.



abdomen (lateral view)
(after Holthuis, 1974)



dorsal view

Fig. 63

click for next page

Geographical Distribution : Western Atlantic from off Massachusetts and Bermuda to French Guiana and Suriname, including the entire Gulf of Mexico and Caribbean Sea (Fig. 64).

Habitat and Biology : Deep sea between 137 and 824 m, mostly between 200 and 600 m. Bottom: mud or fine sand.

Size : Maximum total length about 14 5 cm Carapace length 1.5 to 7 cm.

Interest to Fisheries : Potential. Exploratory fishing in the Gulf of Mexico (off the mouth of the Mississippi, and off East Florida) showed the presence of considerable quantities of the species; with a 65 foot trawl, catches of up to 40 kg/h were obtained.

Literature : Holthuis, 19741776, figs 15, 16A,B; Fischer (ed.), 1978:vol. 6.

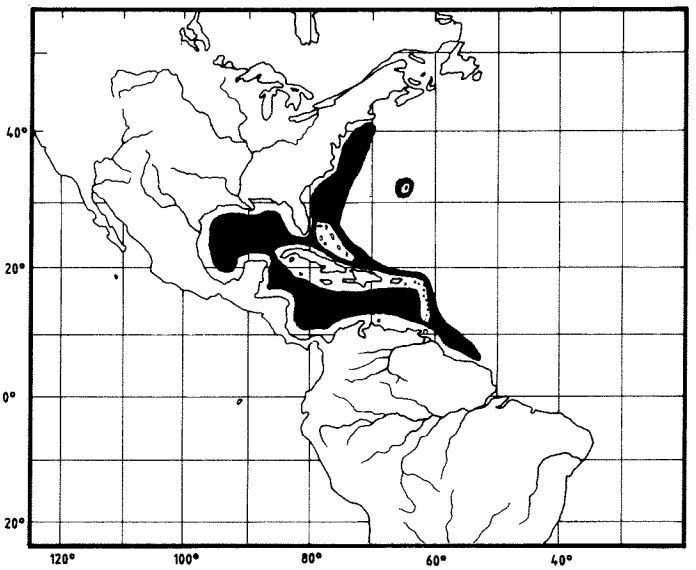


Fig. 64

Nephropsis agassizii A. Milne Edwards, 1880

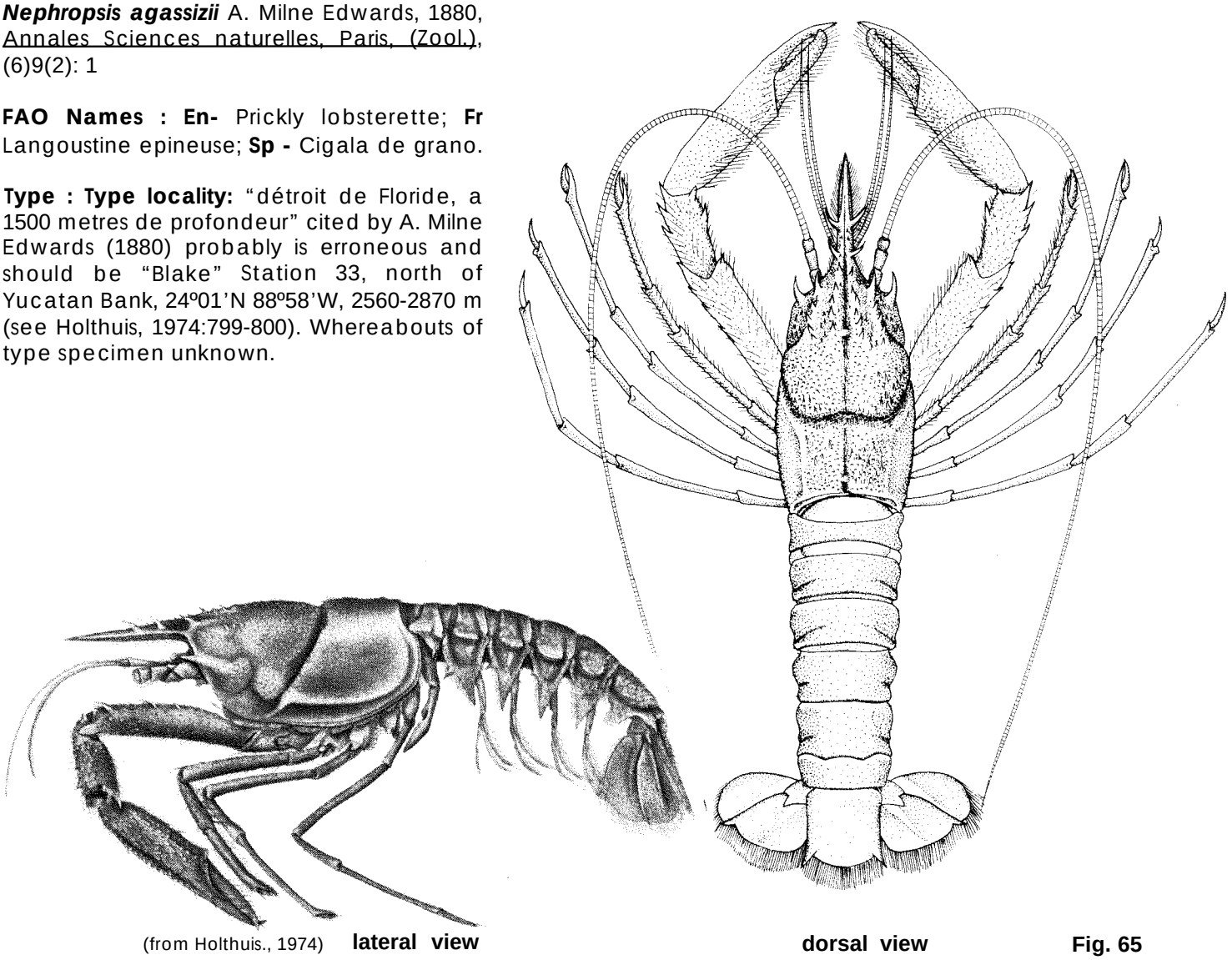
Fig. 65

NEPH Nephps 2

Nephropsis agassizii A. Milne Edwards, 1880, Annales Sciences naturelles, Paris, (Zool.), (6)9(2): 1

FAO Names : En- Prickly lobsterette; **Fr** Langoustine epineuse; **Sp -** Cigala de grano.

Type : Type locality: "détroit de Floride, a 1500 metres de profondeur" cited by A. Milne Edwards (1880) probably is erroneous and should be "Blake" Station 33, north of Yucatan Bank, 24º01'N 88º58'W, 2560-2870 m (see Holthuis, 1974:799-800). Whereabouts of type specimen unknown.



(from Holthuis., 1974) **lateral view** **dorsal view**

Fig. 65

Geographical Distribution : Western Atlantic: Bahama Islands, Gulf of Mexico, Caribbean Sea, Tobago and off São Paulo, Brazil (Fig. 66).

Habitat and Biology : Deep sea between 878 and 2560 m, most common between 1100 and 1900 m.

Size : Maximum total length about 12 cm (carapace length 5.6 cm); adults with carapace length usually between 4 and 5 cm.

Interest to Fisheries : Hardly potential. The species is taken occasionally during exploratory trawling, but never in great quantities. This, plus the fact that the species is relatively small and lives at very great depths make it unlikely that it ever will form the subject of a fishery.

Local Names: USA: Agassiz's lobsterette.

Literature : Holthuis, 1974:796, figs 19,20; Fischer, (ed.), 1978: vol. 6.

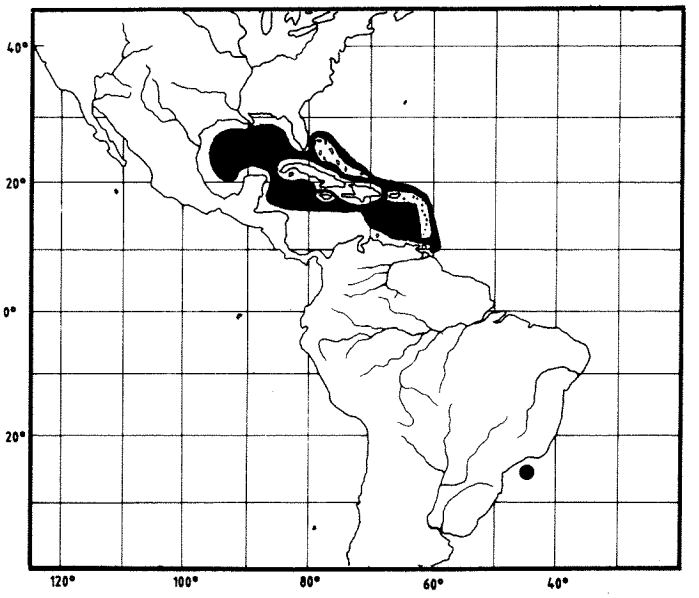


Fig. 66

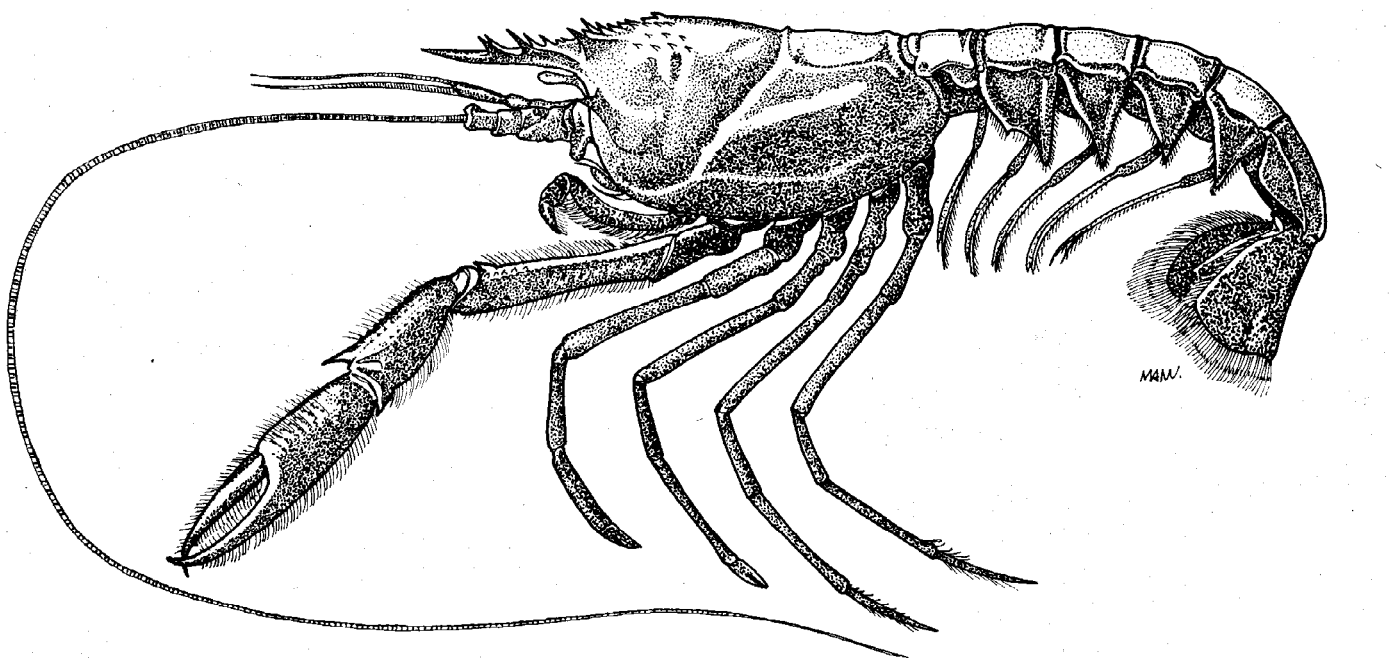
Nephropsis atlantica Norman, 1882

Fig. 67

NEPH Nephps 4

Nephropsis atlantica Norman, 1882, Proceedings Royal Society Edinburgh, 11:684.

FAO Names : En - Scarlet lobsterette.



(after Bouvier, 1917)

Fig. 67a

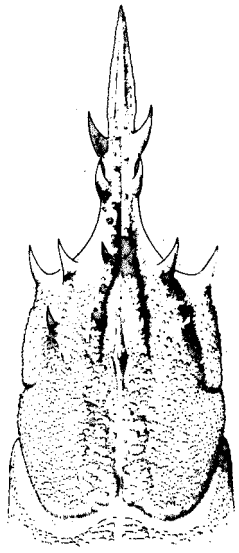
Type : Type locality: ""Knight Errant" August 10, 1880. Station 4; in 555 fathoms (Norman, 1882). Norman evidently made an error in the station number, as the date and depth given by him are those of Station 30 and not Station 4. The position of Station 30 in the Faeroe Channel is 59º33'N 7º14'W, 555 fms = 1015 m, bottom mud. Whereabouts of type unknown, not in BM.

Geographical Distribution : Eastern Atlantic between 61ºN and 24ºs (Faeroe Islands to Namibia) (Fig. 68). Records of the species from the Indo-West Pacific region refer most probably to ***N. sulcata.***

Habitat and Biology : Deep sea from 470 to 1804 m, mostly between 900 and 1400 m; bottom mud.

Size : Maximum total length 10.3 cm; ovigerous females are 8 to 10 cm long.

Interest to Fisheries : Only potential. The fact that the species is rather small and inhabits great depths makes its suitability for a fishery unlikely, although sometimes it is taken in numbers (RV J.E. PILLSBURY took respectively 16 and 31 specimens at a single station off respectively the Ivory Coast and Liberia).



anterior part of carapace (dorsal view) **Fig. 67b**
(from Macpherson, 1990)

Literature : Selbie, 1914:48, pl. 7 figs 1-13; Holthuis, 1974:801, fig. 21.

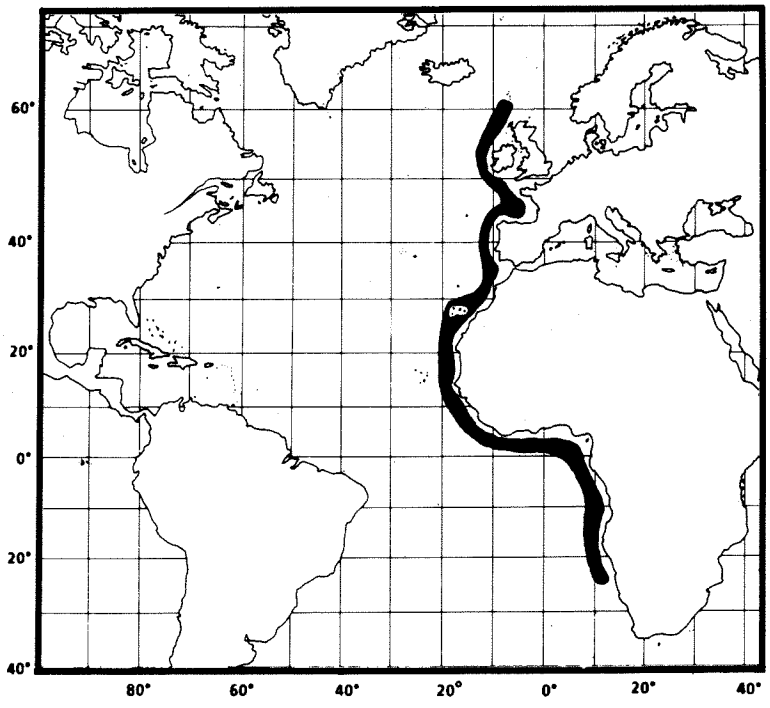


Fig. 68

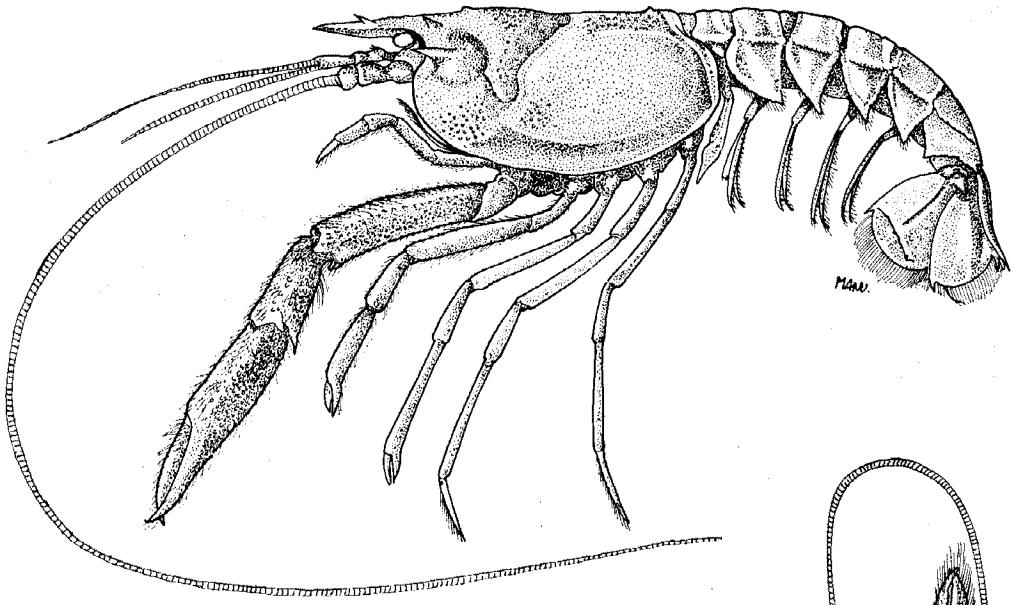
Nephropsis carpenteri Wood-Mason, 1885 **Fig. 69**

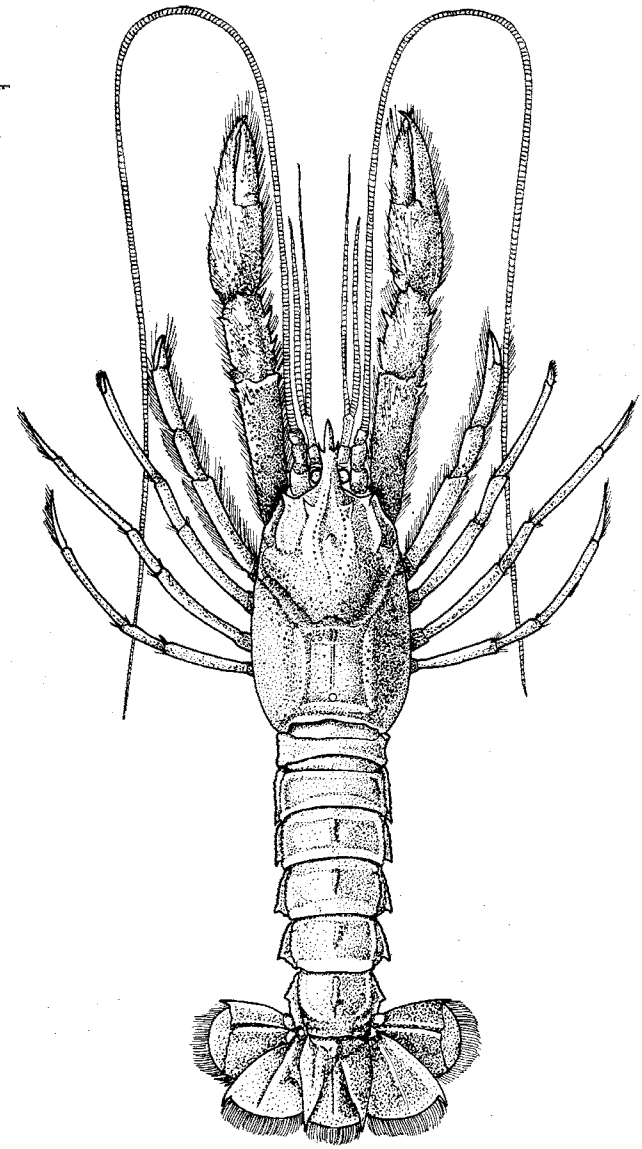
NEPH Nephps 5

Nephropsis carpenteri Wood-Mason, 1885, Proceedings Asiatic Society Bengal, 1885:71.

FAO Names: En - Ridge-back lobsterette.

Type : Type locality:"Investigator" Station 162. Bay of Bengal, 13º51'12"N.80º28'12"E, 145-250 fms [= 265-457m], brown mud. Holotype in ZSI, no. 4251/7, in alcohol, condition poor.





(after Alcock &Anderson, 1896) **Fig. 69**

Geographical Distribution : Indo-West Pacific region Arabian Sea, Bay of Bengal, Japan (Fig. 70)

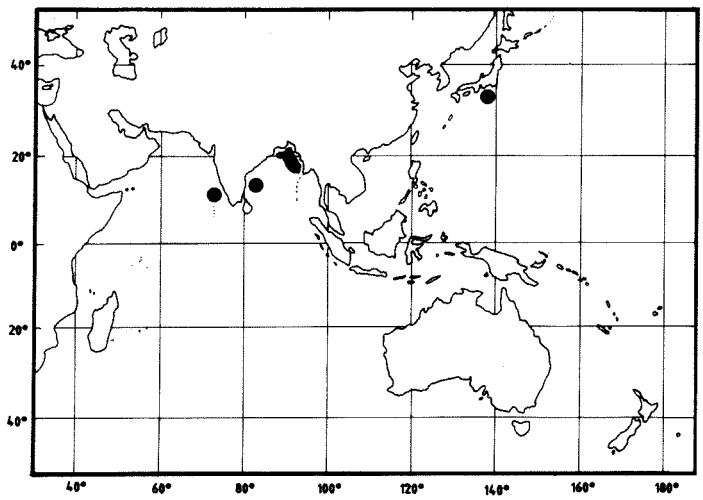


Fig. 70

Habitat and Biology : Depth range between 200 and 500 m.

Size : Total length 9 to 12 cm.

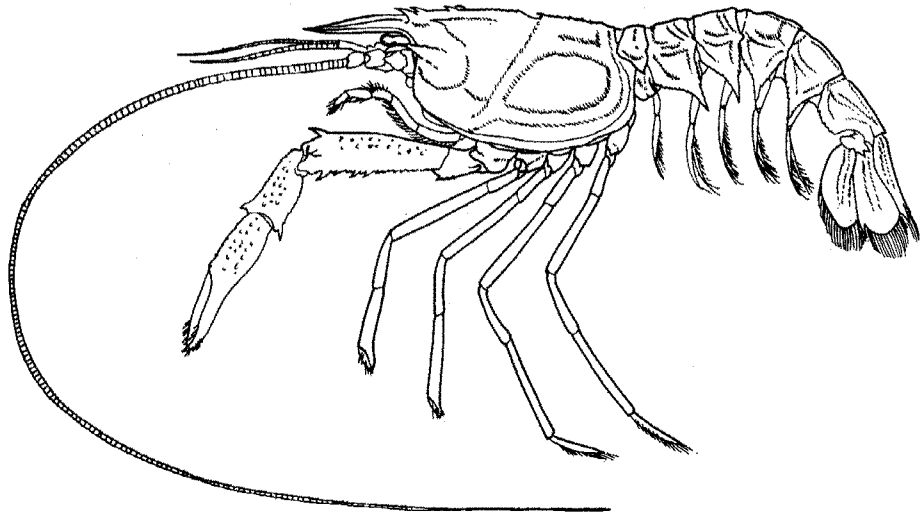
Interest to Fisheries : So far none. There are as yet no indications of fishing grounds with a sizeable population Of this species.

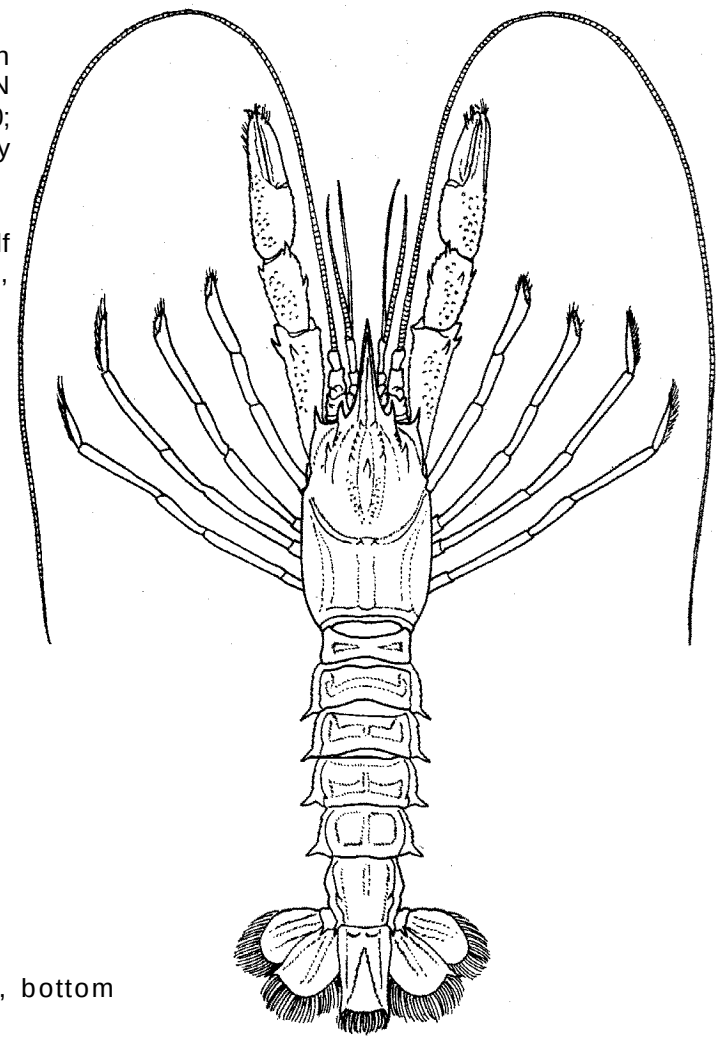
Literature : Alcock &Anderson, 1896, pl. 27, fig. 2; Alcock, 1901:160; Macpherson, 1990:316, figs 5f, 1 1e,f,12, 16f.

Nephropsis ensirostris Alcock, 1901 | **Fig. 71** | **NEPH Nephps 6**

Nephropsis ensirostris Alcock, 1901, Descriptive catalogue of Indian deep-sea Crustacea Macrura and Anomala: 162, pl. 1 fig. 2.

FAO Names : En - Gladiator lobsterette.





(after Alcock, 1901)

Fig. 71

Type : Type locality:I Investigator" Station 177, "Arabian Sea, north of the Laccadives 636 fathoms" [= 13º47'49"N 73º7'E, 1163 m, green mud]. Type material, ZSI, no. 3892/10; 2 specimens preserved in alcohol, condition poor, probably are types.

Geographical Distribution : Indo-West Pacific region: Gulf of Aden, Arabian Sea, Bay of Bengal, Andaman Sea, Philippines and Indonesia (Fig. 72).

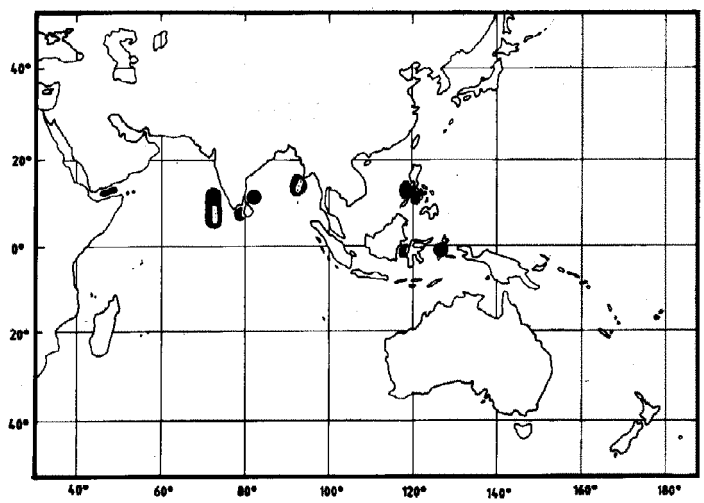


Fig. 72

Habitat and Biology : Deep sea from 580 to 1160 m, bottom mud or sandy mud.

Size : Total length about 6 cm.

Interest to Fisheries : So far none. The species has been rarely caught, while also the fact that it is rather small and lives in the deep sea makes its commercial value less likely.

Literature : Alcock, 1901:162, pt. 1 fig. 2; Alcock & McArdle, 1902:pl. 58 fig 1; Macpherson, 1990:303, figs 5a,6,8a,b, 16a.

Nephropsis malhaensis Borradaile, 1910

NEPH Nephps 7

Nephropsis malhaensis Borradaile, 19 10, Transactions Linnean Society, London, Zoology, 13(2):262.

FAO Names : En - Saya de Malha lobsterette.

Type : Type locality:"dredged in 300 fms off Saya de Malha", Western Indian Ocean. Holotype in ZMC in alcohol, condition good.

Geographical Distribution : Only known from the type locality (Fig. 65).

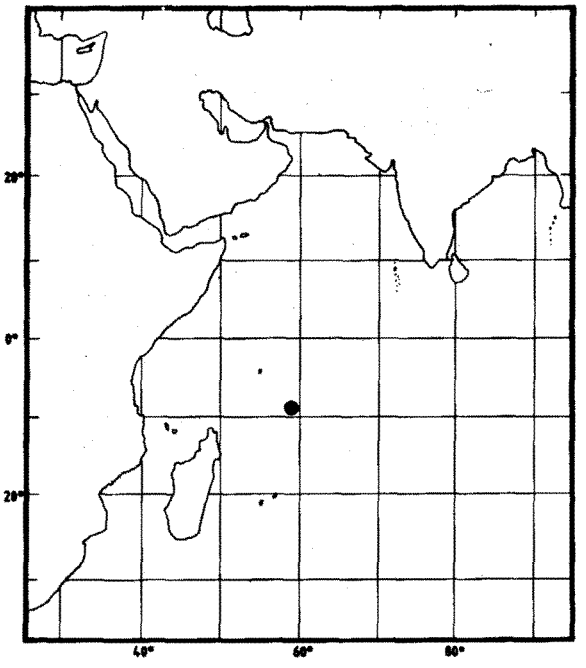


Fig. 73

Habitat and Biology : Deep sea, in 550 m.

Size : Total length of holotype, only specimen known, 7.75 cm.

Interest to Fisheries : None. The species, being only known from the holotype, is mentioned here solely for completeness' sake. There are no indications that it ever will have commercial possibilities.

Literature : Borradaile, 1910:262; Macpherson, 1990:317, figs 13a,b, 14c,d.

Remarks : The original description is short and not accompanied by a figure. Macpherson (1990) gave an additional illustrated description of the holotype.

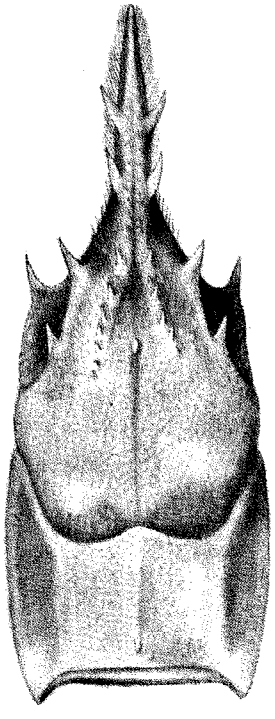
Nephropsis neglecta Holthuis, 1974

Fig. 74

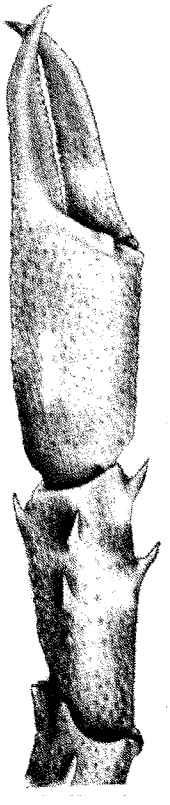
NEPH Nephps 8

Nephropsis neglecta Holthuis, 1974, Bulletin Marine Science, University Miami, 24:792, fig. 18.

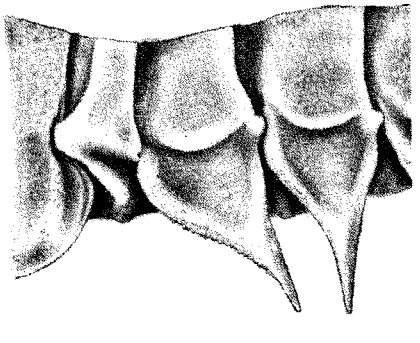
FAO Names : En - Ruby lobsterette.



a. carapace (dorsal view)



b. cheliped



c. abdomen (lateral view)

(from Holthuis, 1974)

Fig. 74

Type : Type locality: "16-20 miles s. of Dry Tortuqas, Florida [USA], 1065 m". Holotype in USNM, no. 136690 paratypes in USNM; UMML, RMNH, MCZ.

Geographical Distribution : Western Atlantic from Florida (USA) to the Guianas, including the Caribbean Sea and the Lesser Anlilles (Fig. 75).

Habitat and Biology : Deep sea between 655 and 1234 m, most catches between 800 and 1300 m; substrate sand or mud, sometimes with rubble.

Size : Carapace length between 1.5 and 3.5 cm, corresponding with a total length of about 3 to 7.5 cm.

Interest to Fisheries : So far none. The fact that the species is relatively small, usually taken singly or in pairs, and inhabits the deep sea, makes it not likely that it ever will be exploited commercially.

Literature : Original description

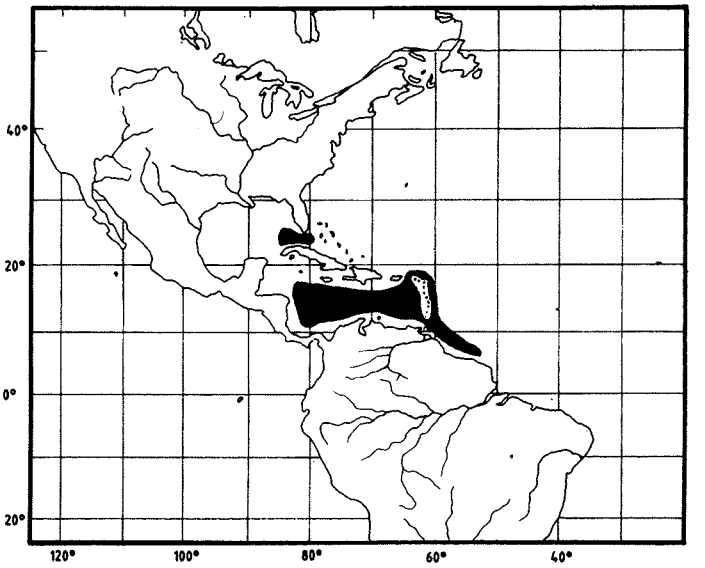
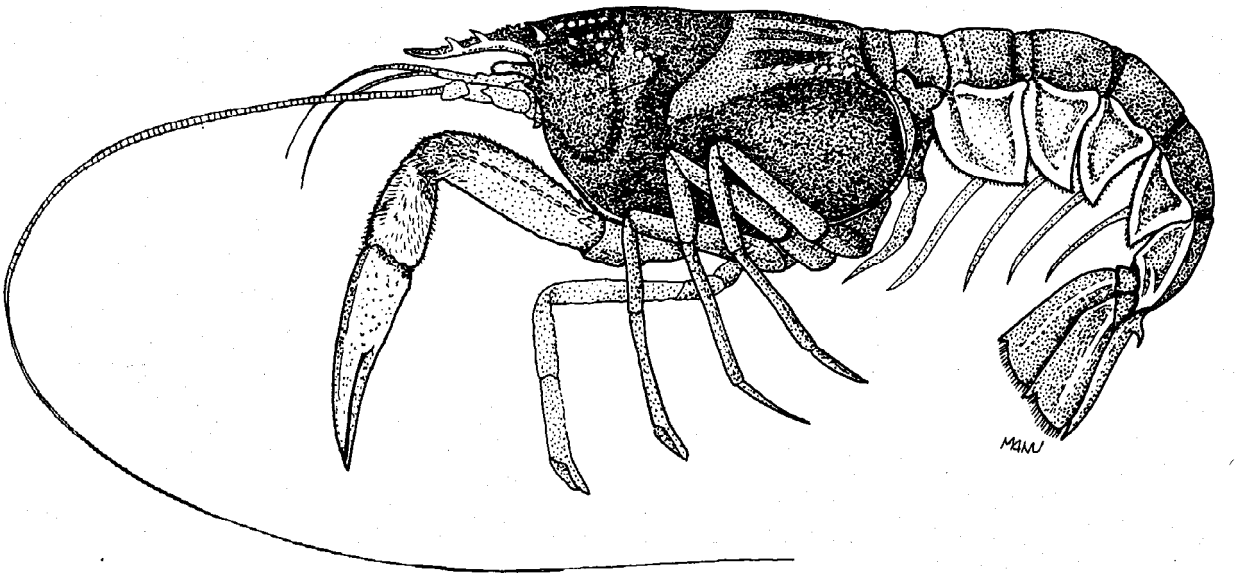


Fig. 75

Nephropsis occidentalis Faxon, 1893 **Fig. 76** **NEPH Nephps 9**

Nephropsis occidentalis Faxon, 1893, Bulletin Museum comparative Zoology..Harvard Colleae, 24: 195.

FAO Names : En - Pacific lobsterette; **Fr -** Langoustine du Pacifique; **Sp -** Cigala del Pacifico.



(after Faxon, 1895)

Fig. 76

Type : Type localities:"Albatross" Station 3418, off Acapulco, Mexico, 16º33'N 99º52'3O"W; 660 fms [= 1207 .m], brown sand, broken specks; syntype in USNM, no. 21081. "Albatross" Station 3424, near Tres Marias Islands, Mexico, 21º15'N 106º23'W, 676 fms [= 1236 m], grey sand, broken specks; syntype in USNM, no. 2 1082.

Geographical Distribution : Eastern Pacific from Baja California, Mexico (27ºN) to Valparaiso, Chile (ca. 32ºS) (Fig. 77). As Manning (1970:868) pointed out, the records from the Galapagos and Marion Islands are erroneous.

Habitat and Biology : Deep sea between 300 and 1200 m; muddy or sandy bottom.

Size : Total length 5 to 13 cm; carapace length 3,8-5. 1. A published record giving the maximum length as 25 cm is clearly erroneous.

Interest to Fisheries : Retamal (1977: 17) remarked that the species is commonly found in commercial catches of the shrimp Heterocarpus reedi Bahamonde in Chilean waters, and that with the right gear and a better knowledge of the habitat and habits of the species a commercial fishery might be feasible off Chile.

Local Names : CHILE: Camarón gigante, Camarón gigante de profundidad,

Literature : Faxon, 1895:127, pl. 0 fig. 1-16; Manning, 1970:865-70, fig. l-3; Macpherson, 1990:308, figs 5c, 8e,f, 9a-c, 16c.

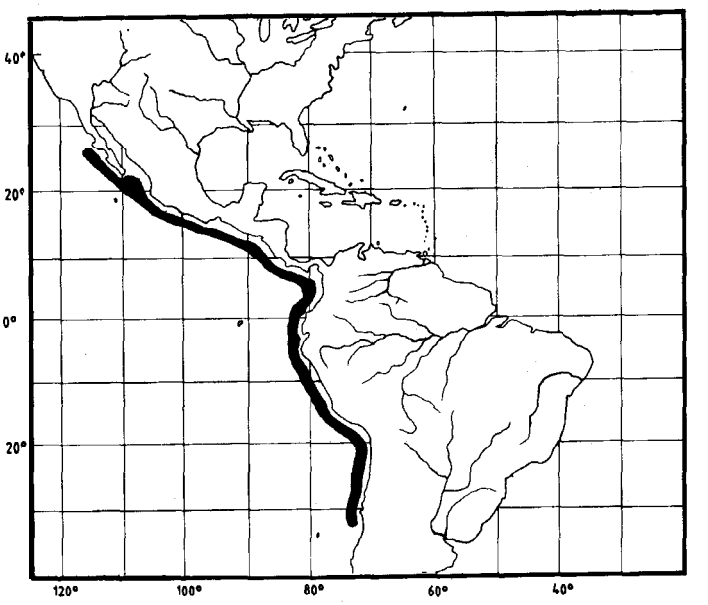


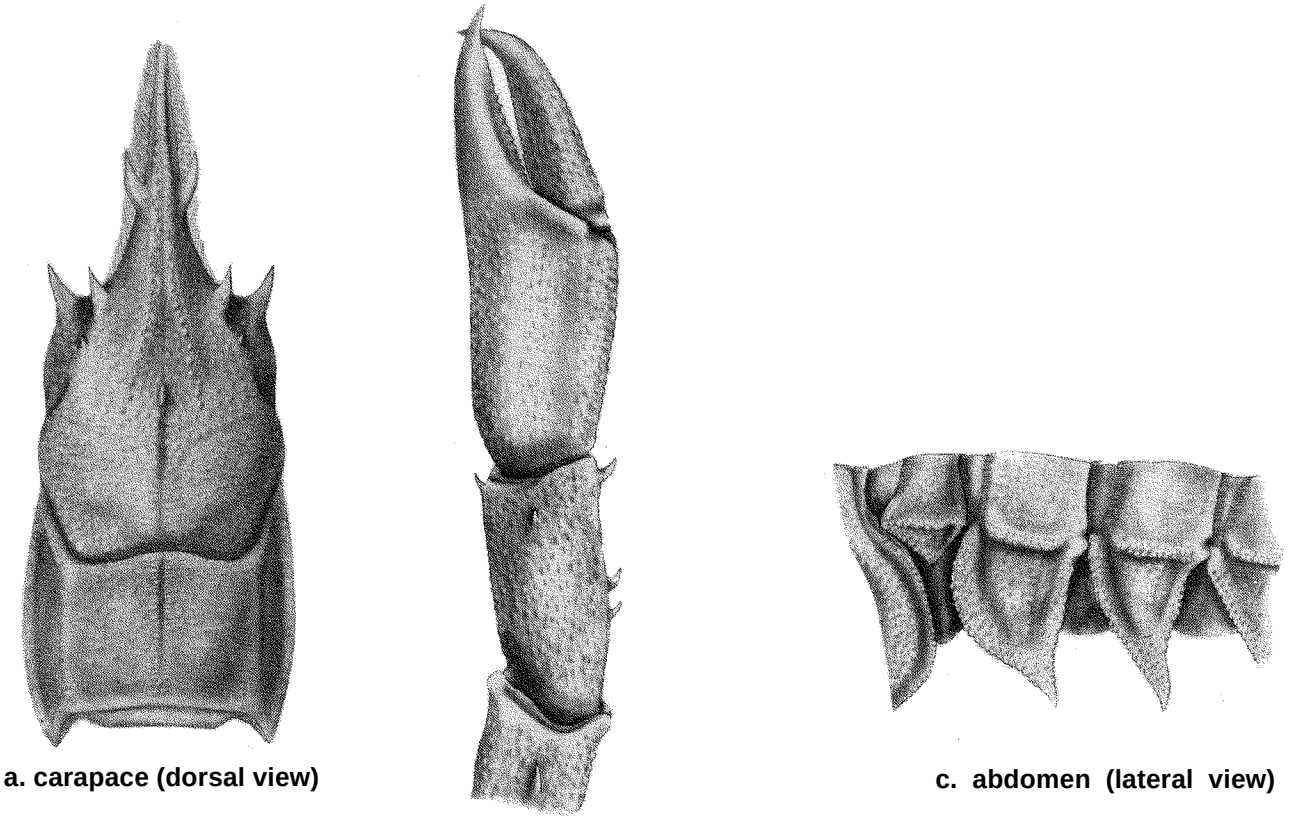
Fig. 77

Nephrupsis rosea Bate, 1888 **Fig. 78**

NEPH Nephps 10

Nephropsis rosea Bate, 1888, Report Voyage Challenger, Zool., 24: 178, text-fig. 39, pl. 23 figs 1,2, pl. 24 fig. 1

FAO Names : En - Two-toned lobsterette; **Fr -** Langoustine bicolore.



a. carapace (dorsal view)

b. cheliped

c. abdomen (lateral view)

(from Holthuis. 1974)

Fig. 78

Type : Type locality: "Challenger" Station 57, off Bermuda, 32º11'7"N 65º3'20"W; 1262 m. Holotype in BM, now completely disintegrated.

Geographical Distribution : Western Atlantic from Bermuda (32ºN) to northern South America (Guiana, 7ºN), including the Bahama Islands, the Gulf of Mexico and the Caribbean Sea (Fig. 79).

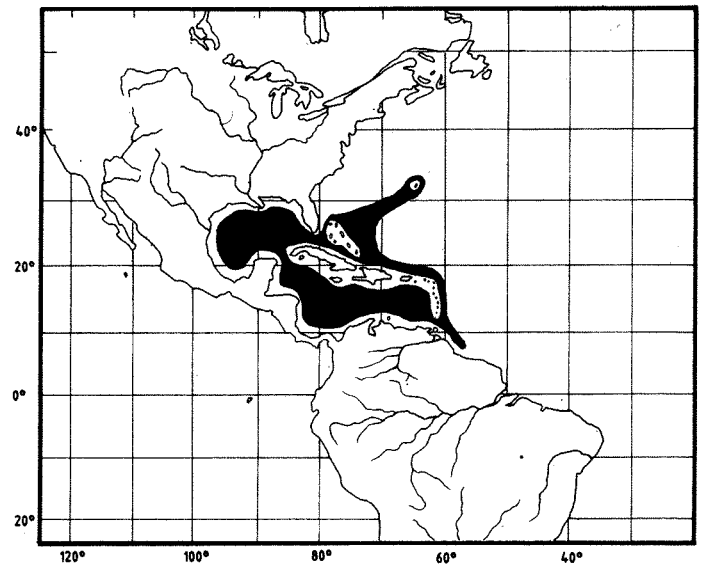


Fig. 79

Habitat and Biology : Deep sea between 420 and 1260 m, mostly between 500 and 800 m. On muddy or sandy bottoms.

Size : Carapace length between 1 and 6 cm, corresponding to a total length of about 2 to 13 cm.

Interest to Fisheries : Potential. The species is not rare and some of the hauls reported contain several specimens. With proper gear and a better knowledge of its habits and habitat, it may perhaps be possible to fish it commercially.

Literature : Holthuis, 1974:787, figs 16C,D, 17.

Nephropsis stewarti Wood-Mason, 1872

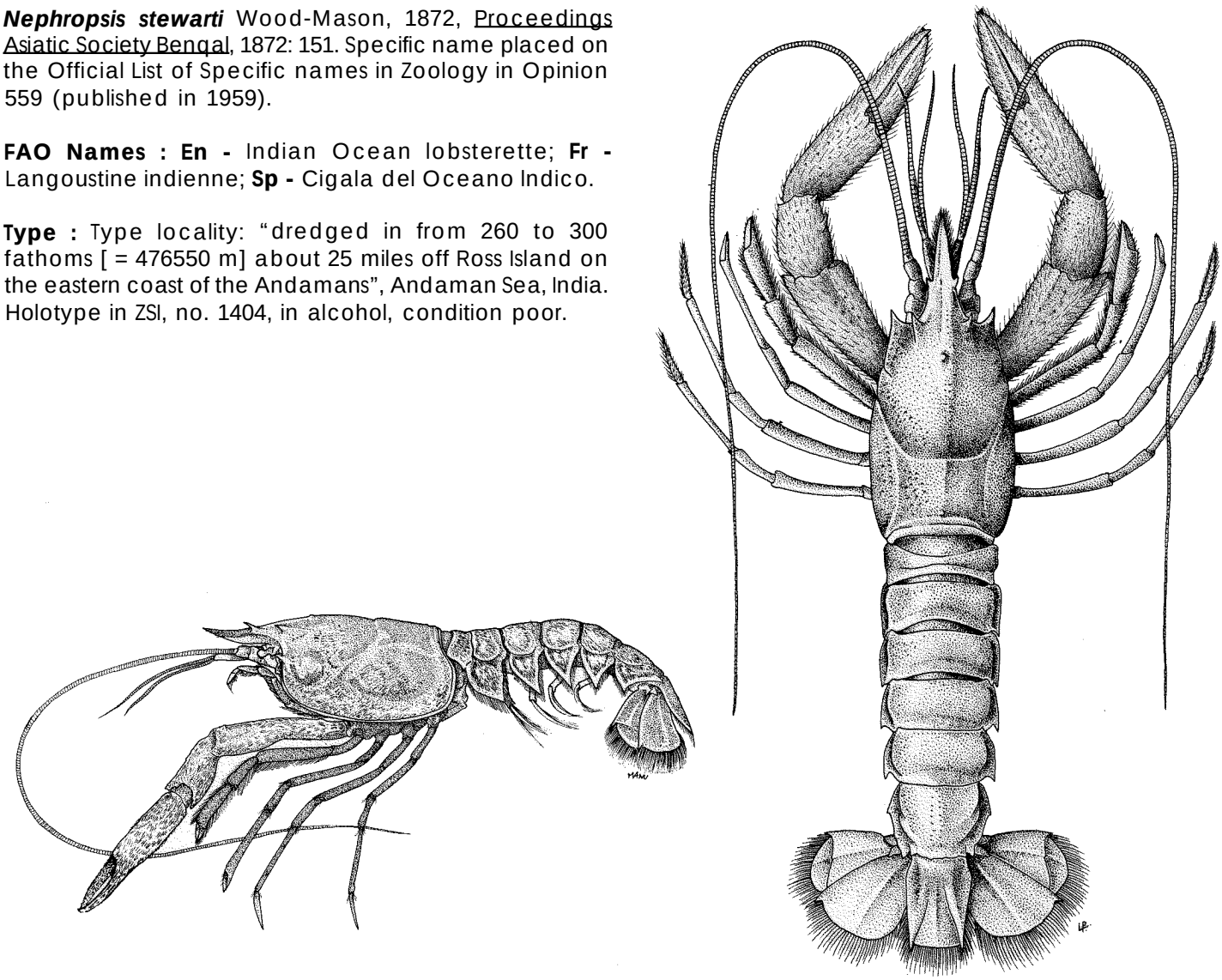
Fig. 80

NEPH Nephps 3

Nephropsis stewarti Wood-Mason, 1872, Proceedings Asiatic Society Bengal, 1872: 151. Specific name placed on the Official List of Specific names in Zoology in Opinion 559 (published in 1959).

FAO Names : En - Indian Ocean lobsterette; **Fr -** Langoustine indienne; **Sp -** Cigala del Oceano Indico.

Type : Type locality: "dredged in from 260 to 300 fathoms [= 476550 m] about 25 miles off Ross Island on the eastern coast of the Andamans", Andaman Sea, India. Holotype in ZSI, no. 1404, in alcohol, condition poor.



(after Alcock &Anderson, 1896)

Fig. 80

Geographical Distribution : Indo-West Pacific region from the Gulf of Aden and East Africa to Japan (Sagami Bay to Tosa Bay), Taiwan, the Philippines, Indonesia and Western Australia (Fig. 81).

Habitat and Biology : Deep sea between 170 and over 1060 m, usually between 500 and 750 m. On soft muddy substrates.

Size : Maximum body length 15 cm, common around 10 cm. Carapace length: male 2.2-7.1 cm; female 1.4-7 cm; ovigerous females 4.2-7 cm.

Interest to Fisheries : So far none, but perhaps of potential interest. Crosnier & Jouannic (1973: 13) reported small catches in exploratory trawling off Madagascar (1/2 kg per hour or less), but consider that the species "parait presenter peu d'intérêt" for commercial fishery.

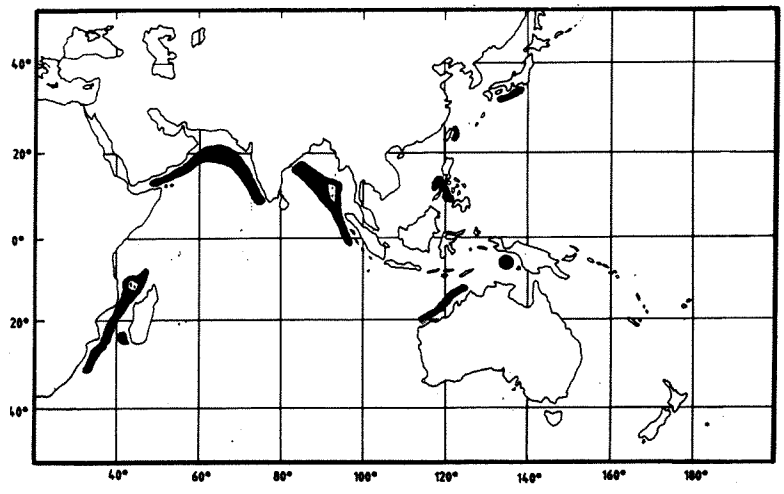


Fig.81

Local Names: AUSTRALIA: Stewart'sscampi; JAPAN: Okina-ebi (= old gentleman); MOZAMBIQUE: Lagostim indiano.

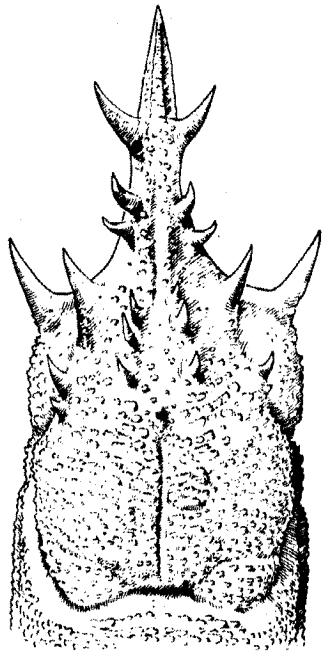
Literature : Fischer & Bianchi (eds), 1984:vol.5; Macpherson, 1990:312, figs 5e, 10, 1 lc,d, 16e.

Nephropsis suhmi Bate, 1888 **Fig. 82** **NEPH Nephps 11**

Nephropsis suhmi Bate, 1888, Report Voyaae Challenger, Zoology, 24: 181, pl. 23 fig. 3, pl. 24 fig. 2.

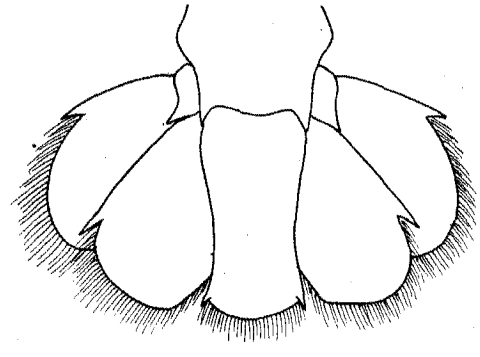
Synonyms : ***Nephropsis orientalis*** Bate, 1888: 171, 175 (a name that Bate evidently originally intended for the species, and which on p. 171 and 175 he forgot to change to ***N. suhmi***, of which it is to be considered an objective synonym).

FAO Names : En - Red and white lobsterette.



anterior part of carapace (dorsal view)

(from Macpherson, 1990)



tail fan

Fig. 82

Type : Type locality: "Challenger" Station 191, "lat. 5º41'S, long. 134º4'30"E.; off Dobba, Arrou Island [= Dobo, Aru Islands, Indonesia]; depth 800 fathoms [= 1463 m]; bottom green mud". Holotype in BM, no. 88.22 (in alcohol, condition fair).

Geographical Distribution : Indo-West Pacific region: western Indian Ocean (Gulf of Aden, Arabian Sea), Madagascar, Indonesia (Makassar Strait, Aru Islands), Australia (E. of Queensland), New Caledonia (Fig. 83).

Habitat and Biology : Deep sea between 786 and 2029 m, most catches between 1600 and 1900 m. Substrate: mud.

Size : Total length between 2 and 11 cm, carapace length between 0.8 and 5.9 cm.

Interest to Fisheries : So far none. A better knowledge of its biology and occurrence may show the species to be of potential interest. The soft substrate on which it lives indicates that it could best be obtained by trawling, but the efficiency of this and other gear should be tested experimentally.

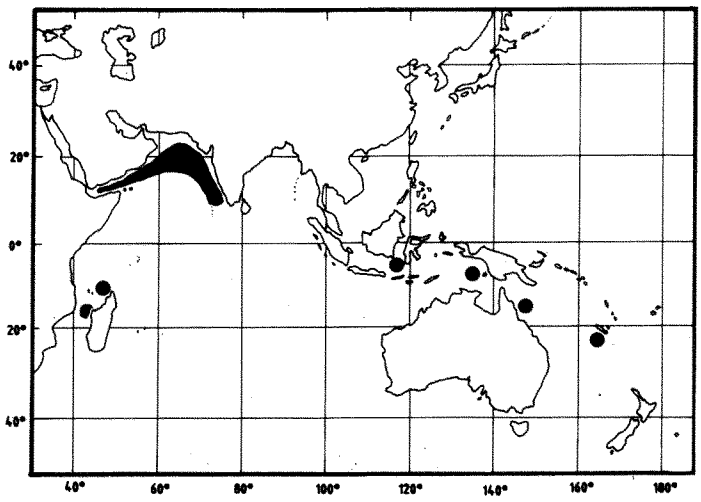


Fig. 83

Literature : Original description; Alcock, 1901: 163; Macpherson, 1990:306, figs 5b, 7d-f, 8c,d.

Nephropsis sulcata Macpherson, 1990

Fig. 84

NEPH Nephps 13

Nphropsis sulcata Macpherson, 1990, Mémoires Museum National Histoire naturelle, Paris, (A) 145:319, figs.13e-g, 14a,b, 15a,b, 16g .

FAO Names : En - Grooved lobsterette.

Type : Type locality: Philippines, 13º53.7'N 119º56.3'E, 865 m. Holotype male, MP no. AS 523.

Geographical Distribution : Indo-West Pacific: South Africa (Natal), Madagascar, Laccadive Sea, South China Sea, Philippines, Australia (E. of Queensland), Chesterfield Islands, New Caledonia (Fig. 85)

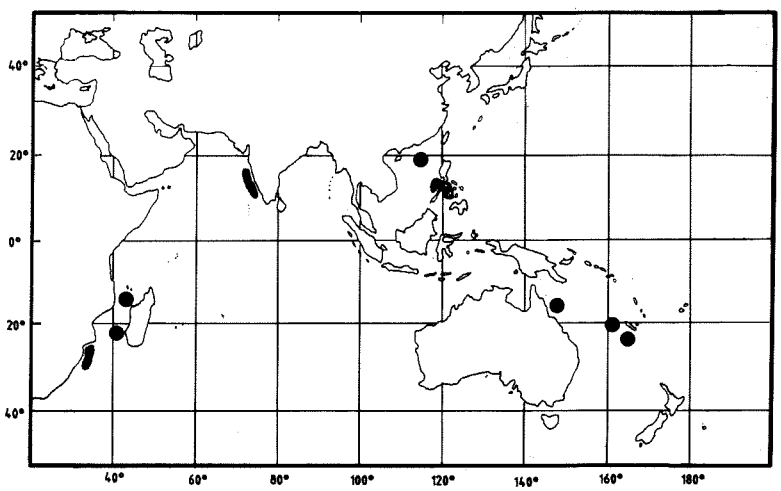
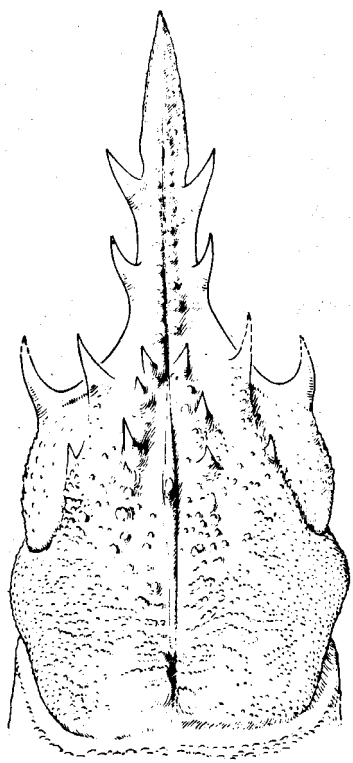


Fig. 85



anterior part of carapace (dorsal view)

(from Macpherson, 1990) **Fig. 84**

Habitat and Biology : Deep sea between 750 and 1115 m. Muddy bottom.

Size : Carapace length, including rostrum: male 1.5 to 3 cm; female 1.8 to 3.4 cm, smallest ovigerous female 2.6 cm.

Interest to Fisheries : So far none.

Literature : Original description.

Remarks: The species has often been confused with ***N. atlantica*** and most, if not all, records of N. atlantica from the Indo-West Pacific region pertain to the present species.

Thymops Holthuis, 1974

NEPH Thym

Thymops Holthuis, 1974, Bulletin Marine Science, University Miami, 24(4):763. Gender masculine.

Type Species : by original designation and monotypy: ***Nephropides birsteini*** Zarenkov & Semenov, 1972.

The genus so far is known to have a single species.

Thymops birsteini (Zarenkov & Semenov, 1972)

NEPH Thym 1

Nephropides birsteini Zarenkov & Semenov, 1972, Zoolooicheski Journal Moscow, 51:599, figs 1-6

FAO Names : En - Patagonian lobsterette.

Type : Type locality: "Akademik Knipovich" Station 1021, 49º00.8'S 57º07. 6'W, 515-525 m. Holotype male in Zoological Museum, University of Moscow.

Geographical Distribution : Continental shelf of southern tip of South America, on the Atlantic side (Argentina) south of 37ºS;on the Pacific side (Chile) south of 51ºS; including the area north, east and southeast of the Falkland/Malvinas Islands, and east of South Georgia. The entire area lies between 37" and 57ºS and 35" and 76ºW (Fig. 87).

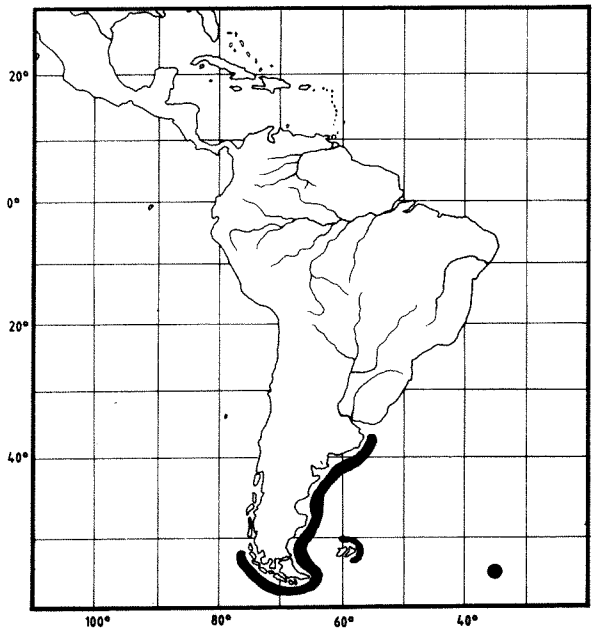


Fig. 87

Fig. 86

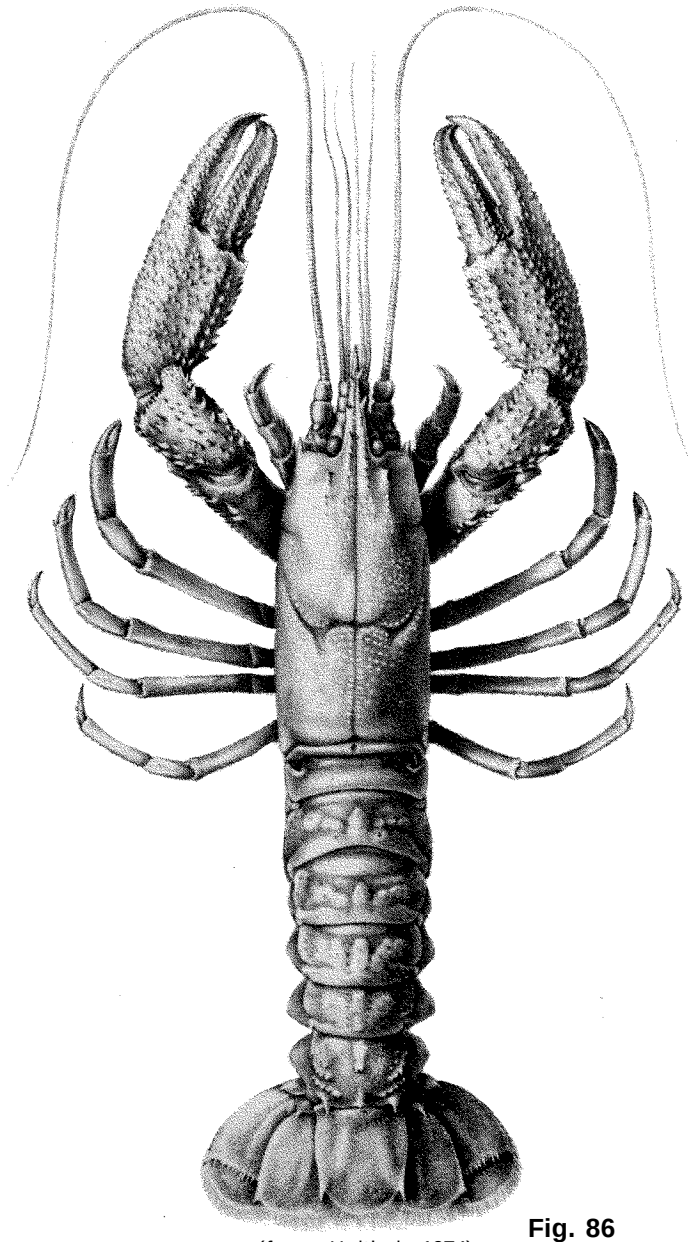


Fig. 86

(from Holthuis 1974)

Habitat and Biology : Deep sea between 122 and 1400 m, mostly between 122 and 900 m.

Size : 'Total lengthreported from8to25cm;carapacelengthfrom2to10cm(mostlybetween3and6cm).Ovigerous females with cl 3 4to 7.4 cm.

Interest to Fisheries : According to Boschi, Irio & Fischbach (1982:233) the species would be of potential interest off the Argentine coast if large concentrations could be detected.

Local Names : ARGENTINA: Langosta de aguas profundas.

Literature : Holthuis, 1974:764, figs 13, 14.

Thymopsis Holthuis, 1974

NEPH Thymop

Thymopsis Holthuis, 1974, Bulletin Marine Science, University Miami, 24(4):754. Gender feminine.

Type Species : by original designation and monotypy: ***Thymopsis nilenta*** Holthuis, 1974.

A single species is known in this genus.

Thymopsis nilenta Holthuis, 1974

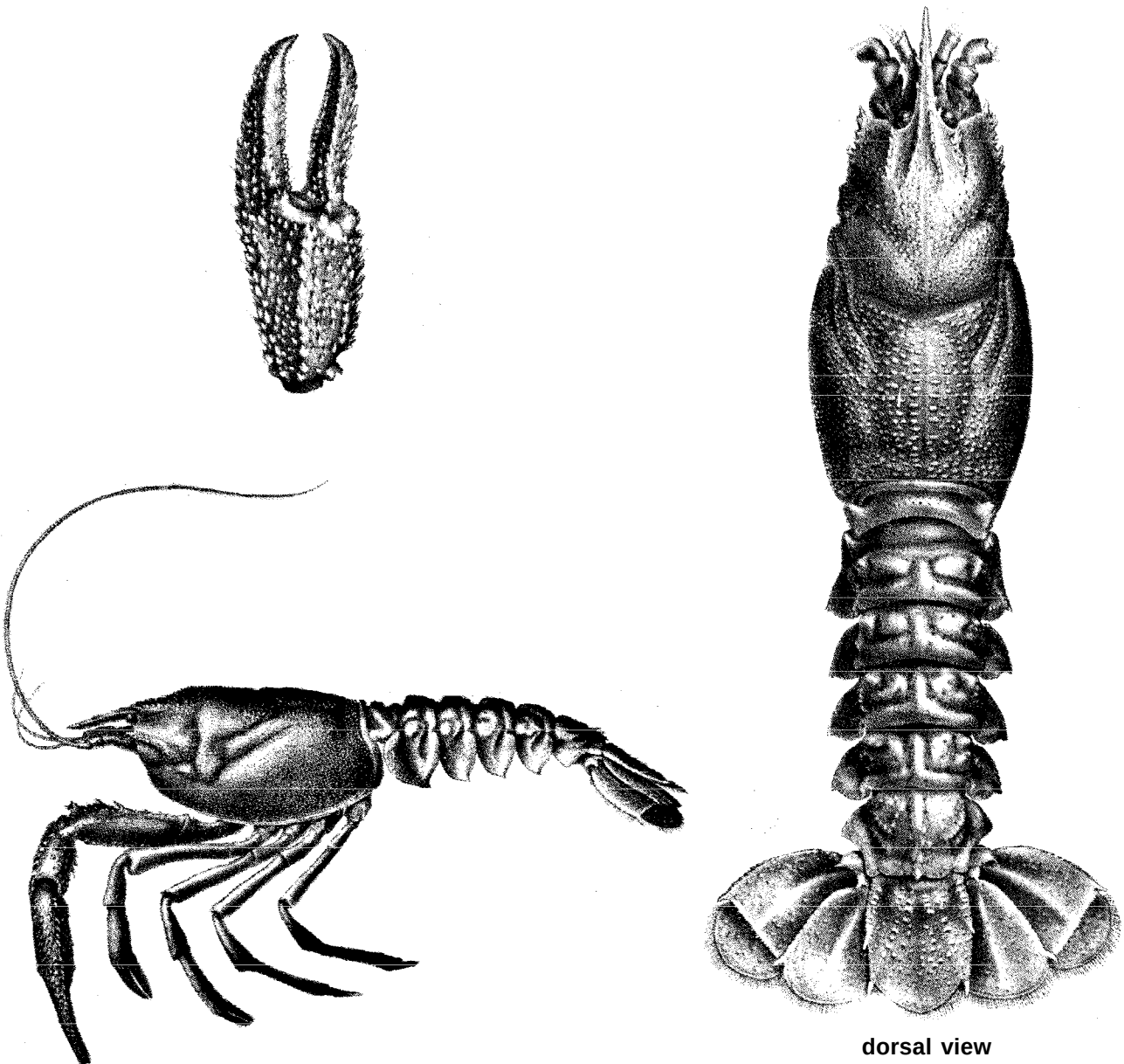
Fig. 88

NEPH Thymop 1

Thymopsis nilenta Holthuis, 1974, Bulletin Marine Science, University Miami, 24(4):756, fig. 10-12.

FAO Names : En - Nilenta lobsterette.

Type : Type locality: "Eltanin" 22 Station 1555, * S of South Georgia, 60º04'S-60º08'S, 35º59'W-36º04'W, 1976-2068 m". Holotype female in USNM, no. 141257; paratypes in USNM, RMNH.



lateral view

dorsal view

(from Holthuis 1974)

Fig. 88

click for next page

Geographical Distribution : Southern Atlantic. ,So far only known from two localities: southeast of the Falkland/ Malvinas Islands (55º01'-55º10'S 39º55' - 39º46'W) and south of South Georgia (6º04' - 60º08'S 35º59' 36º04'W) (Fig. 89).

Habitat and Biology : Deep sea between (1976-J 2068 and 2886 (-3040) m.

Size : Total body length about 15 cm, carapace length (without rostrum) 5 to 6 cm.

Interest to Fisheries : None so far. Until now only 4 specimens have been collected of this species. Its scarcity and the very great depths at which it is found, make it an unlikely candidate for a fishery, notwithstanding its relatively good size.

Literature : Original description.

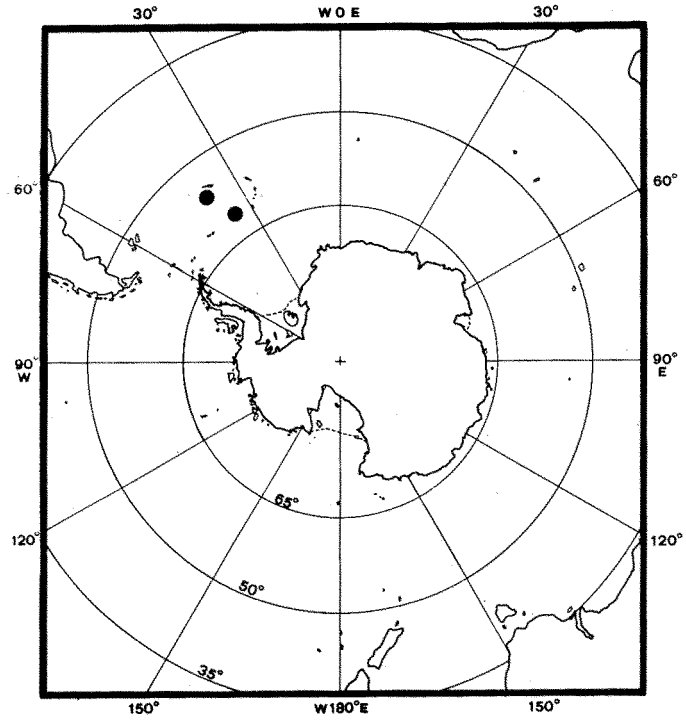


Fig. 89

SUBFAMILY **NEPHROPINAE** Dana, 1852

Nephropinae Dana, 1852, Proceedings Academy Natural Sciences, Philadelphia, 6: 15.

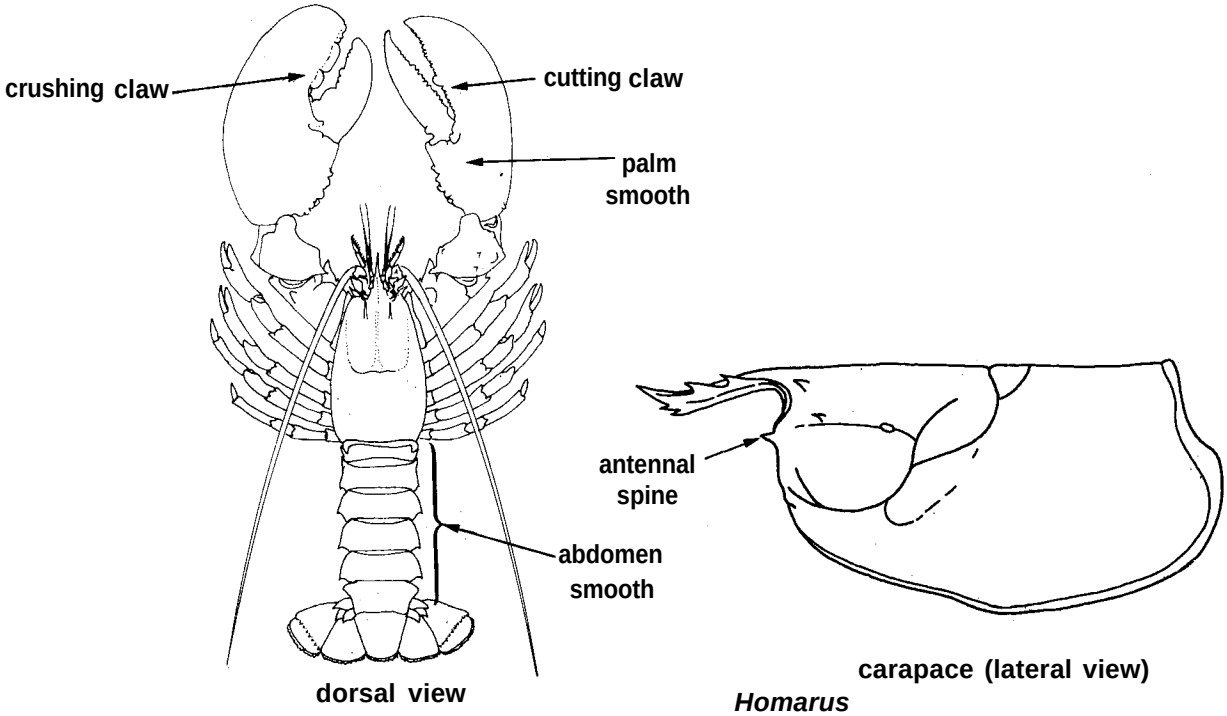
This, the typical subfamily of Nephropid lobsters, contains the following 5 genera. ***Eunephrops, Homarus, Metanephrops, Nephrops*** and ***Thymopides.***

All species of Nephropinae are of present or potential commercial interest, and all are listed here.

Key to Genera:

1a. Left and right first chelipeds unequal, one a crushing claw, the other a cutting claw. Antennal spines without a strong posterior carina (Figs 90,91) First abdominal sternite of the male without a median spine

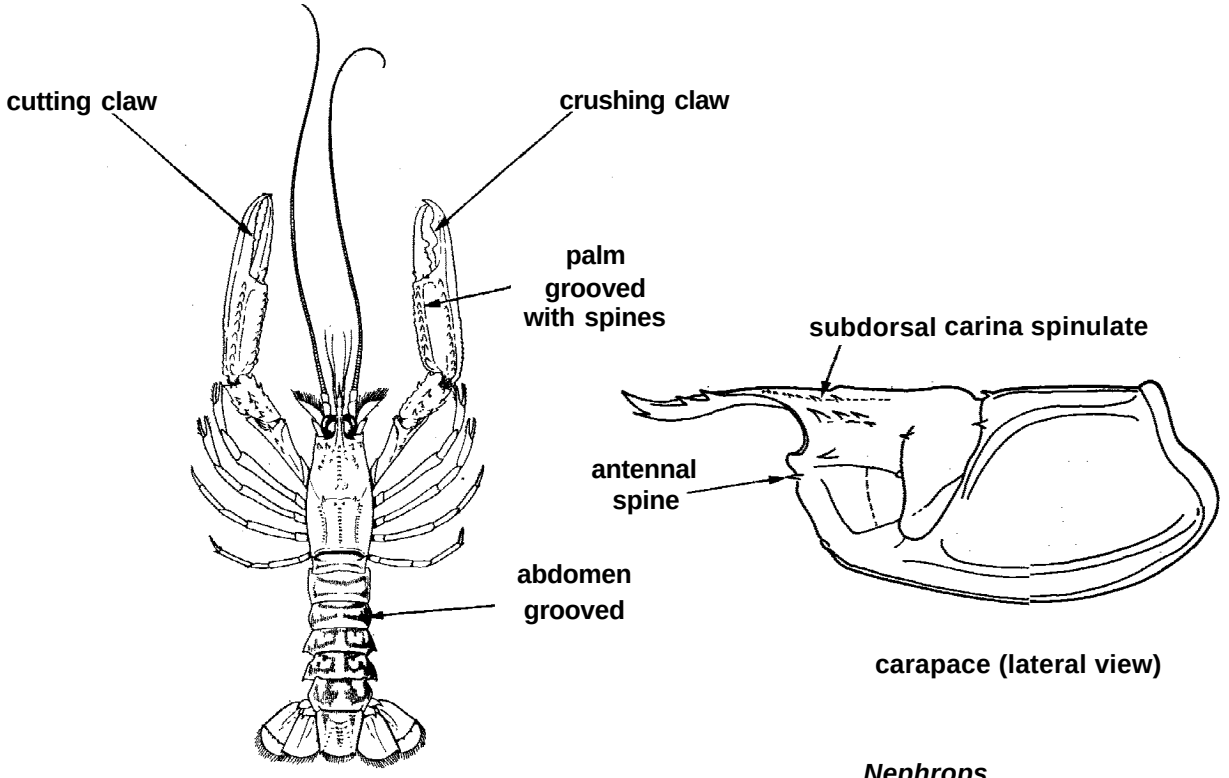
2a. Palm of first chelipeds smooth, without ridges. Subdorsal carinae without spinules. Abdominal somites smooth, without grooves;no carinae separating the tergites from the pleura (Fig. 90) **.....*Homarus***



Homarus

Fig.90

2b. Palm of first chelipeds with distinct longitudinal grooves, ridges and rows of spines. Subdorsal carinae spinulate. Abdominal somites dorsally with distinct transverse grooves, a blunt carina separates the tergites from the pleura (Fig. 91). ..... ***Nephrops***

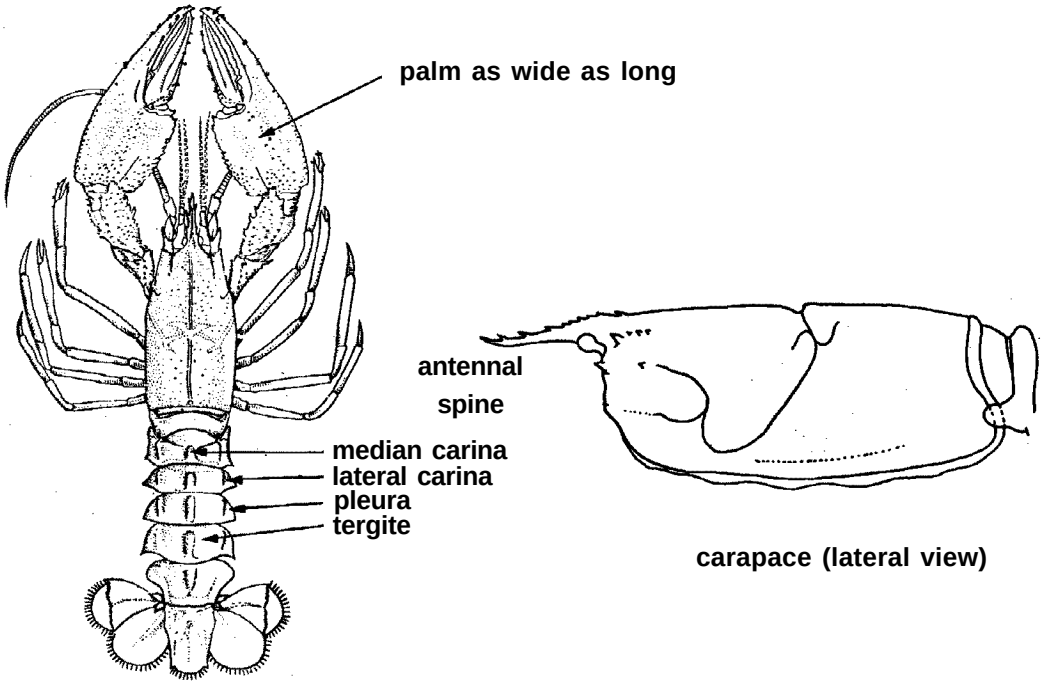


Nephrops **Fig. 91**

1b. Left and right chelipeds of the first pair similar in site and shape. Antennal spine in most species followed by a strong carina. A distinct carina separates the abdominal tergites.from the pleura. First abdominal sternite of the male with a median spine (this character not known from Thymopides)

3a. Antennal spine not followed by a strong carina. Palm of'first chela as wide as long. Abdomen with a blunt median carina (Fig. 92). ..... ***Thymopides***

3b. Antennal spine followed by a strong carina. Palm of first chela distinctly longer than wide



Thymopides **Fig. 92**

4a. Supraorbital spine followed by a strong toothed ridge which extends almost to the postcervical groove. Posterior part of carapace with several longitudinal carinae (Fig. 93) ..... ***Metanephrops***

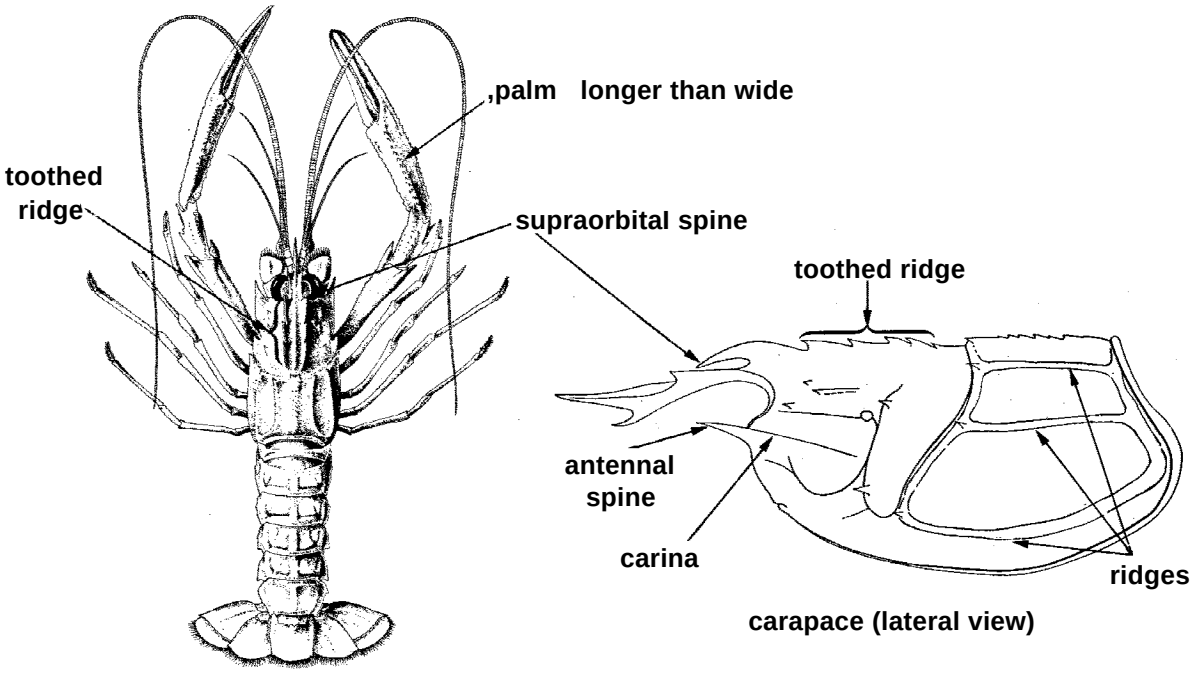


Fig. 93

4b. Supraorbital spine followed by a single post-supraorbital spine, no supraorbital carina is present. The posterior part of the carapace is evenly granulate, without longitudinal carinae (Fig. 94) ..... ***Eunephrops***

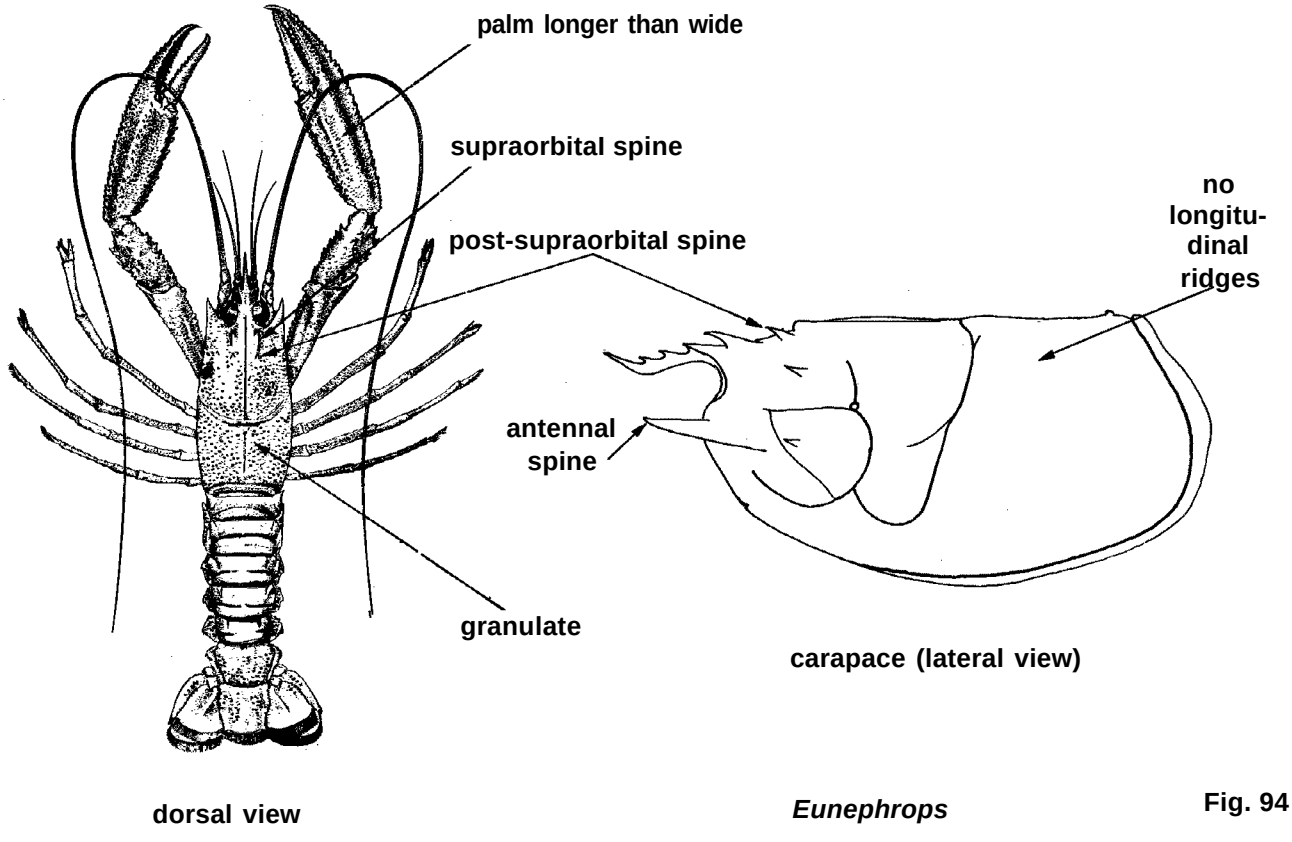


Fig. 94

Eunephrops S.I. Smith, 1885

NEPH Euneph

Eunephrops S.I. Smith, 1885, Proceedings United States National Museum, 8: 167. Gender masculine.

Type Species : by monotypy: ***Eunephrops bairdii*** S .I. Smith, 1885.

The genus is restricted to the Western Atlantic and has three known species, all of which inhabit the deep sea. They are of potential interest for fishery.

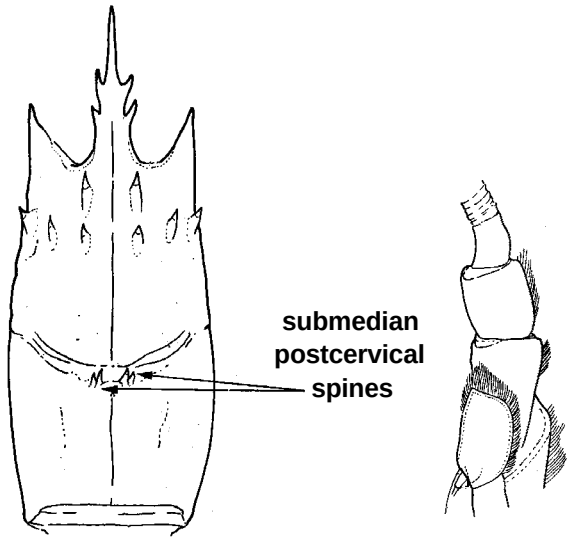
Key to Species:

1a. Carapace with submedian postcervical spines. No spine at the base of the scaphocerite (Fig. 95). Second pereiopod with the fingers slightly less than half as long as the palm (Fig 96a) ..... ***E. bairdii*** (Fig. 98)

1b. Carapace without postcervical spines. A spine on the antennal peduncle near the base of 'the scaphocerite. Second pereiopod with the fingers less than 1/3 as long as the palm (Pig. 96 b,c)

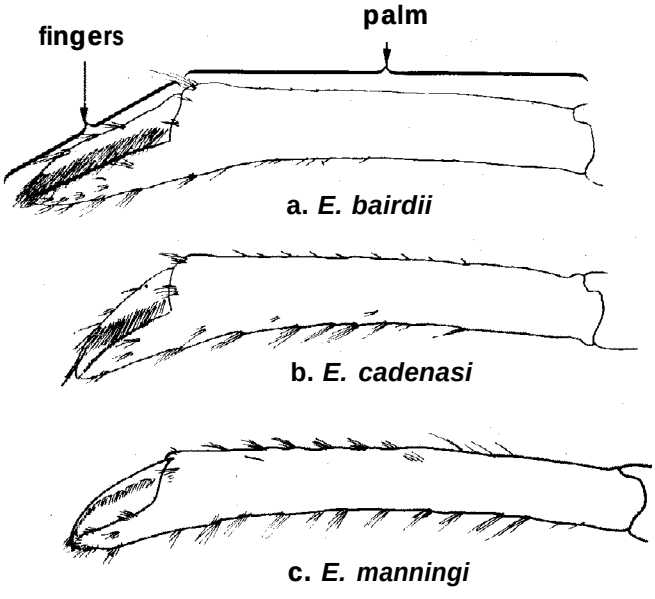
2a. Abdominal somites with distinct longitudinal median carina(Fig. 97a). Scaphocerite reaching to the base of the ultimate segment of the antennal peduncle. Third pereiopod with the fingers about l/3 of the length of the palm ..... ***E. cadenasi*** (Fig. 100)

2b. Abdominal somites with a single transverse groove, which is interrupted in the middle; no median carina is present (Fig. 97b). Scaphocerite small, failing to reach the middle of the penultimate segment of the antennal peduncle. Third pereiopod with the fingers about 1/5 of the length of the palm ..... ***E. manningi*** (Fig. 102)



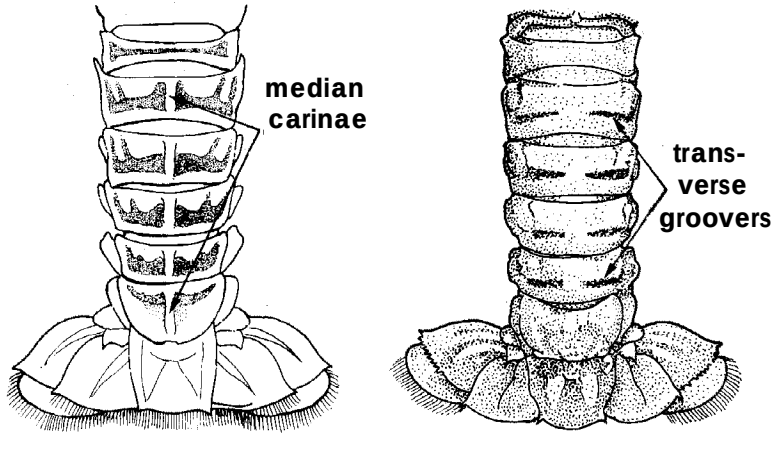
E. bairdii
(after Holthuis, 1974)

Fig. 95



chelae of second pereiopod
(from Holthuis, 1974)

Fig. 96



abdomen (dorsal view)

Fig. 97

Eunephrops bairdii S.I. Smith, 1885

Fig. 98

NEPH Euneph 1

Eunephrops bairdii S.I. Smith, 1885, Proceedings United States National Museum, 8: 167.

FAO Names : En- Red lobster; **Fr** - Langoustine rouge; **Sp** - Cigala colorada.

Type : Type locality: "Albatross" "Station 2143, March 23, 1884; Gulf of Darien; north latitude 9º30'45", west longitude 76º25'30"; 155 fathoms [=284 ml; green mud". Female holotype in USNM, No. 6937.

Geographical Distribution : Western Atlantic: southwest Caribbean Sea off Colombia and Panama (Fig. 99).

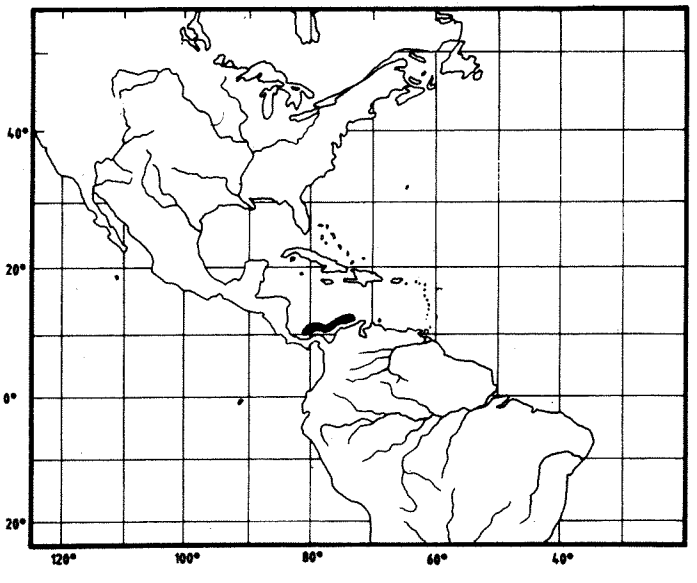
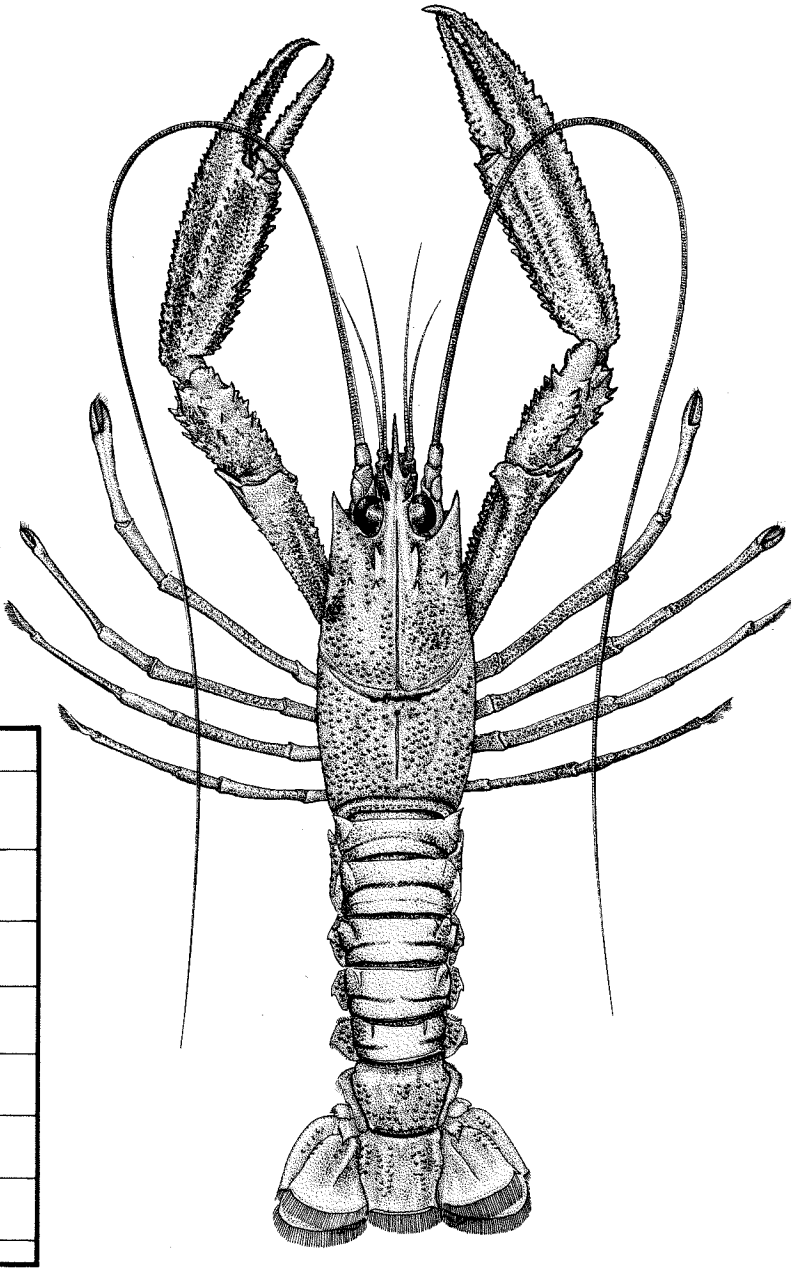


Fig. 99



(after Holthuis. 1974)

Fig. 98

Habitat and Biology : Depth range between 230 and 360 (-400) m. Soft substrate (mud or coralfine rubble).

Size : Carapace length between 4 and 9 cm. Maximum total length about 20 cm.

Interest to Fisheries : The species has been taken occasionally during exploratory commercial fishing. Its large size makes it an attractive fishery subject, but the fact that it seems to be scarce and lives in great depths detracts from its possible commercial value.

Literature : Holthuis, 1974:842, figs 27-29; Fischer (ed.), 1978: vol. 6.

Eunephrops cadenasi Chace, 1939 | **Fig. 100** | **NEPH Euneph 2**

Eunephrops cadenasi Chace, 1939, Memorias Sociedad Cubana Historia natural, 13:40.

FAO Names : En - Sculptured lobster.

Type : Type locality: "Nicholas Channel south of Cay Sal Bank, Lat. 23º21 'N, Long. 79º58'W, 300-315 fathoms [= 550-576 m]". Holotype female in MCZ.

Geographical Distribution : Western Atlantic: off Bahama Islands and Dominica; Caribbean Sea near Jamaica and Colombia (Fig. 101).

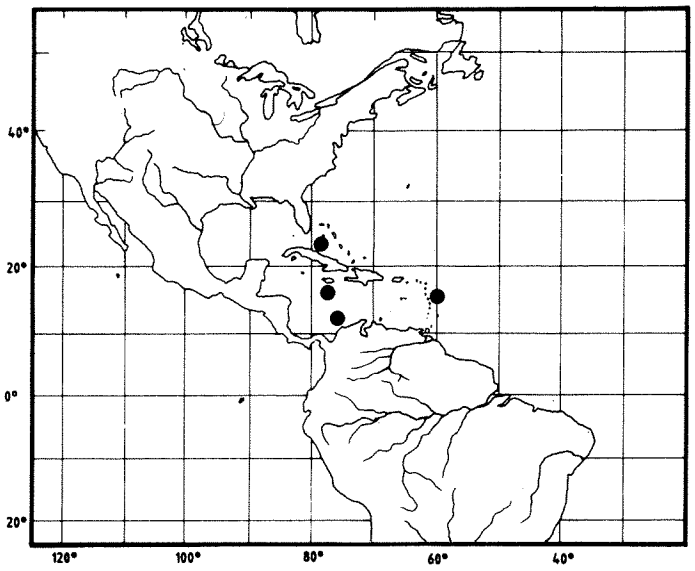
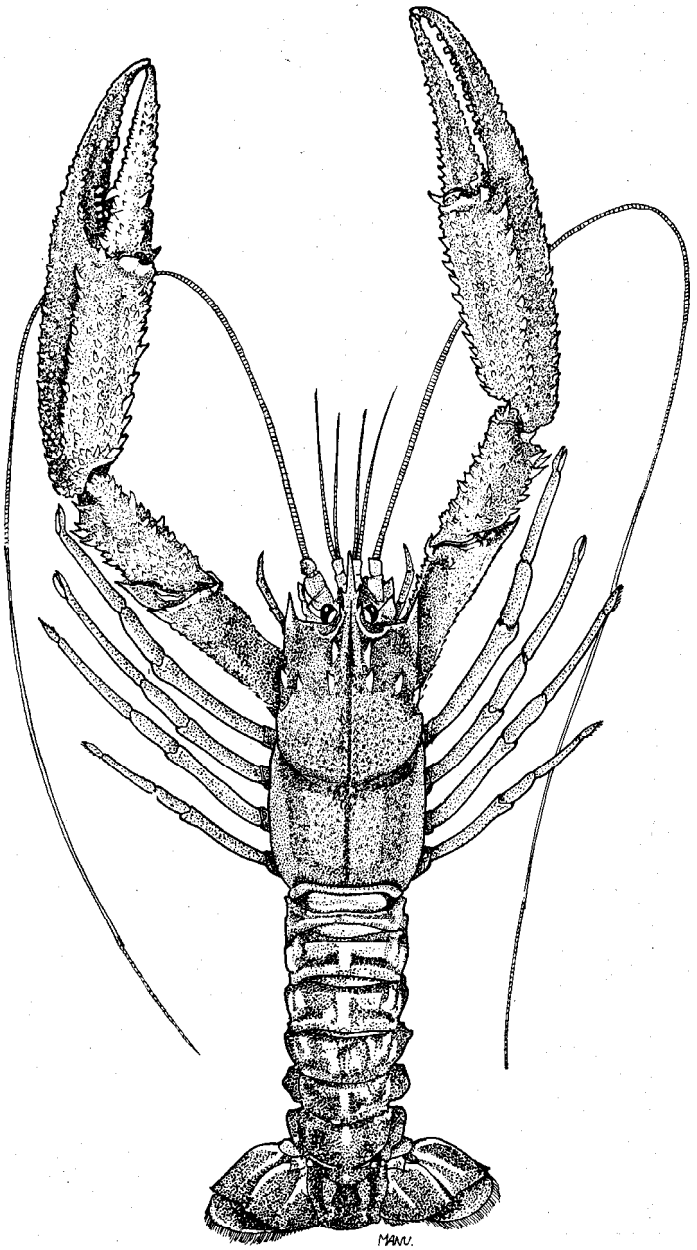


Fig. 101



(after Holthuis, 1974) **Fig. 100**

Habitat and Biology : Depth range between 434 and 591 m.

Size : Maximum total body length (males) about 30 cm. Carapace length 5-14 cm (males), 4-5 cm (females).

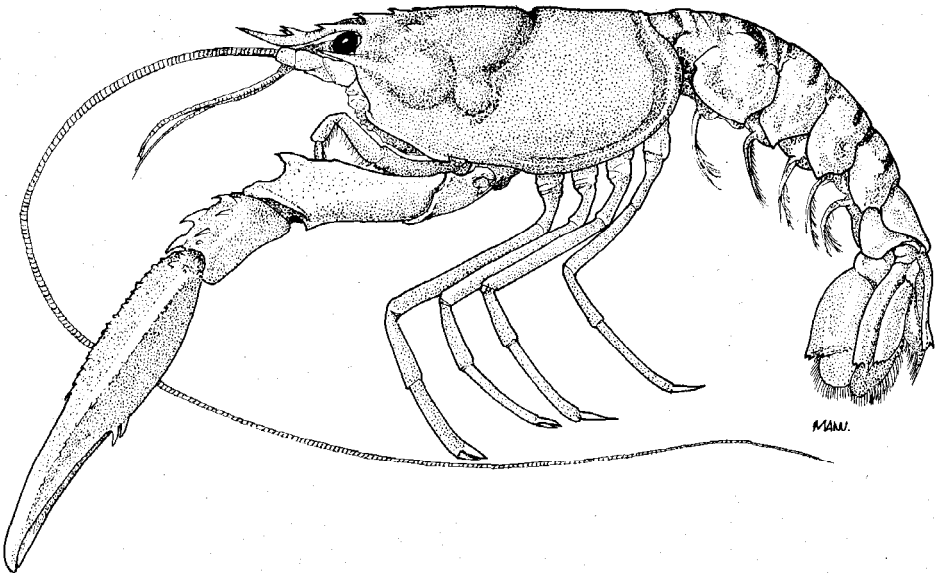
Interest to Fisheries : The large size, that the species may attain, makes it of potential interest to fisheries. Its apparent scarcity and the fact that it inhabits great depths, however, are important obstacles.

Literature : Holthuis, 1974:849, figs 30-32.

Eunephrops manningi Holthuis, 1974 | **Fig. 102** | **NEPH Euneph 3**

Eunephrops manningi Holthuis, 1974, Bulletin Marine Science, University of Miami, 24(4):854, figs 33-35.

FAO Names : En - Banded lobster.



Type : Type locality: "Florida Straits, 550 m, Silver Bay stat. 2483" [= 26º25.5'N 79º01'W]. Male holotype in USNM no. 139626; paratypes in USNM, RMNH.

Geographical Distribution : Western Atlantic: Florida Straits and northwest of Anguilla (Fig. 103).

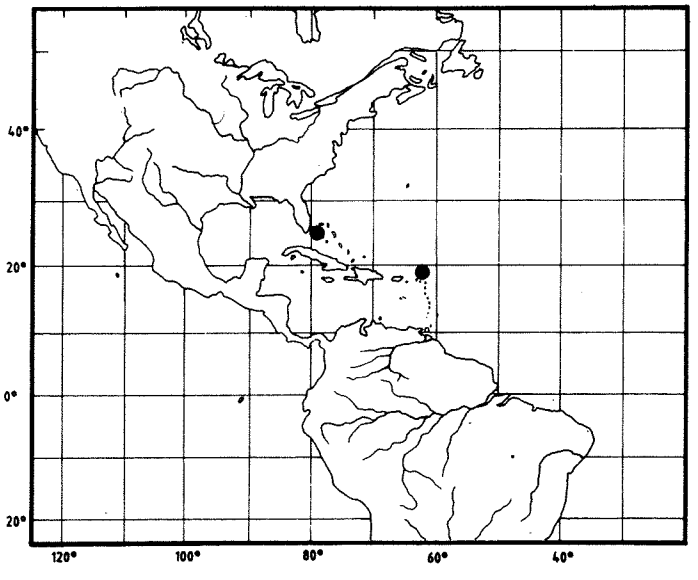
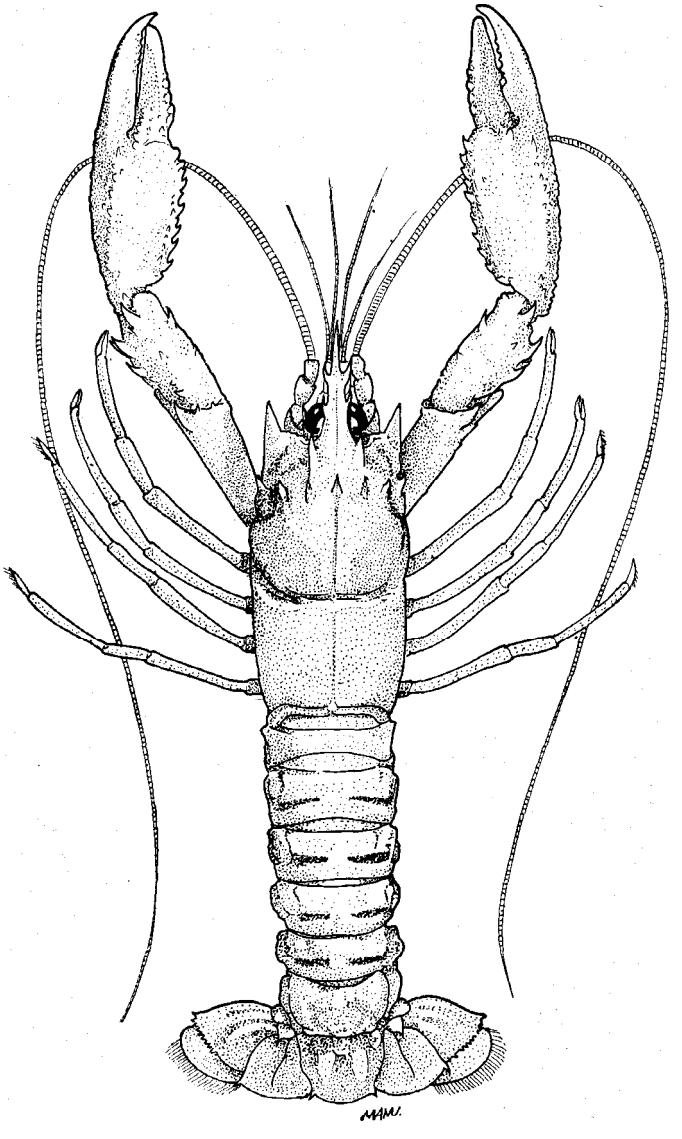


Fig. 103



(after Holthuis, 1974) **Fig. 102**

Habitat and Biology : Depth range between (393-) 451 and 550 m Substrate: mud.

Size : Maximum total body length about 15 cm, carapace length 4 to 7 cm.

Interest to Fisheries : Since so far only three specimens of this species are known, nothing concrete can be said about its fisheries potential. Its size is attractive, but the depth range and low abundance are negative factors.

Literature : Original description.

Homarus Weber, 1795

NEPH Hom

Homarus Weber, 1795, Nomenclator entomologicus: 94. Gender masculine. Name placed on the Official List of generic Names in Zoology, in Opinion 104 (published in 1928).

Type Species: selected by Fowler, 1912, Annual Report New Jersey State Museum, 1911:333: ***Astacus marinus*** Fabricius, 1775 (= ***Cancer gammarus*** Linnaeus, 1758).

Synonyms: ***Homarus*** Guérin Méneville, 1825, Encyclopédie méthodique, Histoire naturelle, Insectes, 10:768. Type species by original designation and monotypy: ***Cancer gammarus*** Linnaeus, 1758. Gender masculine.

Homarus H. Milne Edwards, 1837, Histoire naturelle des Crustacés, 2:333. Type species, selected by E. Desmarest, 1858, in Chenu, Encyclopédie Histoire naturelle (Crustaces, Mollusges, Zoophytes):38: ***Homarus vulgaris*** H. Milne Edwards, 1837. Gender masculine.

The name ***Homarus*** has been independently chosen for this genus by three different authors.Notwithstanding the fact that these three homonyms all have different nominal species as their types, they still are objectively synonymous, as these three different nominal species are objectively synonymous themselves.

The genus ***Homarus*** has three species, two of which belong to the economically most important lobsters in the world. The importance of the genus is well expressed by Herrick (1895:6), who in his monograph "The American Lobster" stated that the lobster "may be rightfully called the King of the Crustacea".

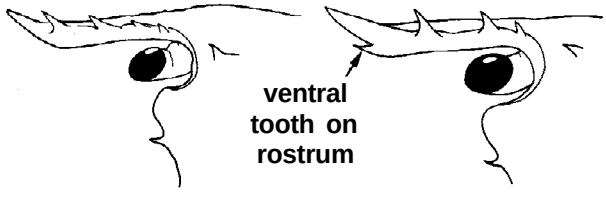
Key to Species :

1a. Palm of first chelipeds covered with hairs, especially near the lower margin (Fig. 104a). Small species, attaining a total body length of 10 cm. Found only off South Africa south of 30ºS ..... ***H.capensis*** (Fig. 108)

1b. Palm of first chelipeds naked, without hair cover (Fig. 104b). Large species, attaining lengths of 40 to 65 cm. Found in the northern Atlantic, north of 30ºN

2a Rostrum without ventral teeth (Fig. 105a). Found in the eastern Atlantic (Norway to Morocco) ..... ***H. gammarus*** (Fig. 110)

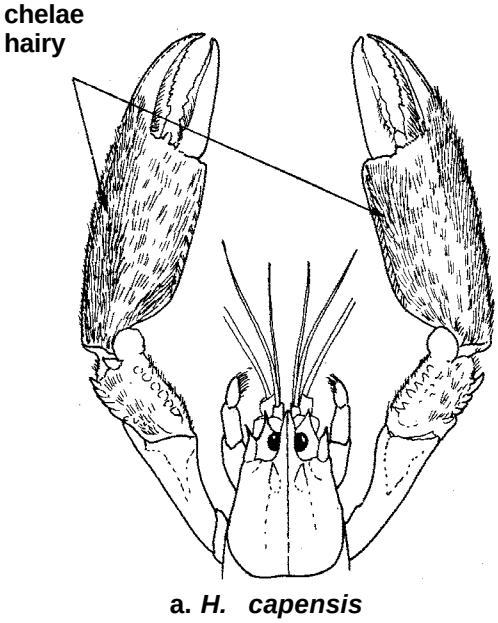
2b. Rostrum as a rule with one or more ventral teeth (Fig. 105b). Found in the western Atlantic (Newfoundland, Canada to North Carolina, USA) ..... ***H. americanus*** (Fig. 106)



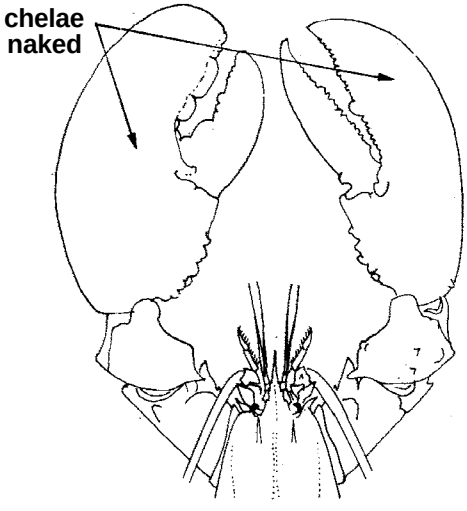
a. *H. gammarus* **b. *H. americanus***

front of carapace (lateral view)

Fig. 105



a. *H. capensis*



b. *H. americanus*

front part **Fig. 104**

Homarus americanus H. Milne Edwards, 1837

NEPH Hom 2

Homarus americanus H. Milne Edwards, 1837, Histoire naturelle des Crustacés. 2:334.

Synonyms : ***Astacus marinus*** Say, 1817 (non Fabricius, 1775); ***Astacos americanus -*** Stebbing, 1893; ***Homarus mainensis*** Berrill, 1956.

FAO Names : En - American lobster; **Fr -** Homard américain; **Sp -** Bogavante americano.

Type : Type locality of ***A. marinus*** Say and ***H. americanus*** H. Milne Edwards: "Long-branch, part of the coast of New Jersey" (Say, 1817: 166), USA. Lectotype, if extant, in ANSP (not located in 1989); paratype(s) in MP.

Type locality of ***H. mainensis:*** "Maine waters". No types indicated.

Geographical Distribution : Western Atlantic: Atlantic coast of North America between Newfoundland (Canada) and North Carolina (USA) (Fig. 107).

Habitat and Biology : Sublittoral to 480 m depth, most common between 4 and 50 m. Hard bottom (hard mud, rocks). As the females carry their eggs for 10 to 11 months, ovigerous females are found throughout the year. Migration does not occur, or only on a limited scale.

Size : Maximum total body length 64 cm, usually around 25 cm or less. This probably is, with ***Jasus verreauxi,*** the largest known Decapod species as far as body length is concerned.

Interest to Fisheries : The species is the subject of one of the most important Crustacea fisheries in the northwest Atlantic. According to FAO statistics, the catches in 1987 and 1988 amounted to 60 096 and 62 457 tons, respectively. The animals are mostly caught with traps, but in recent years trawling proved to be commercially feasible, especially in the southern part of the range of the species. These lobsters are sold fresh or frozen. The meat is also canned.

Local Names : CANADA: Lobster (English), Homard (French); USA : American lobster, Maine lobster, Northern lobster

Literature : Herrick, 1895; Herrick, 191 1; Fischer (ed.), 1978:vol. 6; Williams, 1984: 168, fig.119; Squires, 1990:326, figs 172-174.

Fig. 106

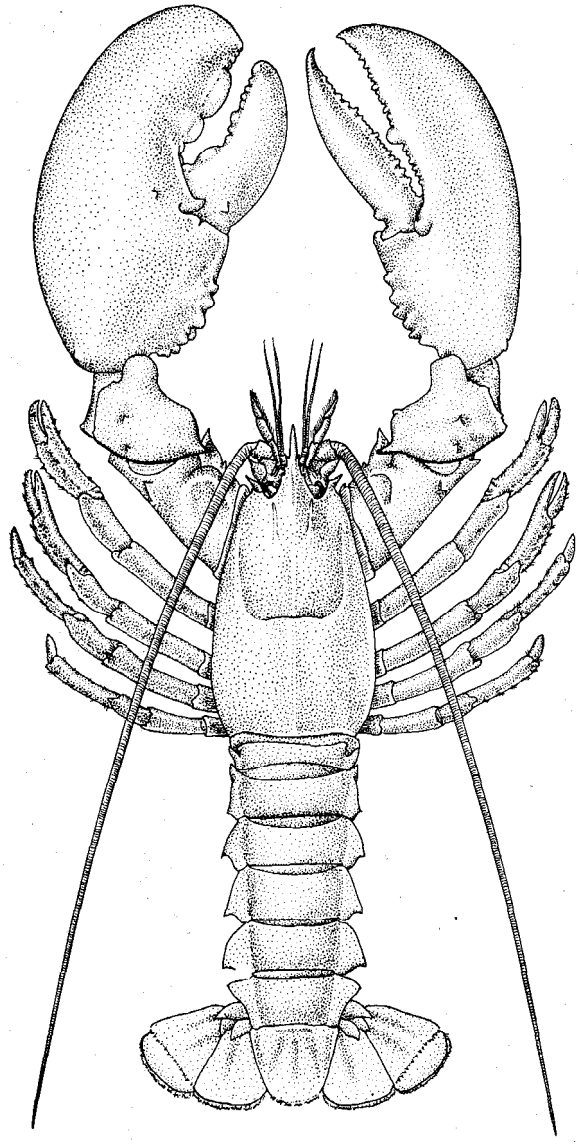


Fig. 106

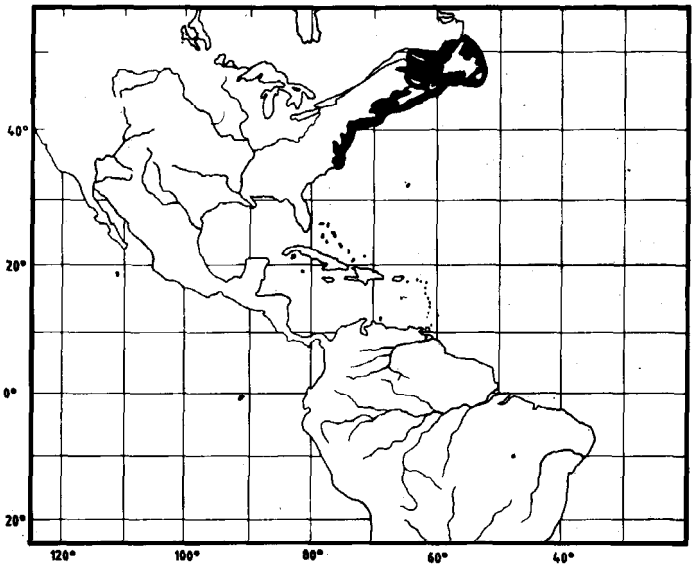


Fig. 107

Homarus capensis (Herbst, 1792)

Fig. 108

NEPH Hom 3

Cancer (Astacus) capensis Herbst, 1792, Versuch einer Naturgeschichte der Krabben und Krebse, 2:49, pl. 26 fig. 1.

Synonyms : ***Astacus fulvus*** Fabricius, 1793; ***Homarus fulvus*** - Weber, 1795; ***Astacus capensis*** - Latreille, 1802; ***Cancer (Astacus) fulvus*** - Turton, 1806.

FAO Names : En - Cape lobster; **Fr -** Homard du Cap; **Sp -** Bogavante del Cabo.

Type : Type locality of ***Cancer capesis:*** "aus dem Kap." (= Cape of Good Hope, South Africa). Holotype in collection L. Spengler, Copenhagen; present whereabouts unknown, but the possibility exists that the specimen is identical with the holotype of ***Astacus fulvus*** Fabr. (see next paragraph).

Type locality of. ***Astacus fulvus:*** "in Oceano". Holotype (possibly also holotype of ***Cancer capensis*** Herbst) in UZM.

Geographical Distribution : South Africa, from Table Bay to East London, 33º55'S-33º06'S 18º22'E-27º49'E (Fig. 109).

Habitat and Biology : Shallow coastal waters, rock pools, etc. The extreme rarity of the species is the cause that very little is known about its habitat and biology. Old records, reporting that it is found in fresh water, are definitely incorrect.

Size : Total body length 8 to 10 cm; carapace length 4 to 5 cm.

Interest to Fisheries : None. The species is extremely rare. Although It lives in shallow water and in a well explored region of the globe (the marine fauna of South Africa is better known than that of any other African country), and although it is almost 200 years since it was first described, so far only 14 specimens (13 males and 1 female) are known to exist in collections. Gilchrist (1918:46) remarked that the species "is not even known to Cape fishermen".

Literature : Holthuis, 1986:243, fig. 1

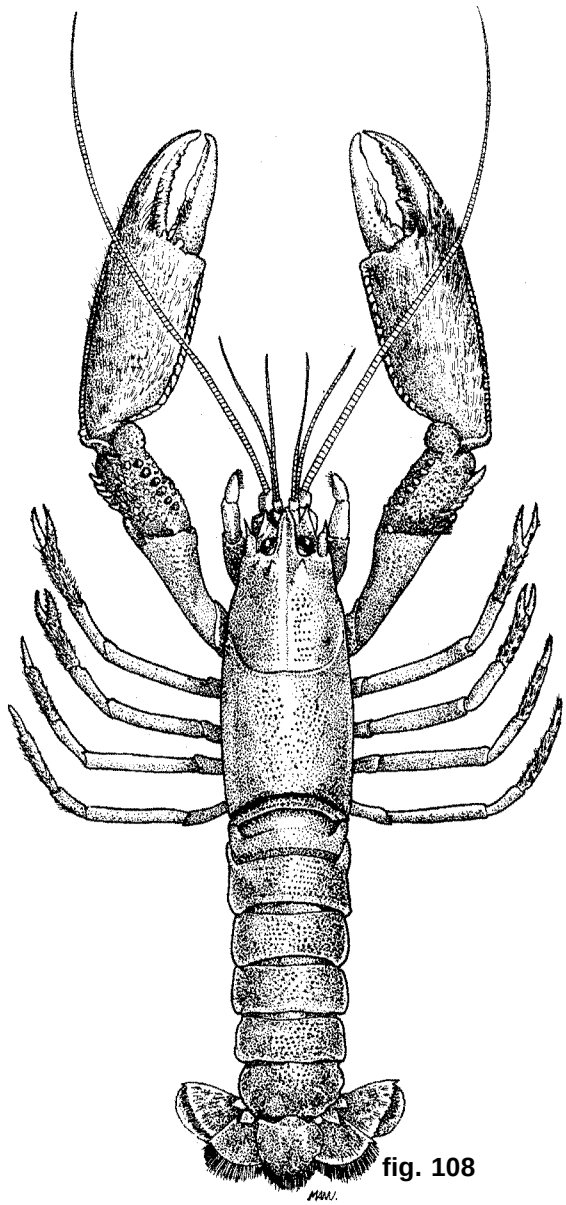


fig. 108

(after H Milne Edwards, 1851)

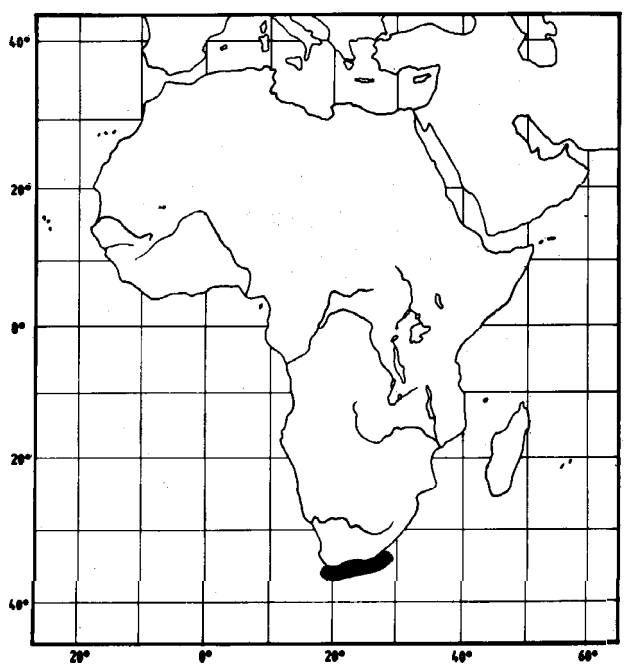


fig. 109

Homarus gammarus (Linnaeus, 1758)

Fig. 110

NEPH Hom 1

Cancer gammarus Linnaeus, 1758, Systema Naturae, (ed.10) 1:631. Name placed on Official List of Specific Names in Zoology in Direction 51 (published in 1956).

Synonyms : ***Astacus marinus*** Fabricius, 1775; ***Astacus gammarus*** - Pennant, 1777; ***Homarus marinus*** - Weber, 1795; ***Astacus europaeus*** Couch, 1837; ***Homarus vulgaris*** H. Milne Edwards, 1837.

FAO Names : En - European lobster; **Fr -** Homard européen; **Sp -** Bogavante.

Type : Type locality of ***Cancer gammarus, Astacus marinus, Astacus europaeus*** and ***Homarus vulgaris:*** Marstrand, west coast of Sweden, about 57º53'N 1 1º32'E. Lectotype selected by Holthuis (1974:820); lectotype and paralectotypes now lost.

Geographical Distribution : Eastern Atlantic from north-western Norway (Lofoten Islands) south to the Azores and the Atlantic coast of Morocco. Also along the northwest coast of the Black Sea. and in the Mediterranean (but lacking in the extreme eastern part, east of Crete). Not present in the Baltic Sea (Fig. 111).

Habitat and Biology : Continental shelf between 0 and 150 m depth; usually not deeper than 50 m. Found on hard substrates: rock or hard mud. The animals are nocturnal and territorial, living in holes or crevices. Females with eggs are found almost throughout the year. The eggs are laid around July and carried for 10 or 11 months.

Size : Maximum total body length about 60 cm (weight 5 or 6 kg), large size specimens usually 23 to 50 cm.

Interest to Fisheries : The European lobster is a highly esteemed food source and is fished throughout its range, fetching very high prices. It is mostly taken with lobster pots, although it occasionally turns up in trammel nets and dredges. Bait (usually pieces of octopus or cuttle fish) tied to lines can tempt them out of their burrows, after which they are caught by hand or with nets. In some areas captured specimens are kept alive in enclosures. The species is sold fresh, frozen or either canned or in powdered form. According to FAO statistics the annual catch of the species was 2 124 tons in 1987 and 2 052 tons in 1988 from the northeastern Atlantic (Fishing Area 27). Experiments in aquaculture of the species are underway in France and Spain.

Local Names : DENMARK: Hummer: FRANCE: Homard; GERMANY: Europäischer Hummer; GREECE: Astakós; ITALY:Astice (official name), Elefante di mare, Lupicante, Lupo di mare; MALTA: Liunfant; MONACO; Leguban; MOROCCO: Taroucht (Chleuh language); NETHERLANDS: Zeekreef-t; NORWAY: Hummer; PORTUGAL: Lavagante, Labugante, Navegante; SPAIN: Bogavante (official name), Abricanto, Homar, Llangant, Lubricante; SWEDEN: Hummer; TUNISIA: Saratan il bahr; TURKEY: Istakoz, Stacoz; U.K.: Common lobster, Lobster; USSR: Omar; YUGOSLAVIA: Hlap.

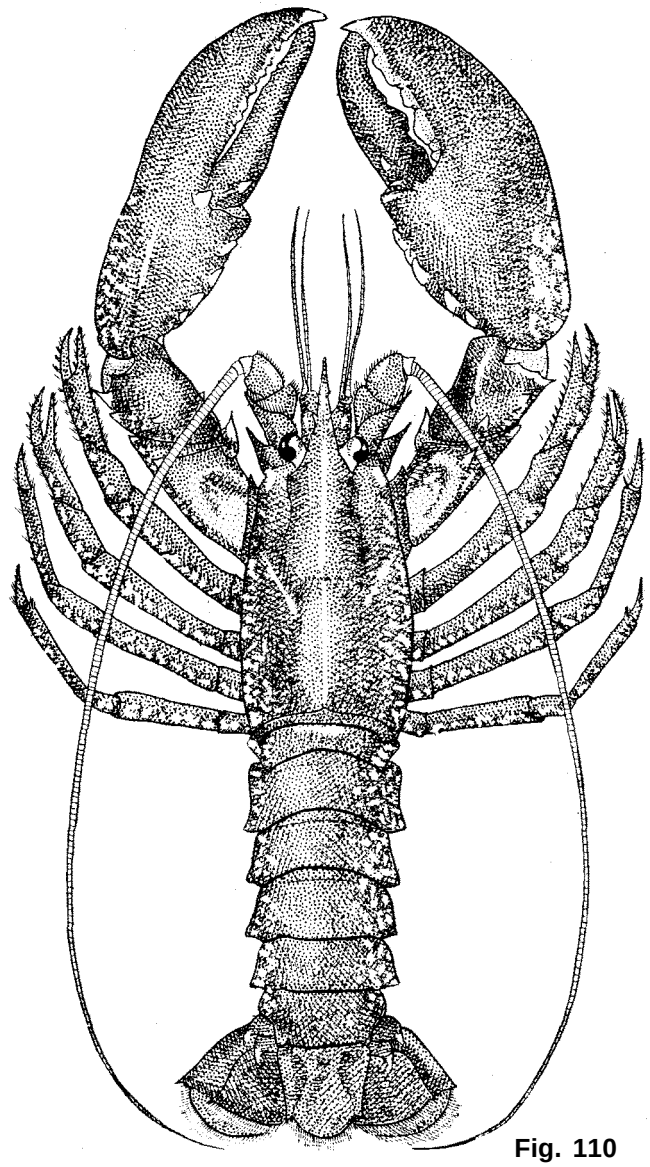


Fig. 110

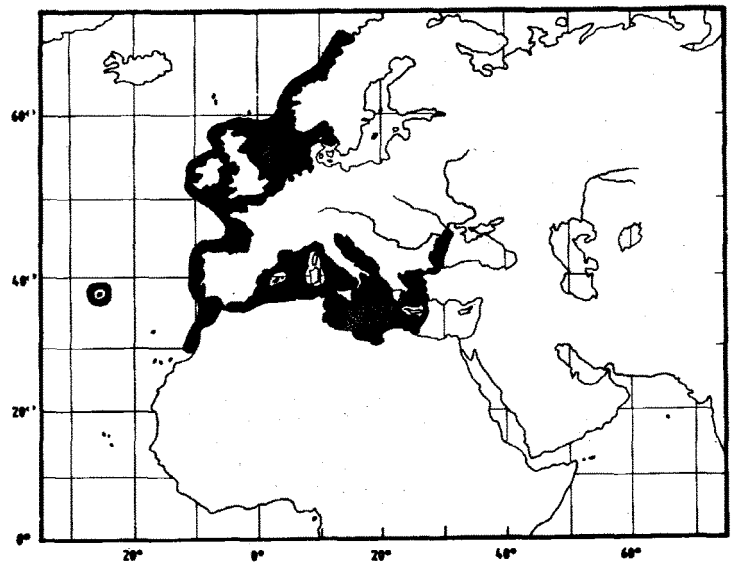


Fig. 111

click for next page

Literature : Rolland, 1881:234 (local French names); Palombi & Santarelli, 1961:366,367 (local Italian names); Fischer, Bianchi & Scott (eds), 1981 :vol. 5; Fischer, Bauchot &Schneider (eds), 1987:301.

Metanephrops Jenkins, 1972

NEPH Metan

Metanephrops Jenkins, 1972, Crustaceana, 22(2): 161. Gender masculine.

Type Species: by original designation: ***Nephrops japonicus*** Tapparone-Canefri, 1873.

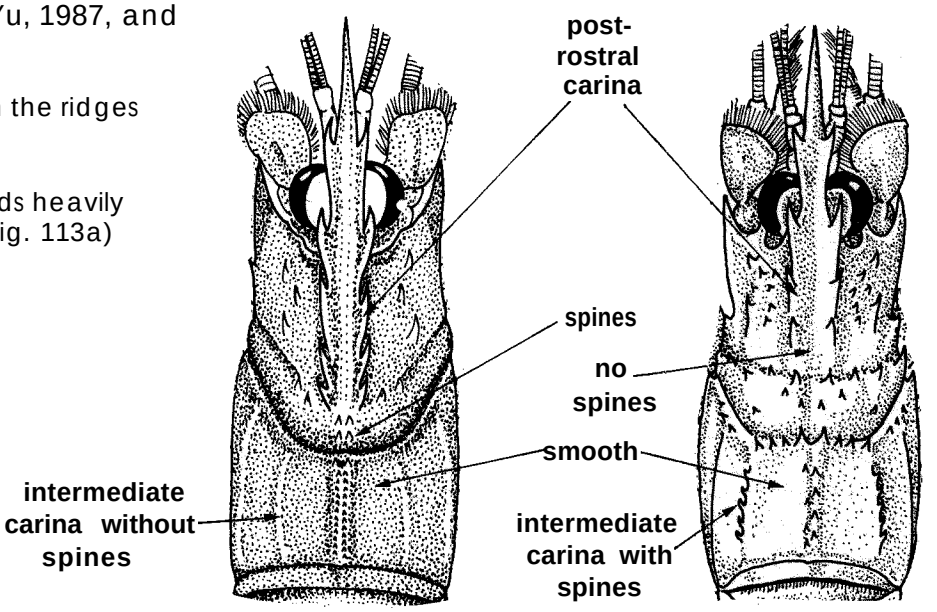
All of the tropical western Atlantic and Indo-West Pacific lobsters formerly assigned to the genus ***Nephrops,*** are now placed in ***Metanephrops.*** The known species of that genus now number 17, not including the fossil species.

Most of the known species are of good size and all are considered either of present or potential commercial importance and therefore, all are enumerated here

Key to Species (after Chan & Yu, 1987, and Chan& Yu, 1991) :

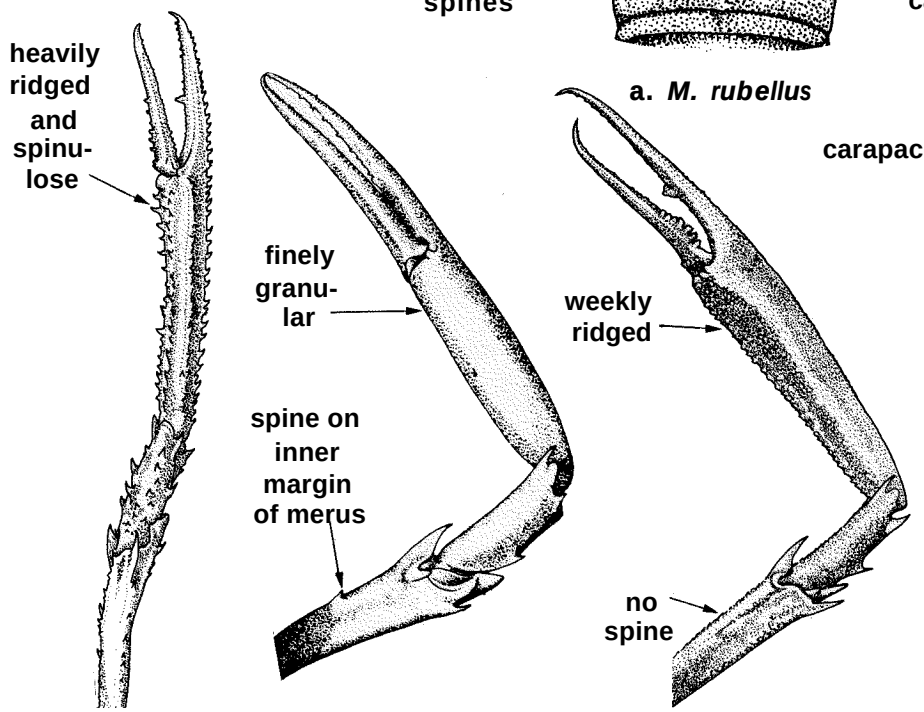
1a. Carapace smooth, between the ridges and large spines (Fig. 112)

2a. Chelae of first pereiopods heavily ridged and spinulose (Fig. 113a)



a. *M. rubellus* b. *M. binghami*

carapace (dorsal view) Fig. 112



a. *M. binghami* b. *M. boschmai* c. *M. sibogae*

first pereiopod Fig. 113

3a. Surface of abdominal tergites smooth (Fig. 114). Western Atlantic ..... ***("binghami"*** group**)**

4a. Spinules present behind postrostral carinae. Intermediate carina smooth (Fig. 112a). SW. Atlantic ..... ***M. rubellus*** (Fig. 150)

4b. Spinules absent behind postrostral carinae. Intermediate carina spinulose (Fig. 112b). West Indian region ..... ***M. binghami*** (Fig. 136)

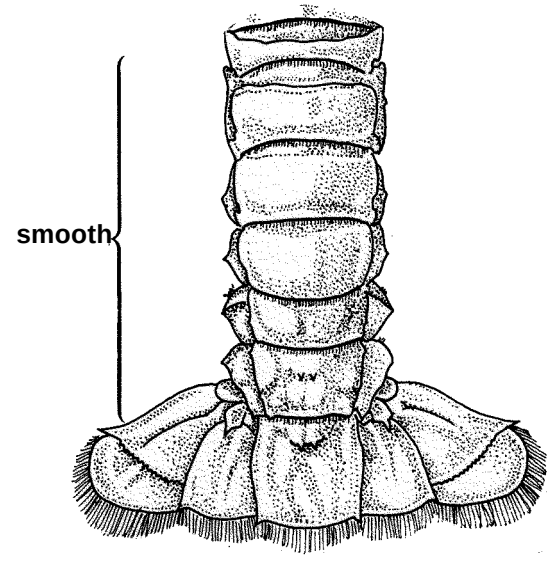
3b. Surface of abdominal tergites conspicuously sculptured (Fig. 115). Indo-West Pacific ..... ***("japonicus"*** group**)**

5a. Fifth abdominal somite with a distinct spine on the carina that separates the tergite from the pleuron. Dorsomedian carina of sixth abdominal somite with one or two pairs of submedian spines (Figs 116, 117). A prominent basal spine on outer edge of movable finger of large chela (Fig. 120a).

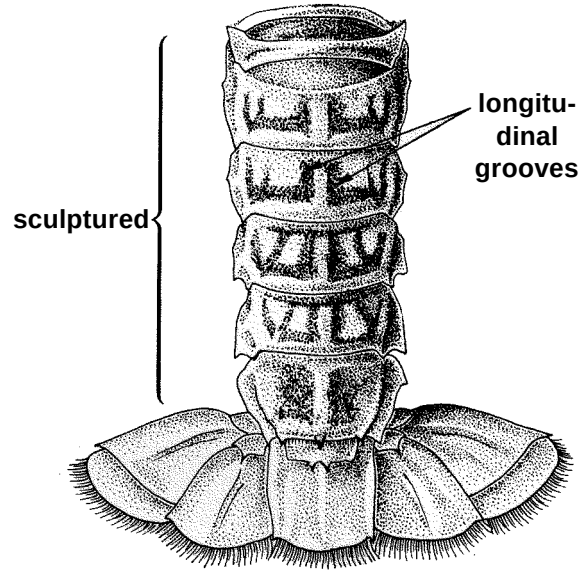
6a. Raised portions of dorsal surface of abdomen subdivided. First abdominal somite with a dorsomedian carina (Fig. 116) (Japan) . ***M. japonicus*** (Fig. 144)

6b. Raised parts of dorsal surface of abdomen smooth, not subdivided. No raised dorsomedian carina on first abdominal somite (Fig. 117) (Taiwan) ..... ***M. armatus*** (Fig. 132)

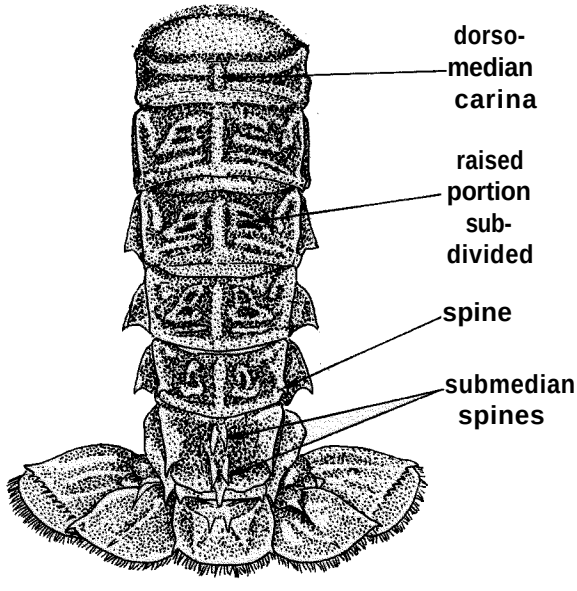
5b. Fifth abdominal somite without distinct spines on carina separating tergite from pleuron. Dorsomedian carina of sixth abdominal somite without submedian spines.



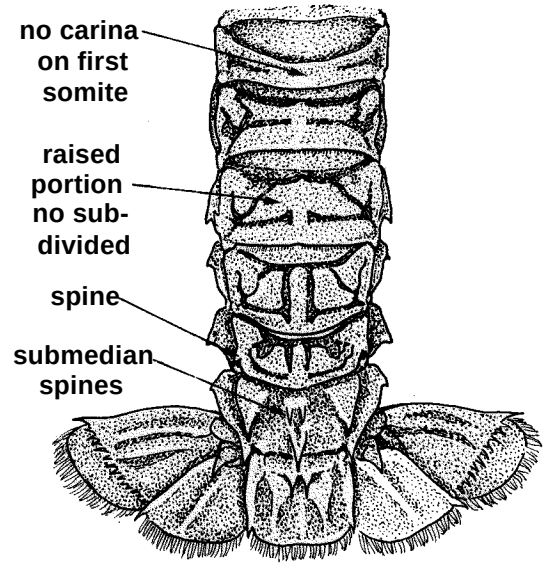
M. binghami
abdomen (dorsal view) Fig. 114



M. andamanicus
abdomen (dorsal view) Fig. 115



M. japonicus
abdomen (dorsal view)
Fig. 116



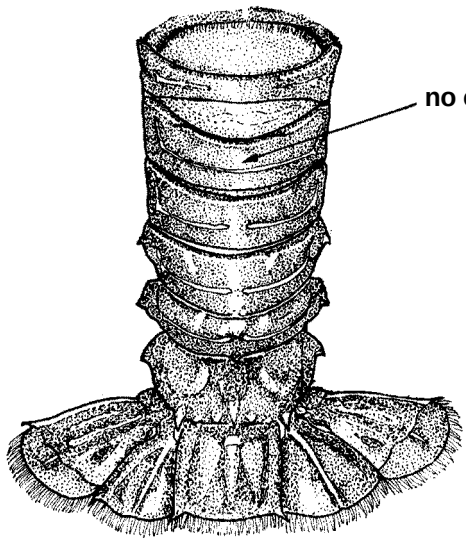
M. armatus
abdomen (dorsal view) **Fig. 117**

7a. Chela of first pereiopod with large spines. A prominent basal spine on outer edge of movable finger of large chela (Fig. 120a). Abdomen without dorsomedian carina (Fig. 118) (Taiwan) ..... ***M formosanus*** (Fig. 142)

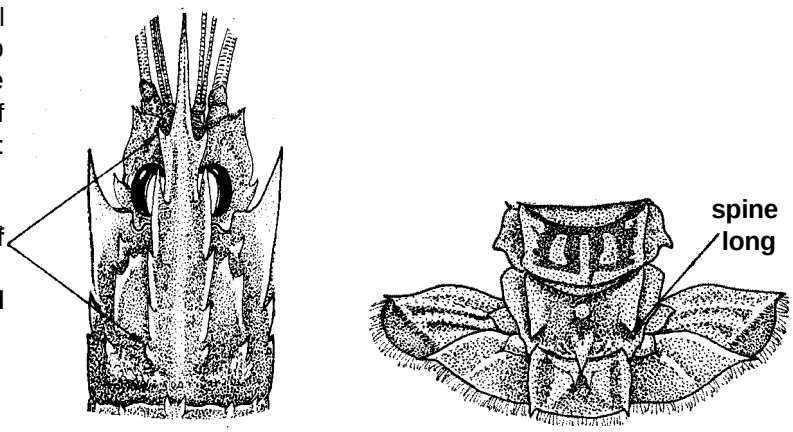
7b. Chela of first pereiopod without large spines. No prominent basal spine on outer edge of movable finger of large chela (Fig. 120b,c) Abdomen with dorsomedian carina

8a. Postrostral carinae with 3 to 5 (rarely 3) teeth (119a). Spine in the middle of the lateral margin of sixth abdominal somite long, reaching to posterolateral groove of the somite (119b). Inner margin of merus of first pereiopod heavily spinulose (Fig. 120b) (Japan, Taiwan) .... ***M. sagamiensis*** (Fig. 152)

8b. Postrostral carinae with never more than 3 teeth. Spine in the middle of the lateral margin of sixth abdominal somite short, tip far from the posterolateral margin of the somite (Fig. 121). Inner margin of merus of first pereiopod weakly spinulose (Fig: 120c).

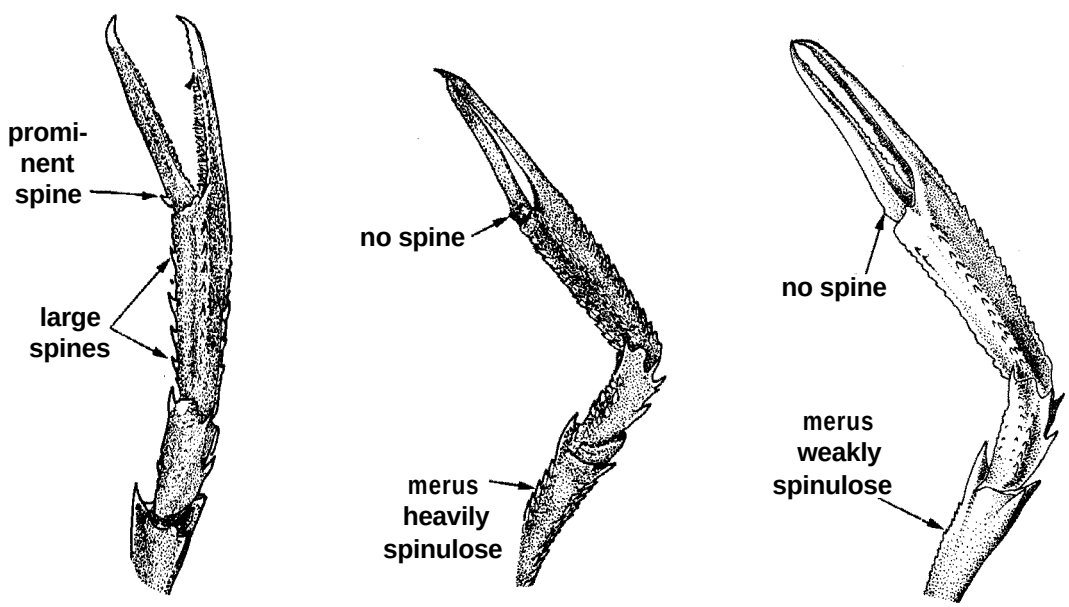


M. formosanus **abdomen (dorsal view)** **Fig. 118**



a. anterior part of carapace (dorsal view) **b. last two abdominal somites (dorsal view)**

M. sagamiensis **Fig. 119**



a. ***M. formosanus*** **b.** ***M. sagamiensis*** **c.** ***M. andamanicus***

first pereiopod **Fig. 120**

9a. Raised parts of the abdominal somites coarse and pubescent (Fig. 121) (Philippines, W. Australia) ..... ***M. velutinus*** (Fig. 160)

9b Raised parts of dorsal surface of abdominal somites smooth and naked (Fig. 122)

10a. Second to fifth abdominal somites with marked dorsomedian carina, flanked by a pair of conspicuous longitudinal grooves (Fig. 115). Indian Ocean, South China Sea ..... ***M. andamanicus*** (Fig. 128)

10b. Dorsomedian carina of abdomen almost level with the dorsal surface of the somite, without grooves at either side (Fig. 122). S.E. Africa, Madagascar .. ***M. mozambicus*** (Fig. 146)

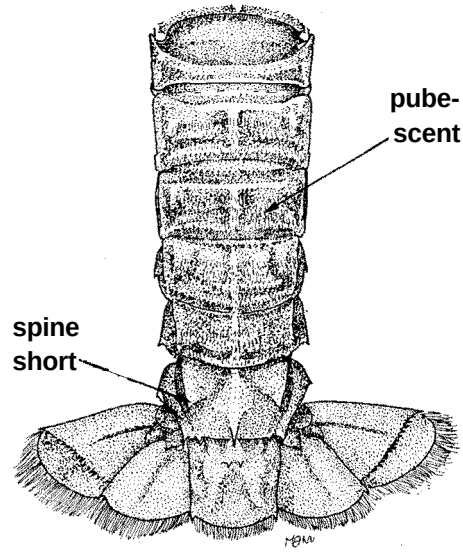
2b. Chelae of first pereiopods weakly ridged and finely granular (Fig. 113b.c). Indo-West Pacific ..... ***("thomsoni"*** group**)**

11a. Transverse grooves present on abdominal tergites 2 to 5

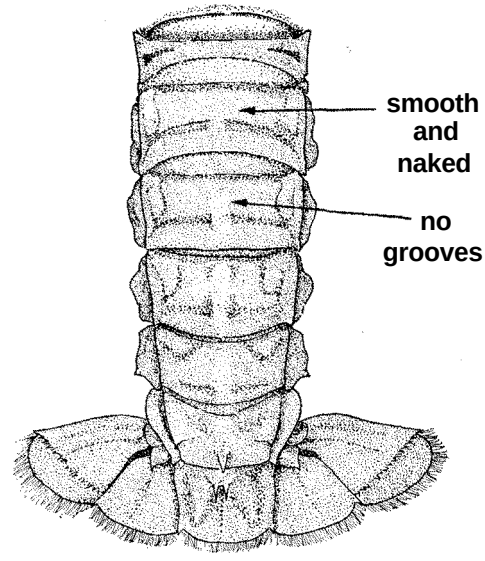
12a. No transverse groove present on first tergite (Fig. 123) (Japan, China, Philippines) M. thomsoni Fig. 158)

12b. Transverse groove present on first tergite (Fig. 124). China Sea ..... ***M. sinensis*** (Fig. 156)

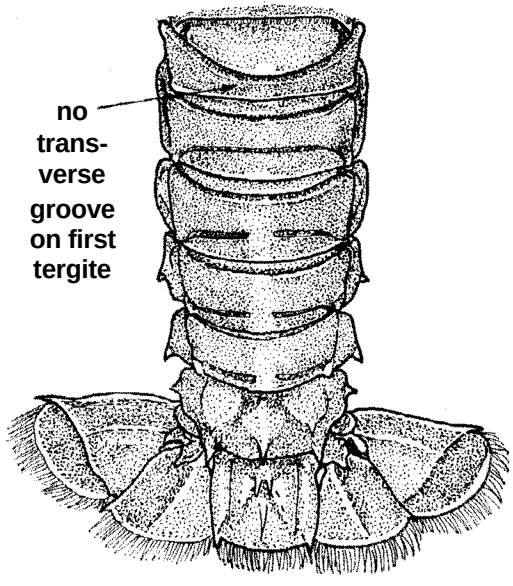
11 b. Transverse grooves absent from abdominal tergites 2 to 5



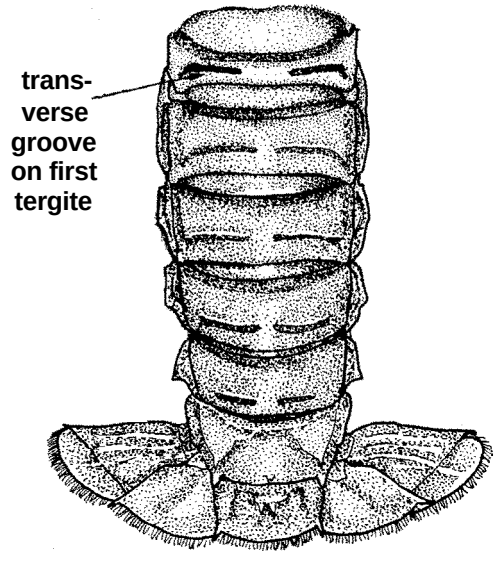
M. velutinus
abdomen (dorsal view) Fig. 121



M. mozambicus
abdomen (dorsal view) **Fig. 122**



M. thomsoni
abdomen (dorsal view)
Fig. 123



M. sinensis
abdomen (dorsal view) **Fig.124**

click for next page

13a. Longitudinal spinulose cardiac ridge absent (Fig. 125a) (New Zealand) ..... ***M. challengeri*** (Fig. 140)

13b. Longitudinal spinulose cardiac ridge present (Fig. 125b)

14a. Distinct spine present in the middle of inner margin of merus of first pereiopod (Fig. 113b) (Australia) ... ***M. boschmai*** (Fig. 138)

14b. No distinct spine present in the middle of inner margin of merus of first pereiopod (Fig. 113c) (Indonesia, Australia) ..... ***M. sibogae.*** (Fig. 154)

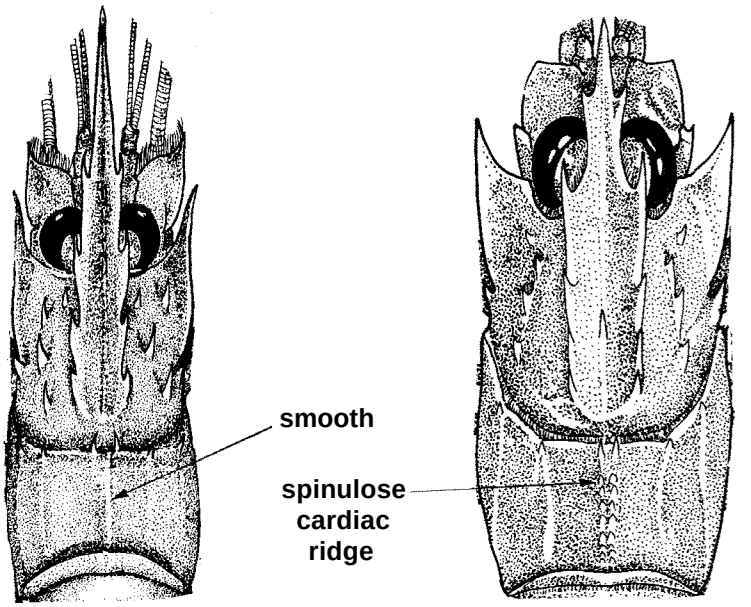
1b. Carapace rather uniformly spinulose (Fig. 126a,b) ..... ***("arafurensis"*** group**)**

15a. Region between postrostral carinae heavily spinulose (Fig. 126a). S China Sea, Australia .. ***M. neptunus*** (Fig. 148)

15b. Region between postrostral carinae smooth (Fig. 126b)

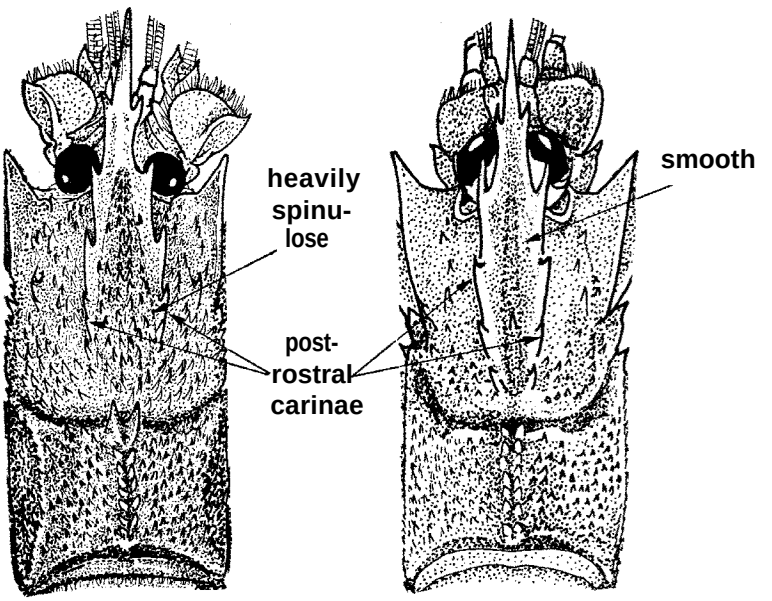
16a. Longitudinal furrows present on abdominal tergites (Fig. 127a) ..... ***M. arafurensis*** (Fig. 130)

16b. Longitudinal furrows absent from abdominal tergites (Fig. 127b) ..... ***M. australiensis*** (Fig. 134)



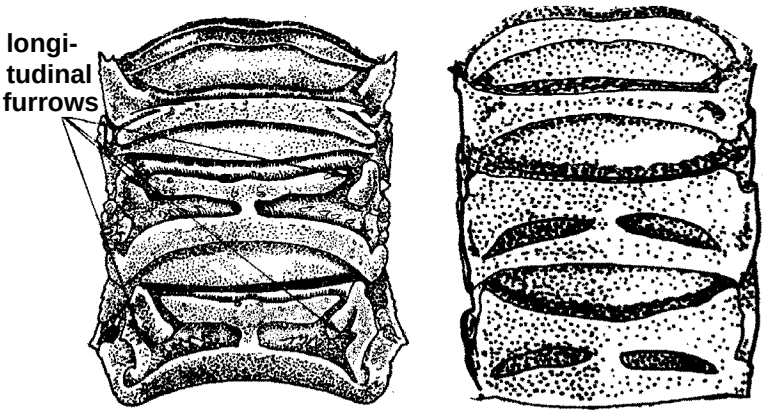
a. *M. challengeri* b. *M.* sibogae

carapace (dorsal view) Fig. 125



a. *M. neptunus* b. *M. australiensis*

carapace (dorsal view) Fig. 126



a. *M. arafurensis* b. *M. australiensis*

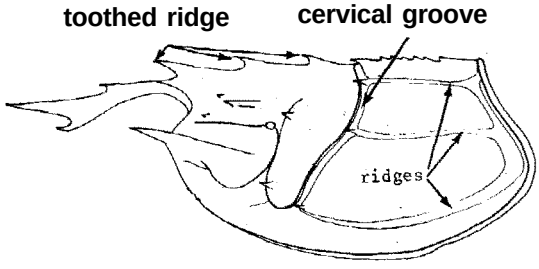
first three abdominal somites Fig. 127

Metanephrops andamanicus (Wood-Mason, 1891) **Fig. 128** **NEPH Metan 2**

Nephrops andamanicus Wood-Mason, 1891, Illustrations of the Zoology of H.M.S. Investigator. Crust. 1 :pl. 4.

Synonyms : ***Nephrops thomsoni andamanicus*** **-** Alcock, 1901.

FAO Names : En - Andaman lobster; **Fr -** Langoustine andamane; **Sp -** Cigala de Andamán.



carapace (lateral view)

Type : Type locality:"Investigator" Station 115, Andaman Sea, 1 1º31'40"N 92º46'40"E; 188-220 fathoms (= 344-402 m), green mud. Holotype male in ZSI, no. 5812/10, in alcohol, condition poor (not labelled as type).

Geographical Distribution : Indo-West Pacific region: East Africa, the Andaman Sea, the South China Sea, and Indonesia(Fig. 128). Records of ***M. andamanicus*** from S.E. Africa and Madagascar pertain to ***M. mozambicus,*** those from Australia to ***M. velutinus.*** A record from Madang, Papua New Guinea (King, 1988: 109) needs verification.

Habitat and Biology : Depth range from 250 to 750 m, but mostly between 300 and 450 m. Substrate of hard mud; the species possibly lives in burrows.

Size : Total body length up to 20 cm, most common between 15 and 18 cm; carapace length about 4.5 to 6 cm.

Interest to Fisheries : Longhurst (1970:286) mentioned the species 'as a potential fishery resource off Hong Kong. It is well possible that the same is true in other parts of its range.Its size and the fact that the species lives on trawlable bottoms are in favour of this supposition. Records of commercial catches of ***M. andamanicus*** off SE. Africa and Madagascar refer to ***M. mozambicus;*** such records from Australia are actually based on material of ***M. velutinus.***

Literature : Fischer & Bianchi (eds), 1984: vol. 5; Chan & Yu,1991:32 pls 2a,c, 4a,c, 6a, 7d.

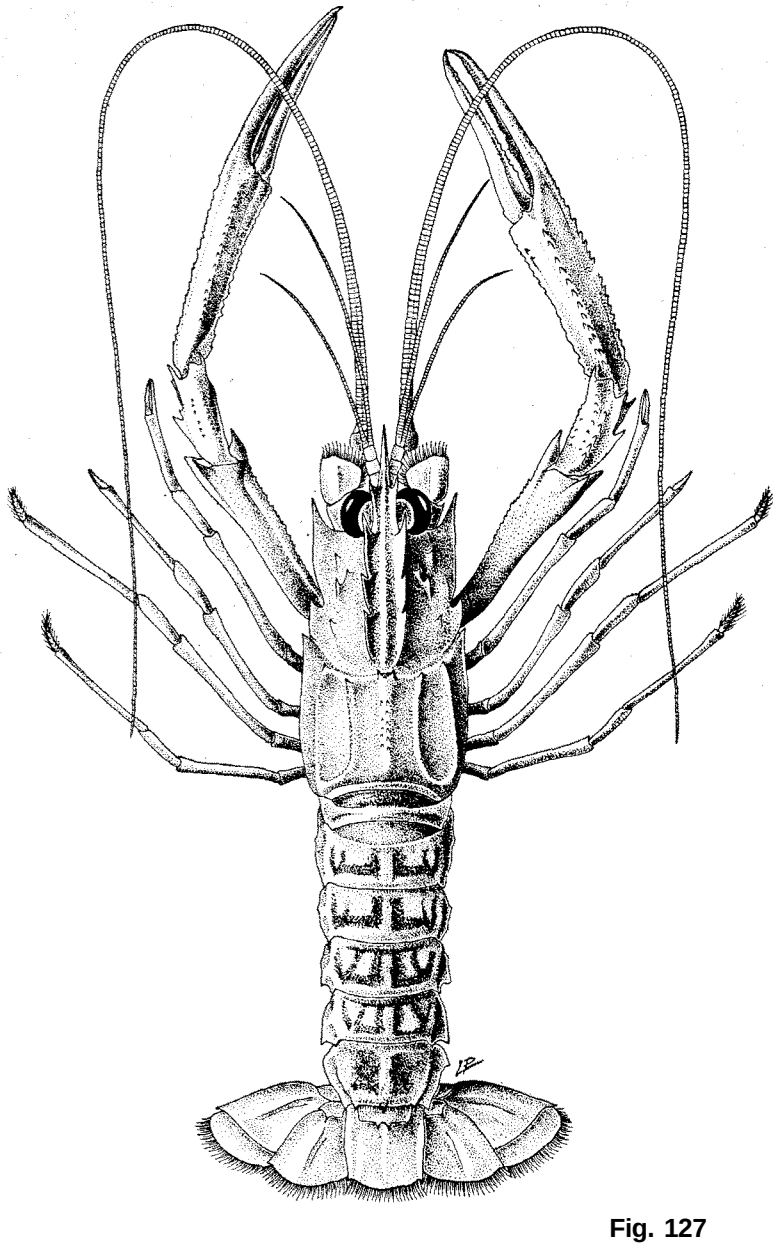


Fig. 127

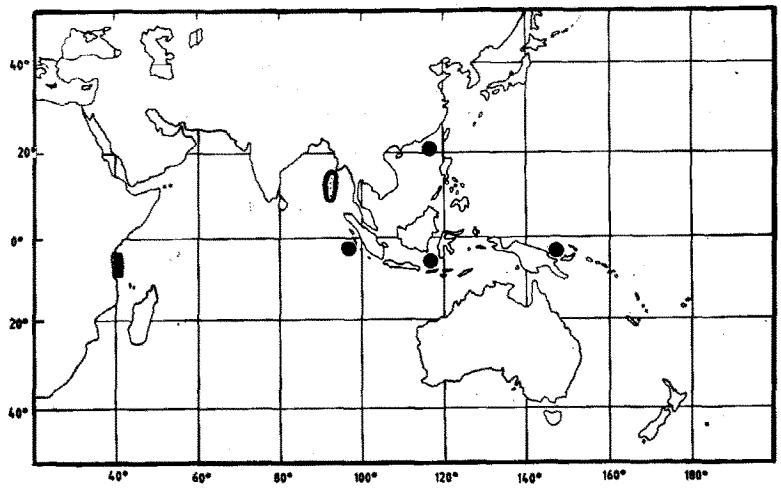


Fig. 128

Metanephrops arafurensis (De Man, 1905)

Fig. 130

NEPH Metan 3

Nephrops arafurensis De Man, 1905, Tijdschrift Nederlandsche Dierkundiae Vereeniging, (2)9: 587.

FAO Names : En - Arafura lobster.

Type : Type locality: Arafura Sea, Indonesia, "Siboga" Expedition "Station 262. Lat. 5º53.8'S., long. 132º48.8'E. Depth 560 M". Only known from mutilated holotype male in ZMA, no. DE 102.670, condition fair, apart from the original damage.

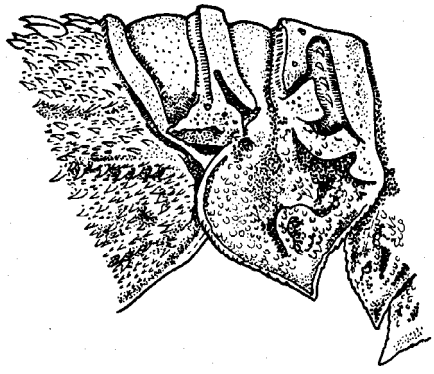
Geographical Distribution : Indo-West Pacific region: Indonesia; only known from type locality (Fig. 131).

Habitat and Biology : Found at 560 m depth; bottom solid bluish grey mud overlaid by softer brown mud.

Size: Carapace length; including rostrum, 5.5 cm; total body length about 12 cm.

Interest to Fisheries : As the species is known only from a single specimen, nothing can be said about its potential commercial value.

Literature : De Man, 1916:107, pl. 3 fig. 16.



first two abdominal somites (lateral view)

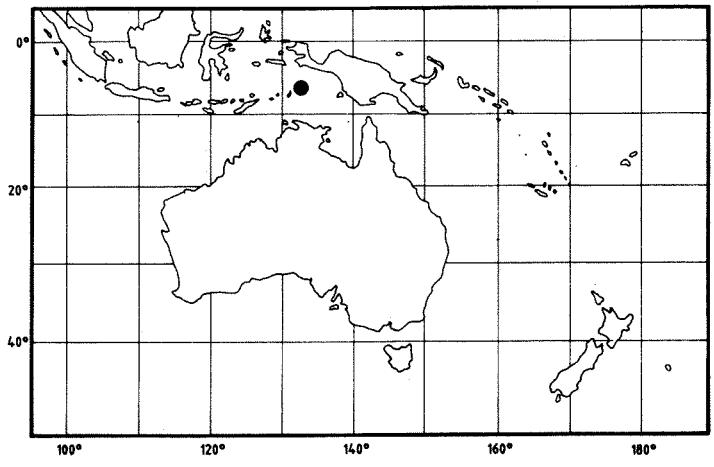
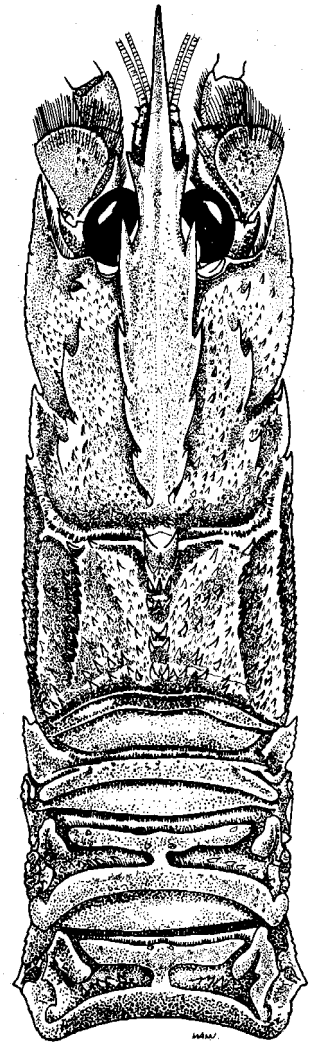


Fig. 131



carapace and,first three abdominal somites

(after De Man, 1916) **Fig. 130**

Metanephrops armatus Chan & Yu, 1991

Fig. 132

NEPH Metan 15

Metanephrops armatus Chan & Yu,1991, Crustaceana, 60(1):25, pls lb, 3b, 5b,d, 7b, 9a,b.

FAO Names : En - Armoured lobster

Type : Type locality: "north-eastern Taiwan, Su-Ao, I-Lan County . fish market, 300-400 m (from fishermen)". Holotype male, NTOU no. 90-3-9H. Paratypes, NTOU, RMNH, TFRI. All type material in good condition, in alcohol.

Geographical Distribution : Indo-West Pacific region: off north-east and south-west Taiwan (Fig. 133).

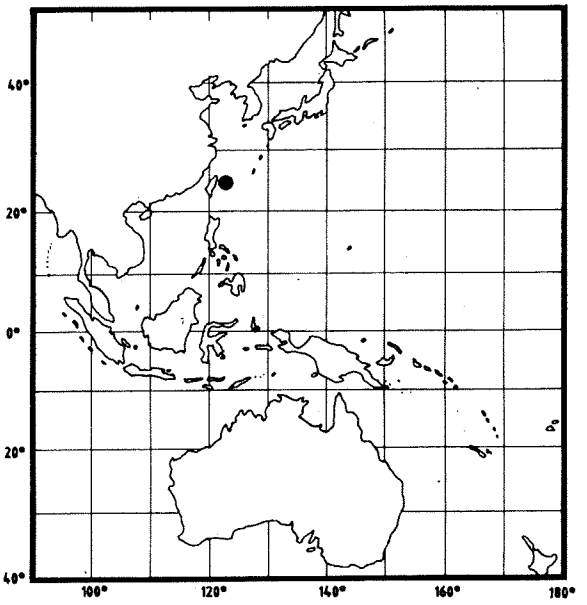


Fig. 133

Habitat and Biology : At depths of 200 to 450 m, mostly more than 300 m. On a more rocky bottom than the other Taiwan lobsters.

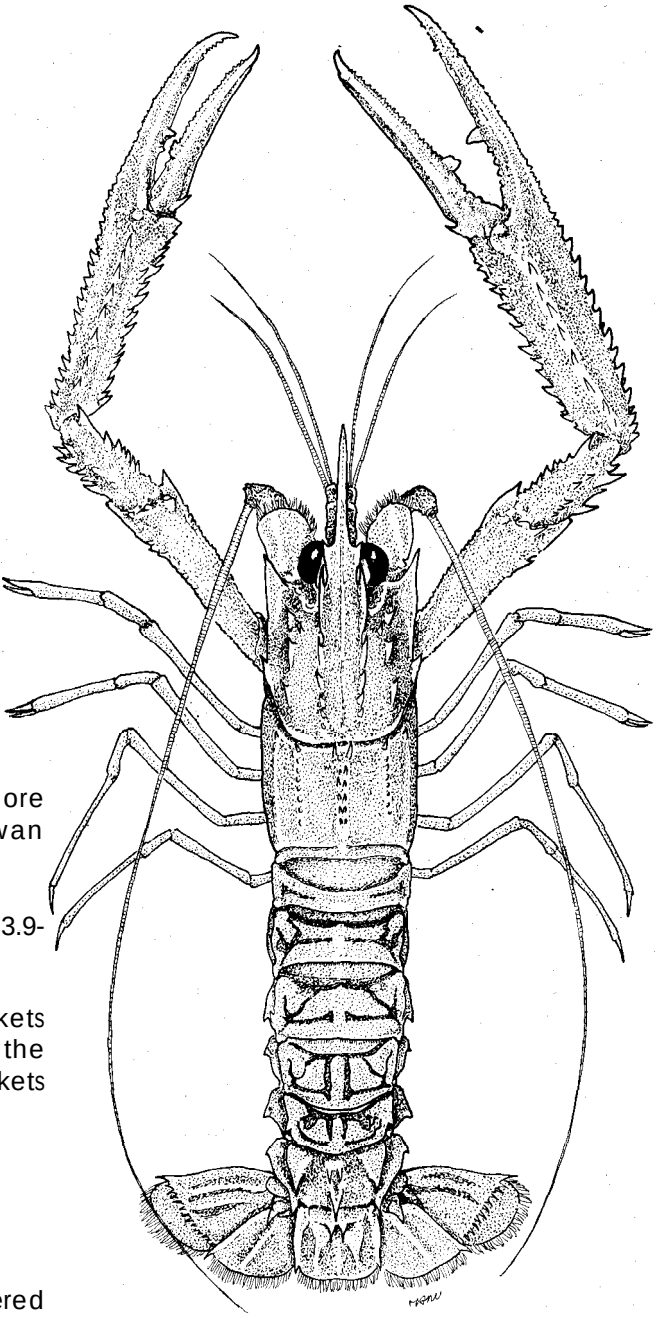
Size: Carapace length 1.7-5.7 cm (males), 1.4-4.8 (females), 3.9-4.4 cm (ovigerous females).

Interest to Fisheries : The species is sold on the Taiwan markets and fetches better prices than the other Taiwan lobsters as the specimens are larger. However, it is less common in the markets than the other species.

Local Names : TAIWAN: Armoured lobster.

Literature : Original description.

Remarks: Before 1991 specimens of this species were considered to belong to ***M. japonicus.***



(after Chan & Yu, 1991) **Fig. 132**

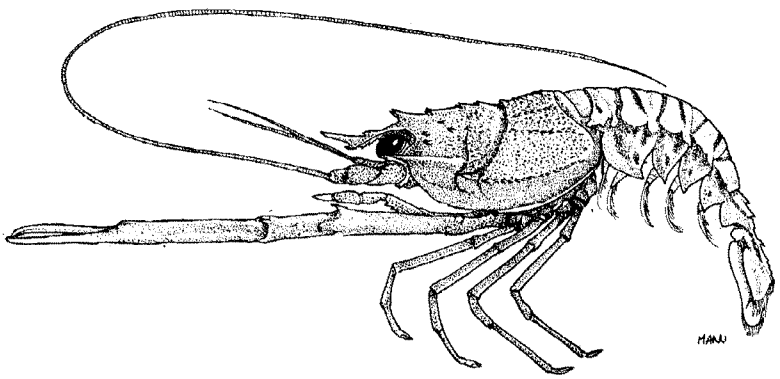
Metanephrops australiensis (Bruce, 1966) **Fig. 134**

NEPH Metan 4

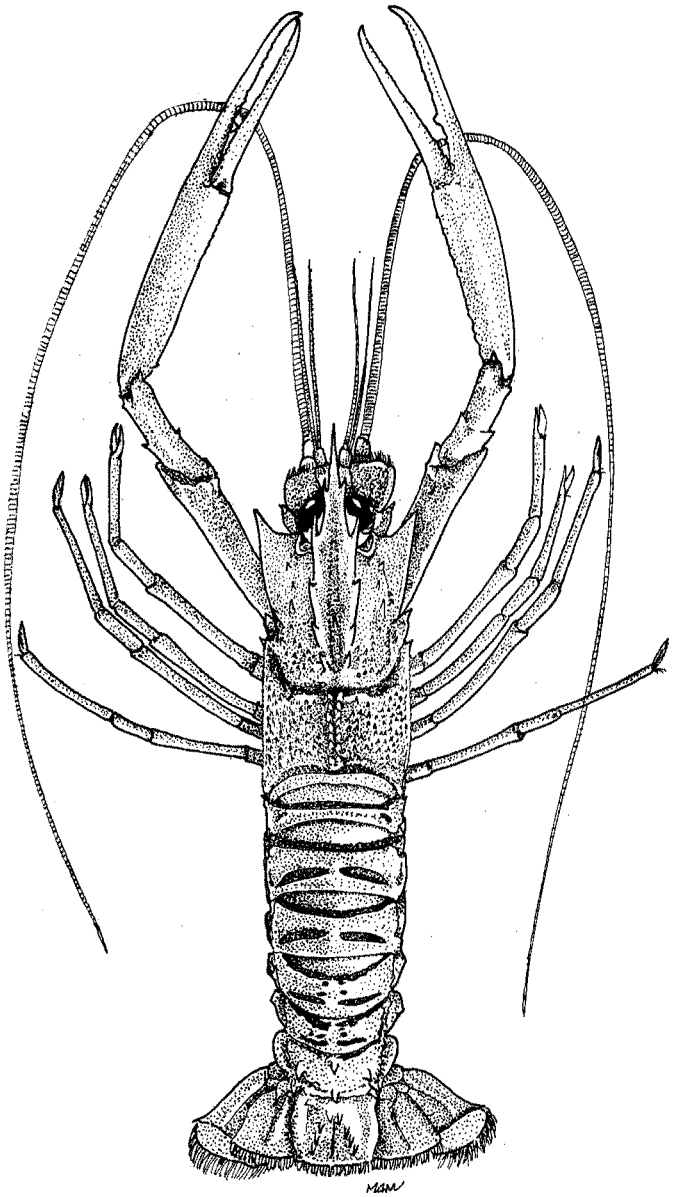
Nephrops australiensis Bruce, 1966, Crustaceana, 10:245, pls 25-27.

FAO Names : En - Northwest lobster.

Type : Type locality: "N.E. of Port Hedland, northern Western Australia, approximately 8.5 miles east of Mermaid Reef, 17º05'S 119º48'E; depth 434 metres". Holotype male in WAM (no. 1 l-64).



(after Bruce, 1966) **lateral view**



(after Bruce, 1966) **dorsal view**

Fig. 134

Geographical Distribution : Indo-West Pacific region. So far the species has only been found off the northwest coast of Western Australia near Port Hedland, at 17º05'S 119º48'E and 18º26'S 117º34'E (Fig. 135).

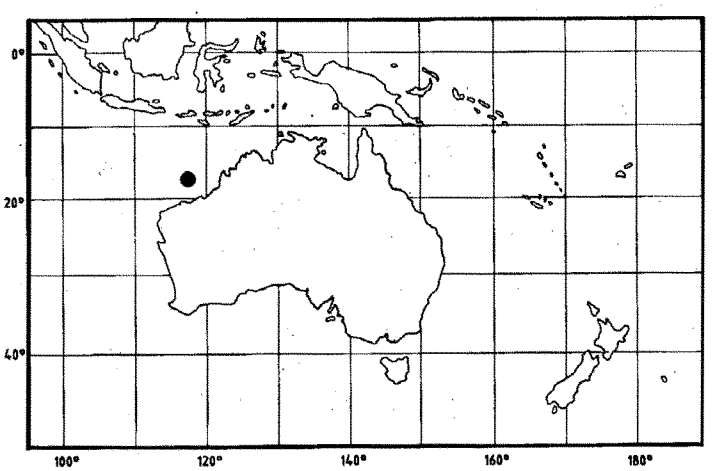


Fig. 135

Habitat and Biology : Depth range from 418 to 500 m, on a bottom of ***Globigerina*** ooze.

Size : Total body length to 18 cm; carapace length 4 to 7 cm, average 5 cm.

Interest to Fisheries : Potential. At the type locality, 39 specimens were obtained by trawl in a single haul. Proper equipment and better knowledge of its occurrence, habitat and habits may show the species to be of economic interest. George (1983: 16) counted this species among the 5 of which off Port Hedland the "commercial prospects . . . are probably the most encouraging". Wallner & Phillips (1988:36) indicated that off N.W. Australia, 38% of the ***Metanephrops*** catch was formed by this species. In 1984, Davis & Ward (1984:42) gave the catch percentages by weight of the trawling off northwest Australia as follows: 50% shrimps, 32.5% ***M. australiensis,*** 12.1% ***M. velutinus,*** and 5.4% ***M. boschmai.***

Local Names : AUSTRALIA: Northwest scampi.

Literature : Original description.

Metanephrops binghami (Boone, 1927)

Fig. 136

NEPH Metan 1

Nephrops binghami Boone, 1927, Bulletin Binaham Oceanographic Collection, 1(2):91, figs 18-20.

FAO Names : En - Caribbean lobster; **Fr -** Langoustine caraibe; **Sp -** Cigala del Caribe.

Type : Type locality: "from north to Glover Reef, in 484 fathoms of water".The exact type locality and depth are not certain (see Holthuis, 1974:835), but it probably is 16º49'38"N 87º58'15"W, 384 fms [= 703 m]. Holotype male in YPM, no. 4380; 4 paratypes in YPM, nos. 4381-4384 (all type material in alcohol and in excellent condition).

Geographical Distribution : Western Atlantic region: from the Bahama Islands and southern Florida (USA) to French Guiana, including the Gulf of Mexico and the Caribbean Sea (Fig. 137).

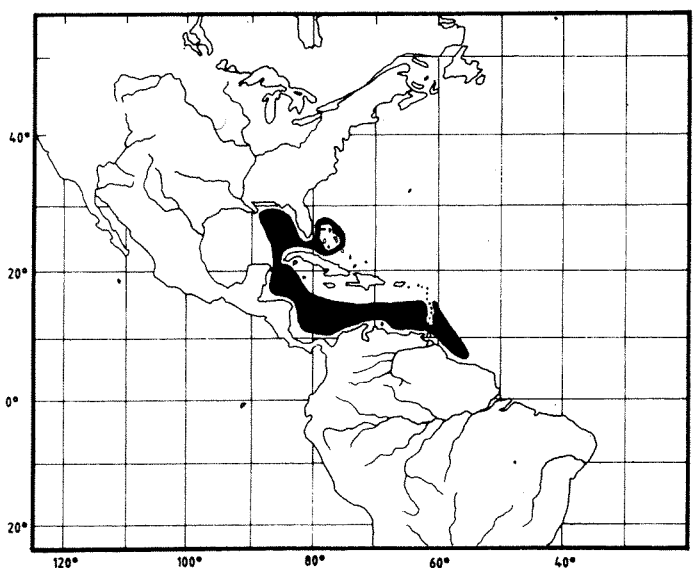
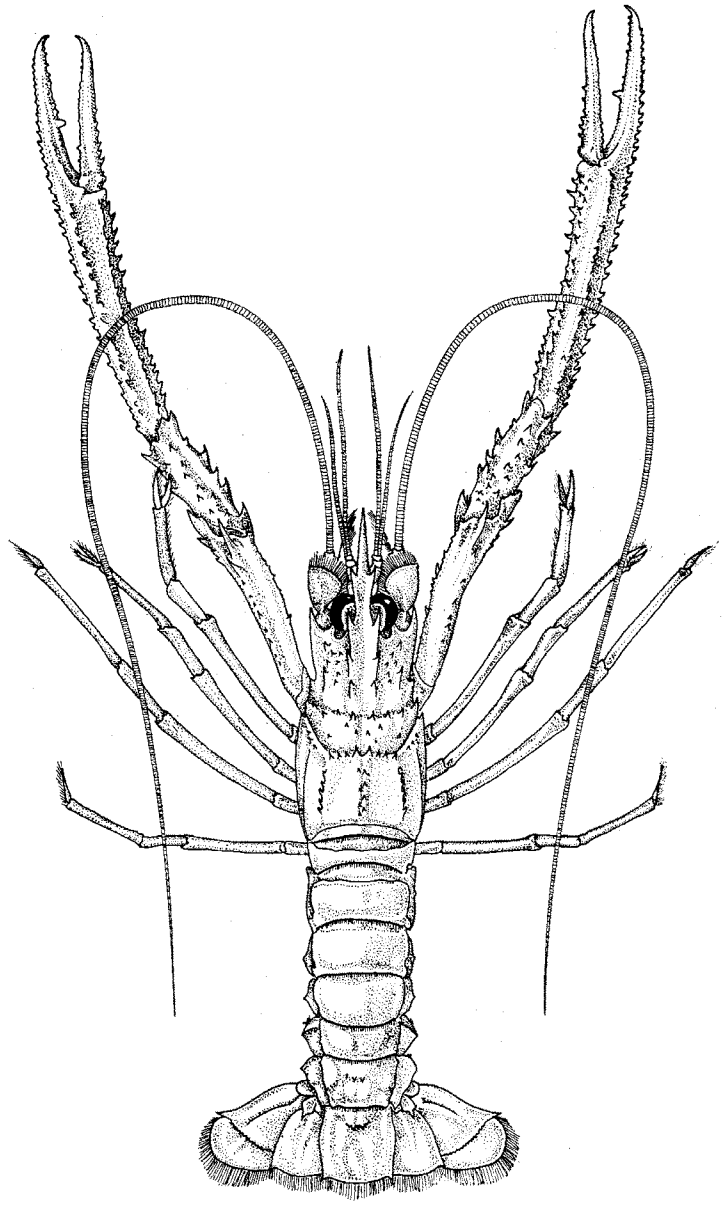


Fig. 137



(after Boone, 1927)

Fig. 136

Habitat and Biology : Depth range from 230 to 700 m, most common between 300 and 500 m; on a substrate of sand or mud.

Size : Total body length to 17 cm, usually around 12 cm.

Interest to Fisheries : The species is not actively fished for at present, but it was taken in commercially attractive quantities during exploratory trawling operations in the western Caribbean Sea (about 10 kg/h).

Local Names : USA: Caribbean lobsterette.

Literature : Holthuis, 1974:827, figs 25,26; Fischer (ed.), 1978:vol. 6.

Metanephrops boschmai (Holthuis, 1964)

Fig. 138

NEPH Metan 5

Nephrops boschmai Holthuis. 1964, Zoologische Mededelingen Leiden, 39: 72, fig. 1.

FAO Names : En - Bight lobster.

Type : Type locality: "Great Australian Bight, 126.5ºE, S. W. of Eucla, .130-190 fathoms [= 238, 348 ml". Holotype male in AMS, no. E3673 (a female paratype under the same number); paratypes in AMS, USNM, RMNH.

Geographical Distribution : Indo-West Pacific region: off the west and south coasts of Western Australia from Port Hedland to Eucla (Fig. 139).

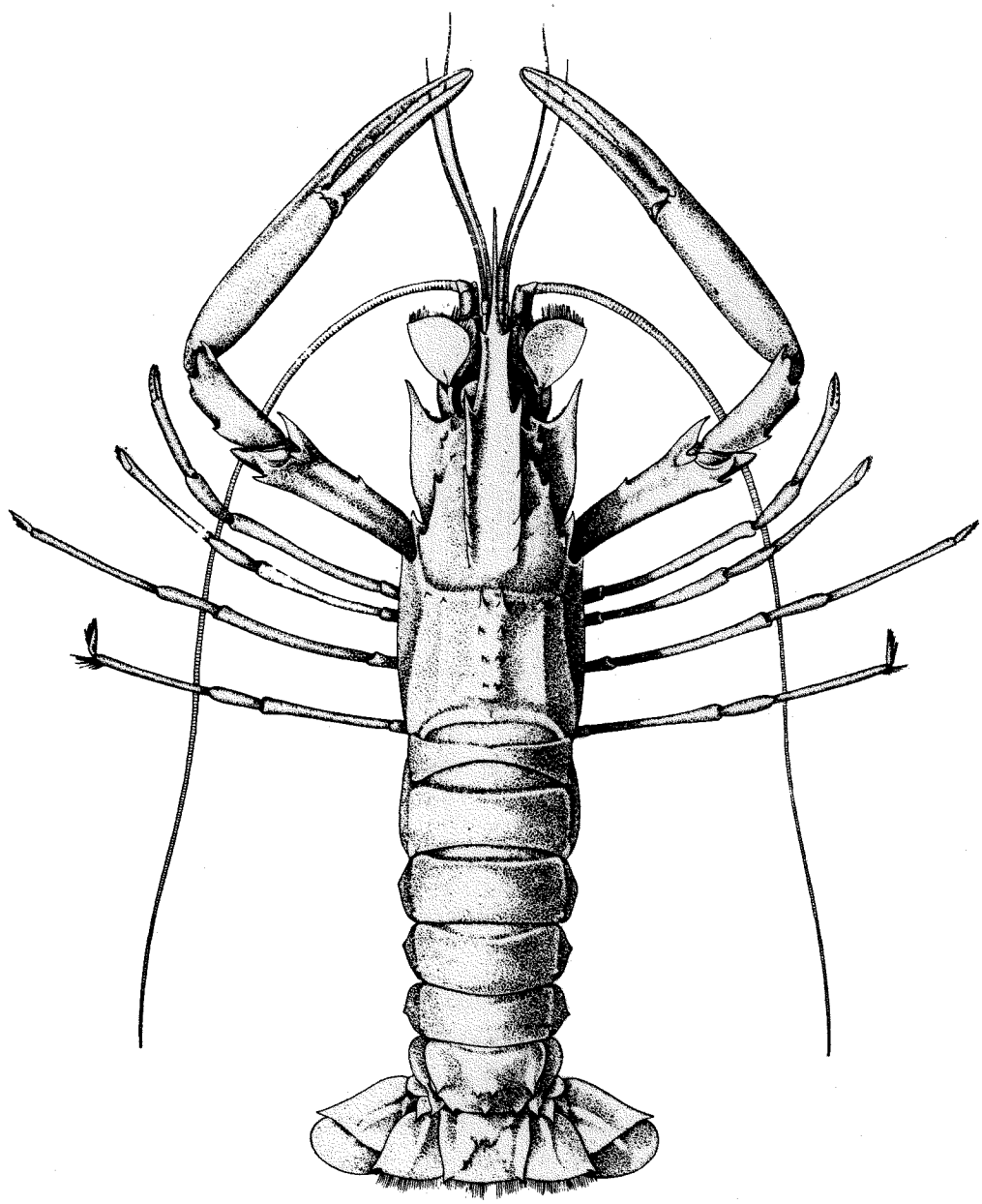
Habitat and Biology : Depth range from 300 to 460 m; on substrates of mud, or mud and rubble.

Size : Total body length to 18 cm; carapace length about 3 to 5 cm.

Interest to Fisheries : George (1983: 17) observed that off Port Hedland, Western Australia, the commercial prospects of the 4 species of ***Metanephrops*** and one of ***Puerulus*** occurring there "are probably the most encouraging" and that of the 4 ***Metanephrops*** species, ***M. boschmai*** is there the most common one. Wallner & Phillips (1988:36) remarked that off north-west Australia " ***M. boschmai,*** which is smaller [than ***M. velutinus*** and ***M. australiensis]*** and therefore less marketable, has not been exploited to any extent" More exploration remains necessary.

Local Names : AUSTRALIA: Bight scampi; Boschma's scampi.

Literature : Original description.



(from Holthuis, 1964)

Fig. 138

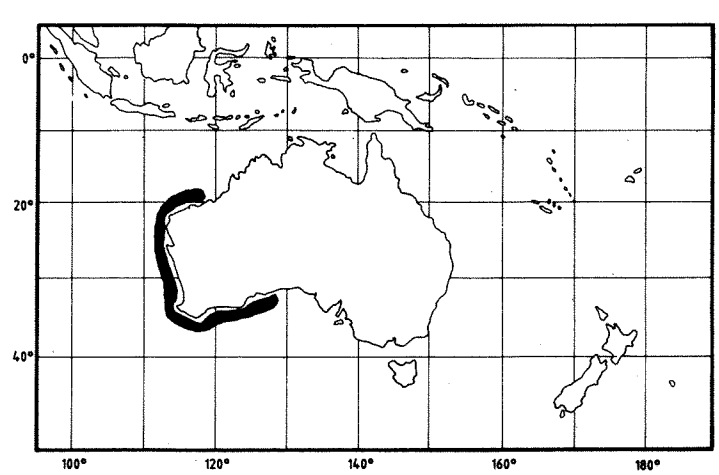


Fig. 139

click for next page

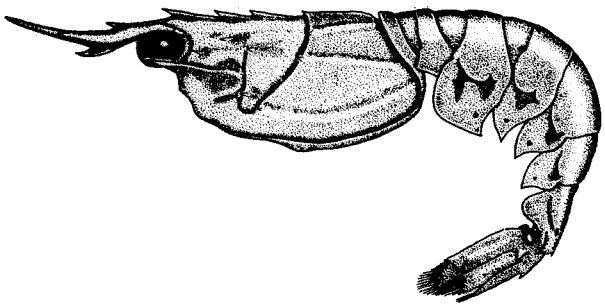
Metanephrops challengeri (Balss, 1914)

Fig. 140

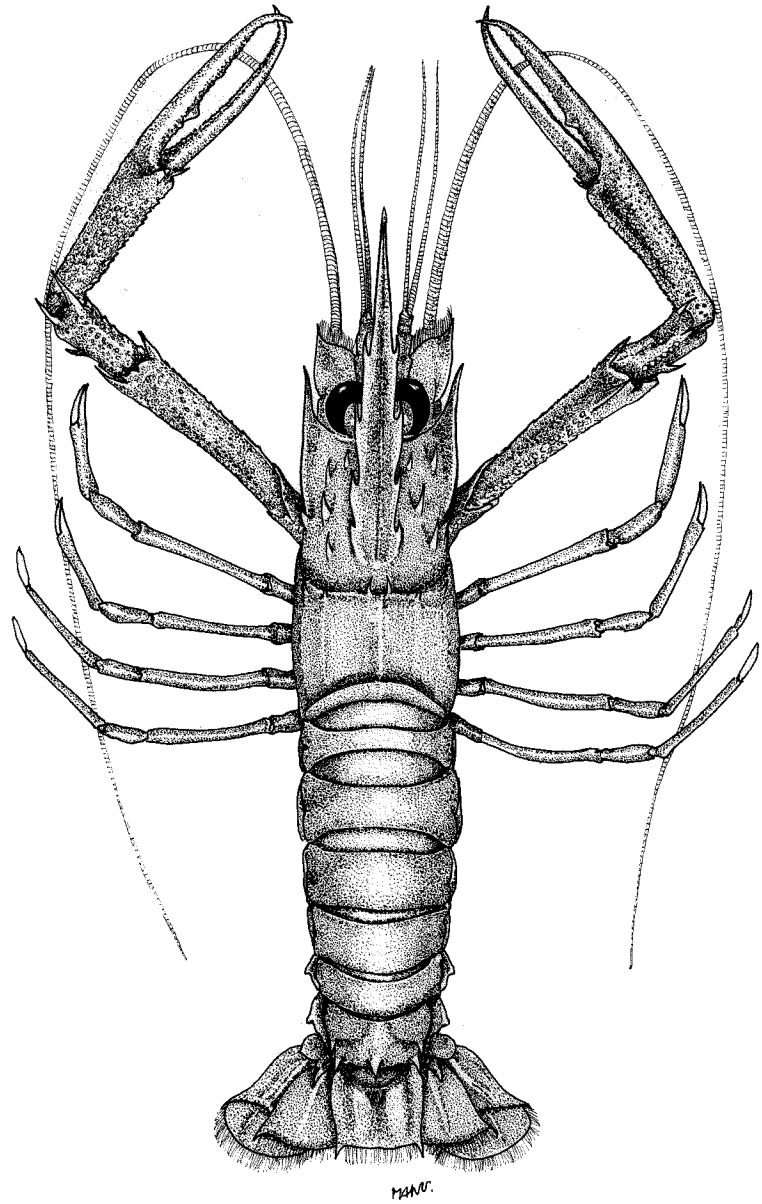
NEPH Metan 6

Nephrops challengeri Balss, 1914, Abhandlungen Baverischen Akademie Wissenschaften (mathematisch-physikalische Klasse), (suppl.2)10:84.

FAO Names : En - New Zealand lobster.



lateral view (from Yaldwyn, 1954)



(combined from Bate, 1888 and Yaldwyh, 1954) **Fig. 140**

Type : Type locality: "Challenger" Station 166, between Australia and New Zealand, 38º50'S 169º20'E, 275 fathoms [= 503 m], bottom Globigerina ooze. Two syntype females in BM, no. 88.22 (in alcohol, condition good).

Geographical Distribution : Indo-West Pacific region. New Zealand waters: continental shelf around both North and South Islands as far east as Chatham Islands (Fig. 141).

Habitat and Biology : Depth range from 140 to 640 m; substrate mud or sandy mud, firm enough for burrowing.

Size : Total body length to 25 cm, mostly between 13 and 18cm.

Interest to Fisheries : Potential. Longhurst (1970:301) reported the species as having "been found in promising quantities in deep water". Wear (1980:25) considered the (still remote) possibility of culture of the species.

Local Names : NEW ZEALAND: New Zealand scampi , Deep-water scampi.

Literature : Yaldwyn, 1954:721-732, figs 1,2.

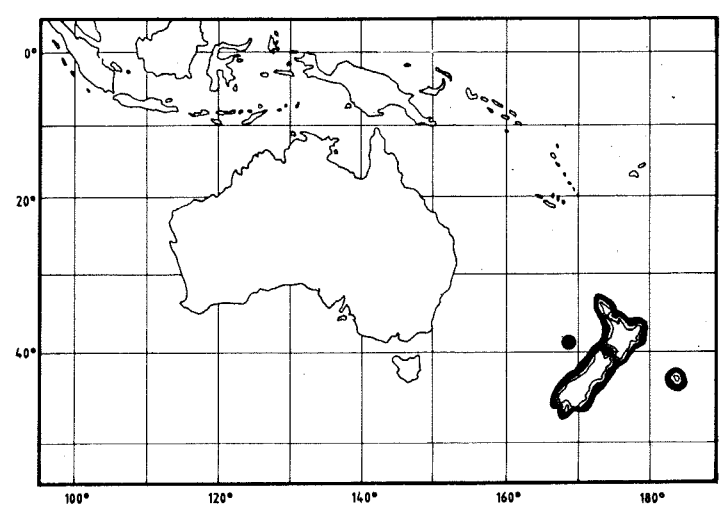


Fig. 141

Metanephrops formosanus Chan & Yu, 1987

Fig. 142

NEPH Metan 7

Metanephrops formosanus Chan & Yu, 1987, Crustaceana, 52: 173, 184, text-fig. 1,2, pls 1, 2.

FAO Names : En - Formosa lobster.

Type : Type locality: "Ta-Chi, I-Lan Country", off north east coast of Taiwan, 180-400 m, bottom mud or sand. Holotype male and paratypes in NTOU; paratypes in RMNH.

Geographical Distribution : Indo-West Pacific region. Only known so far from the north-east and the south coasts of Taiwan (Fig. 143).

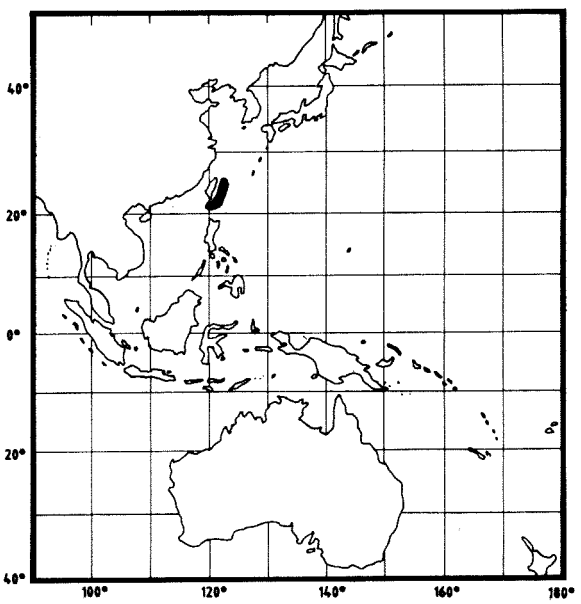
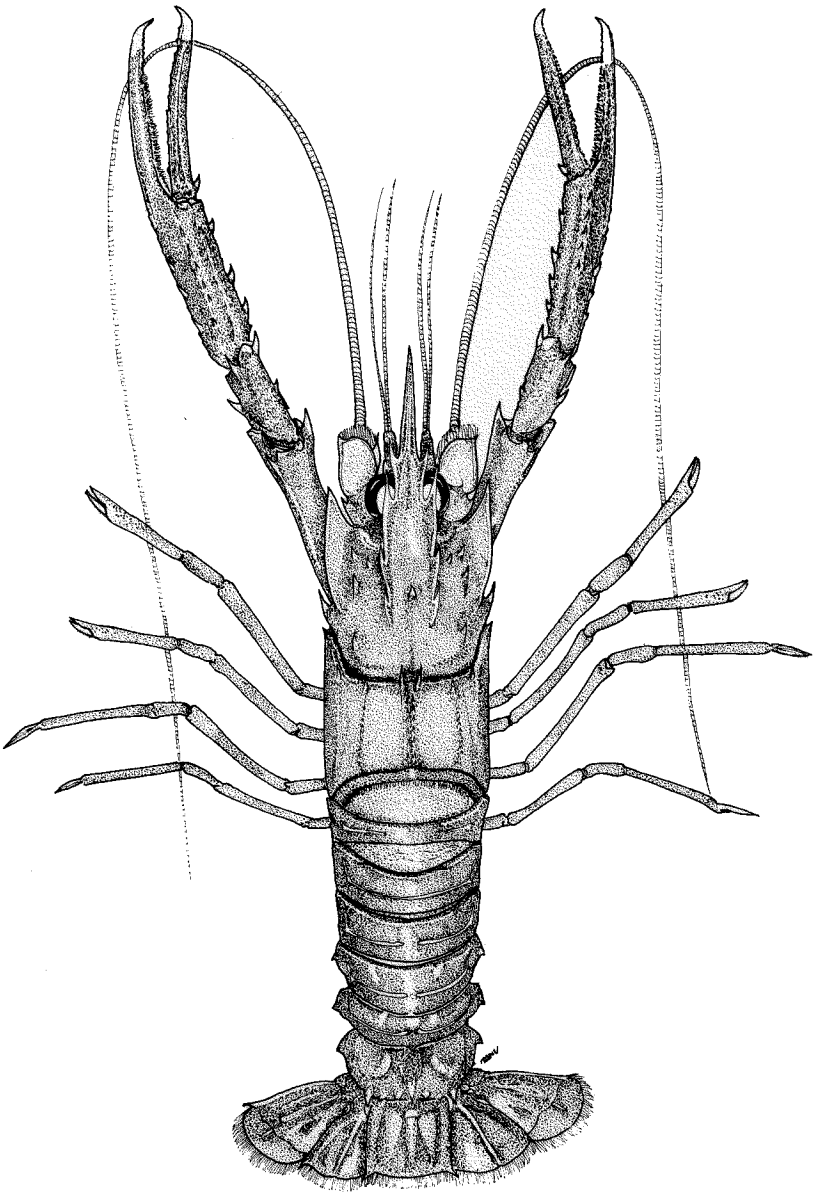


Fig. 143



(after Chan & Yu, 1987)

Fig. 142

Habitat and Biology : Depth range from 150 to 400 m, mostly around 250 m; bottom: mud or sand. Spawning time seems to be in late autumn.

Size : The known males have a total body length of 5 to 12 cm, the females, 5 to 9.5 cm; an ovigerous female measured 8.5 cm. Most specimens are 6 to 9 cm long. Carapace length: 1.8-4.1 cm (males), 1.7-4.8 cm (females), 3.1-4-0 cm (ovigerous females).

Interest to Fisheries : The species is "mainly caught by baby shrimp trawlers" (Chan & Yu, 1987: 183) and sold fresh at the local markets where the price is rather high. The animals are caught throughout the year, but the catch is unstable and not large.

Local Names : CHINA (Taiwan): Te-Chia Shia (= armoured prawn); also used for other species of the genus.

Literature : Original description; Chan & Yu, 1991:27, pls 1c, 3c, 6d.

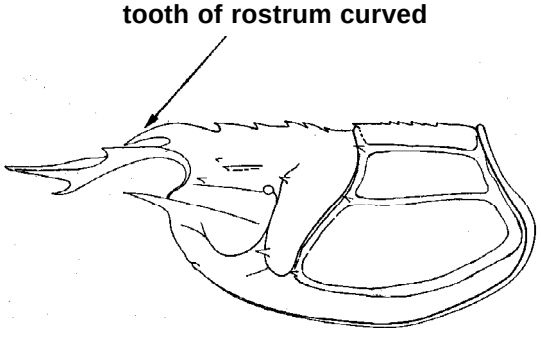
Metanephrops japonicus (Tapparone-Canefri, 1873)

Fig. 144

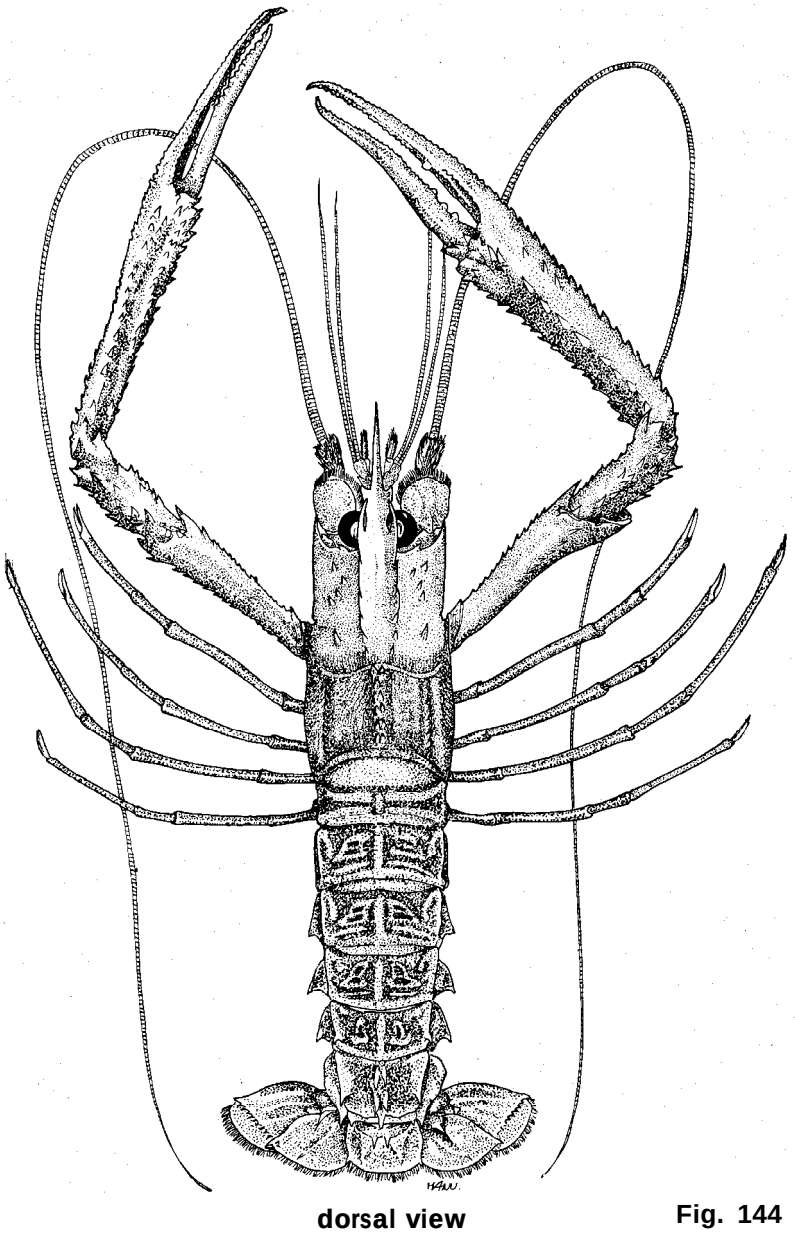
NEPH Metan 8

Nephrops japonicus Tapparone-Canefri, 1873, Memorie Reale Accademia delle Scienze Torino (2)27:326, pl. 1.

FAO Names : En - Japanese lobster.



carapace (lateral view)
(from Holthuis, 1974)



dorsal view

Fig. 144

(combined after Tapparone-Canefri, 1873 and Chan & Yu. 1991)

Type : Type locality: "proveniente dal Giappone". Holotype in MZT, no.Cr.1062.

Geographical Distribution : Indo-West Pacific region: off the Pacific coast of Japan from Choshi, Chiba prefecture, Honshu to east coast of Kyushu (Fig. 145).

Habitat and Biology : Depth range from 200 to 440 m, usually between 200 and 300 m; bottom mud.

Size : Total body length 9 to 12 cm. Carapace length:3.7 cm (males), 3-6 cm (females).

interest to Fisheries : The species is fished throughout its range mostly by trawlers. It is highly esteemed as gourmet food and sold fresh and frozen. In Tosa Bay, the fishing season is between September and April, the catch of this species being smaller there than that of ***M. sagamiensis.***

Local Names : JAPAN: Akaza, Akata-ebi.

Literature : Baba et al., 1986:280; Chan & Yu, 1991:22, pls la, 3a, 5a, 7a.

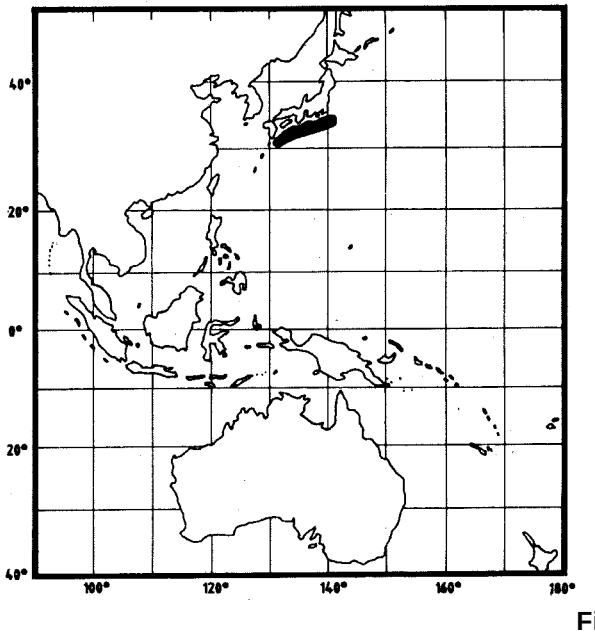


Fig. 145

Metanephrops mozambicus Macpherson, 1990

Fig. 146

NEPH Metan 16

Metanephrops mozambicus Macpherson, 1990, Mémoires Muséum National Histoire naturelle, Paris, (A)145:296, figs 2a,b, 3ab.

FAO Names : En - African lobster

Type : Type locality: South east of Madagascar, "23º36.0'5-43"31.6'E, 395-410 m". Male holotype, MP no. AS 457; female allotype, MP no. AS 458.

Geographical Distribution : Indo-West Pacific region: off E. Africa (from Kenya to Natal), Madagascar (Fig. 147).

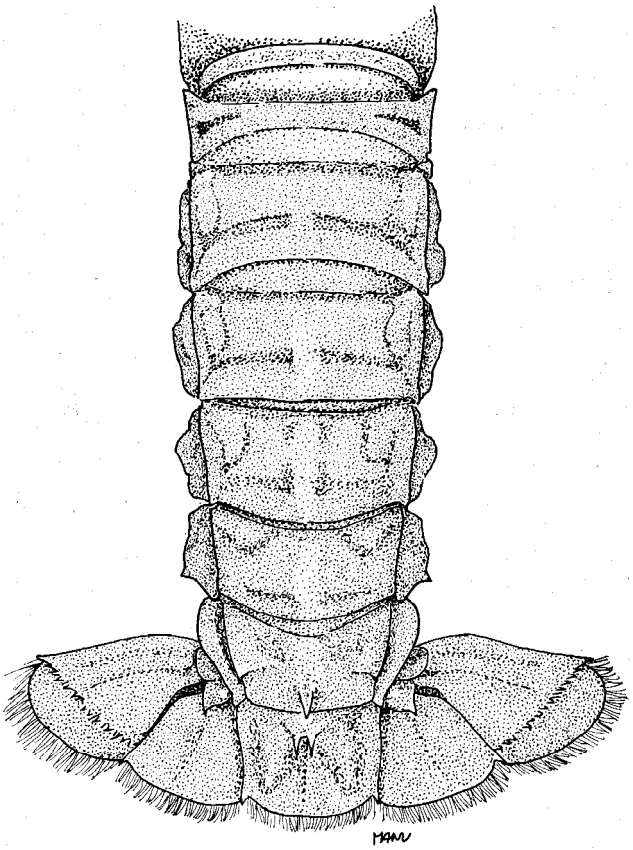
Habitat and Biology : Depth range from 200 to 750 m, most common between 400 and 500 m. Ovigerous females between December and June.

Size : Maximum total length: 20.5 cm (male), 20 cm (female). Carapace length 4.5 to 8.8cm (males), 3.7 to 8.3 cm (females).

Interest to Fisheries : The species is trawled in commercial quantities off the South African east coast between Durban and Bataruto with specially designed "balloon ballerina" nets to dig them out of the mud. According to FAO statistics, the catches of this species (under the previous name of ***M. andamanicus***) in South Africa in 1987 and 1988 amounted to 270 and 298 metric tons respectively. Crosnier & Jouannic (1973), reported catches of 5 kg/hr of this species made near Madagascar.

Literature : Macpherson, 1990:296, figs 2a,b, 3a,b; Chan &, Yu, 1991:38, pls 2d, 4d, 6b. 8b.

Remarks: Before 1990 specimens of the present species were usually considered to belong to ***M. andamanicus.***



(combined after Macpherson, 1990 and Chan & Yu, 1991)

Fig. 146

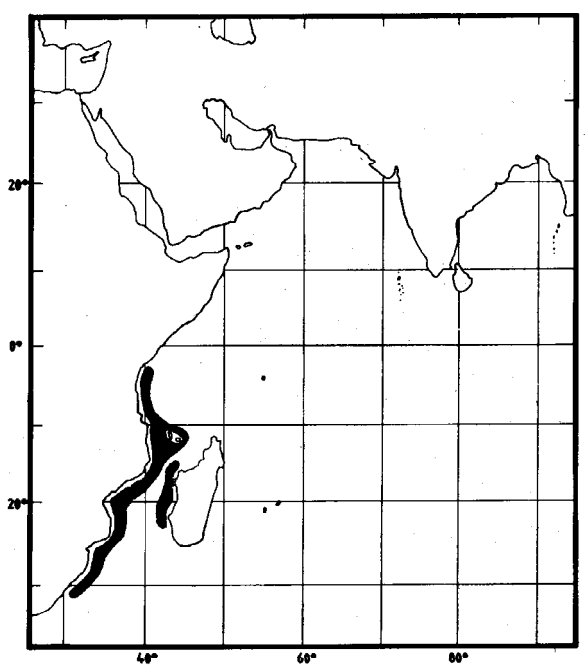
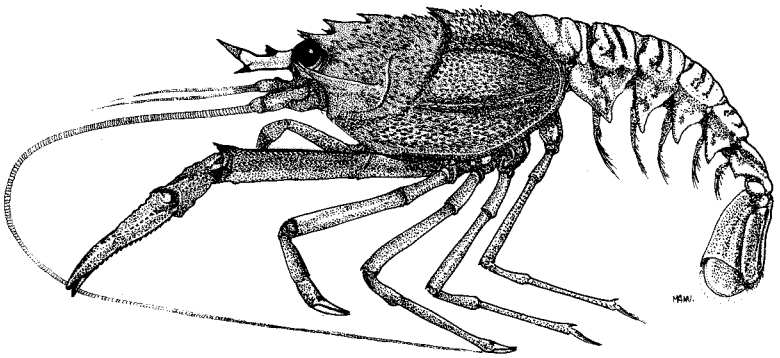


Fig. 147

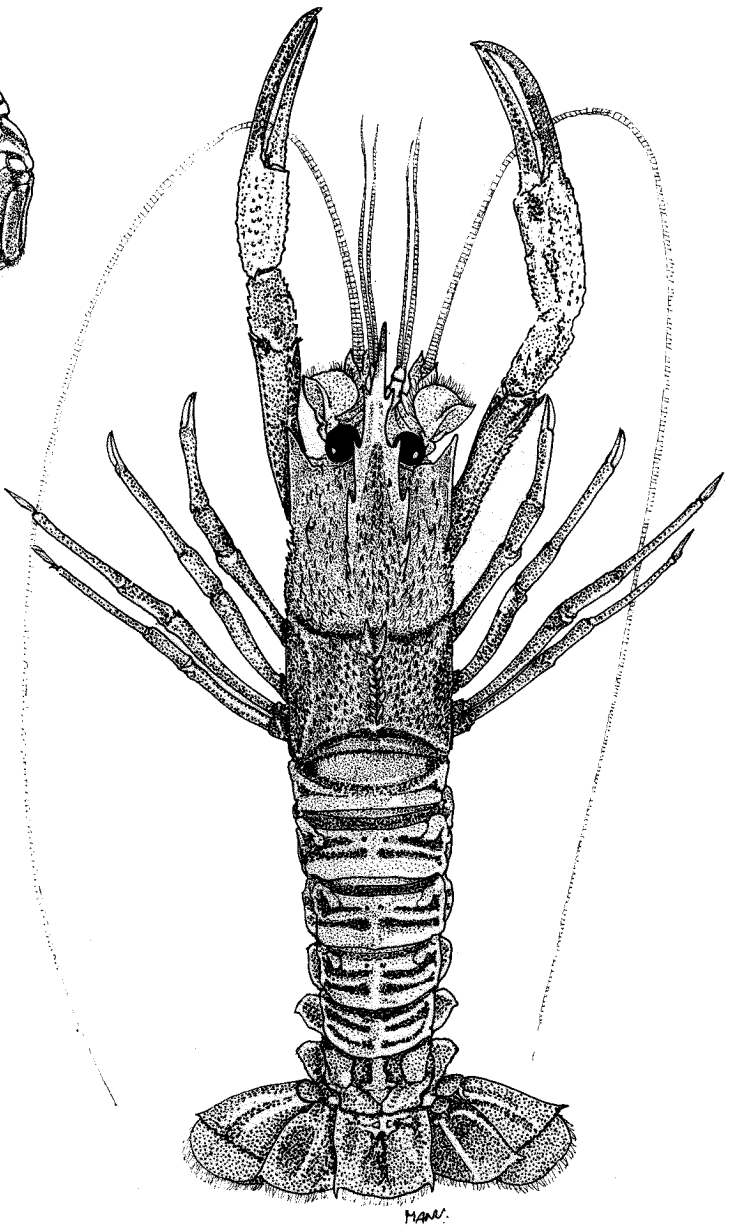
Metanephrops neptunus (Bruce, 1965) **Fig. 148** **NEPH Metan 9**

Nephrops neptunus Bruce 1965, Crustaceana, 9:274, pls 13-15.

FAO Names : En - Neptune lobster.



lateral view (after Bruce, 1965)



dorsal view (after Bruce, 1965) **Fig. 148**

Type : Type locality: ""Cape St. Mary", Cr[uise]. 1/64, Station 26, Trawl 131 [South China Sea, south of Hong Kong]; 19º25.5'N 114º07.5'E to 19º22.0'N 114º1 1.0'E ... Agassiz Trawl, depth 400-435 fmi [=732-796 m]". Holotype female in BM, no. 1964.9.28.1; allotype in RMNH (both types in alcohol, condition good).

Geographical Distribution : Indo-West Pacific region: South China Sea and off western Australia (Fig. 149).

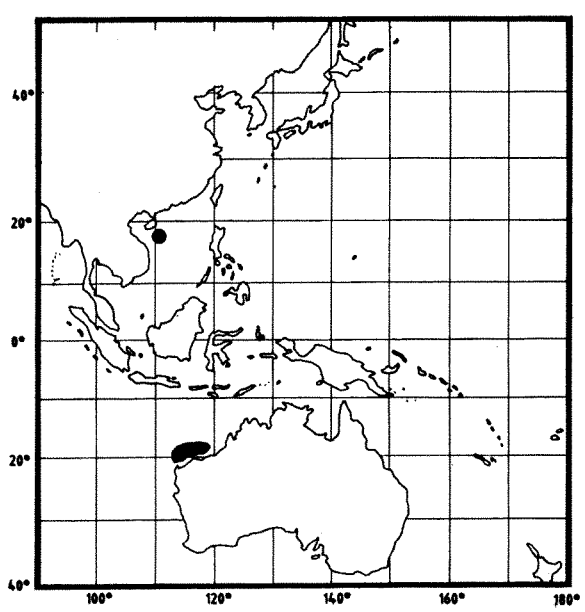


Fig. 149

Habitat and Biology : Depth range from 300 to 800 m. Bottom temperature 5ºC-11.9ºC. Substrate unknown.

Size : Total body length 18 to 25 cm.

Interest to Fisheries : Potential. George (1983:16) counts the present species among the five lobsters off Western Australia for which the "commercial prospects ..... are probably the most encouraging".

Local Names : AUSTRALIA : Neptune's scampi.

Literature : Original description.

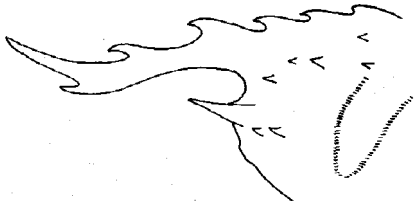
Metanephrops rubellus (Moreira, 1903)

Fig. 150

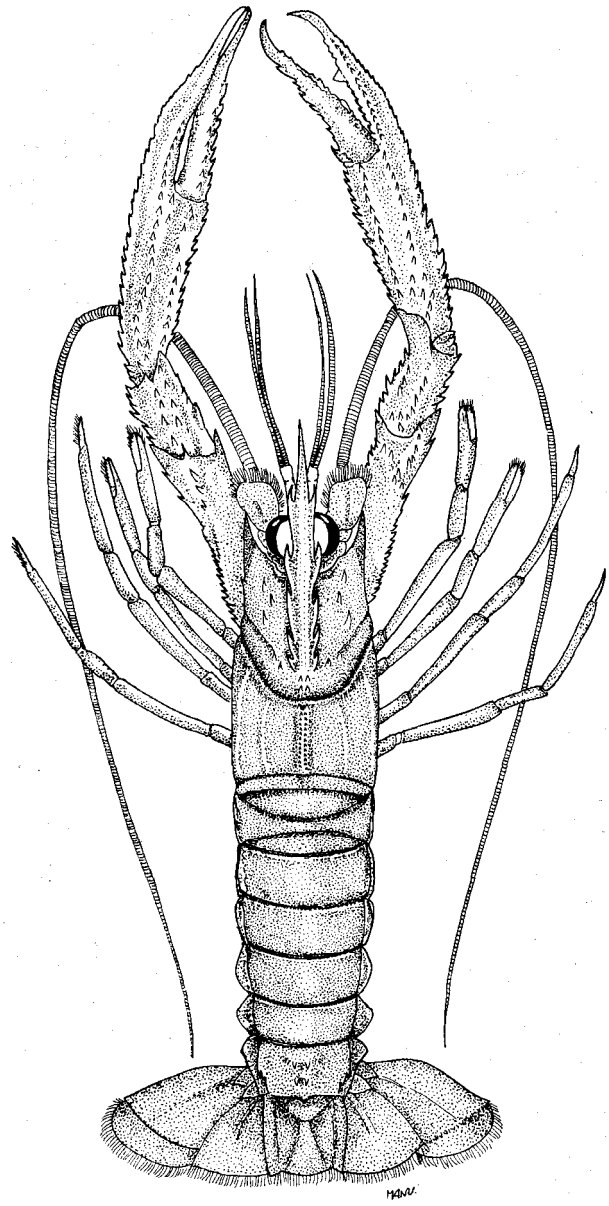
NEPH Metan 10

Nephrops rubellus Moreira, 1903, Lavoura. Boletim da Sociedade nacional de Agricultura Brazileira, 7:62.

FAO Names : En - Urugavian lobster.



front end of carapace (lateral view)
(from Moreira, 1905)



dorsal view (after Moreira 1905) **Fig. 150**

Type : Type locality: E.S.E. of Ilha Rasa at the entrance of the Bay of Rio de Janeiro "á distancia de 30 a 35 milhas da costa entre 43º e 43º30'; W. Greenwich e 6 profundidade de 60 a 100 metros". Syntypes in MNRJ, and USNM, no. 29328.

Geographical Distribution : Western Atlantic region: off the east coast of South America between 23ºS (off Rio de Janeiro, Brazil) and 38ºS (off Buenos Aires Province, Argentina) (Fig. 151).

Habitat and Biology : Found in waters between 50 and 150 m deep.

Size : Total body length of adult specimens between 11 and 18 cm; carapace length between 5 and 8 cm.

Interest to Fisheries : So far none. The species is rather rare (" se encuentra raramente en nuestras costas" Barattini & Ureta, 1960:49) and certainly does not at present form the subject of a fishery.

Local Names : BRAZIL: Lagostim, Langostinha, Langostinha do Mar.

Literature : Moreira, 1905:128, pl.3; Ramos, 1950 :83-91, figs l-3; Holthuis, 1974:836-839.

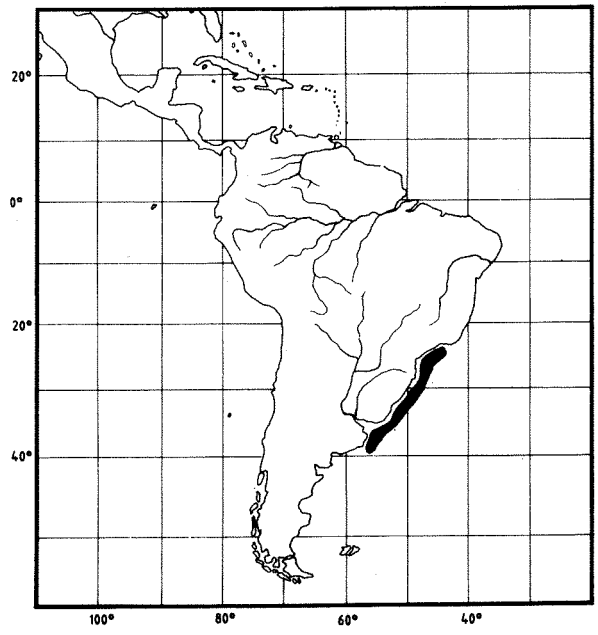


Fig.151

Metanephrops sagamiensis (Parisi, 1917)

Fig. 152

NEPH Metan 11

Nephrops sagamiensis Parisi, 1917, Atti Società Italiana Scienze naturali, 56: 15.

Synonyms: ***Nephrops intermedius*** Balss, 1921.

FAO Names : En - Sculpted lobster.

Type : Type locality ***Nephrops sagamiensis:*** "Baia di Sagami" (= Sagami Bay, Honshu, Japan); two paralectotypes in Museo Civico di Storia Naturale, Milano, Italy, no. 12-13 (ex 1494). Type localities of both ***Nephrops intermedius*** and ***N. sagamiensis:*** "Misaki und Aburatsubo, Sagamibai, Sammlung Doflein, Nr. 2490"; and of ***N. sagamiensis*** (possibly also of ***N. intermedius***): "Station 9, Sagamibai [= 20º10'30"N 139º33'E], 250 m Tiefe, Sammlung Doflein". Through the lectotype selection for both species (see Remarks below), the type locality of both is now restricted to "Aburatsubo, Sagamibai, Japan" [= Aburatsubo near Misaki, Kanagawa Prefecture, Honshu, Japan]; lectotype is the specimen shown on pl. 1 fig. 2 of Balss's (1914) paper, it is preserved in ZSM under no. 33/5, the condition of the alcohol specimen is good; one lot of 3 paralectotypes (of both ***N. intermedius*** and ***N. sagamiensis***) from "Sagamibai, Misaki, Japan" is also preserved in ZSM, it has no. 33/1, and is preserved in alcohol in a good condition. The lectotypes and paralectotypes of ***N. intermedius*** all were collected by F. Doflein in 1904-1905, the lectotype bearing his collecting number 2490. Six lots (10 specimens) of ***Metanephrops japonicus*** from Sagami Bay in the collection of ZSM (nos. 33/1, 33/2, 33/3, 33/4, 33/6 and 36/1) are paralectotypes of ***N. sagamiensis*** (not quite certain for 33/1 and 33/3) but not of ***N. intermedius.***

Geographical Distribution : Indo-West Pacific region: from east coast of Japan near Sagami Bay to Taiwan (Fig. 153).

Habitat and Biology : Depth range from 300 to 400 m, mostly around 350 m.

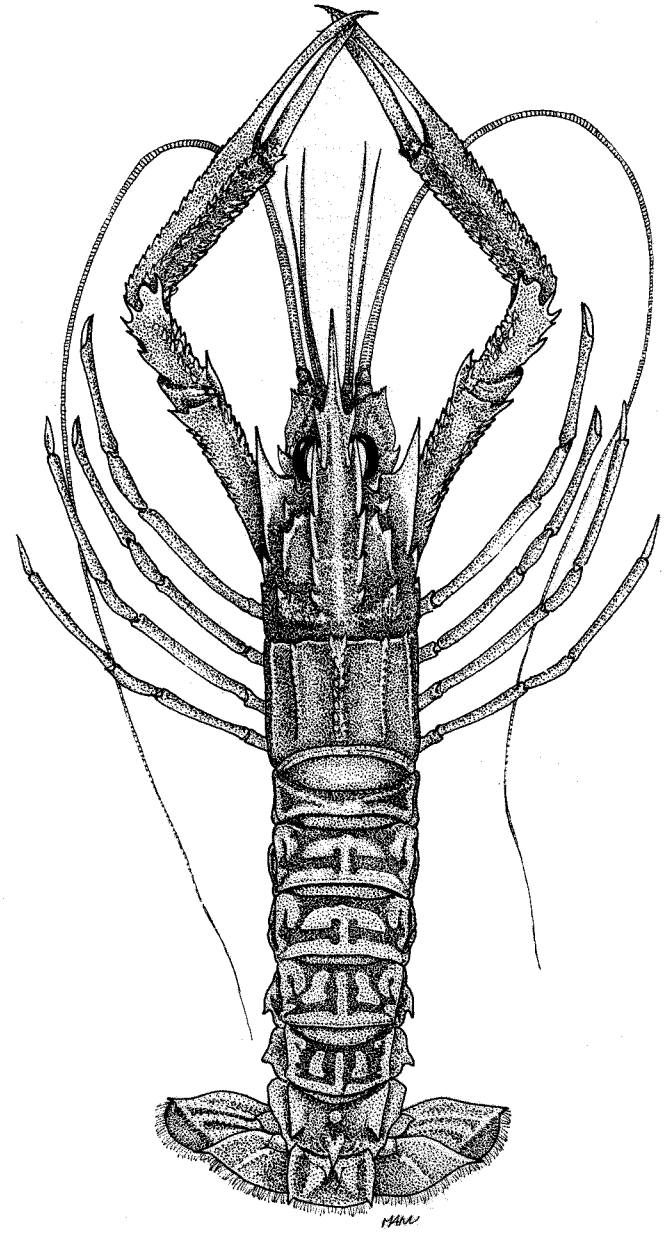
Size : Carapace length 3 to 6 cm (males) and 4.5 to 6 cm (females), corresponding to a total body length of 6 to 14 cm (males) and 10 to 14 cm (females).

Interest to Fisheries : Very little information is available on this species. Baba et al. (1986:280) observed that "in Tosa Bay [Shikoku Island, Japan], the fishing season for ***M. sagamiensis*** as well as for ***M. japonicus,*** is between September and April, the catch of ***M. sagamiensis*** being greater".

Local Names : JAPAN: Sagami akaza-ebi.

Literature : Baba et al., 1986:280; Chan & Yu, 1991:30, pls 1d, 3d, 5c, 7c.

Remarks : Balss (1914:84, pi. 1 fig. 2), under the name ***Nephrops japonicus,*** dealt with several males and females as well as with a juvenile, no exact numbers being given. Later he (Balss, 1921:176) found that this material consisted of two distinct species, and that the specimen figured by him in 1914 was not the true ***N. japonicus*** and belonged to a species that he named ***Nephrops intermedius***; again he did not indicate the exact number of specimens of either species before him. Dr. Ludwig Tiefenbacher of the Munich Museum was so kind to inform me that in the collection of his museum there are two



(after Balss.1914) **Fig. 152**

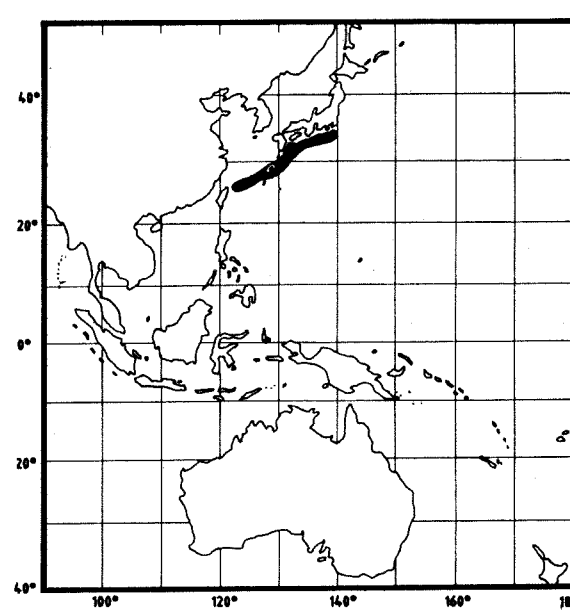


Fig. 153

click for next page

lots (4 specimens) labelled ***N. intermedius*** and which form part of the Doflein collection; one of these specimens could be identified as the specimen figured by Balss (1914). All four specimens thus are syntypes of ***N. intermedius*** and the figured specimen is now selected as the lectotype of that species. In addition the Munich Museum holds five lots of ***Metanephrops japonicus***, all labelled ***Nephrops japonicus*** and all from Sagami Bay. Three of those lots (5 specimens) definitely form part of the material dealt with by Balss (1914), as one of them was collected in 1904 by Doflein and two others were collected in 1903 (one by K.A. Haberer, of the other the collector is not indicated but this could well be Haberer also). The two remaining lots only carry the indications "Sagamibai, Japan", but may well have belonged to Balss' (1914) material. Finally there is one lot of ***Metanephrops japonicus*** collected in Sagami Bay by Doflein, and thus certainly part of the 1914 material;however, this lot (1 specimen) bears in Balss' handwriting the incorrect label "***Nephrops sagamiensis*** Parisi" it is not clear whether or not this is a syntype of ***Nephrops intermedius***, most likely it is not.If it were, however, then the type series of ***Nephrops intermedius*** would consist of two species and a lectotype selection is required.

Parisi (1917), when describing his new ***N. sagamiensis*** included in it all of Balss' (1914) ***Nephrops japonicus*** material; therefore all of Balss' specimens, both those of ***N. intermedius*** and those of ***N. japonicus*** are syntypes of ***N. sagamiensis*** as are also the two specimens before Parisi. The type material of ***N. sagamiensis*** thus is definitely heterogeneous and a lectotype should be chosen. The lectotype of ***N. intermedius*** is here chosen to be also the lectotype of ***N. sagamiensis;*** this action now definitely establishes the identity of the two species, at the same time making their names objectively synonymous.

Metanephrops sibogae (De Man, 1916)

Fig. 154

NEPH Metan 12

Nephrops sibogae De Man, 1916, Siboga Expedition monograph, 39(a2): 102, pl. 4 fig. 18.

FAO Names : En - Siboga lobster

Type : Type locality: Near the Kai Islands, Indonesia, "5º40'S., 132º26'E., 310 m. Bottom fine, grey mud". Syntypes (5 males, 4 females) in ZMA, no. De 104.197, condition fair.

Geographical Distribution : Indo-West Pacific region: Indonesia (type locality only) and Australia (Coral Sea north east of Cape York, and north west of Melville Island, Western Australia) (Fig. 155).

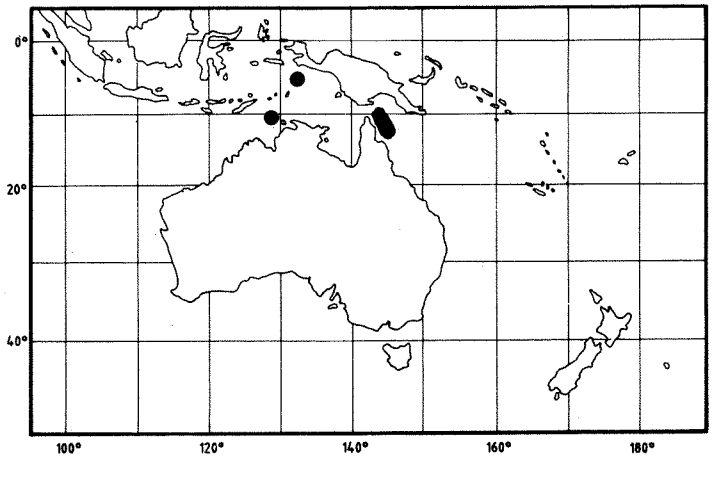
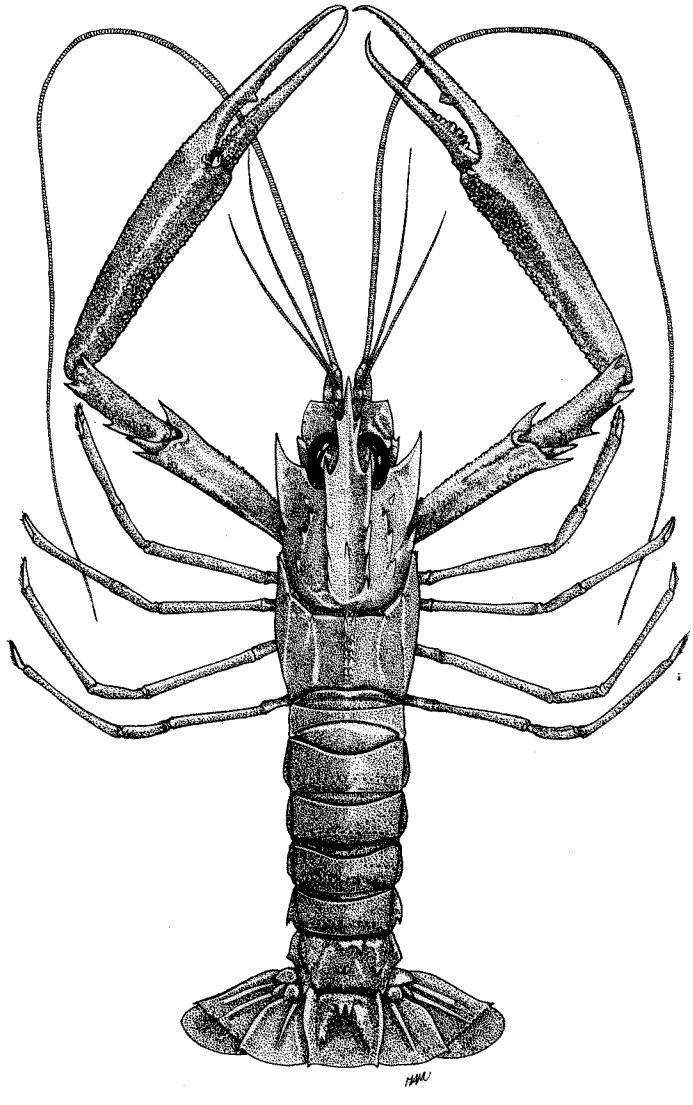


Fig. 155



(after De Man, 1916)

Fig. 154

Habitat and Biology : Depth range from about 300 to 310 m; bottom: soft sediments, like fine grey mud. Ovigerous females found in December.

Size : Total body length 11.5 to 18 cm; ovigerous females 13 and 13.5 cm.

Interest to Fisheries : Potential. The size of the specimens, the fact that they are not solitary (the type haul contained 9 specimens) and that they live on trawlable bottoms, makes them of potential interest for commercial fisheries. But too little is known about the habits and actual habitat of the species.

Local Names : AUSTRALIA: Siboga's scampi.

Literature : **Original description.**

Metanephrops sinensis (Bruce, 1966)

Fig. 156

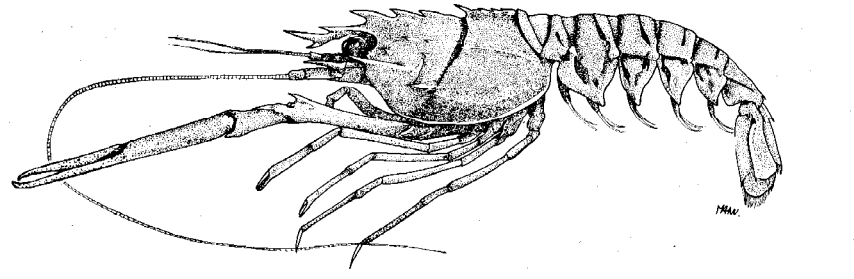
NEPH Metan 13

Nephrops sinensis Bruce, 1966, Crustaceana, 10: 155, pls 10-12.

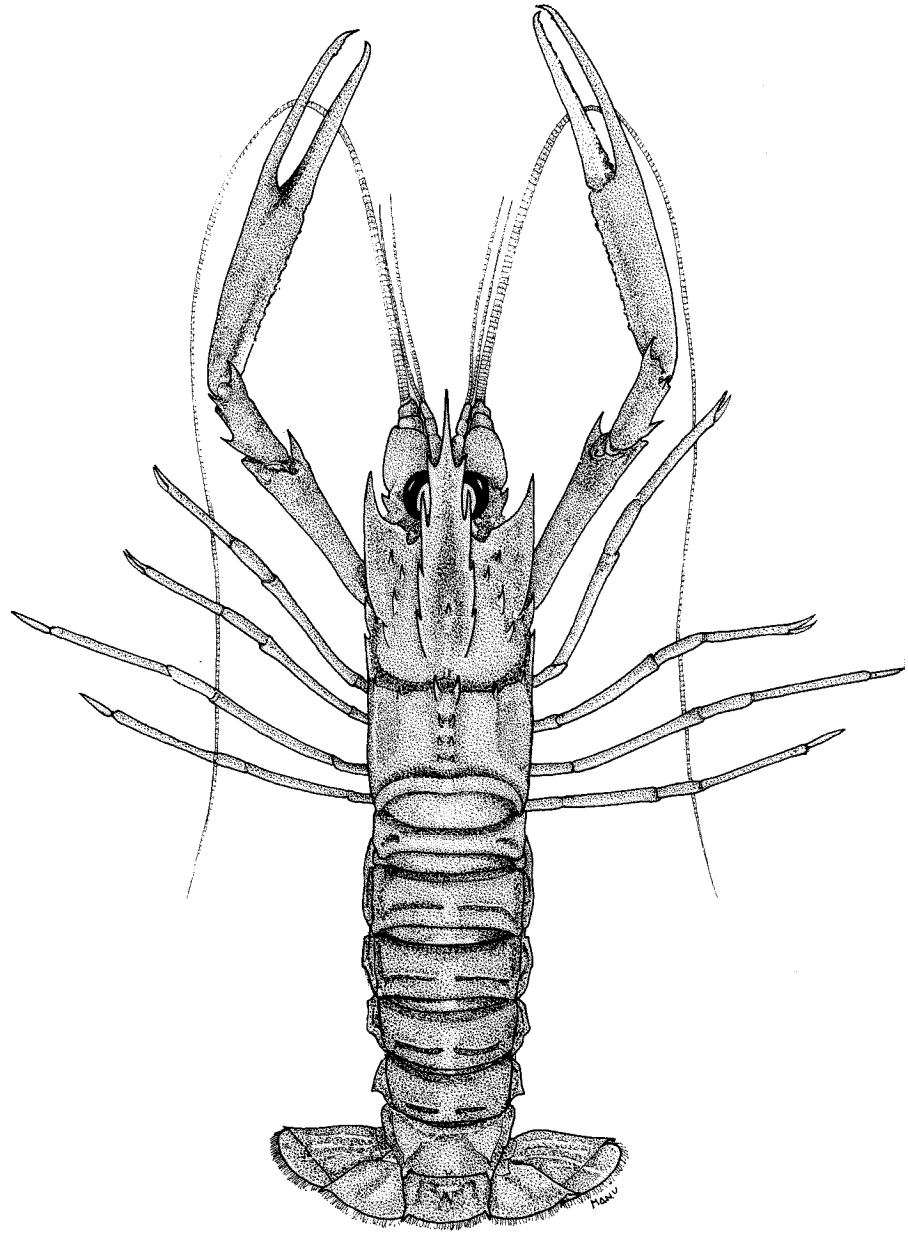
FAO Names : En - China lobster.

Type : Type locality: South China Sea, "Cape St.Mary´´"Sta. 63, Trawl 54, 15º53.0'N 109º26.0'E to 15º53.7'N 109º25.3'E (approx.)... depth 155 fms [=283.5 m] (and deeper)". Holotype female in BM, no. 1964.9.28.2; allotype in BM, no. 1964.9.28.3 (both in alcohol, condition good); paratypes in RMNH, ZSI, and Fisheries Research Station Hong Kong.

Geographical Distribution : Indo-West Pacific region. Only known from the four localities in the South China Sea mentioned in theoriginal description, all situated between 15º53'N-16º00'N and. 109º25.3'E 109º33'E (Fig. 157).



lateral view



dorsal view

(after Bruce, 1966)

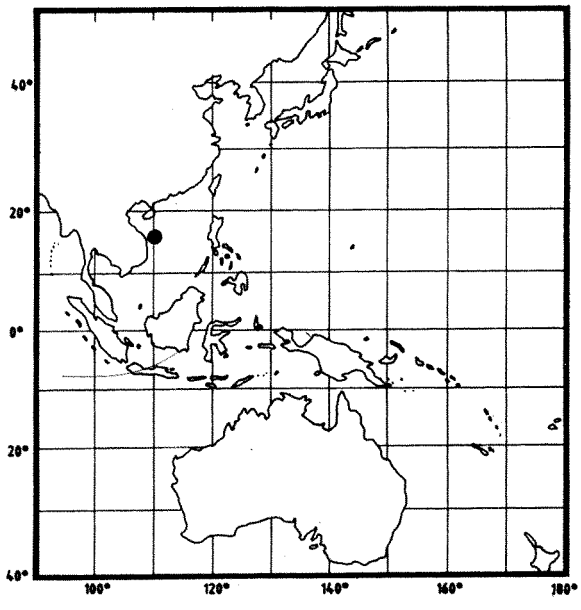


Fig. 157

Fig. 156

Habitat and Biology : Depth range from (205-) 260 to 373 (-390) m. Bottom:' mud, sometimes with shells. Ovigerous females were obtained in September.

Size : Total body length 6 to 15 cm.

Interest to Fisheries : One of the type lots was obtained with a commercial Granton trawl and consists of no less than 137 specimens (including 47 ovigerous females). Two other lots (also taken with a Granton trawl) contained 4 and 11 specimens, and the fourth (with Agassiz trawl) 5 specimens. The size of the specimens, their gregariousness and the configuration of the substrates where they are found, indicate that the species may be of commercial interest.

Literature : Original description

Metanephrops thomsoni (Bate, 1888)

Fig.158

NEPH Metan 14

Nephrops thomsoni Bate, 1888, Report Voyage Challenger. Zool., 24: 185, pl. 25 fig. 1, pl. 26 figs. 1-9.

FAO Names : En - Red-banded lobster.

Type : Type locality: "Challenger" "Station 204A, .. lat. 12º43'N., long. 122º9'E.; between Samboangan [= Zamboanga] and Manila; depth, 100 fathoms [= 182 m]; bottom, green mud". Male lectotype in BM, no. 88.22 (in alcohol, condition good).

Geographical Distribution : Indo-West Pacific region: Korea (Korea Strait), China (Yellow Sea, East China Sea, South China Sea), Japan (from Tosa Bay on the east coast of Shikoku Island, and the west coast of Kyushu south to the Ryukyu Islands), Taiwan, and the Philippines (off Tablas) (Fig. 159).

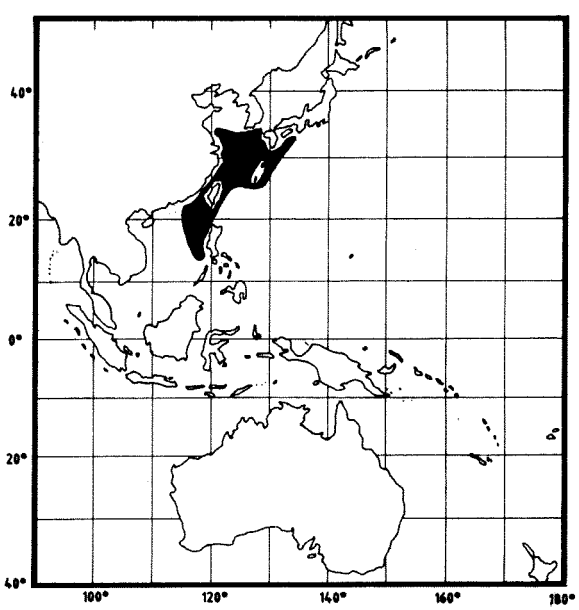


Fig. 159

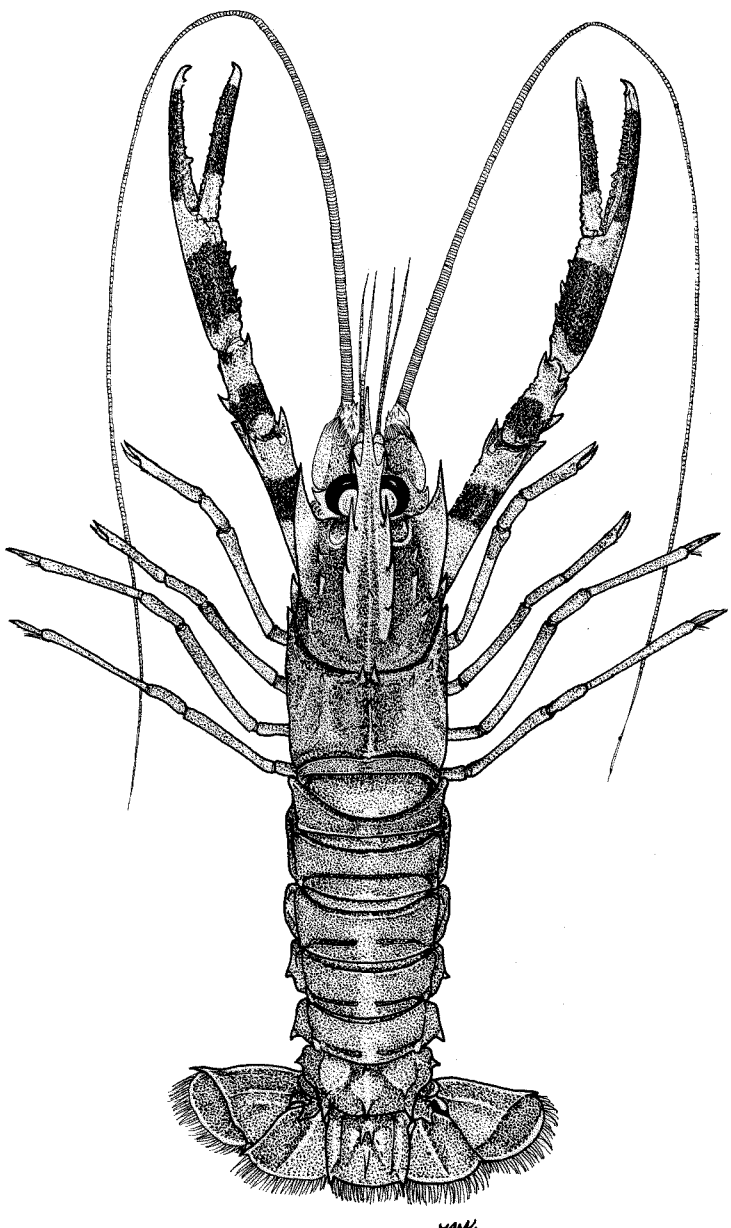


Fig. 158

Habitat and Biology : Depth range from 50 to 500 m, on sandy mud bottom. Ovigerous females are generally caught in the East China Sea from the middle of September to the middle of April. The larval development has been described by Uchida & Dotsu (1973:23-35).

Size : Maximum total body length about 15 cm, usually not more than 12 cm.

Interest to Fisheries : In Korea the species is offered for sale at the Busan markets. According to Uchida & Dotsu (1973:23) the species "is usually caught in the East China Sea by trawl net fishing and used as food". In Taiwan the species is sold in markets, and its price is higher than that of ***M. formosanus,*** which is found in greater quantities (Chan & Yu, 1987:183); it is sold there throughout the year, but is "not valuable" (Chang, 1965:48). Motoh, Dimaano & Pution (1978:22) mention that "a kind of red shrimp (probably ***Nephrops thomsoni***)" is caught by a bobo ("a kind of baited trap") "at deeper water exceeding to 40 m", in Mindanao, Philippines.

Local Names : JAPAN: Minami akaza-ebi ; CHINA (Province of Taiwan): Te-Chia Shia (also used for other species of the genus).

Literature : Baba et al.. 1986:280.

Metanephrops velutinus Chan & Yu, 1991

Fig. 160

NEPH Metan 17

Metanephrops velutinus Chan & Yu, 1991, Crustaceana, 60(1):35, pls 2b,4b, 6c, 8a,c,d.

FAO Names : En - Velvet lobster.

Type : Type locality: "Philippines, 13º51'N 120º30'E, 300-330 m". Male holotype, NTOU no. PM 1. Paratypes MP, RMNH, USNM, WAM.

Geographical Distribution : Indo-West Pacific region: Philippines (south-west of Luton), Western Australia (Cape Leveque to Eucla) (Fig. 161)

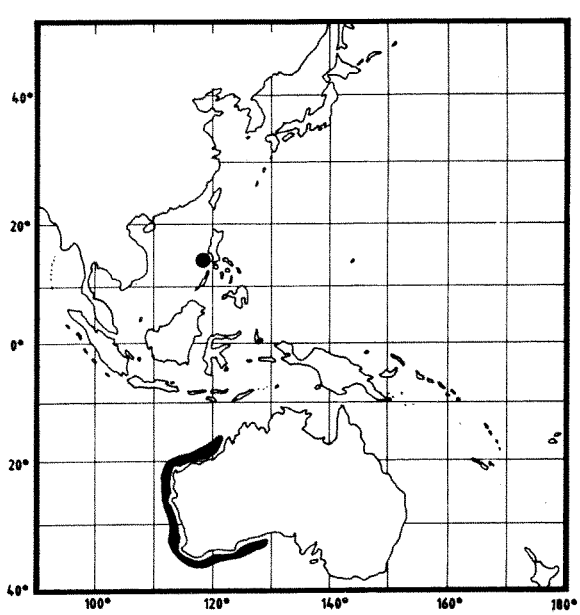
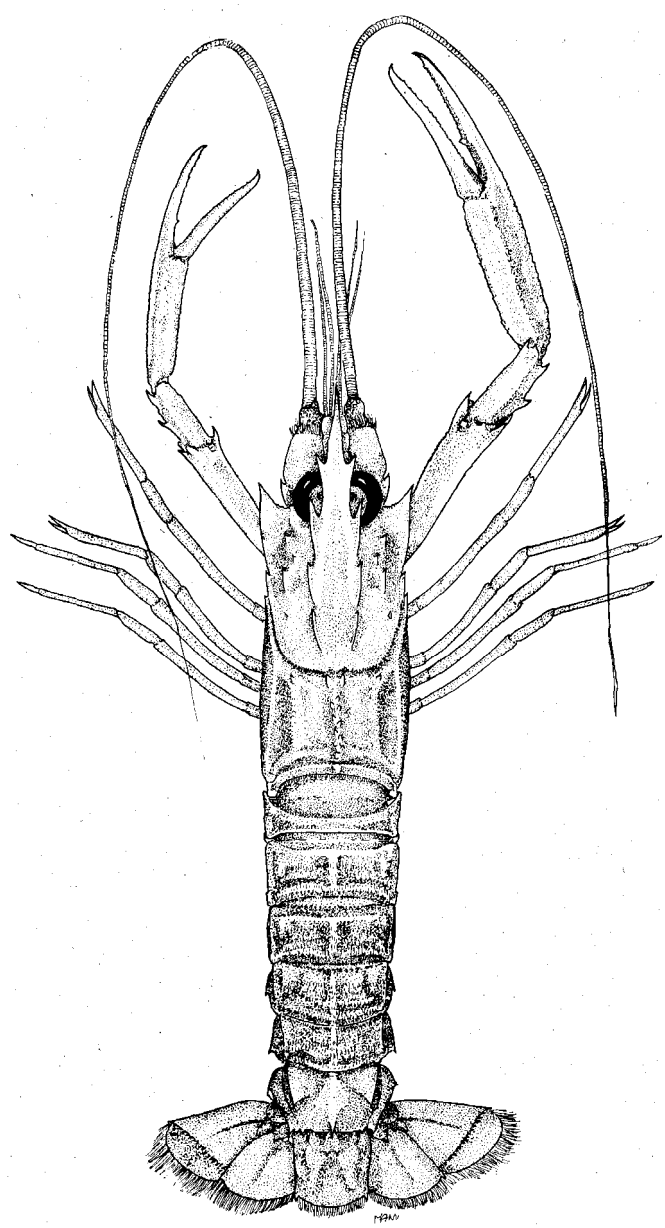


Fig. 161



(after Chan & Yu. 1991)

Fig. 160

Habitat and Biology : Depth range 238 to 702 m, most common at 350 to 450 m. Substrate hard mud.

Size : Carapace length: 3-8.6 cm (males), 2-7.4 cm (females), 4.7-8.2 cm (ovigerous females).

Interest to Fisheries :"***M. velutinus*****,*** which appears slightly larger than ***M. armatus,*** is fished commercially on the North West Shelf of Australia since 1985 (Wallner & Phillips, 1988, under the name of ***M. andamanicus***). Its price is higher than that of the spiny lobsters in Australia and many are used for export; however, the demand of the local markets has greatly increased recently (Bremner, 1985; Ward, Phillips pers.comm.). However, probably due to the low recovery rate of this lobster and the fact that the fishing gear is more selective for ovigerous females, the catch of the species has fallen significantly in the last few years (Wallner & Phillips, 1988)" (Chan & Yu, 1991:38).

Literature : Chan & Yu, 1991:35, pls 2b, 4b, 6c, 8a,c,d.

Remarks : Until 1991 specimens of this species were, often with some doubt, identified as ***M. andamanicus.***

Nephrops Leach, 1814

NEPH Neph

Nephrops Leach, 1814, Brewster's Edinburgh Encyclopaedia, 7:398, 400. Gender masculine. Name placed on the Official List of Generic Names in Zoology in Opinion 104 (published in 1928).

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

Although previously several Indo-West Pacific and tropical West Atlantic species have been assigned to this genus, at present it contains a single north east Atlantic species only. All other species are now placed in the genus ***Metanephrops.***

The single true ***Nephrops*** species, ***N. norvegicus,*** is of considerable economic interest.

Nephrops norvegicus (Linnaeus, 1758)

fig. 162

NEPH Neph 1

Cancer norvegicus Linnaeus, 1758, Systema Naturae, (ed. 10)1:632. Name placed on the Official List of Specific Names in Zoology, in Direction 36 (published in 1956).

Synonyms : ***Astacus norvegicus*** - Fabricius, 1775; ***Homarus norvegicus*** - Weber, 1795; ***Astacus rugosus*** Rafinesque, 1814; ***Nephropsis cornubiensis*** Bate & Rowe, 1880; ***Nephrops norvegicus meridionalis*** Zariquiey Cenarro, 1935.

FAO Names : En - Norway lobster; **Fr -** Langoustine; **Sp -** Cigala.

Type : Type locality for ***Cancer norvegicus:*** "in Mari Norvegico",restricted by lectotype selection by Holthuis (1974:824) to Kullen Peninsula in southern Sweden, 56º18'N 12º28'E: Lectotype and paralectotypes lost.

Type locality for ***Astacus rugosus:*** Sicily. Type no longer extant.

Type locality for ***Nephropsis cornubiensis***: "off the Dudman" [= Dodman Point, Cornwall, UK, 50º13'N 4º48'W]. Type specimen supposed to be deposited "in the museum of the Athenaeum at Plymouth", but probably no longer extant.

Type locality of ***Nephrops norvegicus meridionalis:*** Spain (both the Atlantic coast:Huelva, San Sebastian and Coruña, and the Mediterranean coast: Rosas, Barcelona, Alicante; and Spanish Morocco: Melilla). Type material in Zariquiey collection of the Instituto de Investigaciones Pesqueras, (at present: Instituto de Ciencias del Mar), Barcelona.

Geographical Distribution : Eastern Atlantic region: from Iceland, the Faeroes and northwestern Norway (Lofoten Islands), south to the Atlantic coast of Morocco; western and central basin of the Mediterranean; absent from the eastern Mediterranean east of 25ºE; also absent from the Baltic Sea, the Bosphorus and the Black Sea. A record from Egypt is doubtful (Fig. 163).

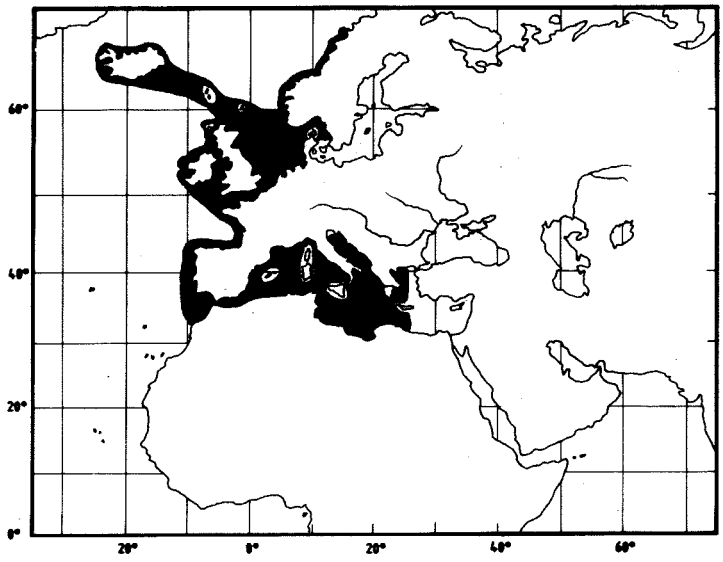


Fig. 163

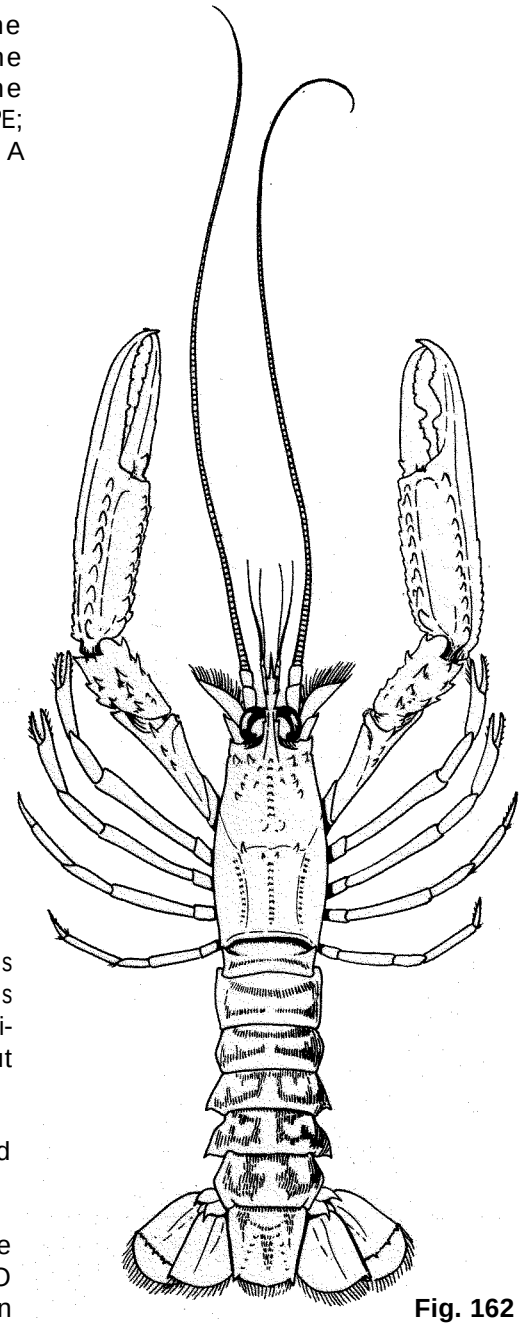


Fig. 162

Habitat and Biology : Depth range from 20 to 800 m; the species lives on muddy bottoms in which it digs its burrows. It is nocturnal and feeds on detritus, crustaceans and worms. Ovigerous females are found practically throughout the year, the eggs laid around July are carried for about 9 months.

Size : The total body length of adult animals varies between 8 and 24 cm, usually it is between 10 and 20 cm.

interest to Fisheries : The species is of considerable commercial value and is fished for practically throughout its range. According to FAO statistics 59 767 tons were caught in 1987, 62 382 tons in 1988, mainly in the northeastern Atlantic (Fishinq Area 27). The species is fished mostly in spring and summer. On the continental shelf, the fishery is most efficient in the very early morning, at twilight of in nights with full moon; on the continental slope, however, the fishery is most productive in daytime. It is caught mostly by trawling, more rarely with lobster pots. Sold fresh and frozen; also canned, either as plain peeled tails or prepared as "bisque de langoustines". Under the Italian name Scampi (plural of Scampo) it was sold all over Europe as a highly esteemed food; but soon the name Scampi became also used for large Penaeid shrimps.

Local Names : DENMARK: Bogstavhummer ; FRANCE: Langoustine, Cacahouete; GERMANY: Norwegischer Hummer, Buchstabenkrebs, Kaisergranat, Kaiserhummer; GREECE: Karavida; ICELAND: Letur humar; ITALY: Scampo, Scampolo; MONACO: Lengustina; MOROCCO: Azeffane, Langoustine; NETHERLANDS: Noorse kreeft; NORWAY: Bokstavhummer, Keiserhummer, Sjskreps; PORTUGAL: Lagostim; SPAIN: Cigala, Escamarlanc, Maganto; SWEDEN: Kejsarhummer, Havskrafta; TUNISIA: Jarradh el bahr; UK: Norway lobster, Dublin bay prawn, Dublin prawn; YUGOSLAVIA: Skamp.

Literature : Palombi & Santarelli, 1961:365-365 (local Italian names); Farmer, 1975; Fischer, Bianchi & Scott (eds), 1981:vol.5; Fischer, Bauchot & Schneider (eds), 1987:302.

Thymopides Burukovsky & Averin, 1977

NEPH Thy

Thymopides Burukovsky & Averin, 1977, Crustaceana, 32:216. Replacement name for ***Bellator*** Burukovsky & Averin, 1976 (non ***Bellator*** jordan & Evermann, 1896). Gender masculine.

Type Species: by original designation and monotypy for ***Bellator*** Burukovsky & Averin: ***Bellator grobovi*** Burukovsky & Averin, 1976.

Synonyms : ***Bellator*** Burukovsky & Averin, 1976, Zoolooicheskii Zhurnal, Moscow, 55:296. Type species, see under ***Thymopides.*** Gender masculine.

So far only one species of this genus is known; it may be potentially of economic value.

Thymopides grobovi (Burukovsky & Averin, 1976)

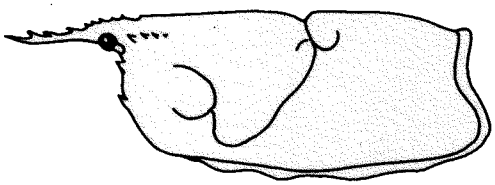
Fig.164

NEPH Thy 1

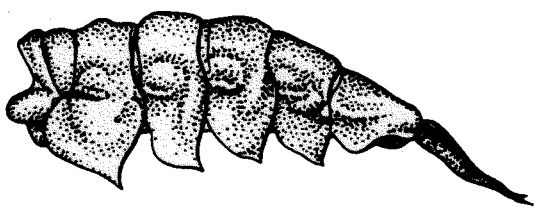
Bellator grobovi Burukovsky & Averin, 1976, Zoolooischeskii Zhurnal, Moscow, 55:296, figs 1-4.

FAO Names : **En -** Bellator lobster.

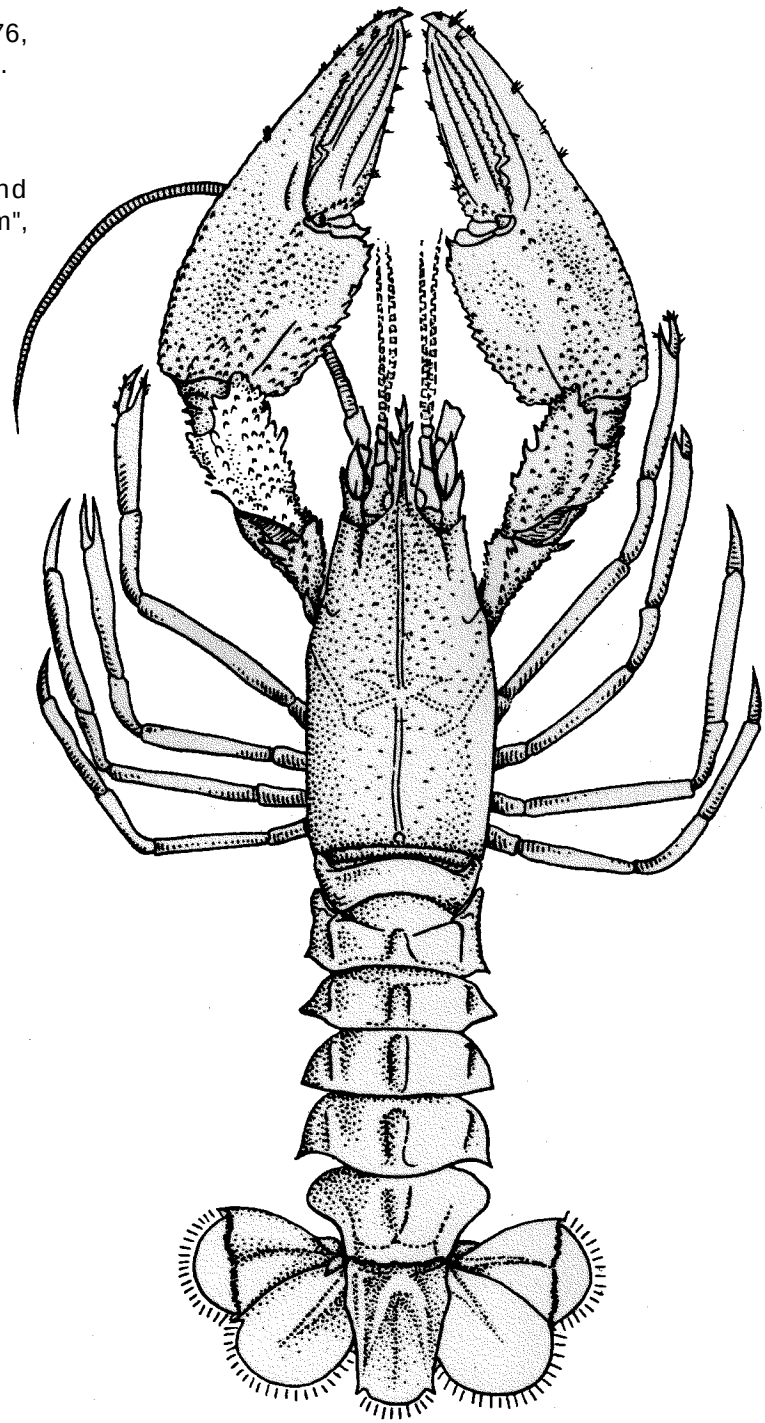
Type : Type locality:"in the Herd [= Heard] Island region [near Kerguelen] at a depth of 1,010 m", 51º30'S 69º37'E. Holotype male in ZISL.



carapace
(lateral view)
(after Ledoyer, 1979)



abdomen (lateral view)
(from Eurukovsky & Averin, 1976)



dorsal View (from Burukovsky & Averin, 1976)

Fig. 164

Geographical Distribution : Southern Indian Ocean: area of Kerguelen Islands and Heard Island (47º-51.5ºS 66º-75.5ºE) (Fig. 165).

Habitat and Biology : Depth range from 560 to 1220 m, on muddy substrate.

Size : Total body length between 3 and 11 cm, mostly between 6 and 11 cm.

Interest to Fisheries : The size of the animals and the fact that they occur in relatively great numbers (see Ledoyer, 1979) suggest that the species might be of potential commercial value. So far, however, this possibility has not been tested experimentally.

Literature : Ledoyer, 1979: 123, figs 1,2.

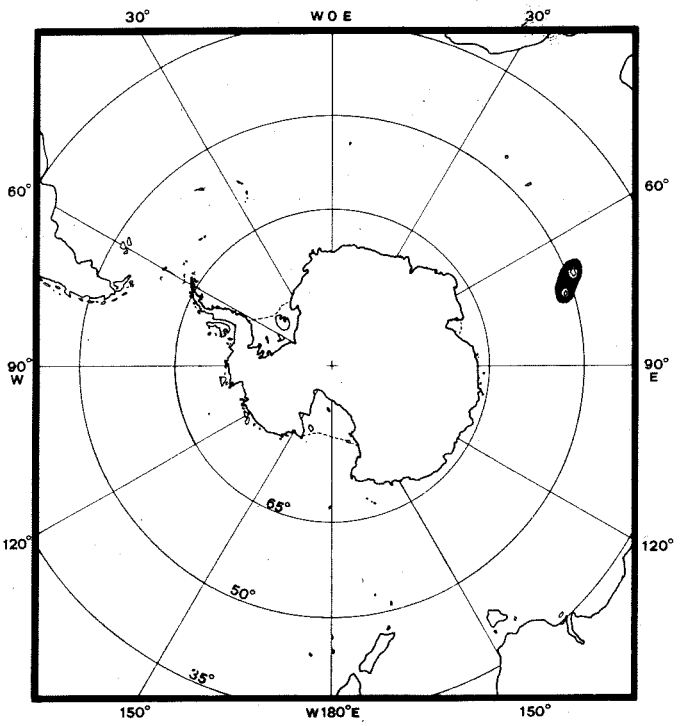


Fig. 165

2.2 INFRAORDER **PALINURIDEA** Latreille, 1802

Palinurini Latreille, 1802, Histoire naturelle générale et particulière des Crustacés et des Insectes. 3:31.

This infraorder consists of 3 superfamilies: Eryonoidea De Haan, 1841, Glypheoidea Zittel, 1885, and Palinuroidea Latreille, 1802. Only the last of these contains species that are of commercial interest.

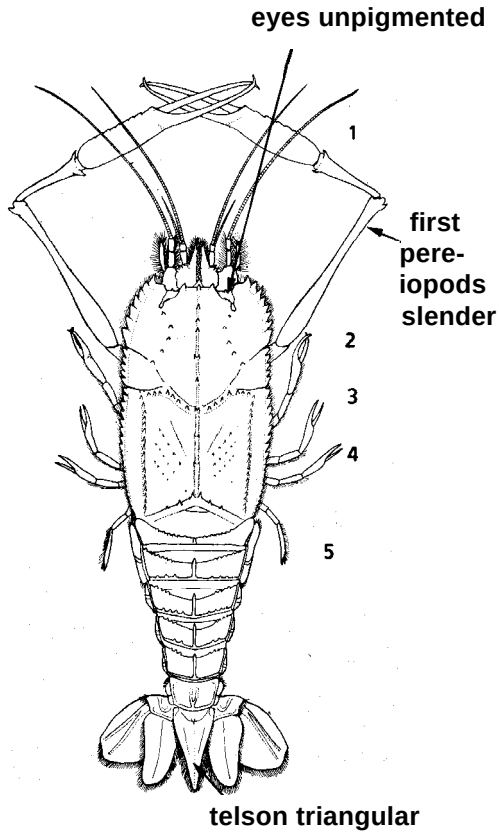
Key to the recent representatives of the three Superfamilies of Palinuridea

1a. Pereiopods 1 to 4 (or all) with true chelae, the first pair very slender, more than twice as long as the second pair. Eyes immovable, not protruding above surface of carapace, and without pigment. Telson triangular, pointed posteriorly (Fig. 166) ..... **Eryonoidea**

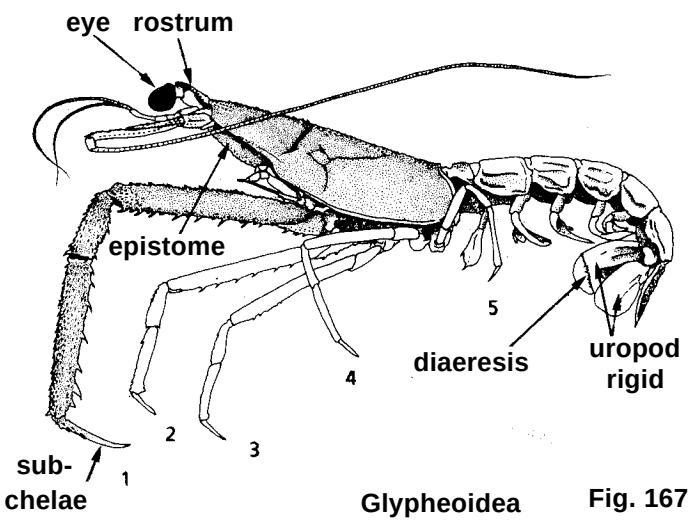
1b. Pereiopods 1 to 4 without true chelae, the first pair sometimes with a subchela. Eyes distinct, movable, cornea with pigment. Telson posteriorly broadly rounded (Figs 167, 168).

2a. Epistome large, 1.5 times as long as wide and about 1/3 of carapace length, its posterior margin about level with cervical groove of carapace. Endo- and exopod of the uropod firm throughout; exopod with a diaeresis. Rostrum well developed, reaching to the base of cornea. Eyes inserted on a median elevation of the cephalon, which reaches to about middle of the rostrum, with which it is partly fused. First pereiopods very strong, spiny and subchelate, the second somewhat similar, but smaller and with fewer spines (Fig. 167) ..... **Glypheoidea**

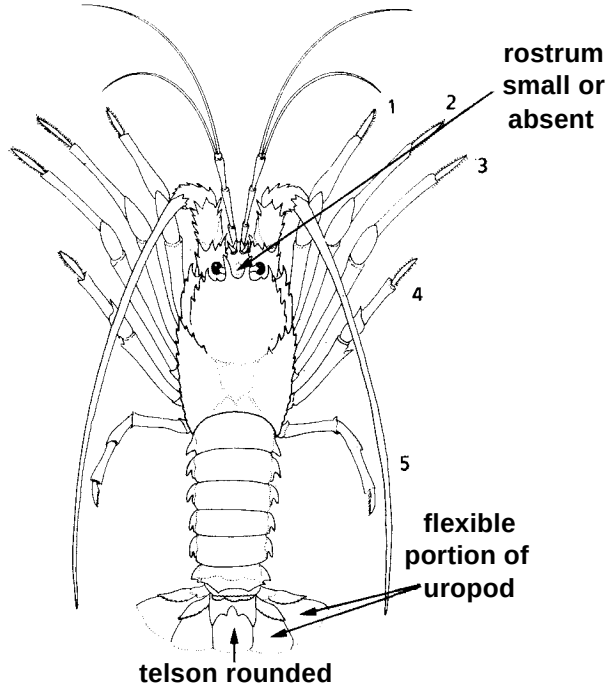
2a. Epistome small, wider than long, not reaching much behind level of eyes. Endo- and exopod of the uropods (as well as the telson) soft and flexible in their posterior half, being strongly chitinized only in the basal part. Rostrum usually very small or absent. Eyes not implanted on a median elevation of the cephalon Fig. 168) ... **Palinuroidea**



Eryonoidea **Fig. 166**



Glypheoidea **Fig. 167**



Palinuroidea **Fig. 168**

SUPERFAMILY **ERYONOIDEA** De Haan, 1841

Eryonidea De Haan, 1841, in P.F. von Siebold, Fauna Japonica, (Crustacea) (5): 148, 149.

This superfamily consists of four families, three of which contain only fossil species. The fourth, Polychelidae Wood-Mason, 1875, is the only one with recent representatives.

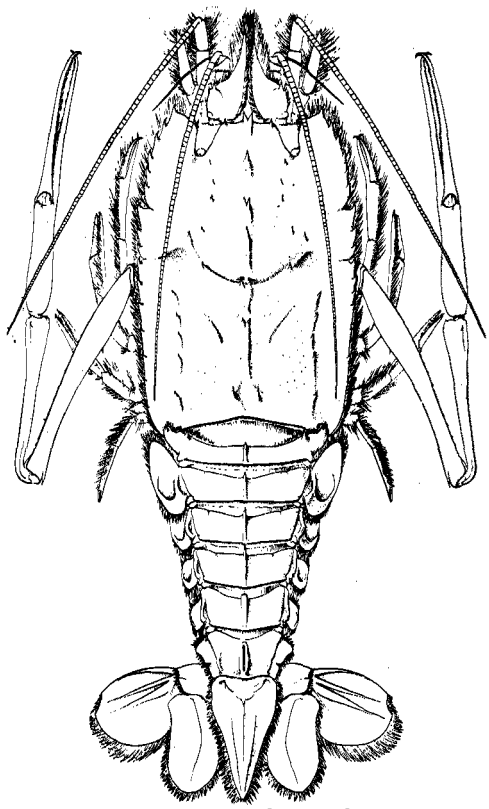
2.2.1 **FAMILY POLYCHELIDAE** Wood-Mason, 1875

POLY

Polychelidae Wood-Mason, 1875, Annals Magazine natural History, (4)15: 132

This family has several genera and numerous species. All species inhabit the deep sea and none are of commercial value. Although some of them attain good sizes, they seem to have relatively little meat and for that reason are of no economic interest. However, some species can be caught in considerable quantities. During the 1964 cruises of R.V. JOHN ELLIOT PILLSBURY the catch of ***Stereomastis sculpta talismani*** (Bouvier, 1917) (Fig. 169), at one of the stations off West Africa, was so large that most of it had to be shoveled overboard.

Notwithstanding all this, none of the numerous (more than 35) species appears ever to have been brought to the fish markets, or sold as food or bait. Therefore this group is not further considered here. The taxonomy of the Polychelidae, especially of the generic level, is still very unsettled.



Stereomastis sculpta
(from S.I. Smith, 1882) **Fig. 169**

SUPERFAMILY **GLYPHEOIDEA** Zittel, 1885

Glyphaeidae Zittel, 1885, Handbuch der Paläontologie, 1(2):689

This superfamily has three families, two of which are exclusively fossil. The third, Glypheidae Zittel, 1885, next numerous fossil taxa, contains a single recent genus with a single species.

Zittel (1885) cited Winkler (1881:73) as the author of the name Glyphaeidae. However, Winkler (1881) although dealing extensively with the genus ***Glyphea*** did not establish a family name based on this generic name, he at most used the expression “les glyphees”. Zittel (1885) therefore must be considered the author of the family name; Zittel used the incorrect spelling ***Glyphaea*** and Glyphaeidae for the genus and family, respectively.

2.2.2 **FAMILY GLYPHEIDAE** Zittel, 1885

GLYPH

Glyphaeidae Zittel, 1885, Handbuch der Paläontologie, 1(2):689.

The only recent genus is the following:

Neoglyphea Forest & De Saint Laurent, 1975

GLYPH Neog

Neoglyphea Forest & De Saint Laurent, 1975, Comptes-Rendus hebdomadaires seances l'Académie Sciences, Paris, (D) 281: 155. Gender feminine.

Type Species: by original designation (gen.nov., sp.nov.) and monotypy: ***Neoglyphea inopinata*** Forest & De Saint Laurent, 1975.

A single species.

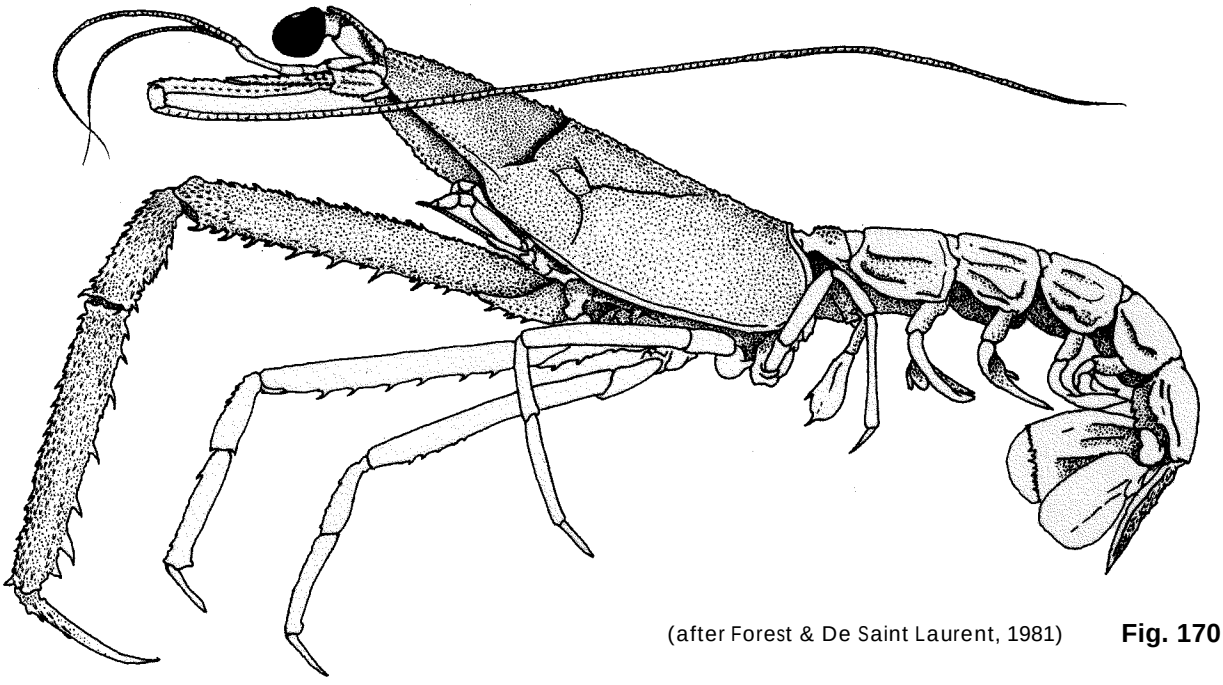
Neoglyphea inopinata Forest & De Saint Laurent, 1975

Fig. 170

GLYPH Neog 1

Neoglyphea inopinata Forest & De Saint Laurent, 1975, Comptes-Rendus hebdomadaires seances l'Académie Sciences, Paris, (D)281 : 155, pls 1,2.

FAO Names : **En** - Fenix lobster.



(after Forest & De Saint Laurent, 1981) **Fig. 170**

Type : Type locality: "Albatross, Station 5278 ... 14º00'10"Nord; 120º17'15"Est; 185 m",south west of entrance of Manila Bay, Philippines. Holotype male, in USNM, no. 152650.

Geographical Distribution : Indo-West Pacific region. The species is known only from 14 specimens all trawled south west of the entrance of Manila Bay in a small area between 13º59.0'- 14º08.0'N and 120º15.8'-120º20.5'E, 186-189 m, and from 3 specimens taken in the Timor Sea, 9º46'S 130º00'E, 240-300 m (Fig. 171).

Habitat and Biology : Depth range from 186 to 300 m; firm substrate with mud

Size : Total body length between 7 and 14.9 cm, carapace length between 3 and 6.7 cm.

Interest to Fisheries : The scarcity of the species (only 17 specimens known) and its probably very restricted range, do not make it a likely subject for a fishery.

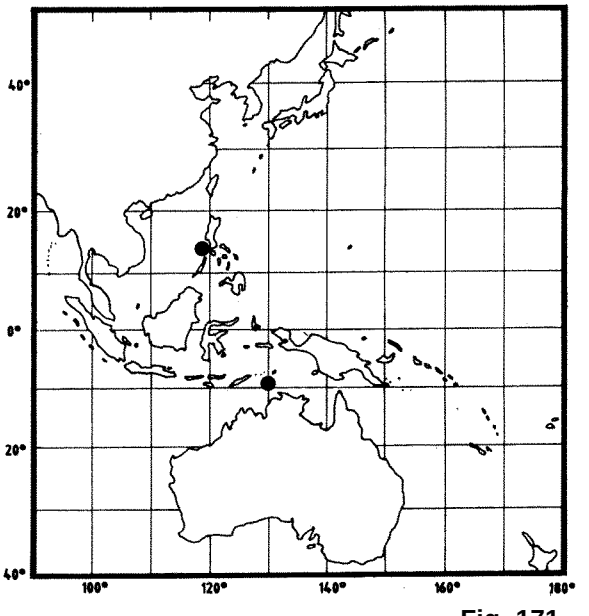


Fig. 171

Literature : Forest & De Saint Laurent, 1981:51-84, figs I-28.

click for next page

SUPERFAMILY **PALINUROIDEA** Latreille, 1802

Palinurini Latreille, 1802, Histoire naturelle générale et particulière des Crustacés et des Insectes, 3:31.

Three families make up this superfamily, namely the Palinuridae (spiny lobsters), Synaxidae (furry lobsters) and Scyllaridae (slipper lobsters), they will be dealt with in this order.

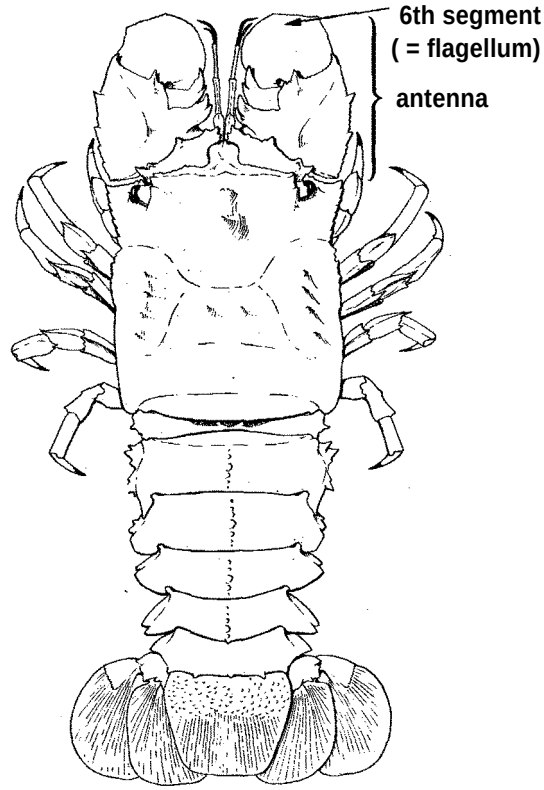
Key to Families

1a. Antennal flagellum reduced to a single, flat, plate which forms the sixth and final segment of the antenna. The shovel-like appearance of the antennae is responsible for the names shovel-nose lobster and bulldozer lobster also used for the animals of this group (Fig. 172) ..... **Scyllaridae**

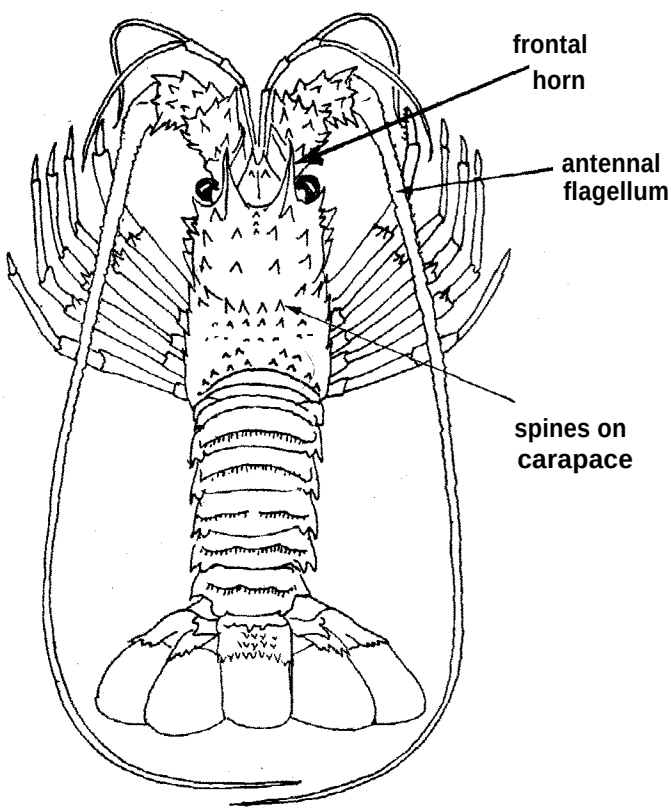
1b. Antennal flagellum long and consisting of numerous small articles, whip-like or spear-like

2a. Rostrum absent or visible as a small spine on anterior margin of carapace. Carapace with a pair of frontal horns above the eyes, and usually with spines on the dorsal surface; hairs on carapace, if present, few and scattered (Fig. 173) ..... **Palinuridae**

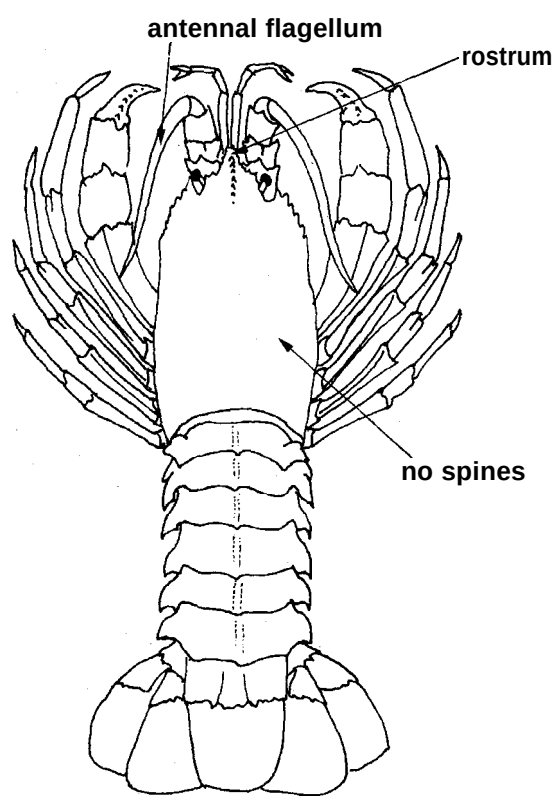
2b. Rostrum a large, broad and flat triangular or rounded plate between the eyes. Carapace without frontal horns or other spines. Body covered only with granules and a rather dense fur of short hair (Fig. 174) ..... **Synaxidae**



Scyllaridae **Fig. 172**



Palinuridae **Fig. 173**



Synaxidae **Fig. 174**

2.2.3 FAMILY PALINURIDAE Latreille, 1802

PALIN

Palinurini Latreille, 1802, Histoire naturelle générale et particulière, des Crustacés et des Insectes, 3:31. Name placed on the Official List of Family Names in Zoology, in Opinion 519 (published in 1958).

This family, known best as spiny lobsters or langoustes, consists of eight genera (***Jasus, Justitia, Linuparus, Palinurus, Palinustus, Panulirus, Projasus*** and ***Puerulus***). Several of these genera are of great economical value, others are of minor or only potential importance. All known species of the family are dealt with in this catalogue.

Key to Genera:

1a. First pair of legs enlarged in males, ending in subchelae, with wide, red crossbands; carapace ornamented with a strong, scale-like sculpture; abdomen brick red, with 4 or 5 conspicuous transverse grooves on each somite and with yellowish spots and stripes (Fig.175) ..... ***Justitia***

1b. First pair of legs not enlarged, with no trace of a pincer, without crossbands; carapace without a scale-like sculpture; abdomen variously coloured, smooth or with at most 2 transverse grooves per somite

2a Frontal horns fused to a broad 2- or 4-spined median projection on the anterior margin of the carapace between the eyes; antennal flagella straight, inflexible (Fig. 176) ***...Linuparus***

2b. Two distinct, widely separated tooth-like frontal horns, between which the anterior margin of the carapace is visible; antennal flagella although large and firm, quite flexible

3a. Flagella of antennulae long, whip-like, longer than peduncle of antennules (Fig. 177).....***Panulirus***

3b. Flagella of antennules short, shorter than last segment of antennular peduncle

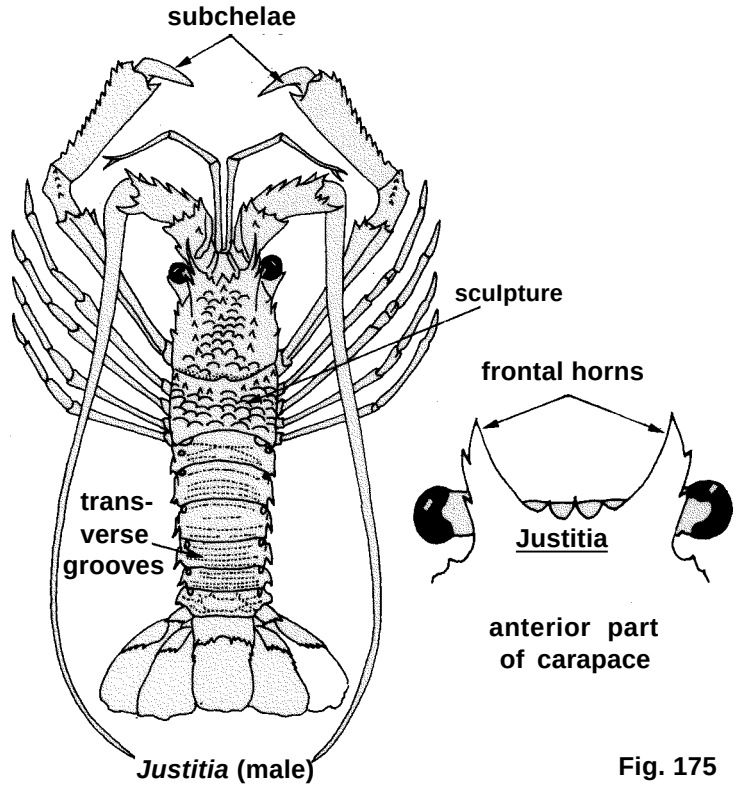


Fig. 175

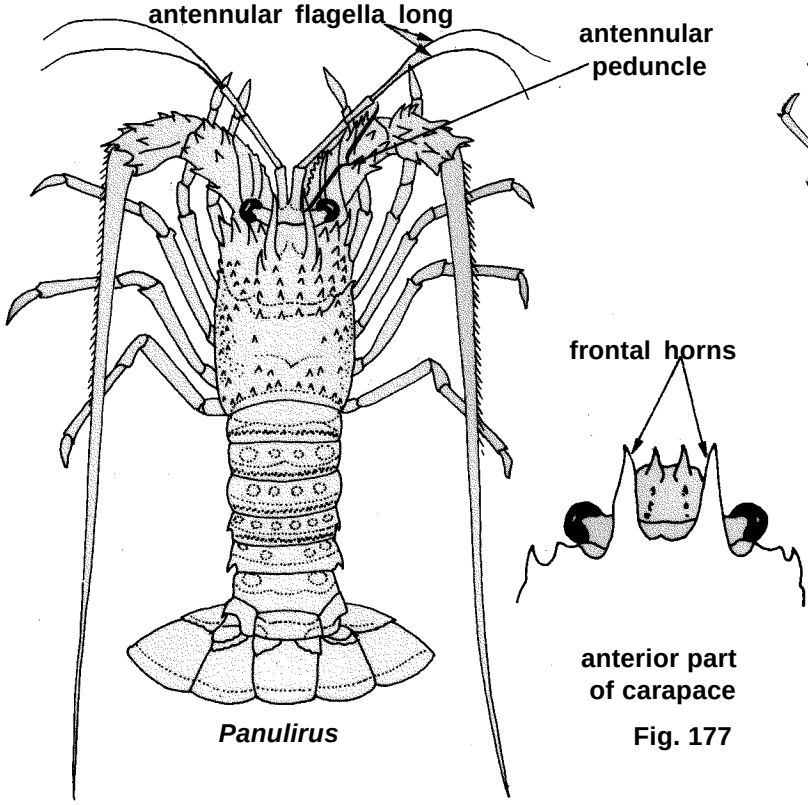


Fig. 177

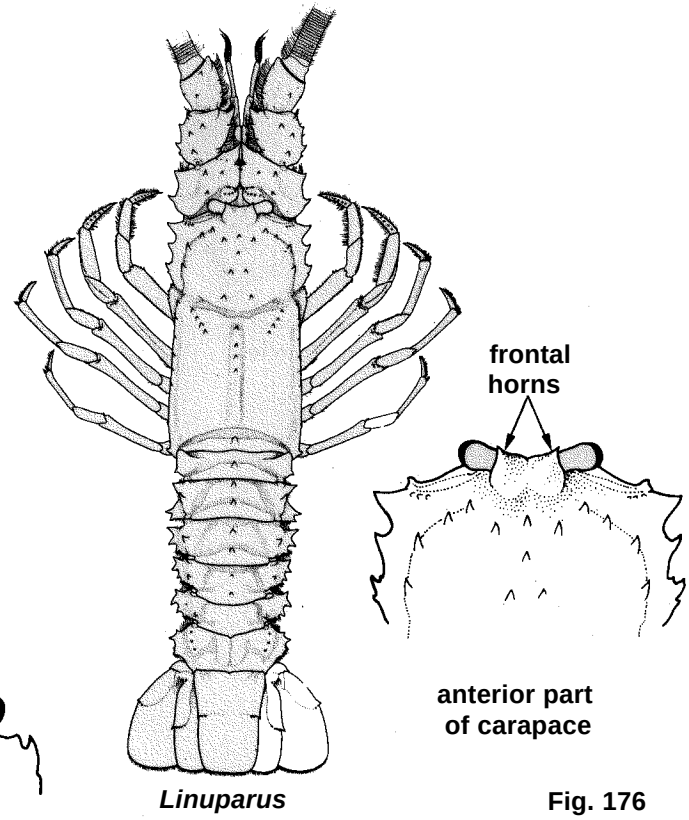


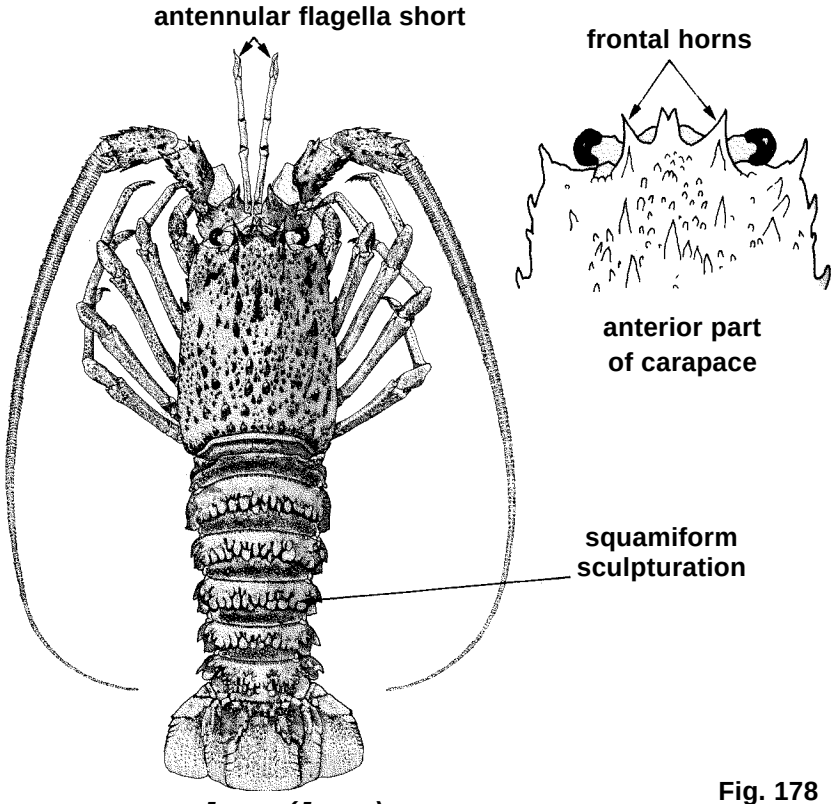
Fig. 176

4a. Abdominal segments usually with squamiform sculpturation before transverse groove; no distinct antennular plate between bases of antennae (Fig. 178) ..... ***Jasus* (*Jasus*)**

4b. Abdominal segments with a sometimes interrupted transverse groove, but without squamiform sculpturation; antennular plate between bases of antennae distinct or absent

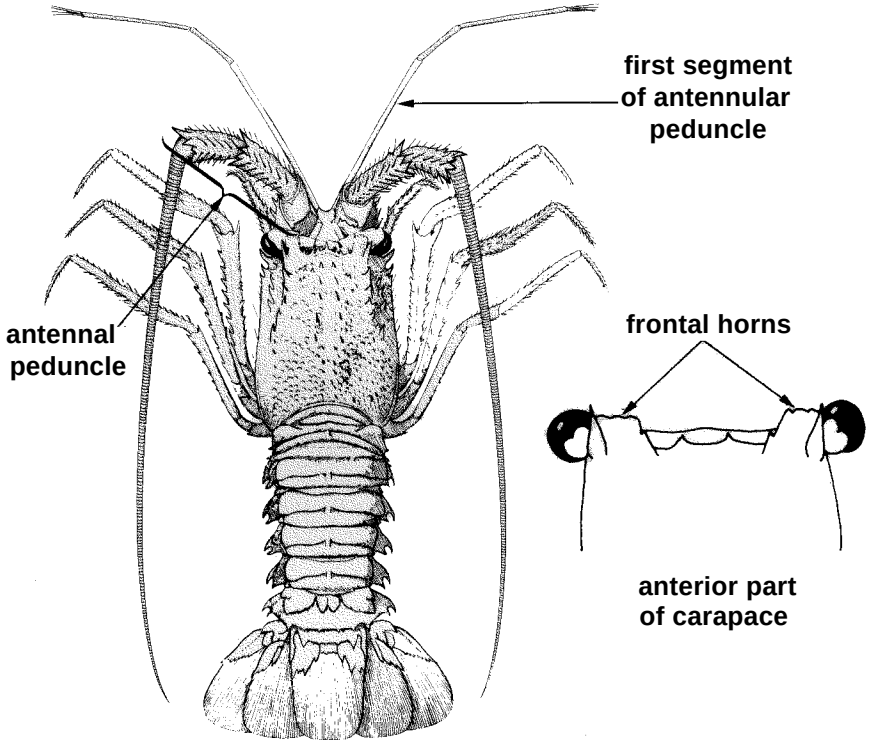
5a. Frontal horns truncated with anterior margin crenulate; first segment of antennular peduncle reaching beyond antennal peduncle (Fig. 179) ..... ***Palinustus***

5b. Frontal horns tapering to a sharp point; first segment of antennular peduncle not over-reaching antennal peduncle



Jasus (Jasus)

Fig. 178

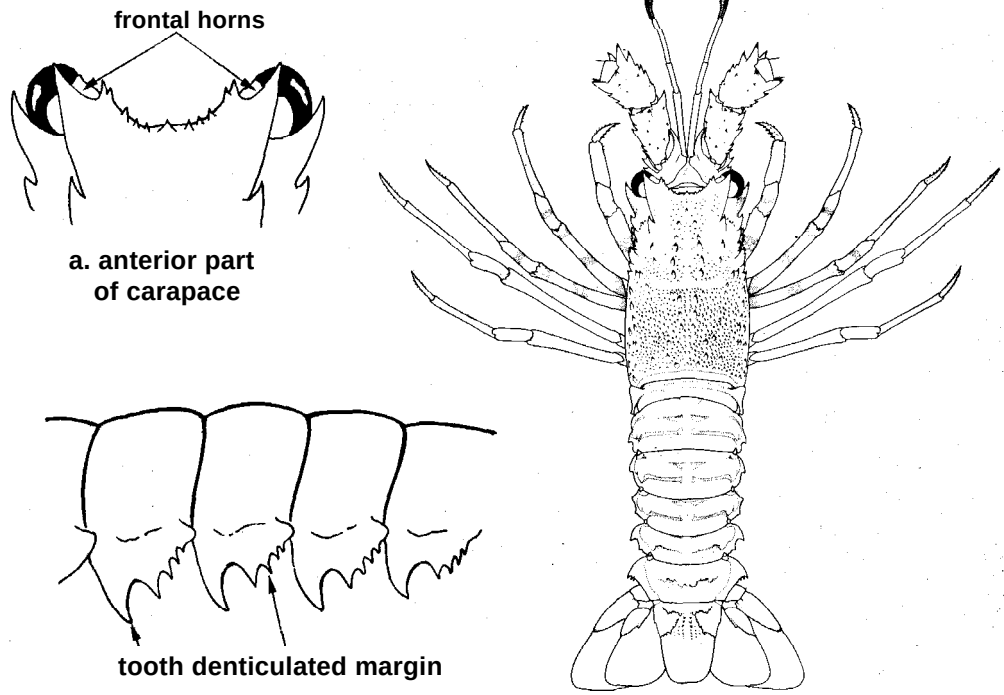


Palinustus

Fig. 179

6a. Anterior margin of carapace between frontal horns with about 10 small, sharp teeth (Fig. 180a); pleura of second to fifth abdominal somites with a strong anterior tooth followed by a lobe denticulated on the posterior margin (Fig. 180b) ..... ***Palinurus*** (Fig. 180c)

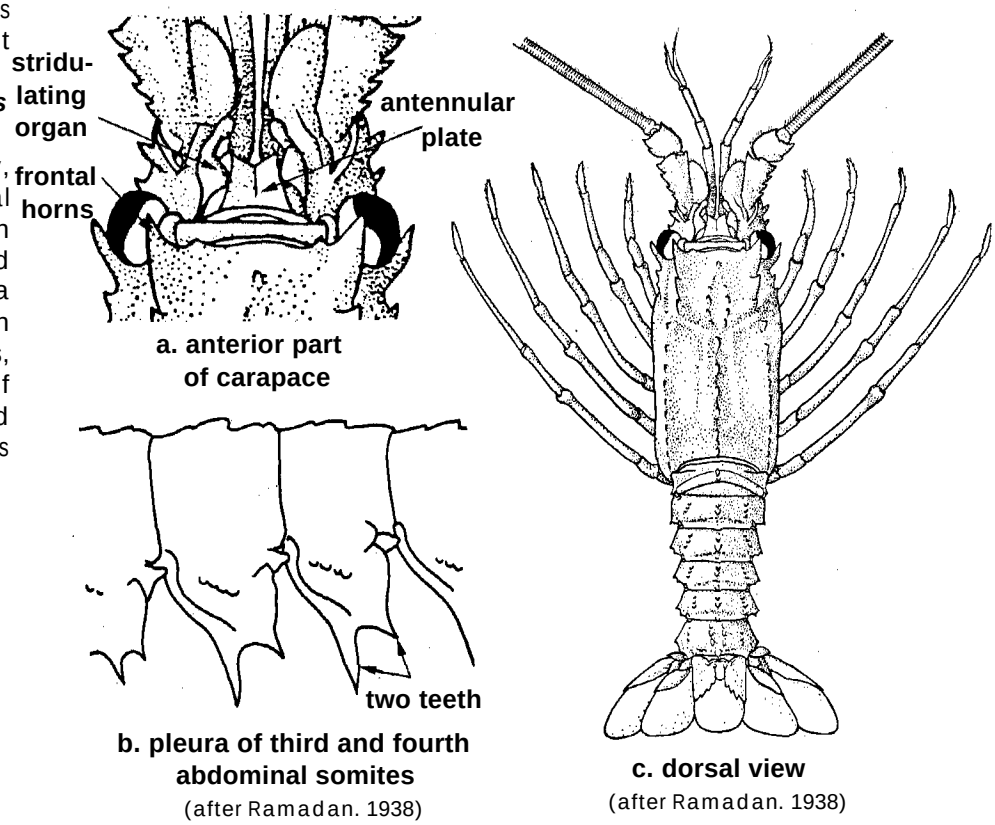
6b. Anterior margin of carapace unarmed between frontal horns, except for the presence, in some species, of a small triangular rostrum and a small denticle near the base of the frontal horns (Fig. 181a). Pleura of second to fifth abdominal somites ending in two simple, strong, sharp teeth without denticles (Fig. 181 b); only in ***Sagmariasus*** the second tooth is replaced by a denticulated lobe



Palinurus **Fig. 180**

7a Antennular plate distinct, a stridulating organ present (Fig. 181a). Carapace with a median ridge behind the cervical groove, often with spines or tubercles, but without submedian rows (Fig. 181 c) ..... ***Puerulus***

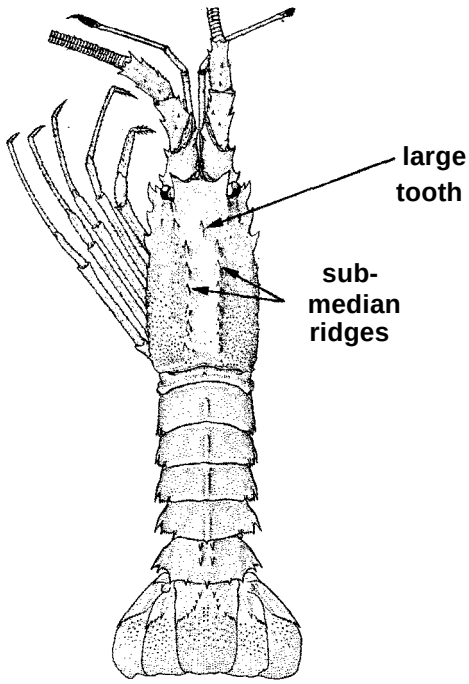
7b Antennular plate hardly, if at all, visible in dorsal view. Stridulating organ absent. Carapace behind cervical groove without a median ridge, but with two submedian ridges, each bearing a row of large, sharply, pointed teeth or numerous spinules (Fig. 182)



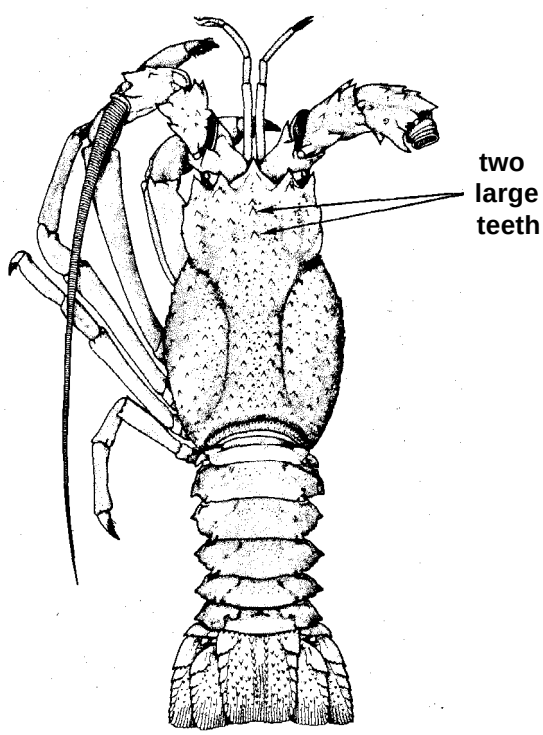
Puerulus **Fig. 181**

8a. A large single median tooth before the cervical groove. Apart from two submedian and two lateral longitudinal rows of spines the posterior half of the carapace is smooth and without spinules (Fig. 182). Abdominal pleura ending in two single sharp teeth (Fig. 181 b) **.....*Projasus***

8b. Two large median teeth before cervical groove. Posterior half of carapace closely set with numerous sharp spinules (Fig. 183). Abdominal pleura ending in a sharp anterior tooth and a broad, distinctly denticulate posterior lobe **..... *Jasus (Sagmariasus)***



Projasus **Fig. 182**
(trum Webber & Booth. 1988)



Jasus (Sagmariasus)
(from Kensler. 1967)
Fig. 183

click for next page

Jasus Parker, 1883

PALIN Jas

Jasus Parker, 1883, Nature, London, 29:190. Gender masculine. Name placed on the Official List of Generic Names in Zoology in Opinion 612 (published in 1961).

Type Species : by selection by Holthuis (1960; Bulletin Zoological Nomenclature, 17:193): ***Palinurus lalandii*** H. Milne Edwards, 1837.

Synonyms : ***Palinosytus*** Bate, 1888, Report Voyage Challenaer, Zool., 24:93. Type species, by selection by Holthuis (1960, Bulletin of Zoological Nomenclature, 17:193): ***Palinurus lalandii*** H. Milne Edwards, 1837. Gender masculine. Name placed on the Official Index of Rejected and Invalid Genus-Group Names in Zoology in Opinion 612 (published in 1961).

Palinostus Bate, 1888, Report Voyage Challenger, Zool., 24:56,76,85. An incorrect original spelling of ***Palinosytus*** Bate, 1888, and therefore unavailable. Name placed on the Official Index of Rejected and Invalid Genus-Group Names in Zoology in Opinion 612 (published in 1961).

The genus consists of seven species, all of which are of commercial interest, and live in restricted zones in the temperate area of the southern hemisphere.

The genus ***Jasus*** can be divided into two subgenera: the nominate subgenus, ***Jasus*** or "scalloped rock lobsters", includes all but one of the species, and is characterized by the scalloped sculpturation of the upper surface of the abdominal somites. The other subgenus is ***Sagmariasus*** nov. subgen. and includes as type and only species the Packhorse rock lobster, ***Jasus verreauxi*** (H. Milne Edwards). It is characterized by that the abdominal somites do not show any scalloped sculpturation.

Subgenus ***Jasus*** Parker, 1883

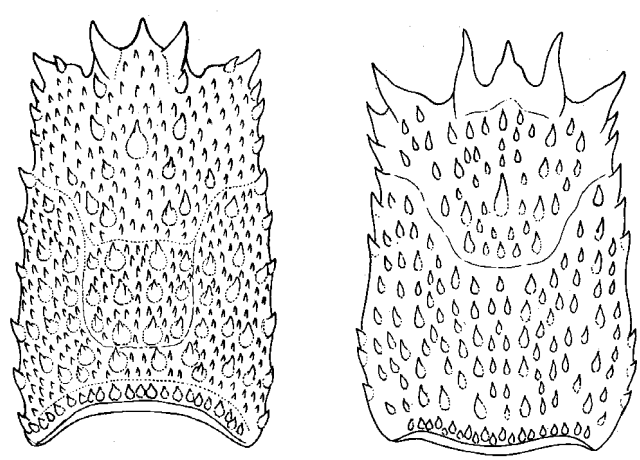
Six species are known in this subgenus.

Key to Species:

1a. Large spines of carapace broad and flattened, about as wide as long, and much larger than the small spines (Fig. 184a). Sculpturation of abdomen wide, with relatively few squamae, and with an extensive smooth area on the anterior part of each somite (Fig. 185a,b,c). Eastern Pacific, South Central Atlantic, Western Indian Ocean (exclusive of South Africa) **.....*"frontalis"*** subgroup

2a. First abdominal somite without any squamiform sculpturation. The following somites with only a single transverse row of large squamae before the transverse groove of the somite, sometimes with some very small squamae just before or just behind it Posterior half of the abdominal somites behind the transverse groove without squamiform structures (Fig. 185a) (Juan Fernandez Island) ..... ***J. frontalis*** (Fig. 189)

2b. First and following abdominal somites with a transverse row of squamiform sculpturation behind the transverse groove (Figs 185 b,c)



a. *"frontalis"* subgroup **b. *"lalandi"* subgroup**

carapace (dorsal view) **Fig. 184**

3a. Indian Ocean area (St. Paul and Amsterdam Islands, rarely at Ker-gueien). Frontal horns almost equilaterally triangular, shorter and broader than in ***J. tristani.*** Squamiform sculpturation of the abdomen with the squamae narrower and more numerous than in ***J. tristani*** (Fig. 185b)..... ***J. paulensis*** (Fig. 195)

3b South Atlantic Ocean area (Tristan da Cunha Archipelago, Gough Island, Vema Seamount). Frontal horns with the upper margin slightly more convex than the lower, more slender than in ***J. paulensis.*** Squamiform sculpturation of the abdomen coarser than in ***J. paulensis*** with the squamae fewer and wider (Fig. 185c). ..... ***J. tristani*** (Fig. 197)

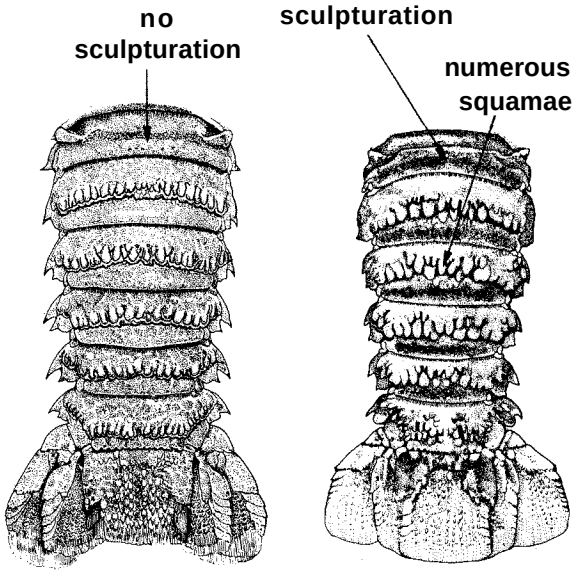
1b. The large spines of the carapace are narrow, often 3 or 4 times as long as wide and not very different from the small spines (Fig. 184b). The sculpturation of the abdomen is more dense, with relatively smaller squamae and a narrower smooth anterior area (Fig. 186a,b,c). South Africa, Australia, New Zealand ..... ***"lalandii"*** subgroup

Anterior half of first abdominal somite with a squamiform sculpturation both anteriorly and posteriorly of the transverse groove (Fig. 186a). South Africa ..... ***J. lalandii*** (Fig. 191)

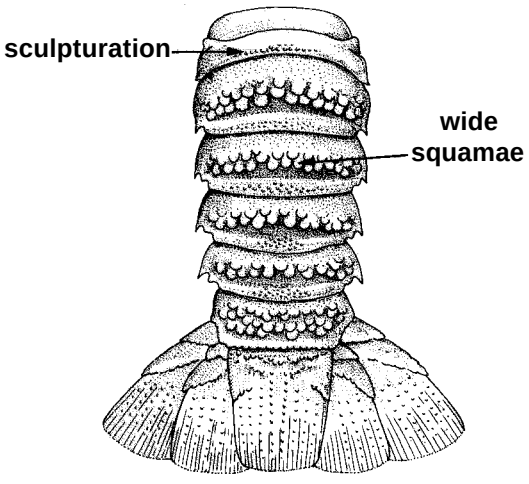
4b. Anterior half of first abdominal somite before the transverse groove entirely smooth, without sculpturation

5a. South and East Australia, Tasmania. The squamiform sculpturation on the posterior half of the second to fifth abdominal somites (behind the transverse groove) dense and covering the entire surface, the squamae arranged in 4 or 5 transverse rows (Fig. 186b) ..... ***J. novaehollandiae*** (Fig. 193)

5b New Zealand. The squamiform sculpturation on the posterior half of the second to fifth abdominal somites (i.e. the part behind the transverse groove) less dense, with larger squamae, which are arranged in 2 or 3 transverse rows (Fig. 186c) ..... ***J. edwardsii*** (Fig. 187)

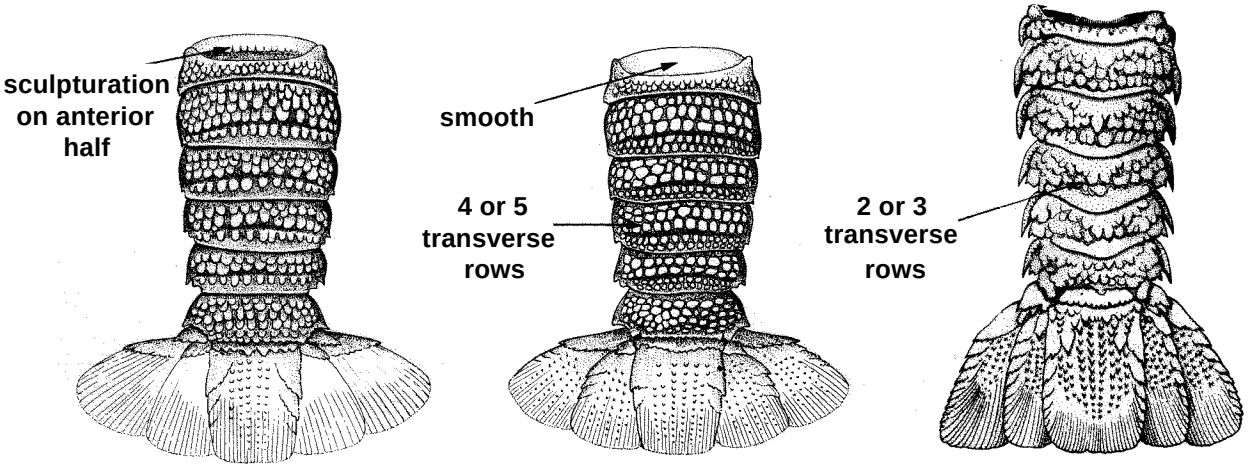


a. ***J. frontalis*** **b.** ***J. paulensis***



c. ***J. tristani***

abdomen (dorsal view) **Fig. 185**



a. ***J. lalandii*** **b.** ***J. novaehollandiae*** **c.** ***J. edwardsii***

abdomen (dorsal view) **Fig. 186**

Jasus (Jasus) edwardsii (Hutton, 1875)

PALIN Jas 2

Patinurus edwardsii Hutton, 1875, Transactions Proceedings New Zealand institute, 7:279.

Synonyms : No synonyms known. The species for a long time has incorrectly been synonymized with ***J. lalandii*** (H. Milne Edwards).

FAO Names : **En** - Red rock lobster.

Type : Type locality: "Otago Heads" near Dunedin, South Island, New Zealand. Syntypes supposedly in DMW, now lost, at least not located in 1988

Geographical Distribution : All coasts of New Zealand, from Three Kings Islands (north west of-the northern tip of North Island) south to the Auckland Islands, also found at the Chatham Islands; most common off the south west part of South Island, and the east coast south of East Cape (Fig. 188).

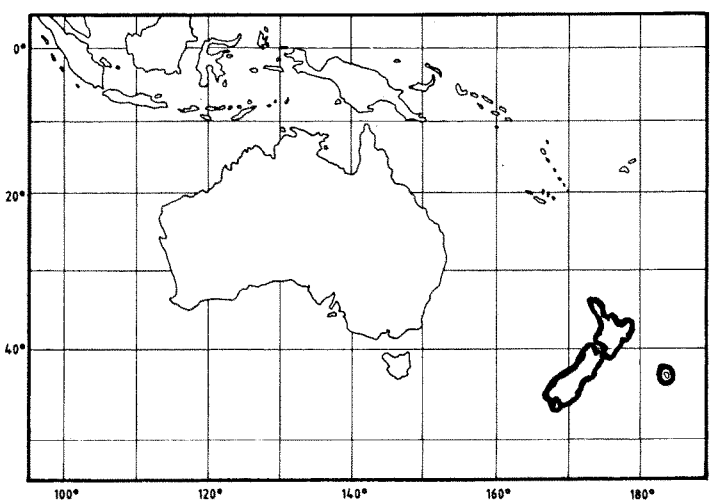
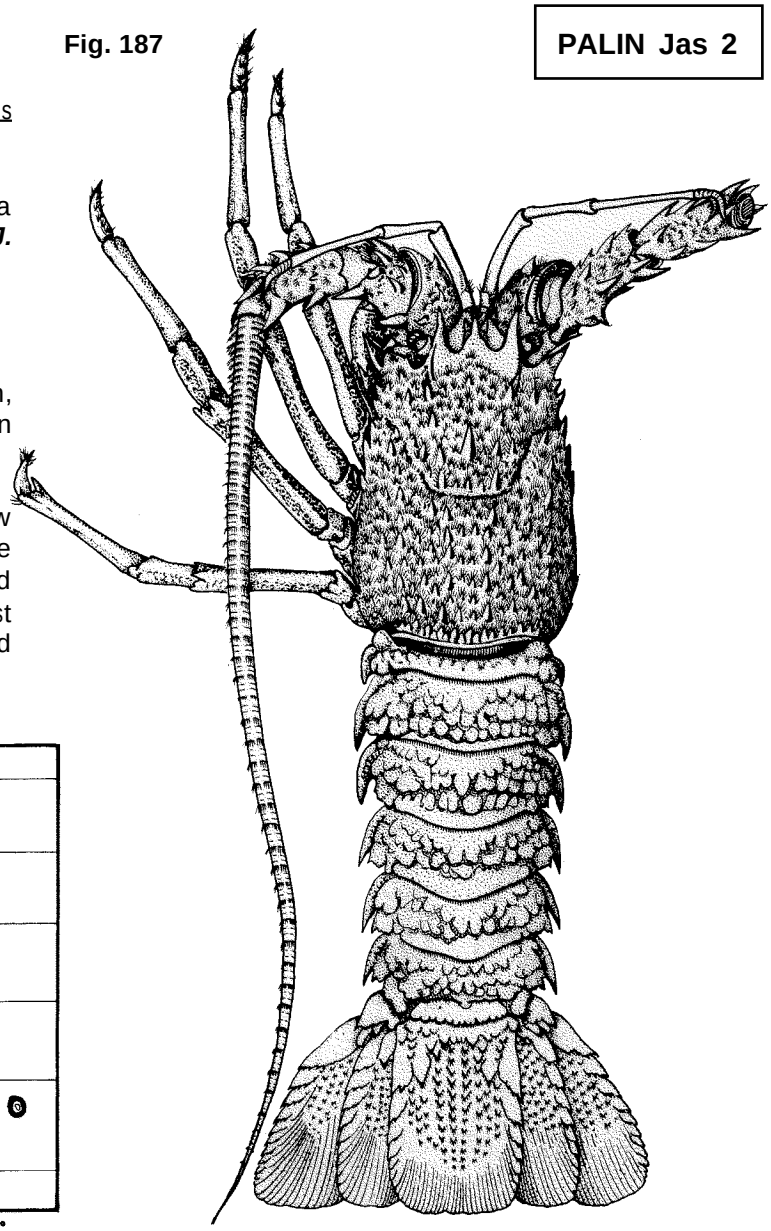


Fig. 188

Fig. 187



(from Kensler, 1967) **Fig. 187**

Habitat and Biology : The species lives in crevices of the rocky shores and among algae at depths between 5 and 200 m. Soft shelled specimen are occasionally caught in December and January.

Size : Maximum total body length is 58 cm (males), and 43 cm (females); maximum carapace lengths 23.5 cm (males), 18 cm (females); minimum legal carapace lengths 10 cm (males), and 9 cm (females).

Interest to Fisheries : The species is usually caught with baited lobster pots, sometimes obtained by trawling and by diving. Protective laws have been introduced, like size limits, prohibition of some gear, prohibition of taking ovigerous females or soft specimens, bag limits for sports fishermen, etc. The specimens are sold as frozen tails (mostly to the USA) and whole live specimens (mainly to Japan). According to FAO statistics, 5 000 tons were caught in 1987 and 1242 tons in 1988. According to Kensler (1969:516) this species sustains "New Zealand's main and most valuable export fishery". It represents 99% of the total lobster fishing in the area (the other 1% is formed by ***J. verreauxi***). In 1988 the species represented the fourth most valuable fishery of New Zealand, after the fishes Orange Roughy (***Hoplostethus atlanticus***), Hoki (***Macruronus novaezelandiae***), and squid (Booth, in litt.). Since 1965, the species is also commercially fished at the Chatham Islands. The Chatham fishery expanded rapidly since 1966 and in 1967 provided about 50% of the total New Zealand catch.

Local Names : NEW ZEALAND: Red crayfish, Red spiny lobster, Common crayfish, Marine spiny crayfish, Rock lobster, Southern crawfish, Spiny crayfish; Koura (Maori language).

Literature : Kensler, 1968:81-89; Kensler, 1969:506-517; Williams, 1986: 13, figs 26,78d-e.

Jasus (Jasus) frontalis (H. Milne Edwards, 1837)

PALIN Jas 3

Palinurus frontalis H. Milne Edwards, 1837, Histoire naturelle des Crustaces, 2:294.

Synonyms : **_Palinostus frontalis_ -** Bate, 1888. The species has often, incorrectly, been synonymized with ***J. lalandii.***

FAO Names : En - Juan Fernandez rock lobster; **Fr** - Langouste Juan Fernandez; **Sp** - Langosta de Juan Fernandez.

Type : Type locality: "Habite le Chili", now restricted to Juan Fernandez Archipelago, Chile. Type material in MP, no longer extant (not found in 1989).

Geographical Distribution : The range of the species is restricted to: (1) the waters around the Juan Fernandez Archipelago, 33º35'-33º49'S 78º45'-80º49'W: Isla Robinson Crusoe (= Isla Más a Tierra), Isla Marinero Selkirk (= Isla Alejandro Selkirk, = Isla Más Afuera) and Isla Santa Clara, and (2) the waters around the Islas Deswenturadas, 26º17'-26º22'S 79º50'-80º6'W: Isla San Felix and Isla San Ambrosio (Fig. 190).

Habitat and Biology : A species inhabiting a rocky and partly sandy environment at depths of 2 to 200 m. Water temperature between 13" and 19°C. Eggs spawned between August and November and carried for about 11 months. Although there is some migration to deeper waters from the end of September onwards, the species never disappears completely from the coast. In January, the migration back to shallow waters starts. The food consists of algae, smaller and larger molluscs and crustaceans, and dead animal matter of any kind. The species is predated by various fishes.

Size : Maximum body length 48 cm (males) and 46 cm (females), carapace length 22 cm (males) and 19 cm (females). Reports of total body lengths of 60-70 cm have to be considered with much reserve.

Interest to Fisheries : The early navigators who visited Juan Fernandez like Jacob Roggeveen in 1722 and George Anson in 1741 already mentioned that the lobsters were found there "in such abundance near the water's edge [of Isla Robinson Crusoe] that the boat-hooks often struck into them, in putting the boats to and from the shore" (Wafter, 1776: 125, 126), also their excellent quality as food was commented upon. Molina (1808: 144; English translation of Molina's original (1782) Italian edition) mentioned that "Lobsters. are also found in such quantities that the fishermen have no other trouble to take them, than to strew a little meat upon the shore, and when they come to devour this bait, as they do in immense numbers, to turn them on their backs with a stick. By this simple method many thousands are taken annually, and the 'tails which are in high estimation, dried and sent to Chili" Albert (1898:6) mentioned that the species was usually fished at depths between 7 and 14 m. Skottsberg (1956: 178), almost 50 years later, stated that "nowadays the best catch is made in depths from 40 to 80 meters". Evidently, the intensity of fishing drove the species to deeper water, and the easy method of picking them by hand was replaced by lobster pots.

Fig. 189

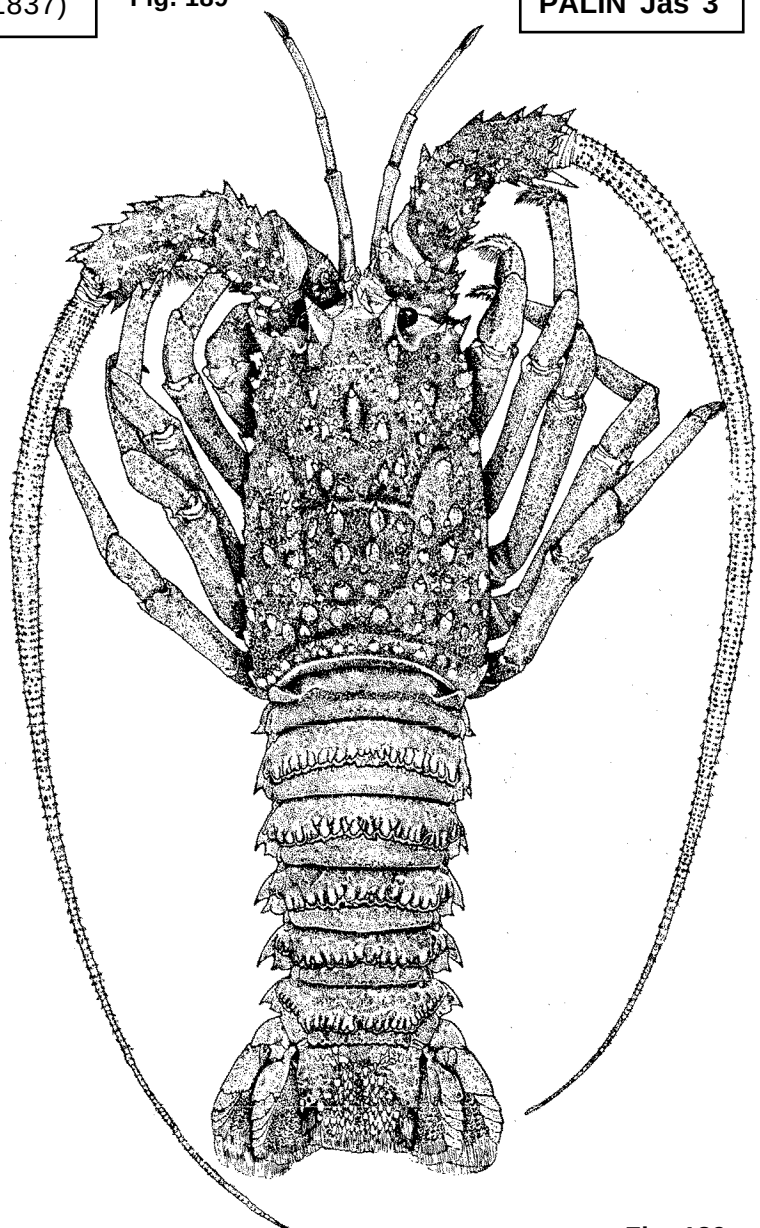


Fig. 189

(combined from Holthuis & Sivertsen, 1967 and Pizarro & Tiffon, 1974)

Fig. 190

By the end of the 19th century, canning lobster tails was tried without too much success; canned and live lobsters were then exported to Chile. In 1970, the main gear for catching the lobsters were lobster pots and they perhaps still are. Evidently, most lobsters are exported live to the mainland. According to FAO statistics, the annual catch of the species was 36 tons in 1987 and 29 tons in 1988. The fishery is of the greatest importance in the Archipelago and gives employment to a large part of the population. Experimental work on reproduction and development in captivity of this species is being conducted in Chile.

Protective measures are in force and well adhered to: (1) the minimum legal size is a carapace length of 11.5 cm, (2) ovigerous females have to be put back Into the sea, (3) the season is closed from 15 May to 30 September.

local Names : CHILE: Langosta de Juan Fernandez, Langosta de tiempo (for larger forms).

Literature : Holthuis & Sivertsen, 1967:25-32, pl. 5; Arana Espina et al., 1971-1973; Pitarro et al., 1974; Pavez Carrera et. al., 1974; Retamal, 1977:13-14, fig. 5; Williams, 1986:13, fig. 27.

Jasus (Jasus) lalandii (H. Milne Edwards, 1837)

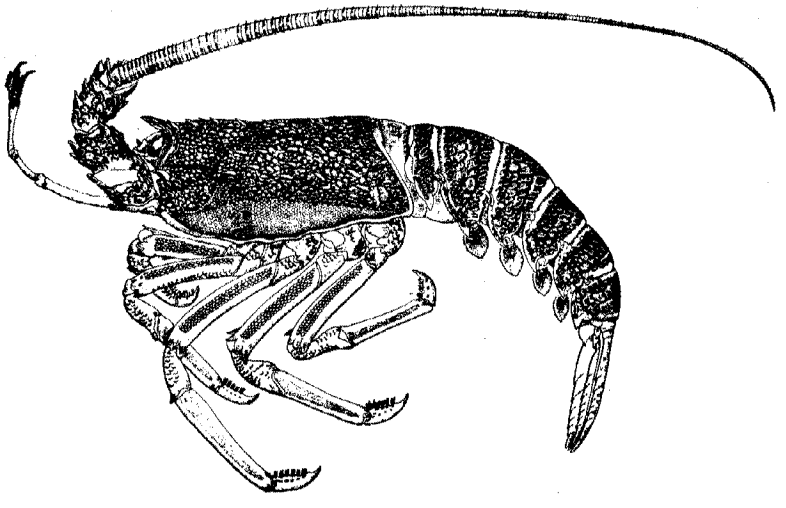
Fig. 191

PALIN Jas 4

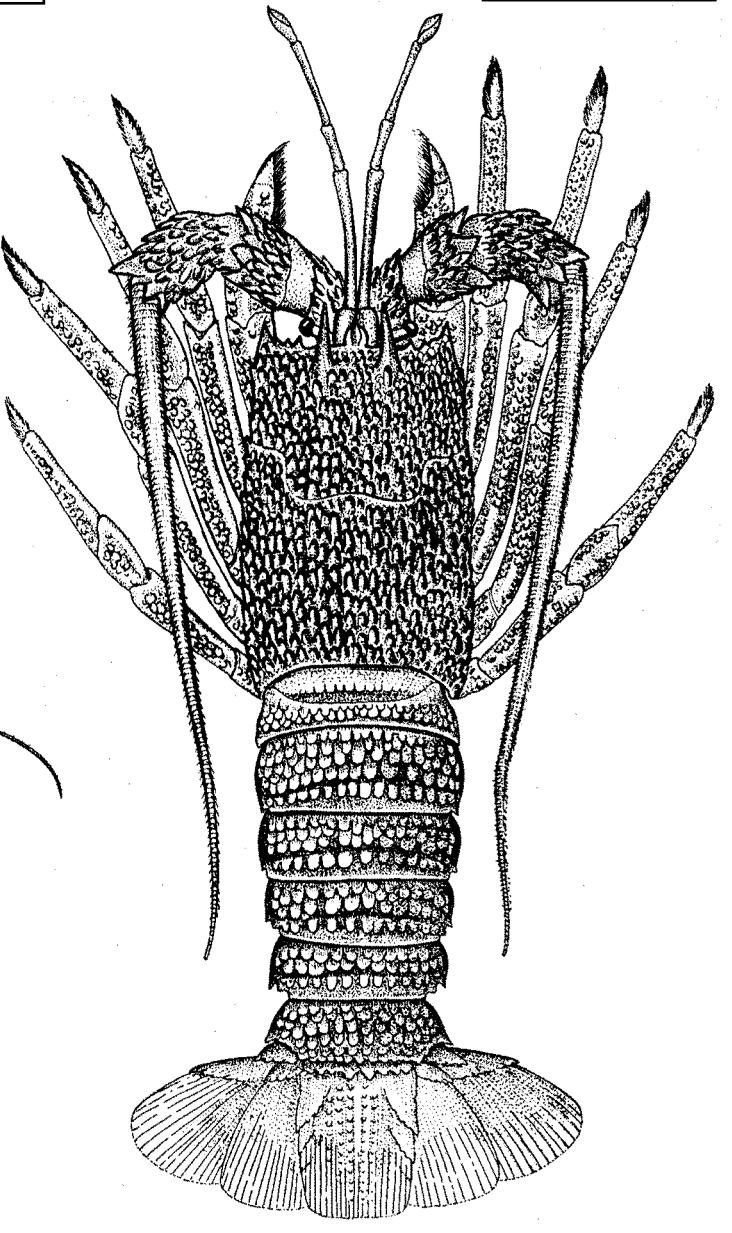
Palinurus lalandii H. Milne Edwards, 1837, Histoire naturelle des Crustacés, 2:293. Name placed on the Official List of Specific Names in Zoology in Opinion 612 (published in 1961).

Synonyms : ***Palinostus lalandii*** **-** Bate, 1888; ***Palinosytus lalandii*** - Stebbing, 1893. The question whether the specific name should be written ***lalandii*** or ***lalandei*** (named for Pierre de la Lande) has been definitely settled in favour of ***lalandii*** by the International Commission on Zoological Nomenclature in their Opinion 612. The specific name ***lalandii*** has, at times, been used for other species of the subgenus ***Jasus.***

FAO Names : **En -** Cape rock lobster; **Fr** - Langouste du Cap; **Sp -** Langosta del Cabo.



lateral view (from Paterson, 1968)



dorsal view **Fig. 181**

click for next page

Type : Type locality: “Habite les côtes du cap de Bonne-Espérance” (=Cape of Good Hope, South Africa). Type material in MP: 2 dry syntypes, the larger (410 mm) in good, the smaller (370 mm), in reasonable condition. The larger, no Pa. 437, chosen as the tectotype; the smaller, no. Pa.433, then becomes para-lectotype.

Geographical Distribution : Restricted to southern Africa from Cape Cross, South West Africa (Namibia) at 21º43’S 13º58’E; around the Cape of Good Hope to Algoa Bay, Cape Province at 33º50’S 25º50’E (Fig. 192).

Habitat and Biology : The species lives in coastal waters at depth between 0 and 46 m, on rocky bottoms, sometimes with patches of sand and mud. The males moult between September and December. In the females, moulting occurs in April or May, after which copulation takes place. Ovigerous females are found from May to October.

Size : Maximum total body length 46 cm, carapace length 18 cm.

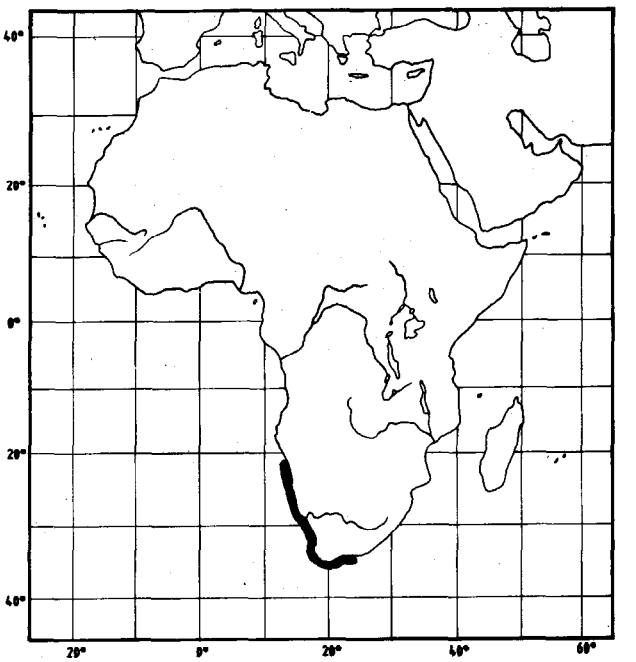


Fig. 192

Interest to Fisheries : The fishery for ***Jasus lalandii*** is of great importance throughout its range. According to FAO statistics, the catches amounted to 6 689 tons in 1987 and 6 820 tons in 1988. The fishery is carried out with lobster pots and hoop nets. The catch is sold fresh or cooked in local markets. Tails are exported frozen in the shell, or peeled and canned.Experimental work on culture techniques for this species are underway in South Africa.

Protective measures for the species include a size limit (carapace length 8.5 cm), a closed season from 1 July to 31 October, bag limits for sportsfishermen (2 specimens per day), and the prohibition of taking ovigerous females or soft-shelled specimens.

Local Names : FRANCE: Langouste du Cap; GERMANY: Kaplanguste, Afrikanische Languste, Rote languste; SOUTH AFRICA: Cape crawfish, Cape crayfish, Cape spiny crayfish, Cape rocklobster, Cape spiny lobster (English); Kaapse kreef, Kreef (Suidafrikaans); UK: South African rock lobster, Cape spiny lobster.

Literature : Barnard, 1950:538-540, fig. 101a b; Williams, 1986:12, figs 24, 78a-b.

Jasus (Jasus) novaehollandiae Holthuis, 1963

Fig. 193

PALIN Jas 5

Jasus novaehollandiae Holthuis, 1963, Proceedings Koninkliike Nederlandse Akademie Wetenschappen, (C)66:56.

Synonyms : In the literature prior to 1963 the species was usually indicated as ***Jasus lalandii,*** as it was not distinguished from the Cape rock lobster.

FAO Names : **En** - Southern rock lobster;

Type : Type locality: “Off the coast of New South Wales near Maroubra, Sydney”, east coast of Australia. Holotype male in RMNH, no. D10642; paratypes in AM.

Geographical Distribution : Australia: from Cape Naturaliste, Western Australia (at about 33ºS; with a few records as far north as Dongara at 29º15'S), along the entire coast of South Australia, Tasmania and Victoria to southern New South Wales (with a few records as far north as Sydney (33º53'S) and Port Stephens (at 32º42'5) (Fig. 194).

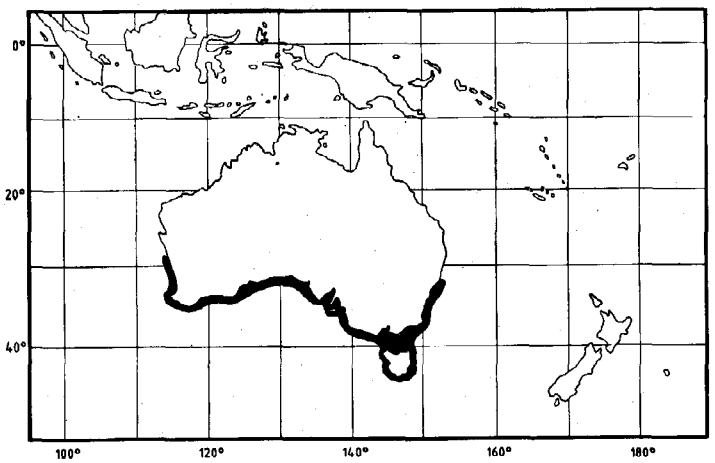
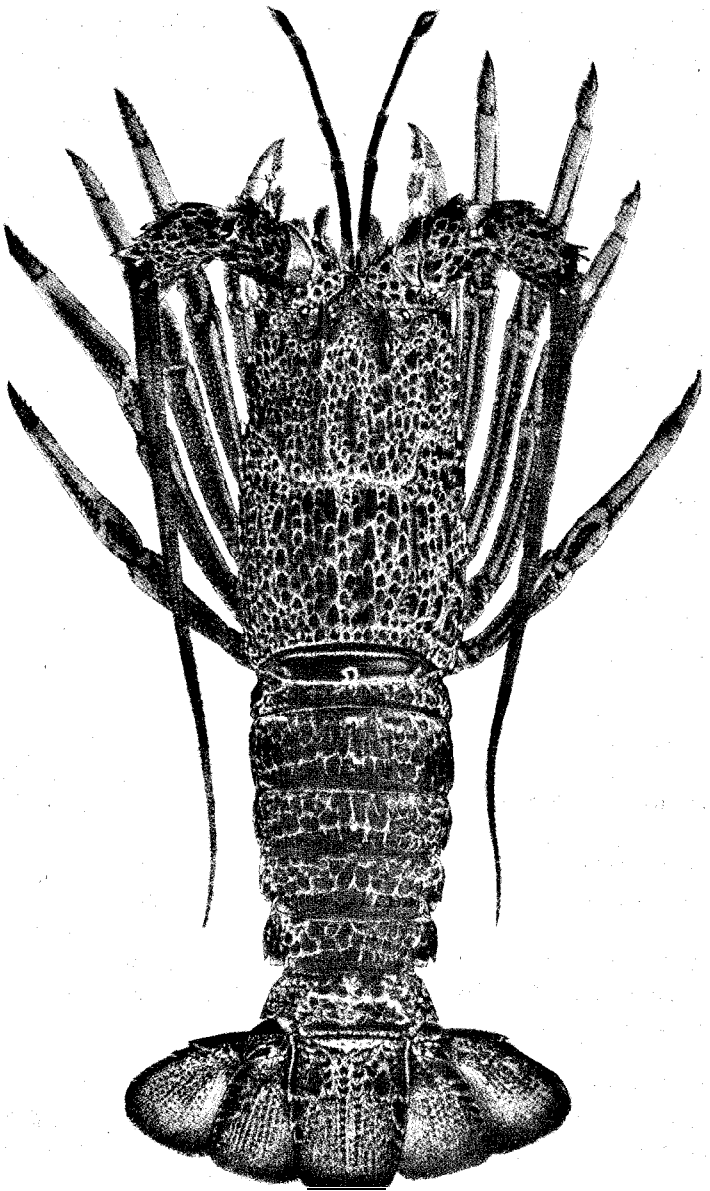


Fig. 194



(from McCoy, 1887) **Fig. 193**

Habitat and Biology : Depths range from 0 to 90 m (seldom 150 m); on a rocky substrate, especially on rocky onshore and offshore reefs with sufficient hiding places. Mating and egg-laying occurs from May to July after the moult of the female; hatching between July and December or even later. The pueruli settle between May and September. The species is gregarious and nocturnal. It is carnivorous and feeds on small crustaceans, molluscs and echinoderms.

Size : Maximum total body length about 51 cm, maximum carapace length about 20 cm. Ovigerous females about 5 to 16 cm carapace length.

interest to Fisheries : The species is fished for throughout its range. Before 1916, about 90% of the animals were caught in depths less than 20 m, while in 1925 fishing was carried out in depths of 65 m. Around 1966 the annual catch of the species was about 5 500 tons.Recent FAO statistics do not mention the species and it is likely that its catches have been mistakenly added to those of ***Jasus werreauxi*** (q.v.). Fished mostly with baited traps (lobster pots, beehive pots, or cray pots) and hoop nets. The animals are marketed fresh on local markets, cooked whole or as tails on markets farther away, and exported as frozen tails. mainly to the USA

Local Names : AUSTRALIA: Southern rock lobster (official Australian name), Cray, Red lobster, Southern crawfish, Southern (marine) crayfish, Southern spiny lobster, Tasmanian crayfish, Tasmanian lobster, Melbourne crayfish (name given to the species by the fishmongers; see McCloy, 1887:142).

Literature : McCoy, 1887:(15)189-93, pls 149, 150 (as ***Palinurus lalandi***); Hale, 1927:65-70, figs 62-7; Williams, 1986:13, figs 25,78c

Jasus (Jasus) paulensis (Heller, 1862) **Fig. 195** **PALIN Jas 1**

Palinurus paulensis Heller, 1862, Verhandlungen zoologisch-botanischen Gesellschaft Wien, 12:525.

Synonyms : The species has often been synonymized with ***Jasus lalandii***, and reported upon under that name (or as ***Palinurus lalandii***).

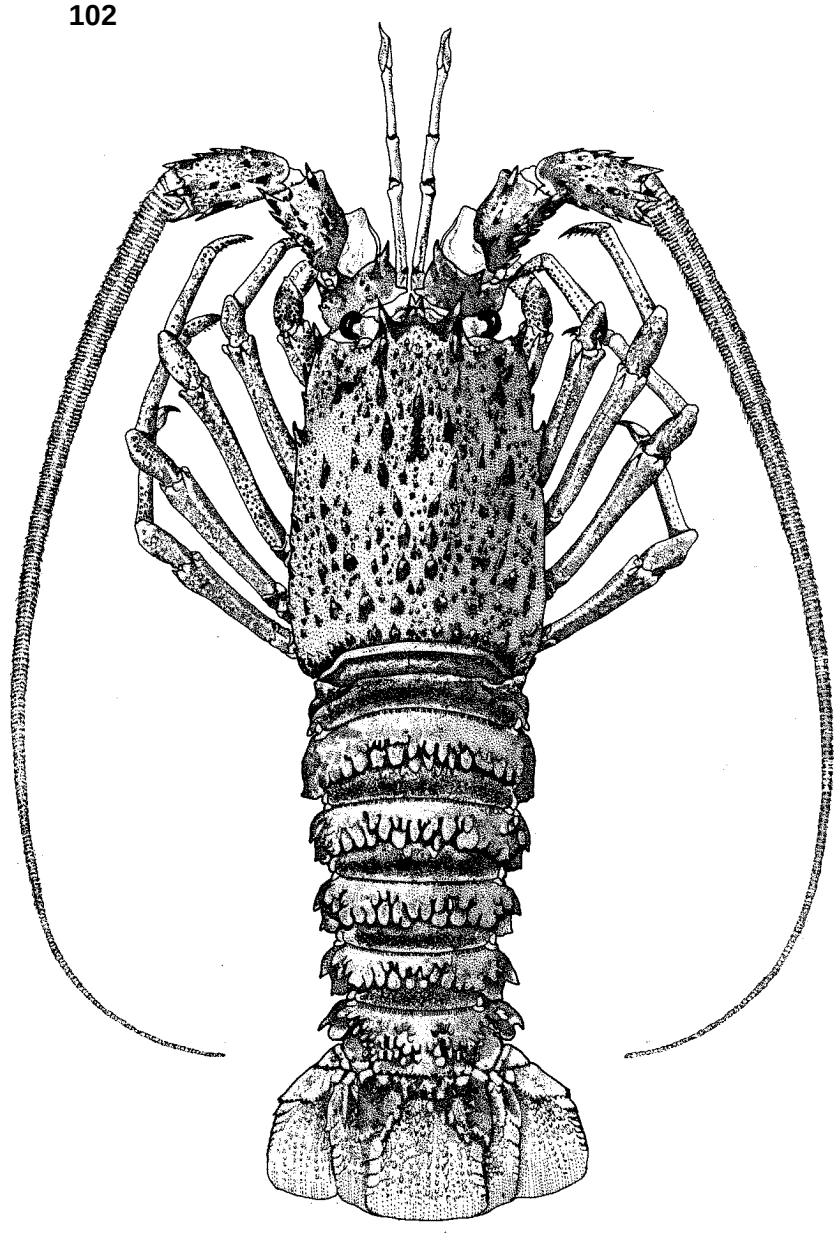
FAO Names : En - St.Paul rock lobster; **Fr -** Langouste de St. Paul; **Sp -** Langosta d'e St. Paul

Type : Type locality: "St. Paul", [=St Paul Island in the southern part of the Western Indian Ocean, at 38º44'S 77º30'E]. Syntypes in NMW.

Geographical Distribution : The species is restricted to St. Paul and Amsterdam Islands in the southern Indian Ocean (Fig. 196). A report of the catch of a single lobster in Kerguelen Islands by Aubert de la Rue (1954: 119) seems very reliable and is well documented (the specimen was brought up with algae entangled in the anchor of the ship "Lozere", a catch witnessed by A. Berland); but this evidently is a freak occurrence, as no lobster catches have been reported from the Kerguelen either before or after this event.

Habitat and Biology : The species lives at depths between 0 and 60 m, on rocky or gravel bottom, being most numerous in the kelp zone between 10 and 35 m. Egg-laying starts in May, and ovigerous females have been observed until November, or exceptionally early December. Females are caught from May to October, while males dominate in most catches from November to April The animals are nocturnal and feed on plants and (dead) animal matter.

Size : The largest specimen ever recorded had a total body length of 37 cm. Males have been reported to attain total body lengths of 14 to 34 cm (carapace length 6 to 13 cm), and females, total body lengths of 9 to 24 cm (carapace lengths 4 to 9 cm). The average sizes are 21 to 28 cm (males), 19 to 21 cm (females). The specimens from Amsterdam Island on the average are slightly smaller than those from St. Paul Island.



(after Holthuis & Sivertsen, 1967) **Fig. 195**

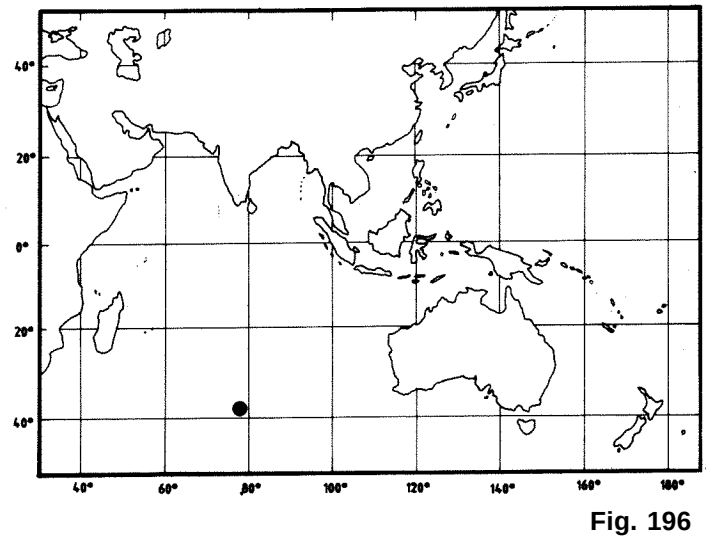


Fig. 196

Interest to Fisheries : The fishing grounds are restricted to the islands of St. Paul and Amsterdam, the shorelines of which are respectively 12 and 27 km long, and the area in which the species can be fished is less than 1 km wide. Early visitors of the then uninhabited islands caught the lobsters by hand in very shallow water. In the crater lake of St. Paul, which is a bay opening to the sea, the lobsters could be brought to the hot springs in the crater bottom without taking them out of the water, and cooked there. In 1928, a rather large fishing enterprise was started with lobster pots. The settlement on St. Paul consisted of a canning factory and the houses for the fishermen and employees of the factory, about 120 people in all. In 1931, the project was abandoned because of health conditions (a beri-beri epidemic). Later attempts (1938-l 939, 1948- 1949, 1949-l 950) with factory ships were also unsuccessful. In 1950, a new French factory ship, the SAPMER, equipped with deep-freeze installations, operated near the islands. The lobsters were headed, washed and frozen on board. Six "campagnes" were carried out between 1950 and 1956, each providing between 214 and 255 tons of lobster tails (the equivalent of 5 000 tons of whole lobsters). Fear for overfishing made that several protective measures have been suggested.

Local Names : FRANCE: Langouste australe; USA: St.Paul spiny lobster.

Literature : Grua, 1960:15-40, figs 1-4; Grua, 1963:1-35, figs l-2, 1-14; Holthuis & Sivertsen, 1967:18-25, pl. 4; Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:14, fig. 29.

Jasus (Jasus) tristani Holthuis, 1963

Fig. 197

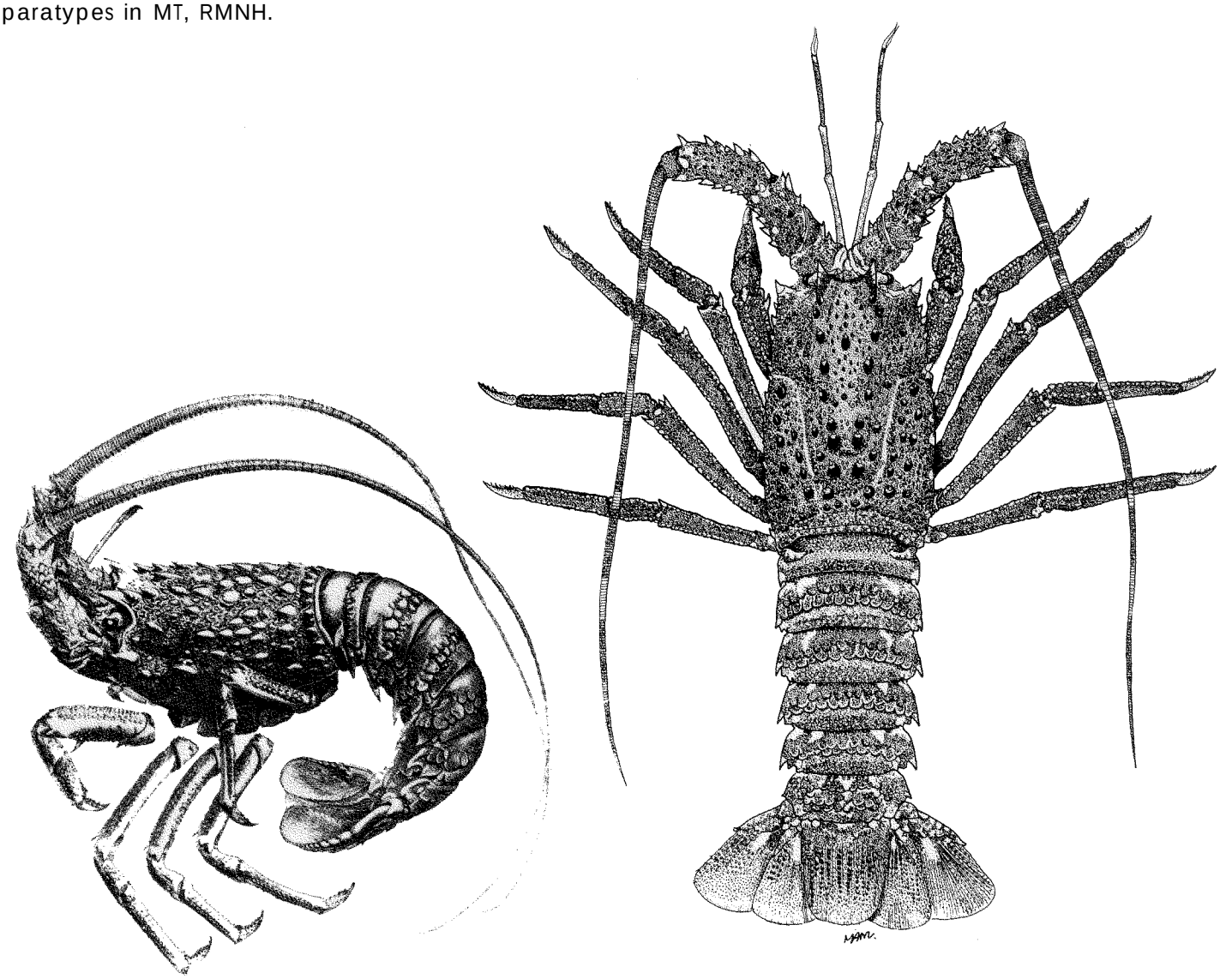
PALIN Jas 6

Jasus tristani Holthuis, 1963, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C)66:57.

Synonyms : In older literature the species is sometimes referred to as ***Jasus*** (or ***Palinostus***, or ***Palinosytus) lalandii.***

FAO Names : En - Tristan rock lobster; **Fr -** Langouste de Tristan; **Sp -** Langosta de Tristan.

Type : Type locality:"Tristan da Cunha", in net off beach. Male holotype in MT; paratypes in MT, RMNH.



dorsolateral view

(after Bate. 1888)

dorsal view

(after Holthuis & Sivertsen. 1967)

Fig. 197

click for next page

Geographical Distribution : Southern Atlantic Ocean. On the shelf of the islands of the Tristan da Cunha group (viz., Tristan da Cunha, Inaccessible Island, Nightingale Island, and Gough Island), as well as on Vema Sea Mount, 1 680 km ENE of Tristan da Cunha (Fig. 198).

Habitat and Biology : Depth range from 0 to 200 m; the greatest concentration of animals occurs between 20 and 40 m. The species is found on rocky bottoms, sometimes with gravel or shells, in the kelp zone. Ovigerous females were taken in September.

Size : Maximum total body length, 355 cm (males), and 27 cm (females); maximum carapace length, 14.5 cm (males) and 10 cm (females). Average carapace length, 8 to 9 cm. Pueruli are 2 to 3 cm in length.

Interest to Fisheries : Until about 1950, the fishery of the species was oriented, almost exclusively towards local consumption. But in 1949, a Tristan da Cunha Exploration (later: Development) Company was founded and the lobster fishery was developed on a commercial basis; a cold storage and a canning plant were built, and one fishing vessel was operated.

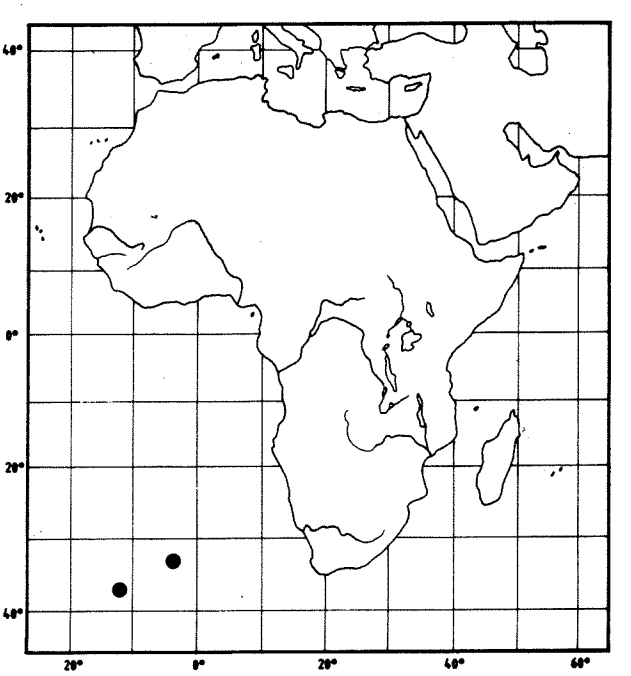


Fig. 198

Diesel-powered dinghies were used to bring the catch to the mother vessel for.cold storage and subsequent delivery to the factory. The volcanic eruption of 1961 destroyed the shore installations and the company, which had not been very successful anyhow, was liquidated in 1962. In 1963, a new fishing company, the South Atlantic Islands Development Corporation, started operations after the islanders had returned to Tristan da Cunha. A harbour was built and in 1966 a new factory was established. Two fishing vessels with refrigeration facilities on board, worked with a number of dinghies, and resumed fishing operations in 1963. Later the larger fishing vessels were modernized, and the fleet was enlarged in 1971 to 4 vessels with facilities on board for heading the lobsters and freezing the tails. The number of vessels was again reduced in 1978, when there were again two. They were based in Cape Town and operated near the Inaccessible, Nightingale and Cough Islands. They used dinghies and later motorboats to put out and retrieve the nets and traps. From Tristan da Cunha Island, the dinghies and motorboats worked from the shore, the catch being processed in the factory there.

The gear used in the early days was a piece of bait on a long string and weighted with a stone. The bait was lowered into the sea and after a few minutes hoisted to the surface. The lobsters clinging to the bait (often like "a bunch of grapes") were then taken. Later, the dinghies and motorboats used hoop-nets and since 1967, metal traps on long lines. The inclement weather conditions allow only about 70 fishing days a year.

The yield in 1960-1961 was 52.5 tons of tails. Pollock (1981:49) estimated total annual yield at 500-800 tons. FAO statistics give the annual catch for 1987 as 405 tons, and for 1988 as 441 tons.

Local Names : TRISTAN DA CUNHA (UK): Crawfish, Tristan crawfish, Tristan da Cunha crayfish, Tristan da Cunha Spiny

Literature : Holthuis & Sivertsen, 1967:7 18, text-figs 1,2, pls. 1-3; Roscoe, 1979:1-47, figs 1-3; Pollock, 1981:49-66, figs 1-11; Williams, 1986: 14, fig. 28.

Subgenus ***Sagmariasus*** nov.

Type species : ***Palinurus verreauxi*** H. Milne Edwards, 1851. Gender masculine.

This new subgenus of the genus ***Jasus*** differs from the nominotypical subgenus by the absence of any sculpturation on the abdomen: the characteristic scalloped pattern found in all species of ***Jasus*** s.s. is completely lacking here. Furthermore, the rostrum of ***Sagmariasus*** is as large and strong as the frontal horns and is of the same shape, forming with the frontal horns a tridentate plate. In ***Jasus*** s.s. the rostrum is a small spine, much smaller than the frontal horns and placed on a much lower level. In ***Sagmariasus*** the antennulae are much less slender than in ***Jasus*** s.s.

The new subgenus includes a single species, ***Jasus (Sagmariasus) verreauxi*** (H. Milne Edwards, 1851), which is its type.

Derivatio nominis: the greek word Sagmarion, meaning packhorse, is combined here with Jasus. The name alludes to the vernacular name "Packhorse crayfish" given in New Zealand to large specimens of the type species. The derivation of the generic name ***Jasus*** has not been given by its author, but it may refer to Iasus, the latin name of a locality in Asia Minor west of the town of Milas in south west Turkey (37º19'N 27º48'E).

Jasus (Sagmariasus) verreauxi (H. Milne Edwards, 1851) **Fig. 199** **PALIN Jas 7**

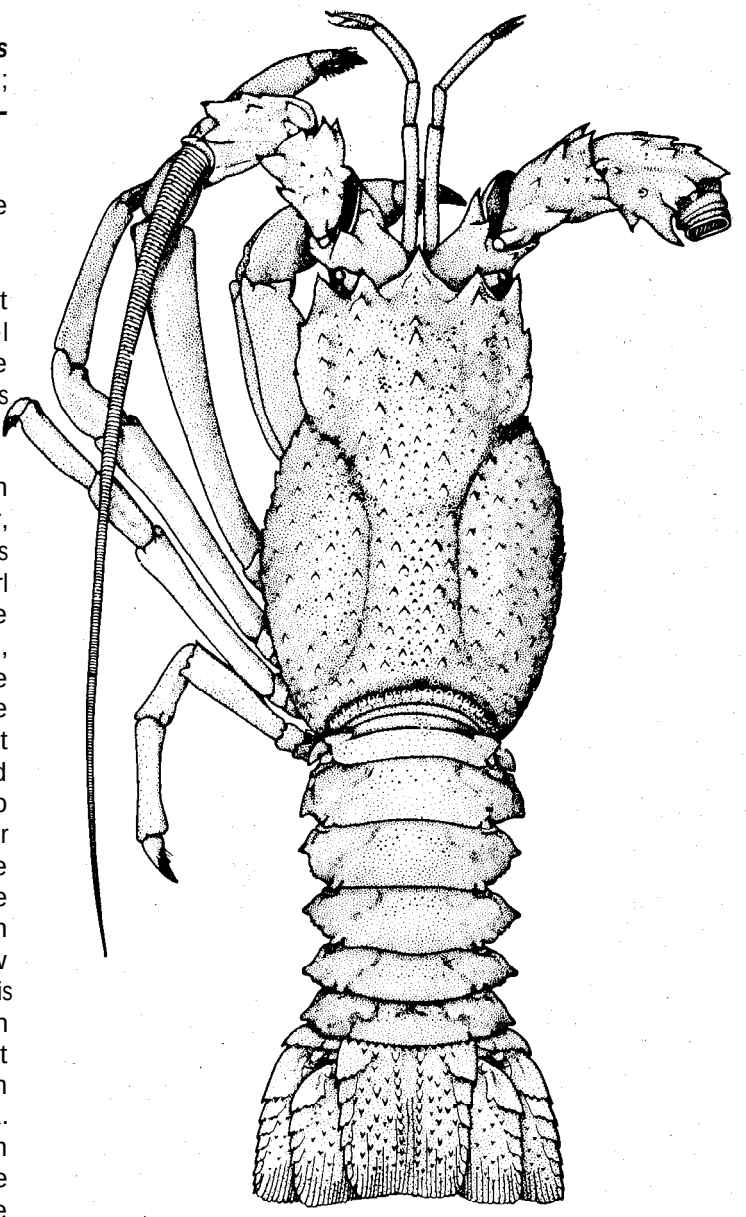
Palinurus verreauxi H. Milne Edwards, 1851, Annales Sciences Naturelles, Paris, Zool., (3)16:255, 290, pl. 8 fig. 15.

Synonyms : ***Palinurus huegelii*** Heller, 1862; ***Palinurus*** tumidus Kirk, 1880; ***Palinurus giganteus*** Kirk, 1880; ***Jasus huegelii*** - Ortmann, 1891; ***Palinosytus huegelii -*** Stebbing, 1893:

FAO Names : En - Green rock lobster; **Fr -** Langouste d'Océanie; **Sp -** Langosta de Oceania.

Type : Type locality of ***Palinurus verreauxi:*** not mentioned in the original description but Gruvel (1911: 15) made clear that H. Milne Edwards' type material came from New South Wales, Australia and is in MP, evidently no longer extant (not located in 1989).

The type locality of ***Palinurus huegelii:*** "wurde von Baron Hügel im indischen Ocean gesammelt" (Heller, 1862:393). This information is obviously erroneous as the species does not occur in the Indian Ocean. Karl Alexander Anselm Freiherr von Hügel, baron of the German Empire (born in Regensburg (= Ratisbon), Bavaria, 25 April 1795, died in Brussels, Belgium, 2 June 1870) spent most of his youth in Austria and was in the service of the Austrian government until his retirement in 1867. Being much interested in horticulture and natural history, he travelled between 1830 and 1836 to England, France and India. He left India in September 1833 and then visited the Philippines, Malaysia, the Netherlands East Indies, the South Pacific but also "the Swan river, King George's Sound, and Sydney in Australia; Van Diemen's Land [=Tasmania], New Zealand, Norfolk Island" (A. von Hügel, 1903:73). His visits to New Zealand and Australia took place between September 1833 and 6 October 1834, at the last mentioned date he left Sydney for the Philippines, from where he returned home via China, Malaysia and India. The type of ***Palinurus huegelii*** can originate either from the Sydney area or from New Zealand, as those are the two only localities visited by Von Hügel, where the species occurs. The type material, probably a holotype, is in NMW.



(from Kensler, 1967) **Fig. 199**

Type locality of ***Palinurus tumidus*** (and ***P. giganteus***):"Whaingaroa, a small harbour on the West Coast of the North Island", New Zealand (Kirk, 1880:313), collected in 1877 by J. Buchanan. Holotype male, dry in DMW, no. 5700.

Geographical Distribution : New Zealand (all around North Island, but most common on the north coast; rare in South Island waters, with a few records from the west, north and north east coast and one from the south point), Kermadec Islands (rare, Chilton (1911:549) reported on 2 specimens from Sunday (= Raoul) and Denham Islands, but no records have been published from the Archipelago since), Chatham Islands (Michael & Booth, 1985:18). Australia (from southern Queensland to Victoria; a few records from Tasmania) (Fig. 200).

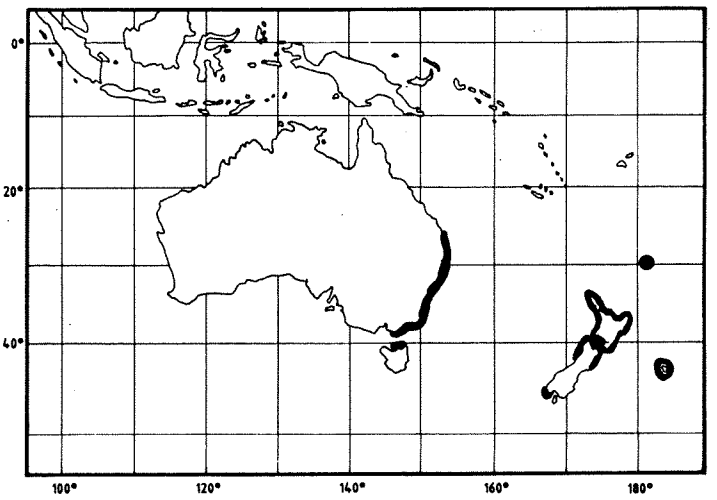


Fig. 200

Habitat and Biology : The species usually occurs in depths between 0 and 155 m, but very few data on depth are published. Booth (1986:2212) indicated that specimens with a tail length of less than 21.6 cm occur at depths between 20 and 130 m, and that the main fishery takes place between 50 and150 m. The substrate is said to be usually sand, gravel, or rocks. Smaller specimens seem to be more frequent on a rocky bottom. Females are ovigerous from late September to January.

Size : The maximum total body length is 60 cm (carapace length about 25 cm). Ovigerous females with a total body length of 38 to 56 cm have been reported (carapace lengths 16 to 24 cm). This species, probably together with ***Homarus americanus,*** is the largest known decapod as far as body length is concerned (see Kaestner, 1970:274).

Interest to Fisheries : The species is fished in the northern part of its range both in New Zealand and Australia. Eighty percent of the New Zealand catches are taken on the north coast of North Island between Cape Maria van Diemen and North Cape; the rest of the catches come mainly from the north coast between North Cape and Cape Runaway (Kensler, 1967:419). Booth (1986:2213) reported that "the species is caught most commonly along the north and east coasts of North Island north of Cape Turnagain [= 40º29'S]. In Australia, the fishery for this species also is concentrated in the northern part of its range, namely north and south of Sydney (Port Stephens, 32º42'S, to Bateman's Bay, 35º45'S). Ogilby (1893:201) remarked that "so abundant is this Crayfish, and with proper legislative precautions, so apparently inexhaustible the supply, that at but little expense a great and profitable canning industry might with ease be established". Gruvel (1911:16) described the fishery for this species near Sydney, carried out with motor boats with a crew of 2 to 4 men, putting out lobster pots and trammel nets among the rocks in coastal waters. Dakin, Bennett & Pope (1969:183) mention that in New South Wales the species is mostly taken with lobster pots, but that it also "constantly falls a prey to the wiles of the spear-gun fisherman",while "we have seen an expert catch over a dozen with his hands in an hour or two while wading amongst the weed along the edge of a rock platform at low water". The same authors also mention that the animals are preferably shipped alive to the markets, since by freezing and cooking much of the taste is lost. Kensler & Skrzynski (1970:46-54) observed that in New Zealand lobster pots are used most, but that lobsters are also obtained by trawling and with Danish seines. As to protective measures, in New Zealand the size limit is 21.6 cm tail length,or carapace length 16.3 cm (males) and 15.5. cm (females), while also the catch of ovigerous females is prohibited.

As far as the commercial importance of ***Jasus verreauxi*** in New Zealand is concerned, this is dwarfed when compared to that of ***J. edwardsii;*** its annual catch being less than 1% of that of ***J. edwardsii*** (see Kensler & Skrzynski, 1970:46). Between 1962 and 1966 these annual catches of ***J. verreauxi*** in New Zealand varied between 23 and 66 tons, with an average of 36 tons. The FAO Yearbook of Fishery Statistics gives the following landings (in metric tons) for New Zealand:10 tons in 1987 and 6 tons in 1988. The annual landings (in tons) for the species in Australia are much higher; in Fishing Area 81 (= New South Wales) they totalled 200 in 1987 and in 1988, and in the area 57 (= Victoria, Tasmania, South Australia and Western Australia) 5 000 tons in both these years. Since ***J. verreauxi*** is absent or scarce in fishing area 57 and as ***J. novaehollandiae*** is not represented in the FAO statistics, it seems most likely that these Australian figures correspond to ***J. verreauxi*** and ***J. novaehollandiae*** combined, and thus give a wrong impression.

Local Names : AUSTRALIA: Eastern rock lobster (official Australian name), Australian crayfish, Common crayfish, Common Sydney crayfish, Eastern crayfish, Green cray, Green crayfish, Marine crayfish, New South Wales spiny lobster, Sea crayfish, Sydney crayfish; NEW ZEALAND: Packhorse crayfish, Green crayfish, Green lobster, Packhorse lobster, Smooth-tailed crayfish; Pawharu (Maori)

Literature : Kensler, 1967:207-10, pl. 1.

Remarks : The name ***Palinurus giganteus*** was only qualifiedly given by Kirk, 1880:313 ("although perhaps, ***giganteus,*** would be quite as appropriate"). It falls as an objective synonym of ***Palinurus tumidus*** Kirk.

Justitia Holthuis,1946

PALIN Just

Justitia Holthuis, 1946,Temminckia,7:113,115.Genderfeminine.

Type Species: by original designation: ***Palinurus longimanus*** H. Milne Edwards, 1837.

Synonyms : ***Nupalirus*** Kubo, 1955, Journal Tokyo University Fisheries, 41(2): 185. Type species, by original designation and monotypy: ***Nupalirus japonicus*** Kubo, 1955. Gender masculine.

The genus includes three species, none of which so far is of commercial importance; the possibility that they will ever be of interest to fisheries is very slim.

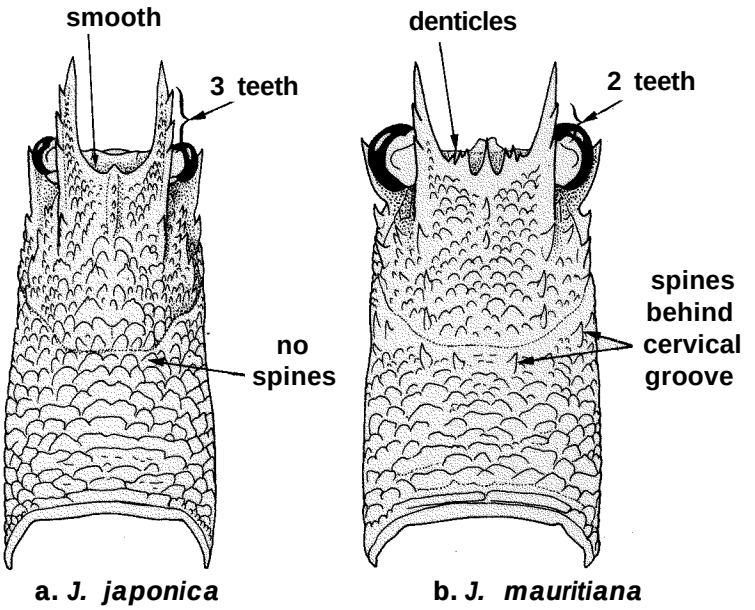
Key to Species:

1a. Frontal horns with three dorsal teeth Anterior margin of carapace between the small, spiniform rostrum and the frontal horns without teeth. Carapace without spines behind the cervical groove (Fig. 201a); 6 or 7 transverse grooves on the second to fifth abdominal somites, all reaching to the base of the pleura (Fig. 202a); Indo-West Pacific **.....*J. japonica*** (Fig. 203)

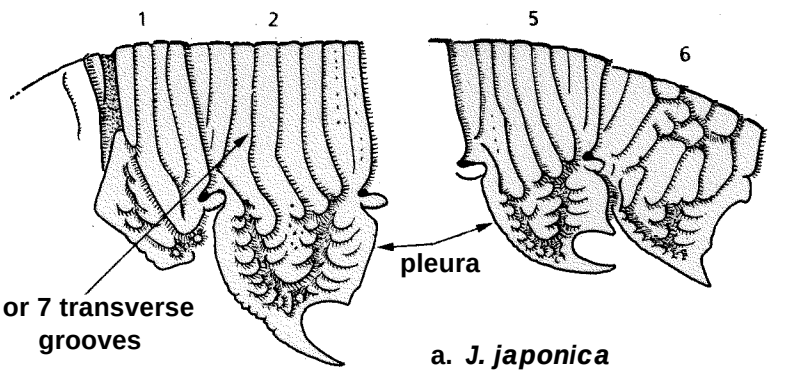
1b. Frontal horns with. two dorsal teeth. Anterior margin of carapace with several sharply pointed small teeth between the small spiniform rostrum and the frontal horns. Carapace behind cervical groove with spines (Fig. 201 b); 4 or 5 transverse grooves on the second to fifth abdominal somites, not all reaching to the base of the pleura, and some interrupted dorsally (Fig. 202b)

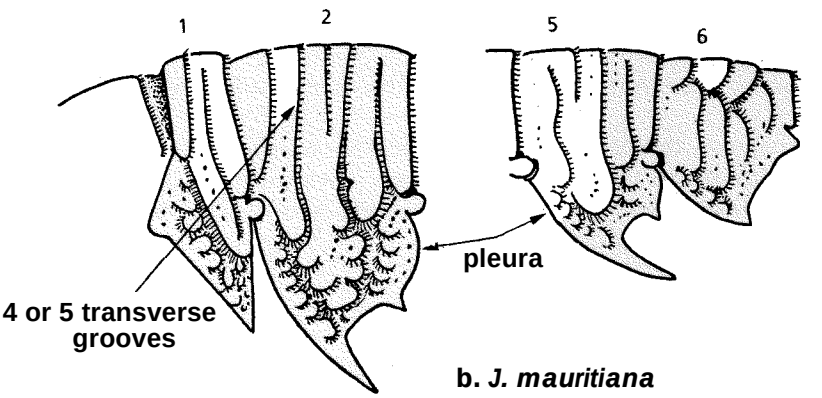
2a. Atlantic species ..... ***J. longimanus*** **(Fig. 205)**

2b. Indo-West Pacific species .. ***J. mauritiana*** (Fig. 207)



carapace (dorsal view) (from Crosnier, 1977) **Fig. 201**





1st and 2nd, and 5th and 6th abdominal somites in lateral View (from Gordon, 1960) **Fig. 202**

Justitia japonica (Kubo, 1955)

Fig. 203

PALIN Just 3

Nupalirus japonicus Kubo, 1955, Journal Tokyo University Fisheries, 41(2); 185, pls. 12,13.

FAO Names : En - Japanese furrow lobster.

Type : Type locality: "about 8 miles off Shimokawaguchi (Shimizu city), Kôchi Pref., Japan". Holotype male "in the biological museum of Kôchi Prefecture Women's University"

Geographical Distribution : Indo-West Pacific region: Madagascar (N.W. coast near Majunga, and SE. coast near Fort Dauphin), Mauritius, Reunion, Japan (off Pacific coast of central and southern Japan from Kii Peninsula to the south coast of Shikoku Island; Bonin Islands) (Fig. 204).

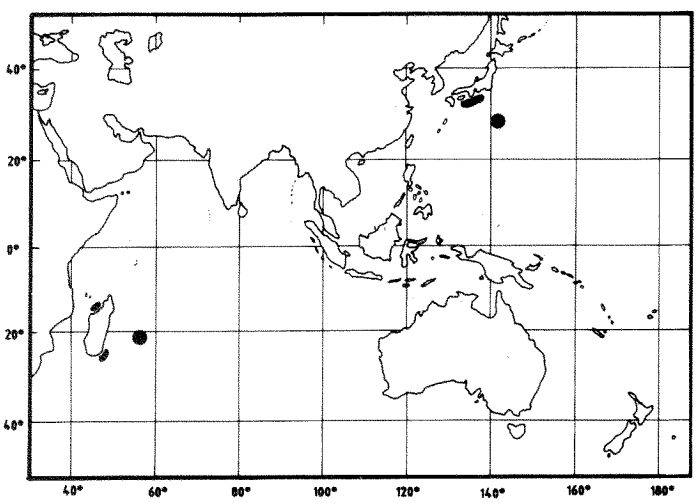
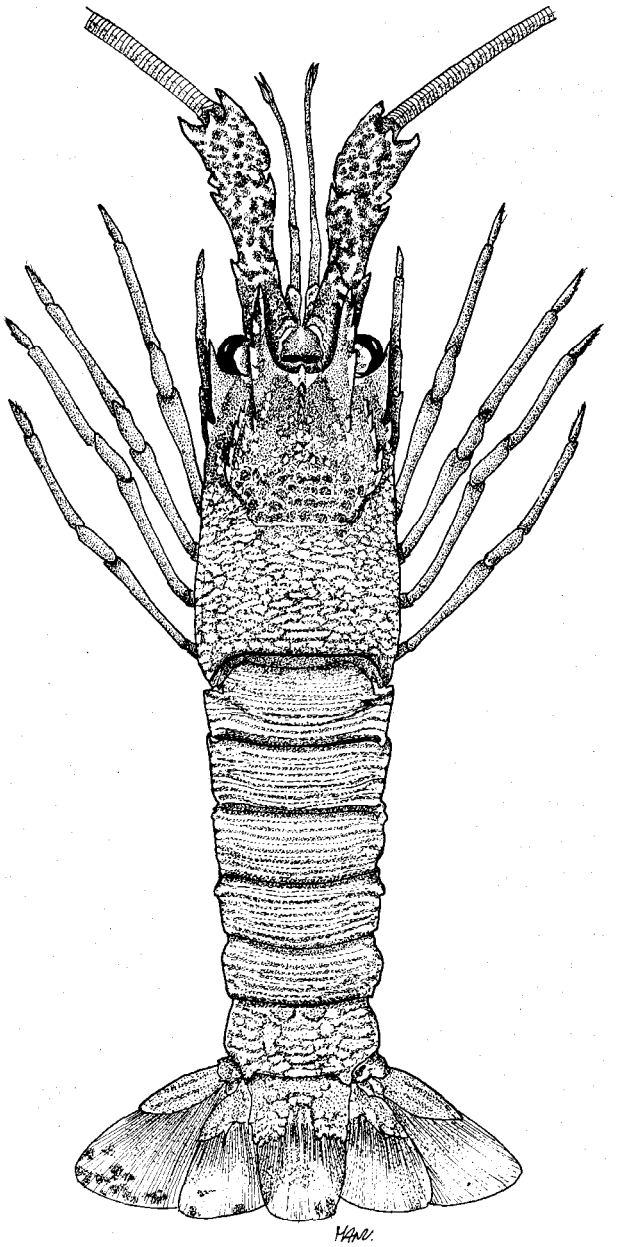


Fig. 204



(after Baba et al, 1986)

Fig. 203

Habitat and Biology : Depth range from 40 to 200 m. According to Crosnier & Jouannic (1973: 13) the species seems to prefer rocky substrates.

Size : Maximum total body length 24 cm; usually not more than 20 cm. Carapace length 6 to 9 cm.

Interest to Fisheries : At present none. Specimens are occasionally taken in lobster pots and trap nets; the habitat evidently is inaccessible to trawls. Sekiguchi & Okubo (1986:21) reported an annual catch of 4 to 41 specimens (between October and April) of this species in Mie Prefecture, Japan. Many of the specimens were placed in the several public aquaria in Japan.

Local Names : JAPAN: Ryoma ebi

Literature : Gordon, 1960, pp. 296-305, figs I-6; Baba et al., 1986, pp. 154, 155,282, fig. 105.

Justitia longimanus (H. Milne Edwards, 1837)

Fig. 205

PALIN Just 1

Palinurus longimanus H. Milne Edwards, 1837 Histoire naturelle des Crustacés, 2:295.

Synonyms: Sometimes when used with-the generic name ***Justitia,*** the specific name is incorrectly spelled ***longimana,*** probably because ***Justitia*** is a feminine name. However, as ***longimanus*** is a noun, its ending is not to be changed with the gender of the generic name (International Code, Art. 31(b)ii).

FAO Names : En - West Indian furrow lobster; **Fr -** Langouste caraïbe; **Sp -** Langosta de muelas.

Type : Type locality: "Habite les Antilles". Type material in MP, no. Pa 421, dry in rather good condition. This type specimen, if not the holotype, is here selected the lectotype. Not located in 1989.

Geographical Distribution : Western Atlantic region: Bermuda, S. Florida (USA), Caribbean arc from Cuba to Isla Margarita (Venezuela), Curaçao, and E. Brazil (Espiritu Santo State) (Fig. 206).

Habitat and Biology : Depth range from 1 to 300 m, usually between 50 and 100 m. Inhabits the outer parts of coral reef slopes.

Size : Maximum total body length about 15 cm, usually up to 10 cm.

Interest to Fisheries : Very slight. The species is not the object of a special fishery, but is sometimes caught incidentally in lobster pots at greater depths. Morice (1958:86) lists the species among the edible Crustacea of Martinique, and states that it is consumed locally by the fishermen, but appears hardly, if ever, on the markets.

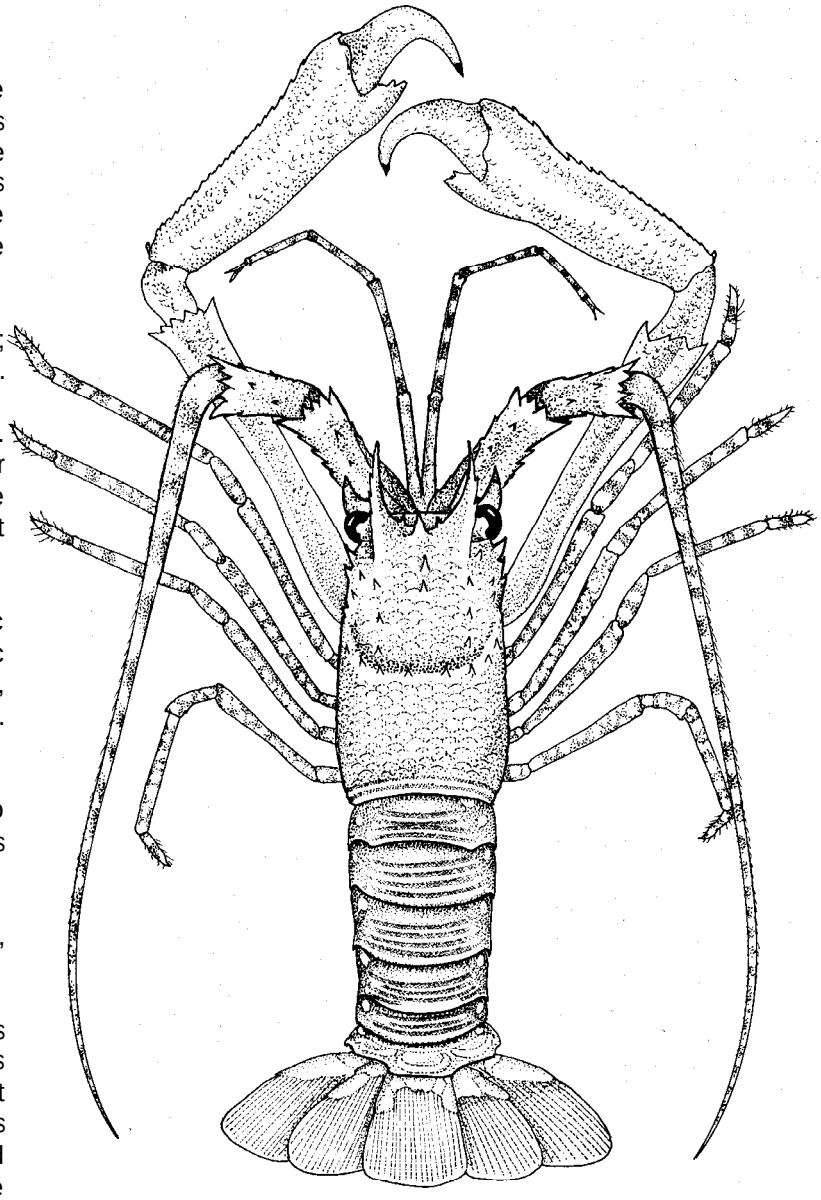


Fig. 205

Local Names : CUBA: Camarón de lo alto; CURACAO: Kreef di laman hundu (= deep sea lobster), Kreef di awa blau (= blue water lobster) (Papiamento language); GUADELOUPE: Criquet (St. Barthelemy); MARTINIQUE: Homard bresilien; USA: Long-armed lobster, Long-armed spiny lobster.

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

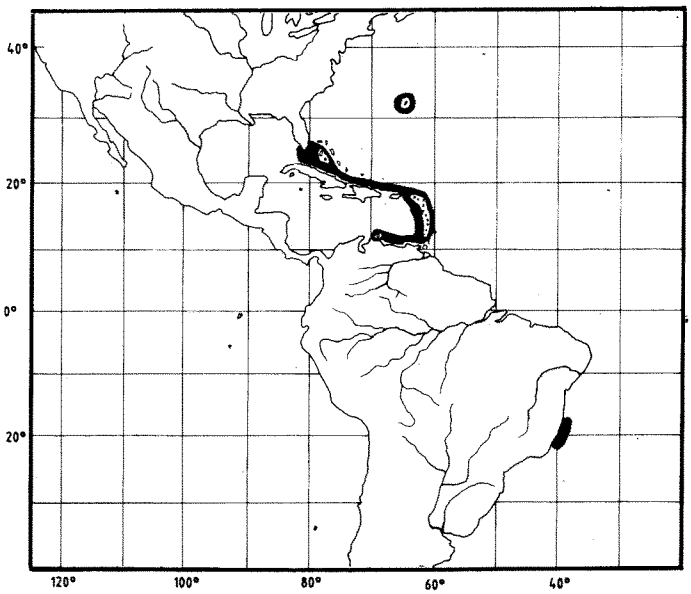


Fig. 206

Justitia mauritiana (Miers, 1882)

Fig. 207

PALIN Just 2

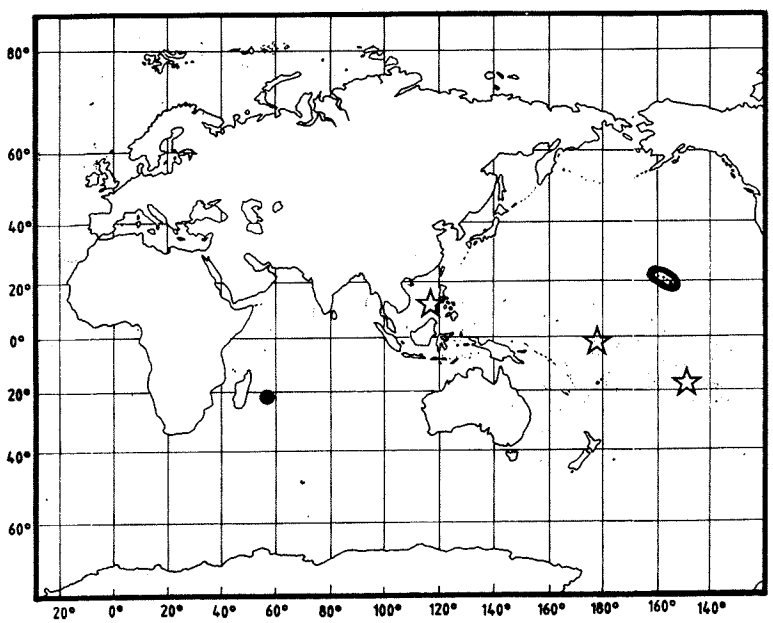
Palinurus longimanus mauritianus Miers, 1882, Proceedings Zoological Society, London, 1882:540, pl. 36 fig. 1.

Synonyms: ***Justitia longimana mauritania*** **-** Holthuis, 1946.

FAO Names : En - Gibbon furrow lobster; **Fr -** Langouste gibbon.

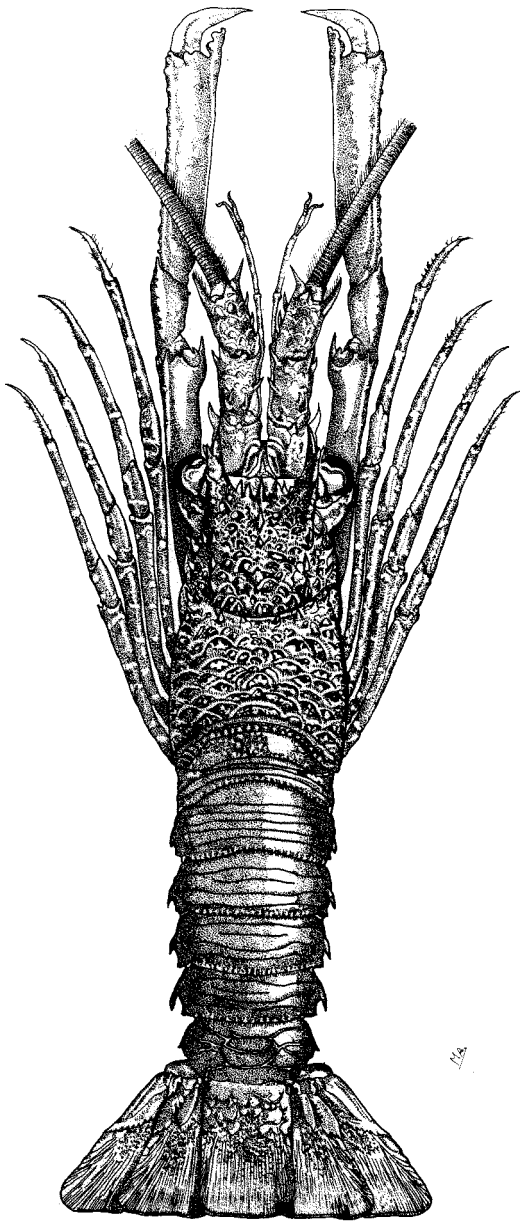
Type : Type locality: Mauritius,"in a fishing-net at a depth of 40 fathoms" (= 73 m). Holotype male, in BM, no 81.12 (dry, condition fair).

Geographical Distribution : Indo-West Pacific region: Western Indian Ocean (Mauritius, Reunion), Hawaiian Archipelago. Larvae supposed to be of this species have been reported from the Philippines, the Gilbert Islands and Tahiti (Fig. 208).



☆ **larval records (supposedly of this species)**

Fig. 208



(after Miers, 1882)

Fig. 207

Habitat and Biology : Depth range from 30 to 200 m. The species seems to prefer rocky or coral substrates.

Size : Maximum total body length 16 cm, carapace length 6 cm; average carapace length 4 to 5 cm.

Interest to Fisheries : The species is not actively fished for. Experimental fishing with lobster pots and trammel nets near Reunion resulted in small catches. Its small size, apparent scarcity and habitat (rough bottom and relatively great depth) make it an unlikely subject for a fishery.

Local Names : USA: Long-handed spiny lobster, Ula (Hawaii).

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

Linuparus White, 1847

PALIN Lin

Linuparus White, 1847, List of the specimens of Crustacea in the collection of the British Museum: 70. Gender masculine. Name placed on the Official List of Generic Names in Zoology in Opinion 519 (published in 1958).

Type Species: by monotypy: ***Palinurus trigonus*** Von Siebold, 1824.

Synonyms : Podocratus Geinitz, 1849, Das Quadersandsteingebirge oder Kreidegebirge in Deutschland:96. Type species, by monotypy: ***Podocratus duelmense*** Geinitz, 1849; gender masculine.

Thenops Bell, 1858, A monograph of the fossil malacostracous Crustacea of Great Britain, (1):33; type species, by monotypy: ***Thenops scyllariformis*** Bell, 1858; gender masculine.

Avus Ortmann, 1891, Zooloaische Jahrbücher. Systematik, 6: 15,21; type species, by monotypy: ***Palinurus trigonus*** Von Siebold, 1824; gender masculine.

Eolinuparus Mertin, 1941, Nova Acta Leopoldina, (n.ser... 10(68):215; type species, by original designation: ***Thenops carteri*** Reed, 1911; gender masculine.

Apart from a great number of fossil species, the genus ***Linuparus*** has three recent species, all are dealt with here.

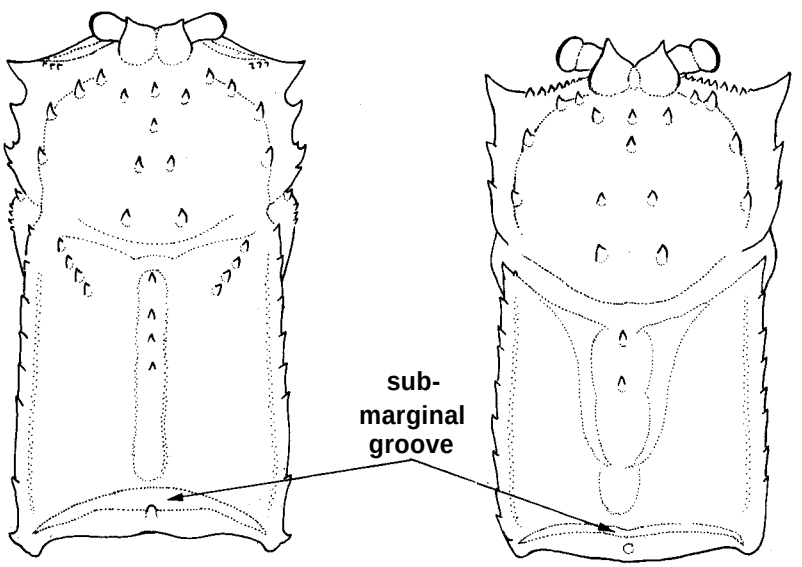
Key to Recent Species (after Berry & George, 1972: 18).

1a. Submarginal posterior groove of carapace much wider medially than laterally (Fig. 209a). Vestigial pleopods present on first abdominal segment of female ..... ***L. somniosus*** (Fig. 211)

1b. Submarginal posterior groove of carapace as wide medially as laterally (Fig. 209b). No pleopods on first abdominal segment of female

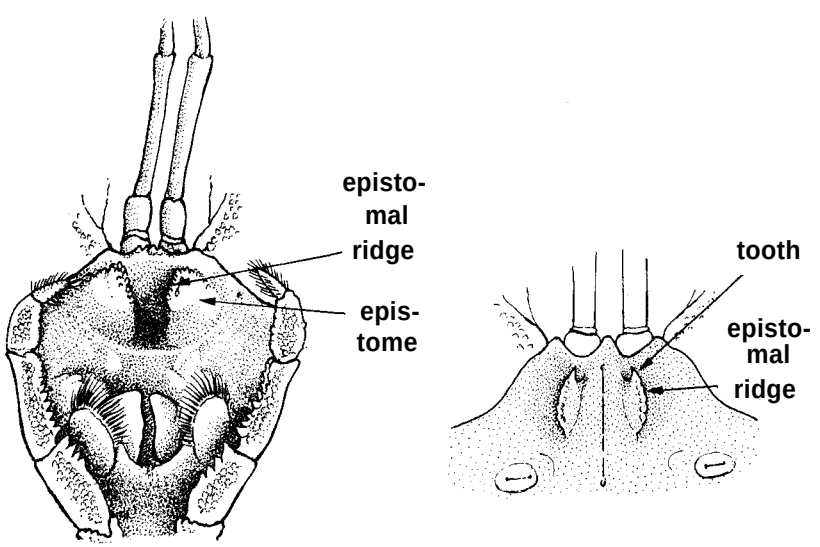
2a. Epistomal ridges coarsely granulated, without an acute well developed anterior tooth (Fig. 210a). Chitinous margin of male genital aperture with toothed median border and entire lateral border ..... ***L. sordidus*** (Fig. 213)

2b. Epistomal ridges feebly granulated, with an acute well developed anterior tooth (Fig. 210b). Chitinous margin of male genital aperture toothed throughout its length ..... ***L. trigonus*** (Fig. 215)



a. *L. somniosus* b. *L. sordidus*

carapace (dorsal view) **Fig. 209**



a. *L. sordidus* b. *L. trigonus*

anterior part of the body (ventral view) epistome **Fig. 210**

Linuparus somniosus Berry & George, 1972

Fig. 211

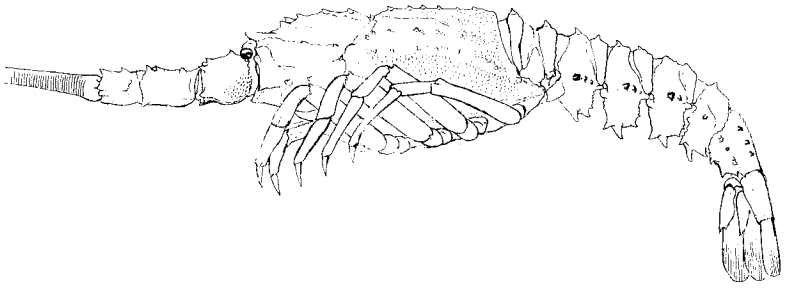
PALIN Lin 1

Linuparus somniosus Berry & George, 1972, Zoologische Mededelingen, Leiden, 46:18, text-fig-1, pls 1,2.

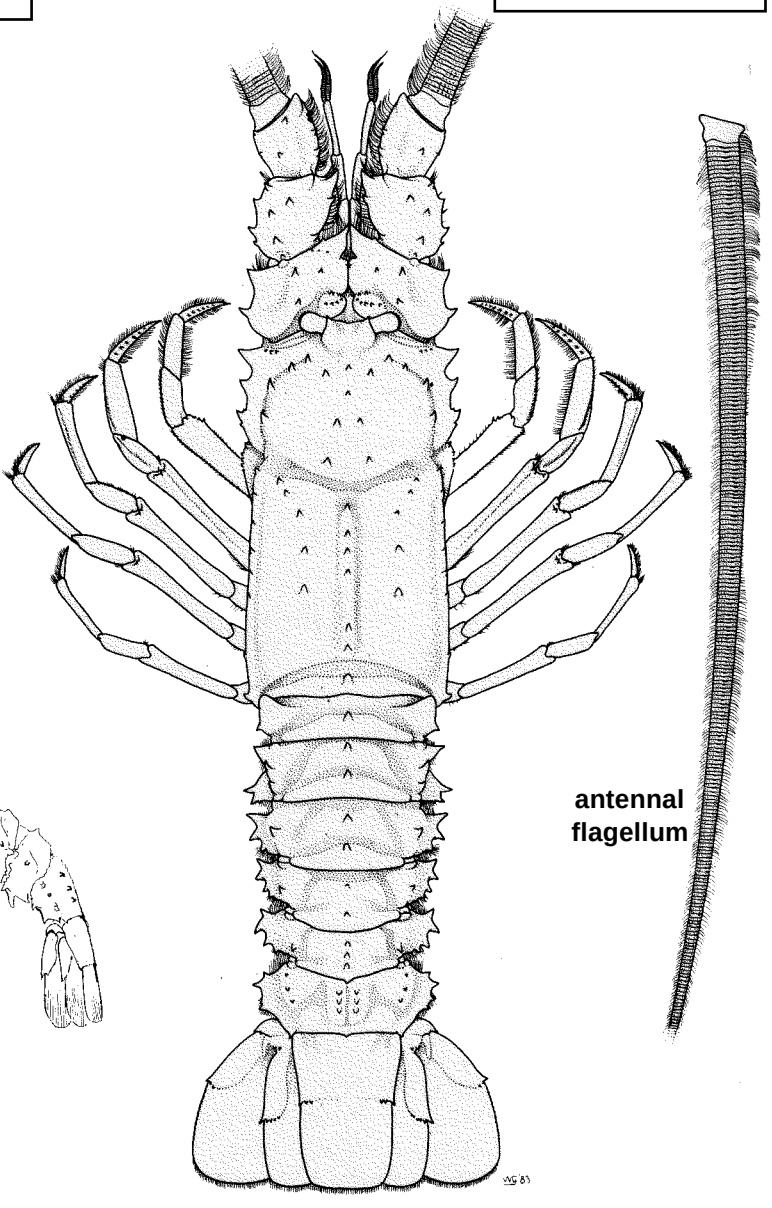
Synonyms: In older literature the species was sometimes incorrectly identified as ***L. trigonus.***

FAO Names : En- African spear lobster; **Fr -** Langouste javelot d'Afrique; **Sp -** Langosta jabalina africana.

Type : Type locality: "N.E. of Bazaruto Island", Natal, South Africa, 234 m depth. Holotype female in BM, no. 1971: 120; 2 paratypes BM, no. 1971:121; 2 paratypes RMNH, nos D 27137 and D 27138 (all types in alcohol, condition good).



lateral view



dorsal view

Fig. 211

Geographical Distribution : Off the east coast of Africa from Kenya to Natal, South Africa (Fig. 212).

Habitat and Biology : Depth range from 216 to 375; on rough substrate with sand and mud.

Size : Maximum total body length about 35 cm, carapace length 14 cm; average carapace length about 10 cm.

Interest to Fisheries : At present very minor. The species is not fished commercially in most of its range, but according to Ivanov & Krylov (1980:286) it supports a commercial fishery in Tanzanian waters, where, off Zanzibar, catches of over 10 kg/h were taken by bottom trawls. The animals are mostly marketed fresh

Local Names : MOZAMBIQUE: Lagosta lanceira.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986: 14, fig. 30.

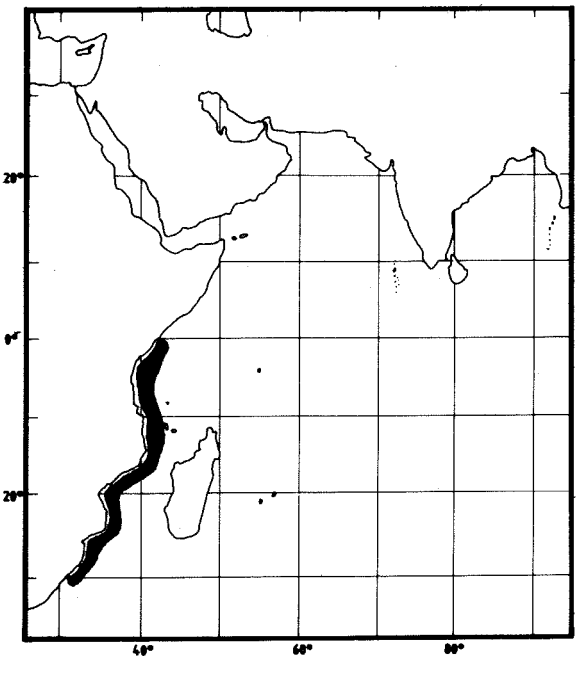


Fig. 212

Linuparus sordidus Bruce, 1965

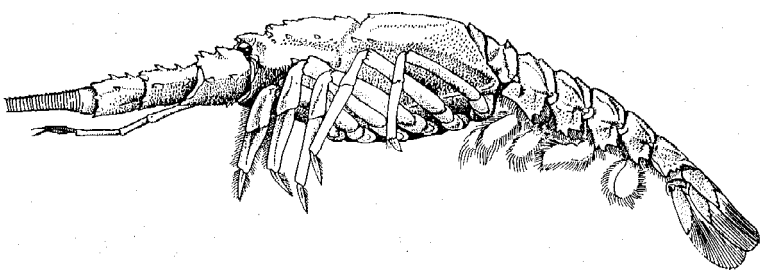
Fig. 213

PALIN Lin 2

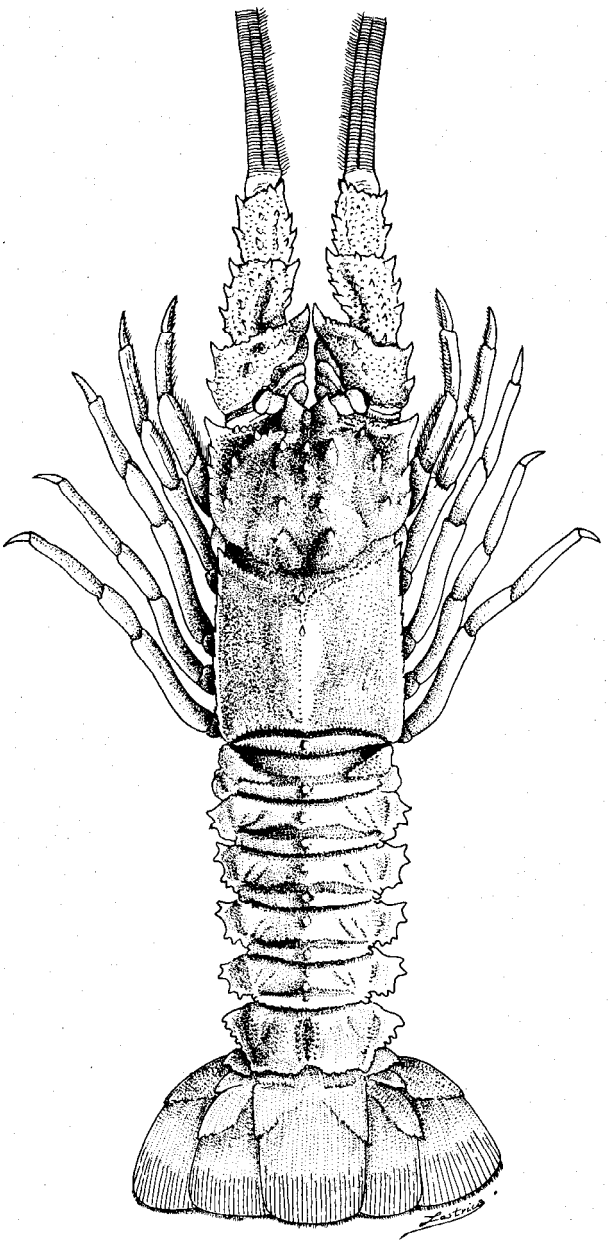
Linuparus sordidus Bruce, 1965, Zoologische Mededelingen, Leiden, 41(1): 1, text-fig.1, pls. 1,2.

FAO Names : En - Oriental spear lobster

Type : Type locality: "South China Sea, 19" 40.0'N 113º 41. 0'E to 19º39.5'N 113º36.0'E, 182-172 fathoms [= 315-333 m], coarse sand". Holotype female in BM, no. 1965.5.21.1 (in alcohol, condition fair); paratype in RMNH, no D 21213 (in alcohol, condition good).



lateral view



dorsal view

Fig. 213

Geographical Distribution : Indo-West Pacific region: Taiwan, South China Sea and N.W. Australia (off Port Hedland, Western Australia) (Fig. 214).

Habitat and Biology : Depth range from 200 to 333 m; bottom mud and limestone rocks.

Size : The total body length (including the antennae) of the holotype is 38 cm, carapace length 7 cm.

Interest to Fisheries : None at present. However, the size of the specimens and the fact that they occur in not very deep water, suggest that, once the right fishing grounds have been found, the species may be commercially exploited, like ***L. trigonus.***

Local Names : AUSTRALIA: Spear lobster

Literature : Original description; George, 1983: 16-20; Williams, 1986.15, fig. 32.

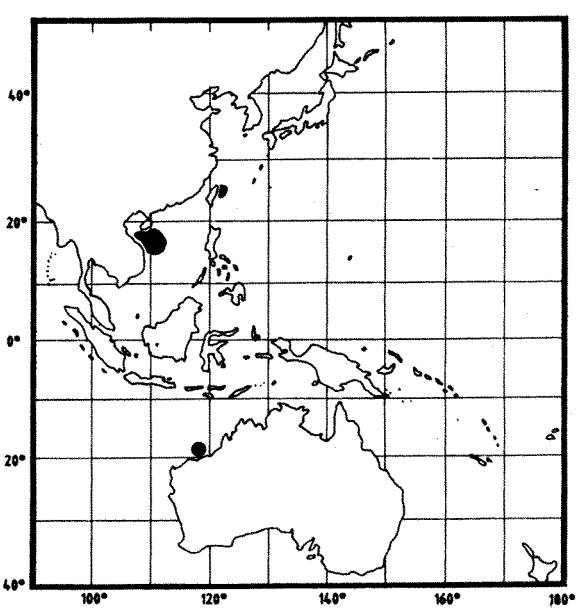


Fig. 214

Linuparus trigonus (Von Siebold, 1824)

Fig. 215

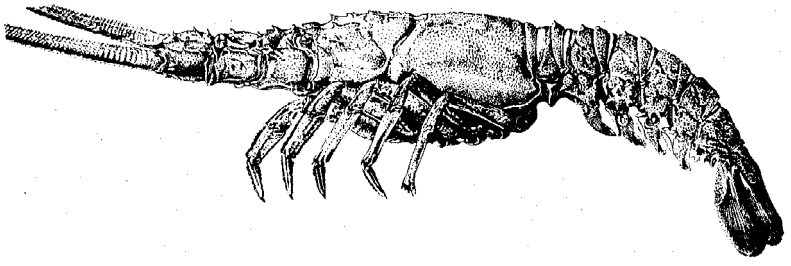
PALIN Lin 3

Palinurus trigonus Von Siebold, 1824, De Historia Naturalis in Japonia statu: 15. Name placed on the Official List of Specific names in Zoology, in Opinion 519 (published in 1958).

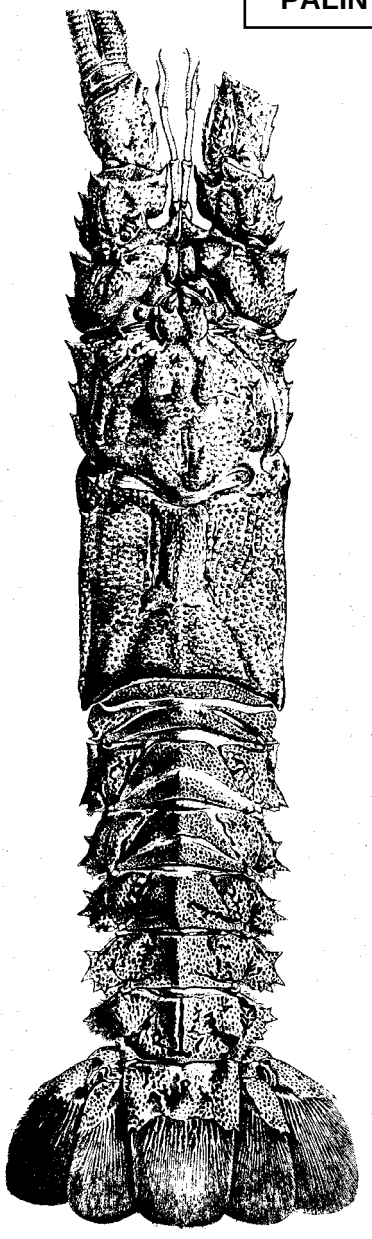
Synonyms: ***Avus trigonus*** **-** Ortmann, 1891

FAO Names : En - Japanese spear lobster.

Type : Type locality: Japan, possibly neighbourhood of Nagasaki; restricted to Omura Bay near Nagasaki, Kyushu, Japan, by Holthuis (1966:265-266). Lectotype in RMNH; no. D 5611 (dry, condition good, paralectotypes in RMNH, BM, USNM).



lateral view



(from De Haan, 1841)

dorsal view Fig. 215

Geographical Distribution: Indo-West Pacific region: Japan, Korea, China, Taiwan, Philippines, eastern and western Australia (Fig. 216).

Habitat and Biology : The species has been reported from depths between 30 and 318 m. The substrate on which it is caught is described as sand or mud, sometimes with shells; some older records indicate rocky environments.

Size : Maximum total length 47 cm; carapace length 8 to 18 cm.

Interest to Fisheries : Already H. Burger around 1830, said that the species is scarce in Japan, but when caught, is used as food (Holthuis, 1966:266). Also in Korea and China the species is sold on the markets as food, but is nowhere plentiful. Chang (1964: 11) remarked that it is very scarce in Taiwan and on the markets it is priced cheaper than the other spiny lobsters because of its coarse flesh and thick shell. Motoh & Kuronuma (1980:56) reported that in the Philippines the species " is rarely offered for sale in the market", and that it is caught there by commercial trawlers. George (1983: 17) remarked that in Western Australia, off Port Hedland, ***Linuparus trigonus*** was trawled with deepwater Engel trawls in 200 m of water "in sufficient quantities to provide occasional excellent meals for the crew and that in Japan this same species IS the basis for a small commercial enterprise". Off Townsville, Queensland, Australia, the species "occurs in densities high enough to support an occasional fishery. The fishery is confined to a small, well-defined area of the continental slope, about 70 km by 20 km, in depths of 200 to 250 m. Here ***L. trigonus*** is taken mainly by prawn trawlers during their off-season" (T.J. Ward, in press).

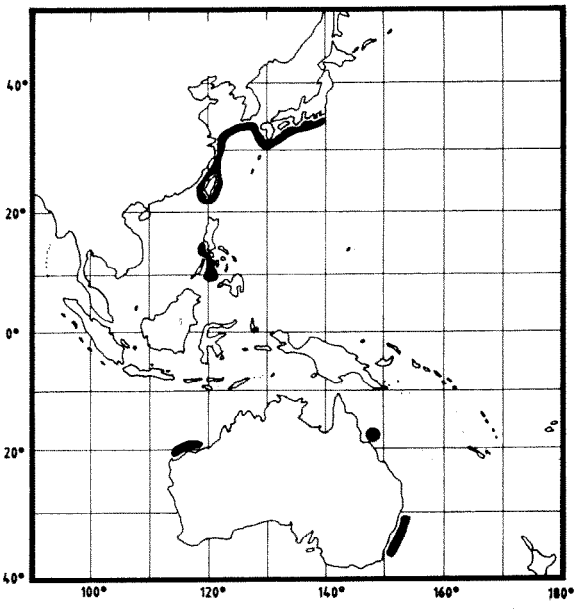


Fig. 216

local Names : AUSTRALIA: Spear lobster, Champagne lobster, Barking crayfish; JAPAN: Hako-ebi (= box lobster), Ishi-ebi (= stone lobster); PHILIPPINES: Uson (Ilongo).

literature : De Haan, 1841:157-158, pls.39,40; Williams, 1986 :15, figs 31,78 f-g

Palinurus Weber, 1795

PALIN Palin

Pallinurus Weber, 1795, Nomenclator entomologicus:94. Gender masculine. Name emended under the plenary power of the International Commission on Zoological Nomenclature to ***Palinurus,*** and placed on the Official List of Generic Names in Zoology, in Opinion 519 (published in 1958).

Type Species: by monotypy: ***Astacus elephas*** Fabricius, 1787

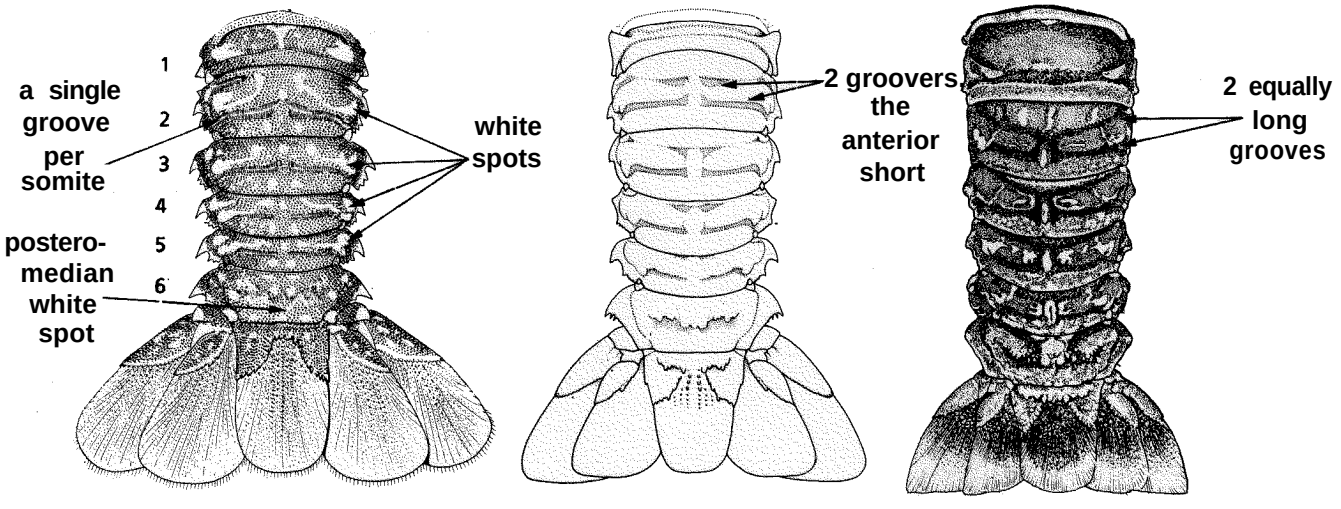
This is the oldest known among the Palinurid genera, and has a restricted distribution:it is found only in the Eastern Atlantic, Mediterranean, and off south east Africa. Five species are known, all of present or potential commercial interest.

Key to Species :

1a North-eastern Atlantic, from S. Norway to the Cape Verde Islands. Abdominal somites with a single distinct transverse groove (Fig. 217a)

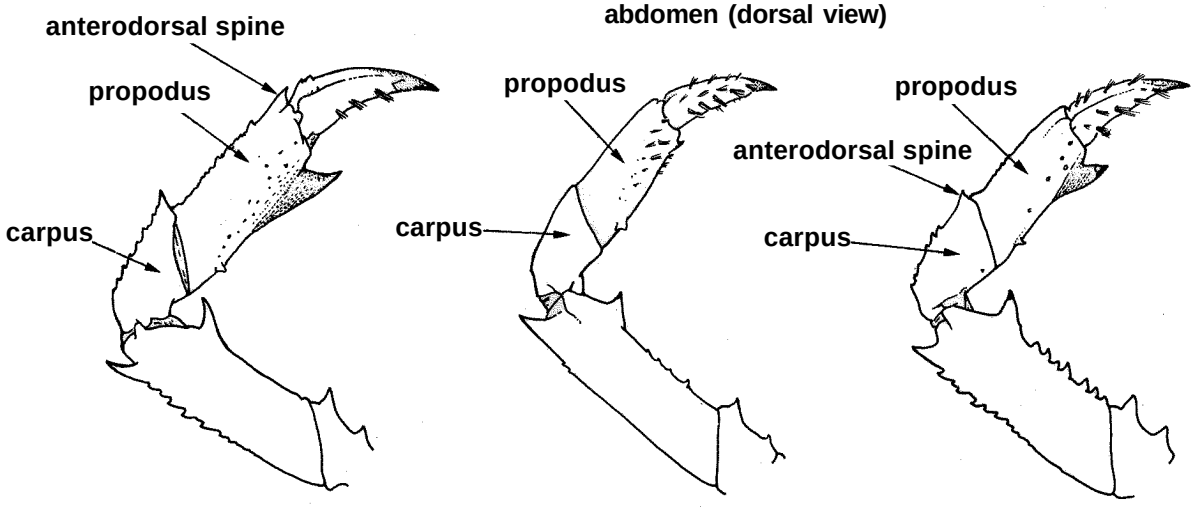
2a. Propodus of first pereiopod of male with an anterodorsal spine (Fig. 218a). Colour dark brown or purple; abdominal somites 2 to 5 each with a distinct pair of large white spots, somite 6 with a single posteromedian white spot (Fig. 217a). Legs longitudinally streaked with brown and yellowish. Depth 0 to 70 m **..** ***P. elephas*** (Fig. 224)

2b. Propodus of first pereiopod of male without anterodorsal spine (Fig. 218b). Colour a pink or reddish marbled with white; abdominal somites irregularly marbled. Legs ringed with whitish and pink. Depth 40 to 600 m or more



a. *P. elephas* b. *P. delagoae* c. *P. gilchristi* **Fig. 217**

abdomen (dorsal view)



a. *P. elephas* b. *P. mauritanicus* c. *P. charlestoni* **Fig. 218**

first pereiopod of male

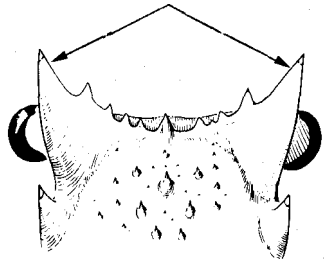
3a. Frontal horns flat, their inner margins forming with the anterior margin of the carapace a shallowly concave arc (Fig. 219a). Carapace in adult males strongly swollen. Carpus of first leg without anterodorsal spine (Fig. 218b). Eastern Atlantic from W. of Ireland to S. Senegal, including the western Mediterranean, depth from 40 to 600 m **... *P. mauritanicus*** (Fig. 228)

3b. Frontal horns with the inner margins and the anterior margin of the carapace forming a V-shaped line (Fig. 219b). Carapace in adult male not swollen. Carpus of first male leg with an anterodorsal spine (Fig. 218c). Cape Verde Islands, 50 to 300 m **..... *P. charlestoni*** (Fig. 220)

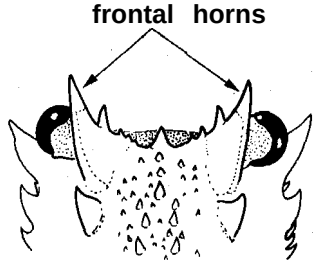
1b. South and Southeast Africa (False Bay, South Africa, to Mozambique, S.E. Madagascar). Abdominal somites 2 to 5 with two transverse grooves (Fig. 217 b, c)

4a. Anterior groove of abdominal somites 2 to 5 shorter and less distinct than the posterior groove (Fig 217b). Carapace before cervical groove naked. Merus of walking legs cylindrical and naked **..... *P. delagoae*** (Fig. 222)

4b. Anterior groove of abdominal somites 2 to 5 very deep and as hairy as the posterior groove (Fig. 217c). Carapace in front of the cervical groove pubescent. Merus of walking legs triangular in transverse section, the flat outer surface pubescent **..... *P. gilchristi*** (Fig. 226)



a. *P. mauritanicus*



b. *P. charlestoni*

anterior pat-t of carapace (dorsal view) **Fig. 219**

Palinurus charlestoni Forest & Postel, 1964 **Fig. 220** **PALIN Palin 2**

Palinurus charlestoni Forest & Postel, 1964, Bulletin Museum National d'Histoire Naturelle, Paris, (2)36: 100, 102, figs 2, 5, 7.

FAO Names : En - Cape Verde spiny lobster; **Fr -** Langouste de Cap Vert; **Sp -** Langosta de Cabo Verde.

Type : Type locality: "Iles du Cap Vet-t, groupe nord, de St. Vincent à Sal, entre 180 et 200 m". Holotype male in MP, no. Pa. 331; paratypes in MP, Pa. 84, Pa. 330; RMNH D. 19544. All type material in alcohol, in excellent condition.

Geographical Distribution : So far known only from Cape Verde Islands (Fig. 221).

Habitat and Biology : Depth range from 50 to 300 m, perhaps deeper; on an uneven rocky bottom, sometimes on steep slopes.

Size : Maximum total body length to 50 cm, average length to 40 cm.

Interest to Fisheries : Minor. In 1963 the first attempts were made for a commercial fishery, using lobster pots. In the most productive areas, two lobsters were caught per pot per day. Due to the rough bottom, the loss of pots was rather substantial. Longhurst (1970:277) reported actual landings of 10 to 20 tons.

Literature : Original description. Fischer, Bianchi & Scott (eds), 1981:vol. 5; Williams, 1986: 16, fig. 36.

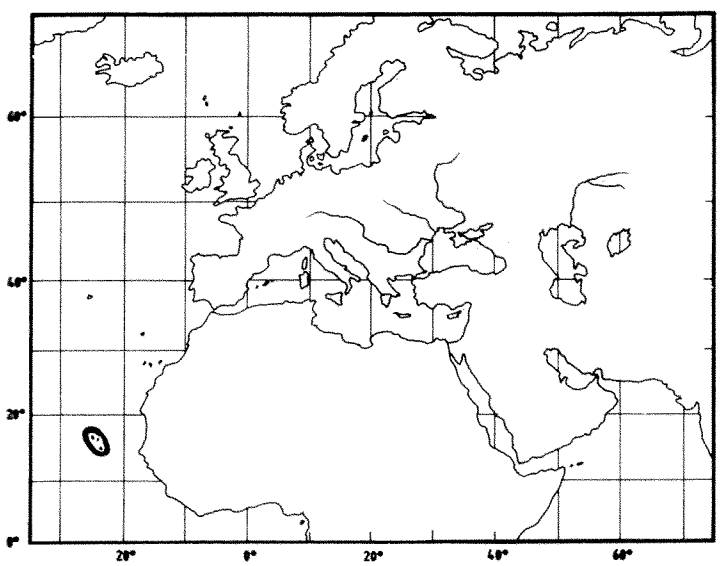


Fig. 221

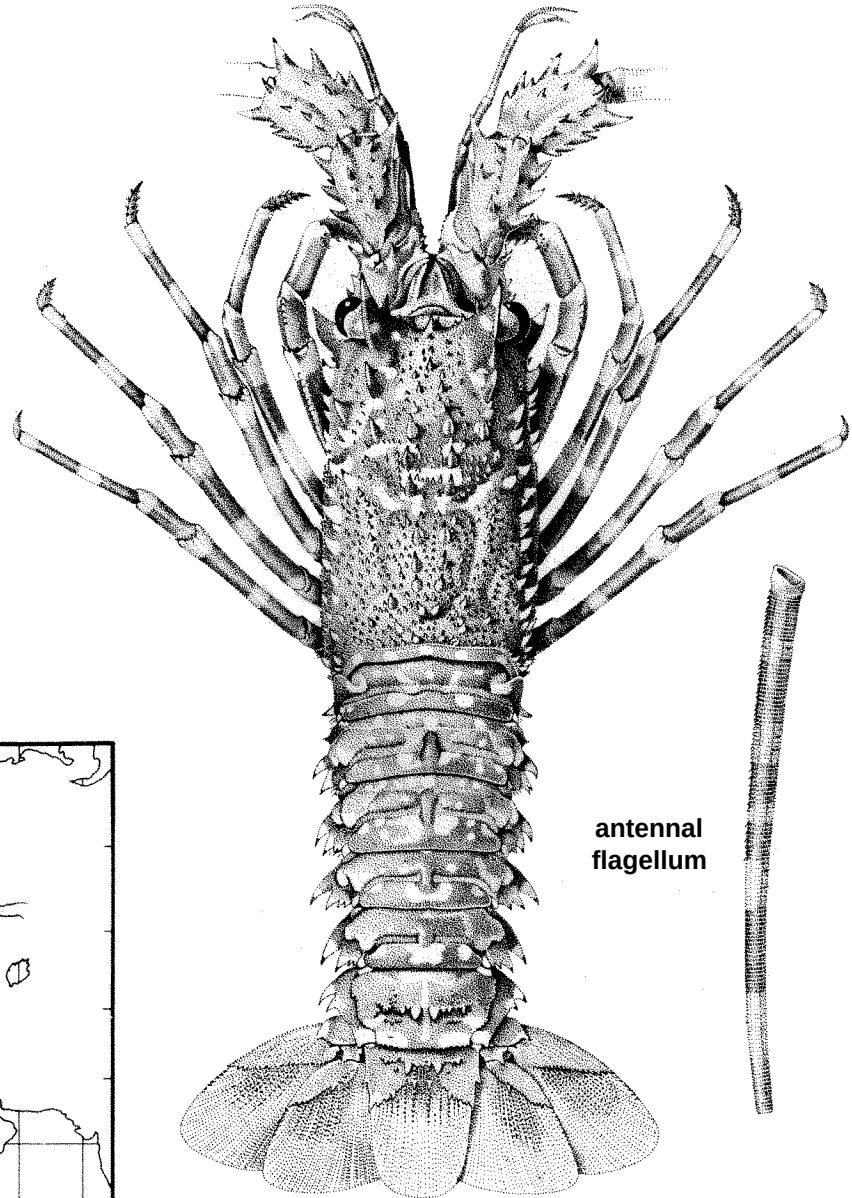


Fig. 220

Palinurus delagoae Barnard, 1926

Fig. 222

PALIN Palin 4

Palinurus *gilchristi delagoae* Barnard, 1926, Transactions Royal Society South Africa, 13: 123, pl. 11.

Synonyms : ***Palinurus gilchristi natalensis*** Barnard, 1926.

FAO Names : En - Natal spiny lobster; **Fr -** Langouste du Natal; **Sp -** Langosta del Natal

Type : Type locality: of ***P. gilchristi delagoae***: off Delagoa Bay, S. Mozambique, "25º58'S., 33º5'E., 228 metres, sand and shell"; male type evidently lost, a neotype selected by Berry & Plante, 1973:374; the neotype. locality is: "off Tongaat, Natal, 324 m", South Africa. Neotype male in SAM, no. A 13179 (in alcohol condition good).

Type locality of ***P. gilchristi natalensis:*** "Natal coast, from off Umkomaas River in the south as far north as off Tugela River and off Delagoa Bay, 100-260 fathoms [=183-480 ml";syntypes in SAM.

Geographical Distribution : Indo-West Pacific region: East coast of Africa from 17ºS (Mozambique) to 30ºS (Natal, South Africa), south east Madagascar (Fig. 223).

Habitat and Biology : Reported from 0 to 400 m depth, usually between 180 and 324 m. Off South Africa it is found, on muddy or sandy sub-strates, sometimes with coral fragments; off Madagascar it has been reported from a rocky substrate The species is gregarious and seems to migrate; it can sometimes be caught in enormous numbers.

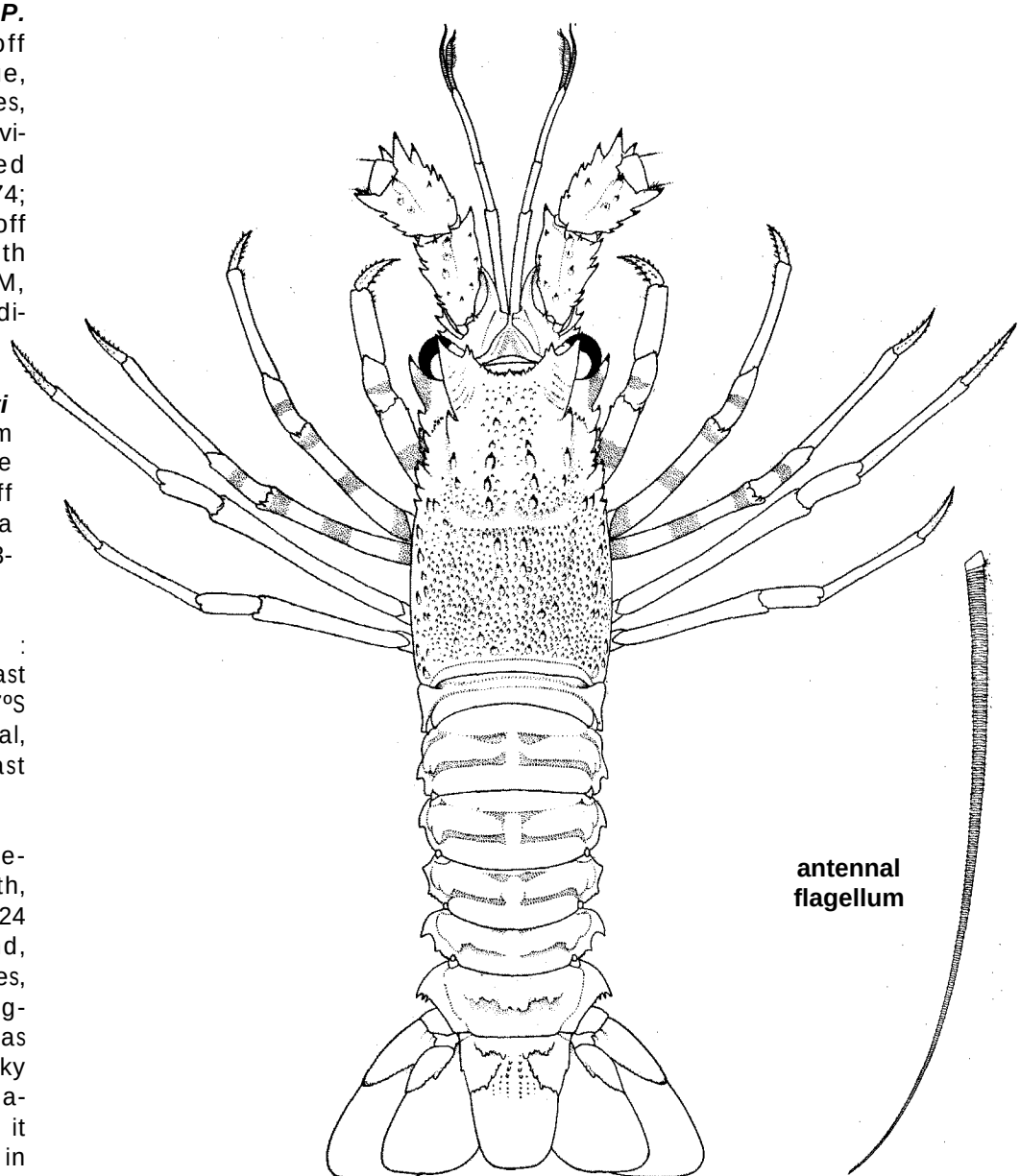


Fig. 222

Size : Maximum total body length 35 cm, carapace length to 17 cm; average carapace length about 10 cm.

Interest to Fisheries : Off south east Africa the species is taken by trawlers, while off Madagascar, lobster pots were used during experimental fishing. It is marketed frozen. The annual catch was 89 tons in 1987 and 25 tons in 1988 (FAO Yearbook of Fishery Statistics, 1990).

Local Names: MOZAMBIQUE: Lagosta de profundidae:

Literature : Berry & Plante, 1973:374-7, text-fig.1, pl. 19; Fischer & Bianchi (eds), 1984:vol.5; Williams, 1986: 15, fig. 33

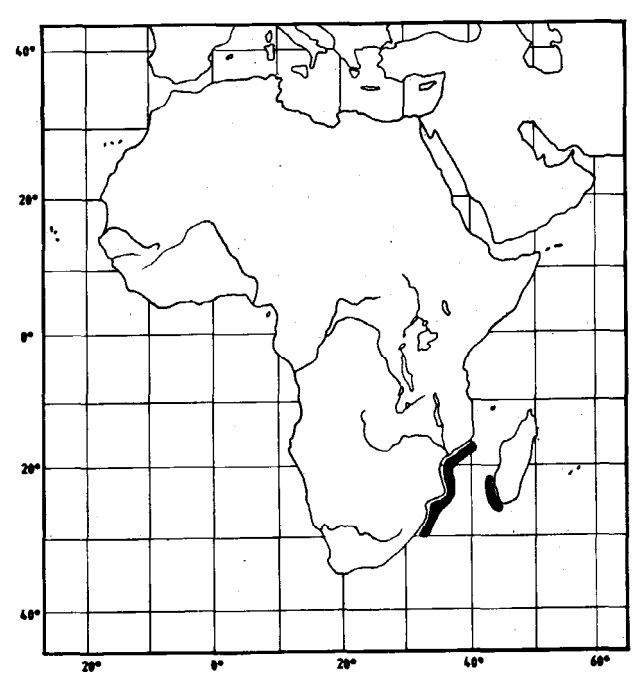
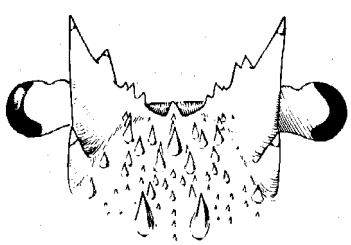


Fig. 223

Palinurus elephas (Fabricius, 1787) | **Fig. 224** | **PALIN Palin 1**

Astacus elephas Fabricius, 1787, Mantissa Insectorum, I :331. Name placed on the Official List of Species Names in Zoology in Opinion 519 (published in 1958).

Synonyms : ***Cancer elephas*** - Gmelin, 1789; ***Cancer locusta*** Wulfen, 1791 (not ***Cancer locusta*** Linnaeus, 1758) (= ***Gammarus locusta*** (L.)); ***Palinurus quadricornis*** Fabricius, 1798; ***Palinurus vulgaris*** Latreille, 1803; ***Palinurus locusta*** - Olivier, 1811; ***Palinurus langusta*** Rafinesque, 1814 (nom.nud.); ***Pagurus maculatus*** Bowdich, 1825 (not ***Pagurus maculatus*** Risso, 1827 (= ***Paguristes eremita*** (L., 1767)); ***Palinurus marinus*** Bate, 1868. ***"[Palinurus] adriaticus,*** Costa" was cited by Carus (1885:487) under ***Palinurus*** and treated as a good species of that genus. Stephensen (1923:77) treated "***Palinurus adriaticus*** Costa" as a synonym of ***P. elephas*** (which he indicated as ***P. vulgaris).*** However, there exists no ***Palinurus adriaticus*** Costa, as Costa never described such a species. He did describe ***Palaemon adriaticus*** in "Fauna del Regno di Napoli" (Crostacei; Pandalus):7 in 1844-1847. It is clearthat with ***Palinurus adriaticus*** Carus really meant ***Palaemon adriaticus*** Costa, since he cited textually Costa's diagnosis for that species. It is interesting that Carus (1885:474) listed ***Palaemon adriaticus*** Costa under the species incertae of the genus ***Palaemon,*** again with the same diagnosis.



anterior part of carapace (dorsal view)

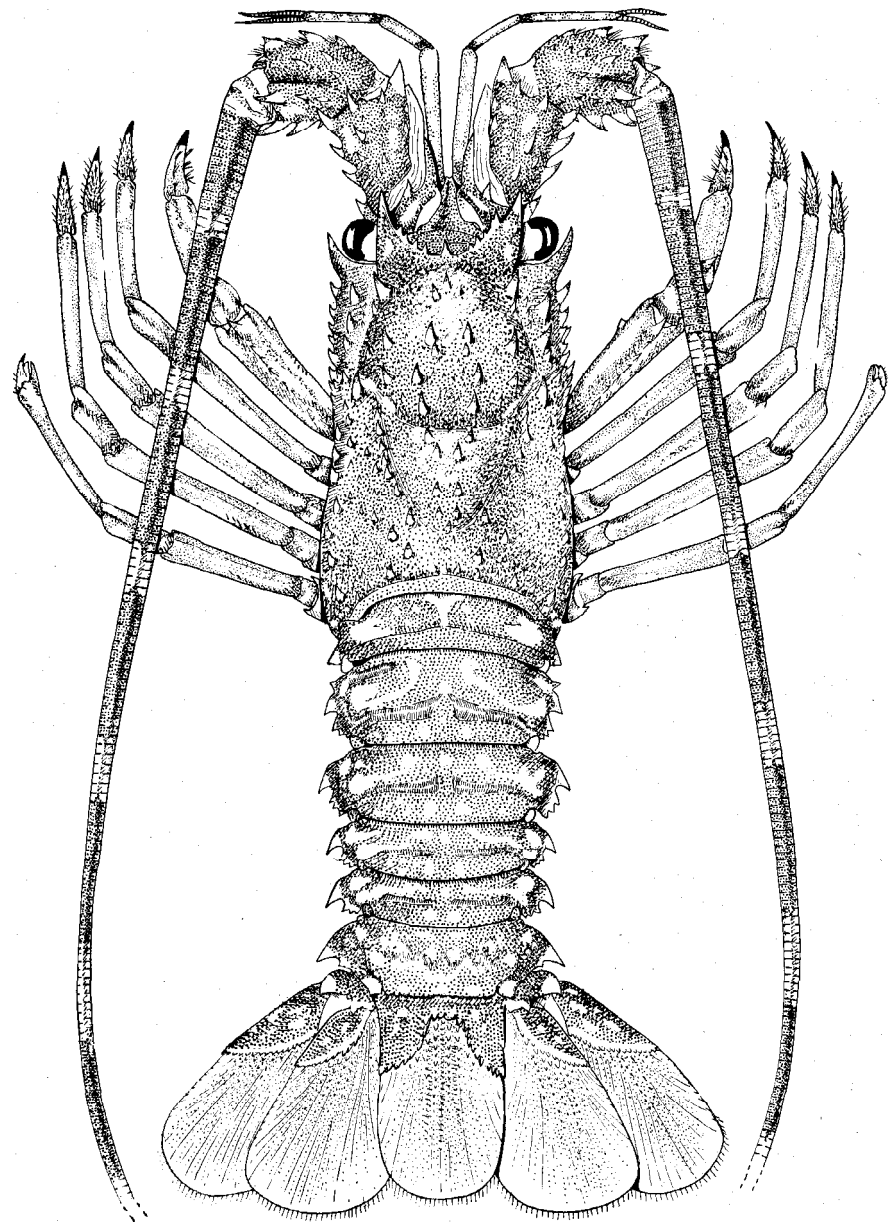


Fig. 224

FAO Names : En - Common spiny lobster; **Fr** - Langouste rouge; **Sp** - Langosta común.

Type : Type. locality of ***Astacus elephas*** Fabricius, 1787 (and ***Palinurus quadricornis*** Fabricius, 1798): the original statement of the type locality"Habitat in Americae meridionalis Insulis" is erroneous. As shown in Fabricius' description of the large supraorbital horns as dentate, and by his reference to Herbst's (1792:2(2): Pl.29 fig.l), his specimen was the common European spiny lobster (in 1787 Fabricius referred to the then still unpublished figure by Herbst). Herbst gives as the locality of his material: 'im Mittellandischen Meer" and elaborates: "In Italien wird er . . . häufig gegessen und auf den Markten verkauft". We may therefore correct the type locality to "Italy". A syntype, originally preserved dry, but recently transferred to alcohol is kept in UZM, condition reasonable. A second dry syntype is in ZMB, no. 19649, condition good; this is the specimen figured by Herbst, 1792.

Type locality of ***Cancer locusta*** Wulfen: near Rovinj, Yugoslavia. The type was bought at the fish market of Trieste, Italy (for 2 florins) from a fisherman from Rovinj:"Non aliter, quam duorum florenorum pretio hunc mihi Tergestino in foro Cancrum piscator vendidit Rovignensis" (Wulfen, 17911314); its present whereabouts unknown.

Type locality of ***Palinurus vulgaris*** Latreille: "dans l'Ocean Asiatique et dans la Mediterranee". Types in MP no longer extant (not located in 1989).

Type locality of ***Palinurus marinus*** Bate, 1868. The name "marinus" probably is a lapsus for "vulgaris", but if the specific names is considered to be new, the type locality of the species is the south coast of Devon and Cornwall, U.K. "mostly between Bigbury Bay [Devon] toward the east, and the Dodman [Cornwall] toward the west"; whereabouts of type material unknown.

Type locality of ***Pagurus maculatus*** Bowdich: Madeira. Types probably no longer extant.

Geographical Distribution : Eastern Atlantic, from southwestern Norway to Morocco, also in the Mediterranean, except the extreme eastern and south eastern parts (Fig. 225).

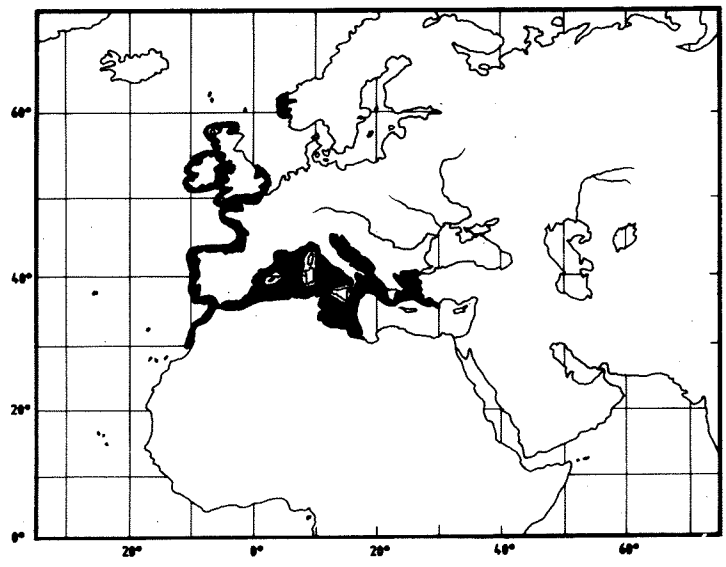


Fig. 225

Habitat and Biology : On rocky bottoms, rarely on sand, in depths from 5 to 160 m, mostly between 10 and 70 m. Ovigerous females from September-October to February-March.

Size : Maximum total body length 50 cm, but usually not larger than 40 cm.

Interest to Fisheries : The species is mostly caught with lobster pots, occasionally on hook-and-line and by spearing, rarely with trawls, tangles, or trammel nets. Longhurst (1970:260) reported the catching of this species "by full-time SCUBA divers off southwest England". In the central and western Mediterranean the species is regularly found at fish markets, and in the eastern Atlantic, outside the Mediterranean, it is fished on a minor scale in England, and more intensively in France and Portugal. No catch statistcs are known, but probably the catches of ***Palinurus*** spp. reported in the FAO Yearbook of Fisheries Statistics correspond partly to ***P. elephas*** and partly to ***P. mauritanicus*** (4921 tons in 1987 and 7869 tons in 1988).

Local Names : CYPRUS: Astakos; DENMARK: Langust; FRANCE: Langouste, Langouste commune, Langouste europeenne; GERMANY: Languste, Europaische languste, Gemeine languste; GREECE: Astakis; ITALY: Aragosta mediterranea (official name), Aragosta, Aligusta, Arigusta; MALTA: Agusta; MONACO: Lengusta; MOROCCO: Azeffane, Bakhouche, Langouste; NETHERLANDS: Langoest, Hoornkreeft; NORWAY: Langust; PORTUGAL: Lagosta; SPAIN: Langosta, Llagosta; SWEDEN: Langust;TUNISIA: Jarradh el bahr, Jrad bharr, Sid; TURKEY: Bocek, Beudic; UK: Spiny lobster, Crawfish, Red crab, Sea crayfish; YUGOSLAVIA: Jastog.

Literature : Rolland, 1881:234 (for regional French names); Palombi & Santarelli, 1961:369-370 (for regional Italian names); Fischer, Bianchi & Scott (eds), 1981 :vol. 5; Fischer, Bauchot &Schneider (eds), 1987:307-308.

Palinurus gilchristi Stebbing, 1900

Fig. 226

PALIN Palin 5

Palinurus gilchristi Stebbing, 1900, South African Marine Fisheries Investigations, 1:31, pl. 1.

FAO Names : En - Southern spiny lobster; **Fr** - Langouste du Sud; **Sp** - Langosta del sur.

Type : Type locality: "False Bay",southern Cape Province, South Africa, and "25 miles S.W. 1/4 w. from Cape St. Blaize" near Mosselbaai, Cape Province, South Africa; syntype male in SAM, no. A 970 (in alcohol).

click for next page

Geographical Distribution : South Africa: south coast of Cape Province from False Bay to Port Alfred (from 18º30' to 27ºE). Also reported from the Fort Dauphin area of Madagascar (Crosnier & Jouannic, 1973:13) (Fig. 227).

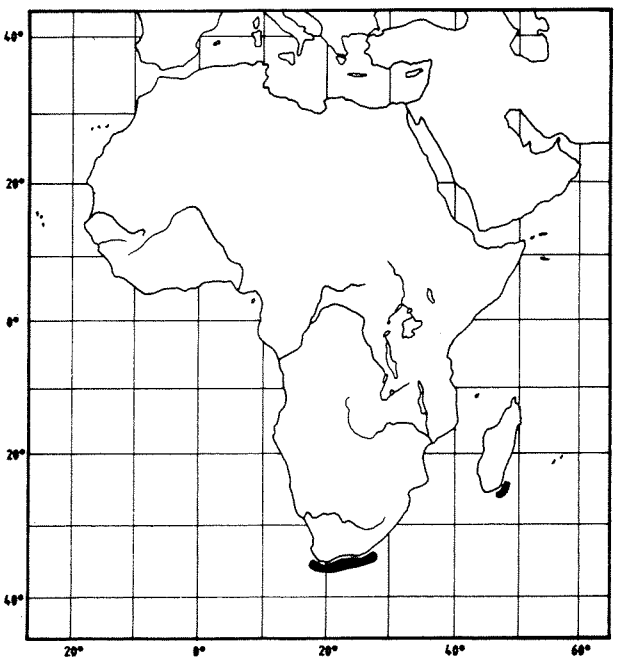
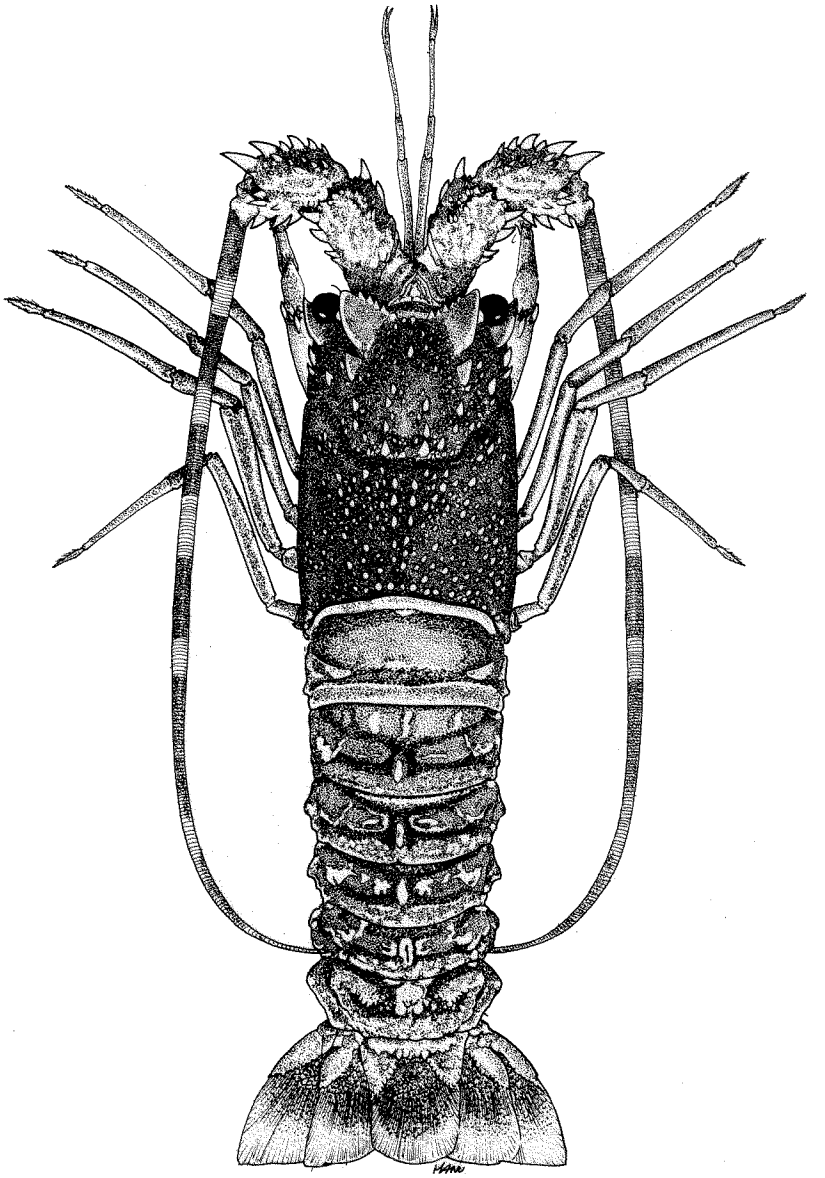


Fig. 227



(after Berry & Plante, 1973)

Fig. 226

Habitat and Biology : The species has been reported from depths between 55 and 360 m; it inhabits rocky areas and shelters in the crevices of the rocks.

Size : Maximum total body length 16 cm (males) and 31 cm (females). The recorded carapace lengths vary from 3 to 13 cm, usually between 6 and 10 cm.

Interest to Fisheries : According to Berry (1971:18) the species did not support a commercial fishery. But Pollock & Augustyn (1982:57-73) reported that commercially exploitable densities of this species were discovered near the edge of the continental shelf between Cape Agulhas and Port Alfred in about 110 m depth. The FAO Yearbook of Fisheries Statistics reports annual catches of 1820 metric tons in 1987 and 880 tons in 1988, all by South Africa. Near Fort Dauphin, Madagascar, Crosnier & Jouannic (1973: 13) found only small quantities of lobsters in areas with rocky bottoms difficult to exploit with the gear available to them.

Local Names : SOUTH AFRICA: Gilchrist's crayfish (Barnard, 1950:542).

Literature : Berry, 1971: l-23; Berry & Plante, 1973:373-380, pls 19, 20; Pollock & Augustyn, 1982:57-73; Williams, 1986: 15, figs 34,78 h-i.

Palinurus mauritanicus Gruvel, 1911

Fig. 228

PALIN Palin 3

Palinurus vulgaris mauritanicus Gruvel, 1911, Annales Institut oceanographique, Monaco, (3)4:22, pl. 1 fig. 4

Synonyms: ***Palinurus vulgaris inflata*** Gruvel, 1910 (not ***Palinurus inflatus*** Bduvier, 1895 (= ***Panulirus inflatus*** (Bouvier)); ***Palinurus thomsoni*** Selbie, 1914.

FAO Names : En - Pink spiny lobster; **Fr** -Langouste rose; **Sp** - Langosta mora.

Type : Type locality: (for **P. v.** inflata and **P. v. *mauritanicus***)" sur toute la côte mauritanienne, du cap Barbas [= Cabo Barbas, western Sahara, 22º18'N, 46º41' W] jusque un peu au nord de Saint-Louis [Senegal, 16º01'N, 16º30'W], par des fonds de 20 m à 50 m et souvent sur le sable coquillier". Syntypes in MP, no longer extant (not located in 1989).

Type locality of ***P. thomsoni:*** "58 mls. W I\2 N of Blackball Head [SW. Ireland], 51º20'N., 11º30'W., 212-229 fms [= 388-420 m], sand" Holotype male in NMI, no. 104.1916, in good condition in alcohol.

Geographical Distribution : Eastern Atlantic from W. of Ireland (53ºN) to southern Senegal (14º N), also in the western Mediterranean, West of about 16ºE, not in the Adriatic (Fig. 229).

Habitat and Biology : Depth range from 180 to 600 m. In the western Mediterranean mostly between 400 and 500 m. On rocky and coral substrates, as well as on mud. At times gregarious. Trawl hauls of 200 to 500 specimens have been recorded off N.W. Africa.

Size : Maximum total body length 50 cm; a single record of a specimen of 75 cm needs confirmation. Usually the body length ranges between 20 and 40 cm.

Interest to Fisheries : The main commercial fishery of the species is off N.W. Africa. At its inception, this fishery was mainly operating by trawls, especially after 1954. From 1958 onwards, however, the lobster-pot fishery gradually replaced trawling. In the western Mediterranean, the commercial importance of the species is not very high, but it is regularly taken by deep sea trawlers as a bycatch. It is brought to the markets in Spain and Italy, but it is far from frequent there. Sold mostly fresh, sometimes frozen. Catch statistics are not recorded for this species. However, the figures given for ***Palinurus*** spp. in the FAO Yearbook of Fishery Statistics most probably correspond to mixed catches of ***P. elephas*** and ***P. mauritanicus*** (4921 metric tons in 1987 and 7869 tons in 1988).

Local Names : FRANCE: Langouste rose, Langouste du large; ITALY: Aragosta bianca, Aragosta mauritanica; MOROCCO: Azeffane, Bakhouche, Langousta; SENEGAL: Soum. Soumpe; SPAIN: Langosta rosada, Langosta roja.

Literature : Fischer, Bianchi & Scott (eds), 1981:vol. 5; Fischer, Bauchot &Schneider (eds), 1987:309-310.

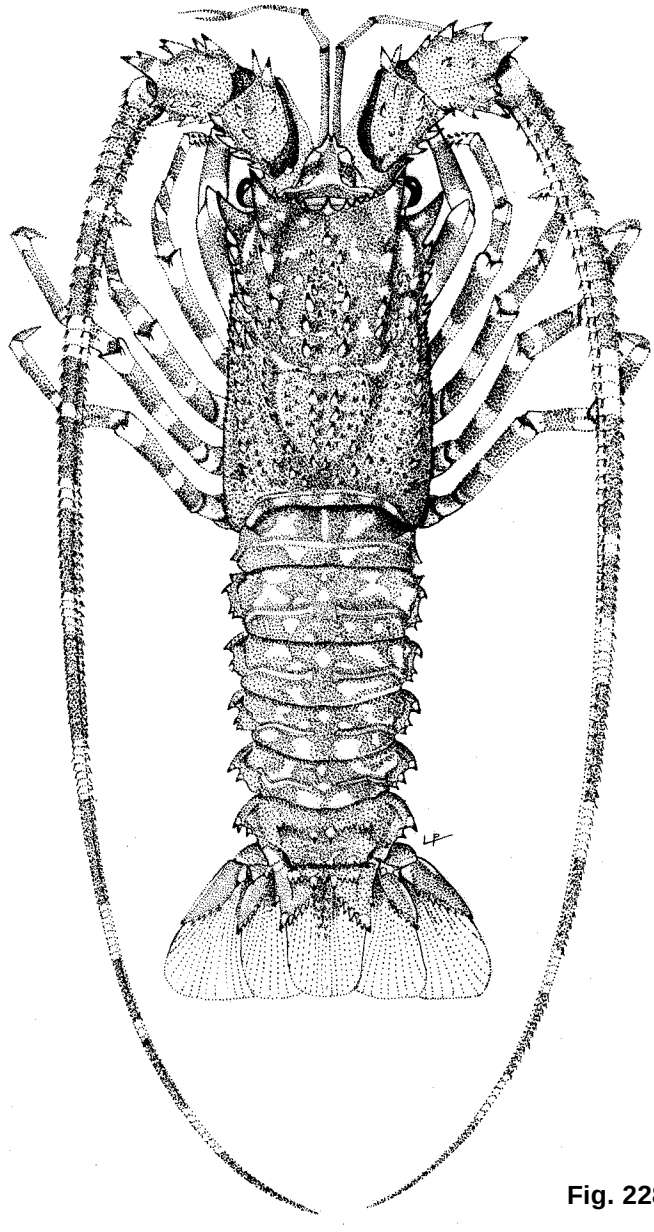


Fig. 228

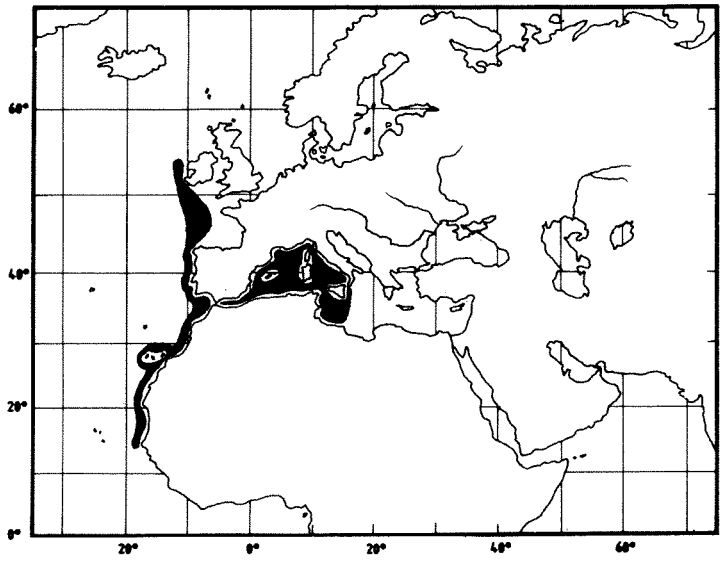


Fig. 229

Palinustus A. Milne Edwards, 1880

PALIN Palinus

Palinustus A. Milne Edwards, 1880, Bulletin Museum Comparative Zooloav, Harvard College, 8(1):66. Gender masculine. Placed on the Official List of Generic Names in Zoology in Opinion 519 (published in 1958).

Type Species : by monotypy: ***Palinustus truncatus*** A. Milne Edwards, 1880.

The genus is characterized by the shape of the frontal horns, that do not end in a sharp point but in a broad, bluntly truncated top that sometimes is crenulated; a strong spine is present on the outer margin of each horn.

Four species have been described of this genus, none with any commercial value as the species all seem to be very scarce and all occur at considerable depths. The taxonomic status of some of the species is not yet clear.

From the data in the literature it seems most likely that almost all the specimens, other than the type material, that have been identified as ***Palinustus mossambicus*** do not belong to that species but must be assigned to ***Palinustus waguensis.*** This assumption, which still has to be proven by thorough study of an extensive material, has been adopted here, admittedly without sufficient basic data.However, this seems the best solution at the present time.

Tentative Key to Species:

1a. Anterior margin of carapace between the frontal horns convex, with a single median spine; no other spines on this margin, but a single, small denticle on the inner margin of each horn (Fig. 230a). Epistome with 5 to 7 spines on the anterior margin, and small spines in the anterolateral corner(Natal, South Africa) ***..... P. unicornutus*** (Fig. 235)

1b. Anterior margin of carapace between the frontal horns straight or convex, with two or more spines. Epistome with spinules or tubercles on the anterior margin;anterolateral corners with a single spine or unarmed

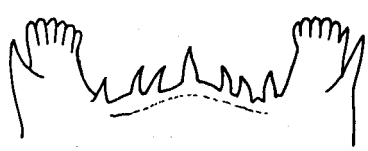
2a. A strong median spine, in addition to several others, on the anterior margin of the carapace between the frontal horns. Inner margin of the horns without spines (230b). Epistome with 5 tubercles on the anteromedian margin; anterolateral corner with a strong spine. Western Atlantic **.** ***..... P.*** **truncatus** (Fig. 233)

2b. No median spine on anterior margin of carapace. Epistome with tubercles or spinules on anteromedian margin; anterolateral corner with a small spine or unarmed. Indo-West Pacific.

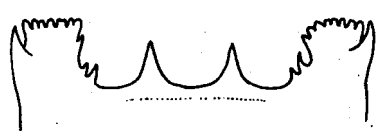
3a. Anterior margin of carapace between frontal horns with a single pair of strong submedian spines; rest of the margin as well as the inner margin of the horns unarmed or with 2 very small spinules (Fig. 230c). Deep sea (406 m), but also reported from 59 to 61 m. East Africa (Somalia, Mozambique) ***..... P. mossambicus*** (Fig. 231)

3b. Anterior margin of carapace as well as inner margin of the frontal horns with several distinct spines (Fig. 230d). Shallow water form, 0 to 180 m. Indo-West Pacific region (India, Thailand, Philippines, Japan) .....***P. waguensis*** (Fig. 237)

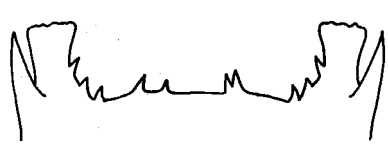
a. *P. unicornutus*



b. *P. truncatus*



c. *P. mossambicus*



d. *P. waguensis*

anterior margin of carapace (dorsal view) **fig. 230**

Palinustus mossambicus Barnard, 1926

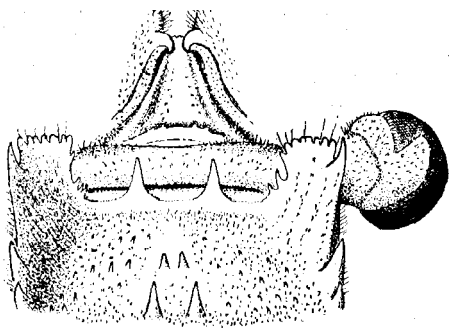
Fig. 231

PALIN Palinus 2

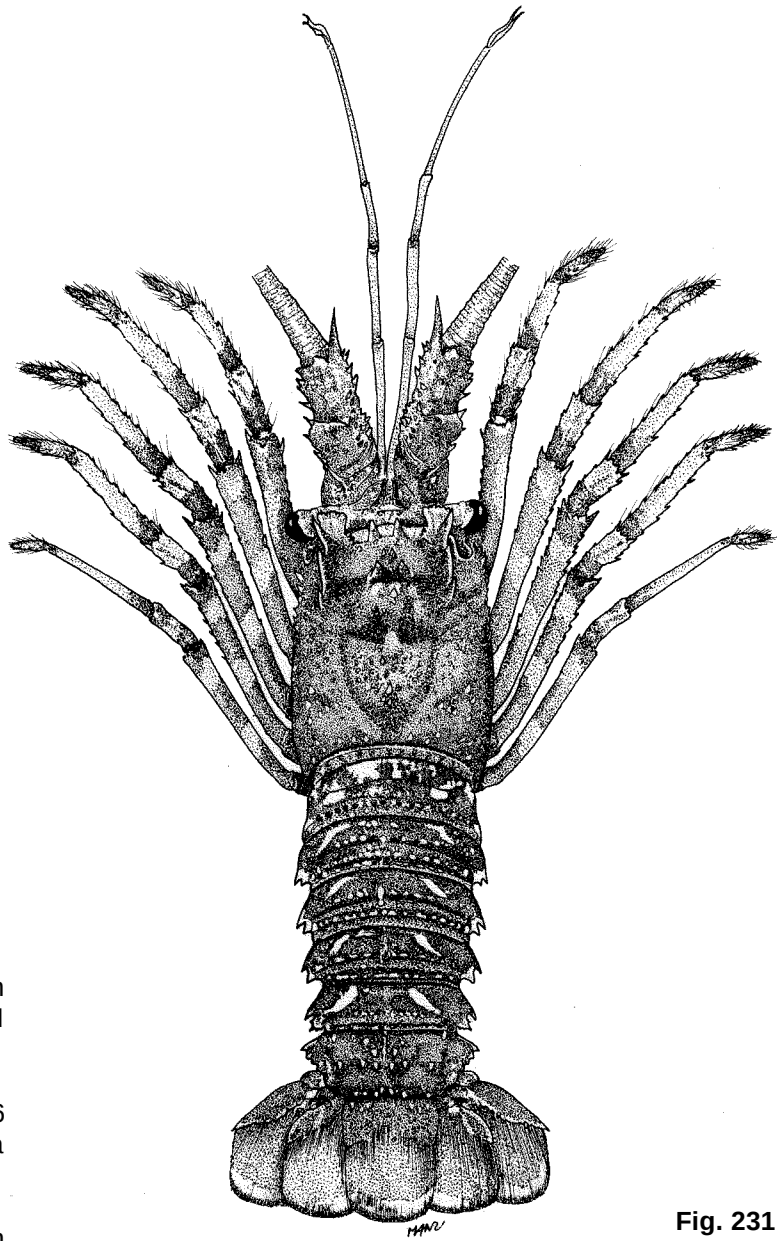
Palinustus mossambicus Barnard, 1926, Transactions Royal Society South Africa, 13: 126, pl. 11.

FAO Names : En - Buffalo blunthorn lobster.

Type : Type locality: Off Mozambique, "25" S., 33º10'E., 406 metres, mud". This position cited by Barnard (1926) is definitely incorrect, as it would be on dry land; it is possible that a number of minutes has to be added to 25" S. Holotype male in SAM, no. A 10684 (in alcohol; condition good).



anterior part of carapace (dorsal view)
(from Barnard, 1950)



(after Barnard. 1926)

Fig. 231

Geographical Distribution : The species has been reported from East Africa (Mozambique and Somalia) (Fig. 232).

Habitat and Biology : Found in deep water (406 m) , but also in 59-61 m depth. Reported from a muddy substrate.

Size : Total body length 9.5 cm. Carapace length 3cm.

Interest to Fisheries : So far none. Very little is known of this species of which only very few specimens have been found.

Literature : Barnard, 1950:545, figs 102 a,b; Berry, 1979:88,89, fig. 1A.

Remarks: Specimens reported under the name ***P. mossambicus*** from India and the Philippines have here, provisionally, been assigned to ***P. waguensis.*** The status of these two species, however, needs further investigation.

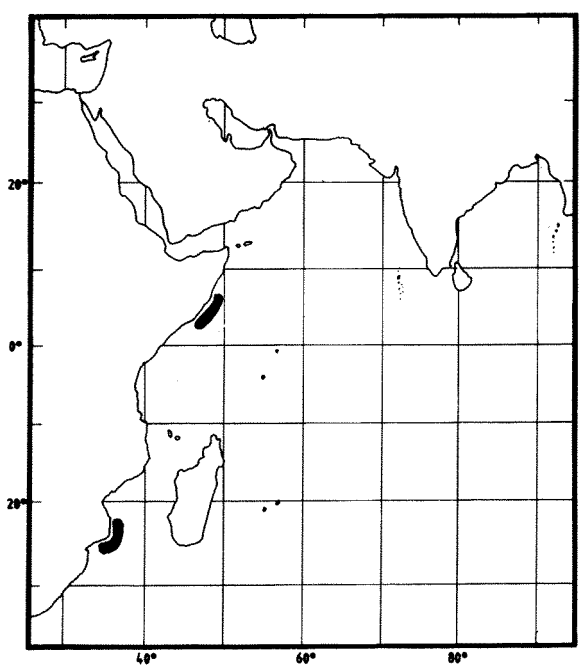


Fig. 232

Palinustus truncatus A. Milne Edwards, 1880

Fig. 233

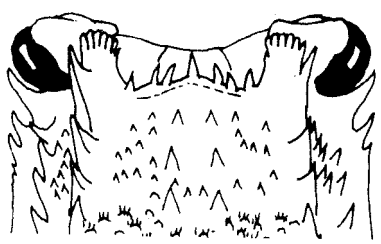
PALIN Palinus 1

Palinustus truncatus A. Milne Edwards, 1880, Bulletin Museum Comparative Zoology, Harvard College, 8:66. Name placed on the Official List of Specific Names in Zoology in Opinion 519 (published in 1958).

Synonyms: ***Palinurus truncatus*** **-** Gruvel, 1911.

FAO Names : En - American blunthorn lobster; **Fr** - Langouste aliousta; **Sp** - Langosta ñata.

Type : Type locality: "Blake" "Station No. 241. Profond. 163 brasses. Cariacou" (= off the Grenadines, 12º28'22"N, 61º32'18"W, 163 fms (= 298 m), sand and coral): type in MCZ.



anterior part of carapace (dorsal view)

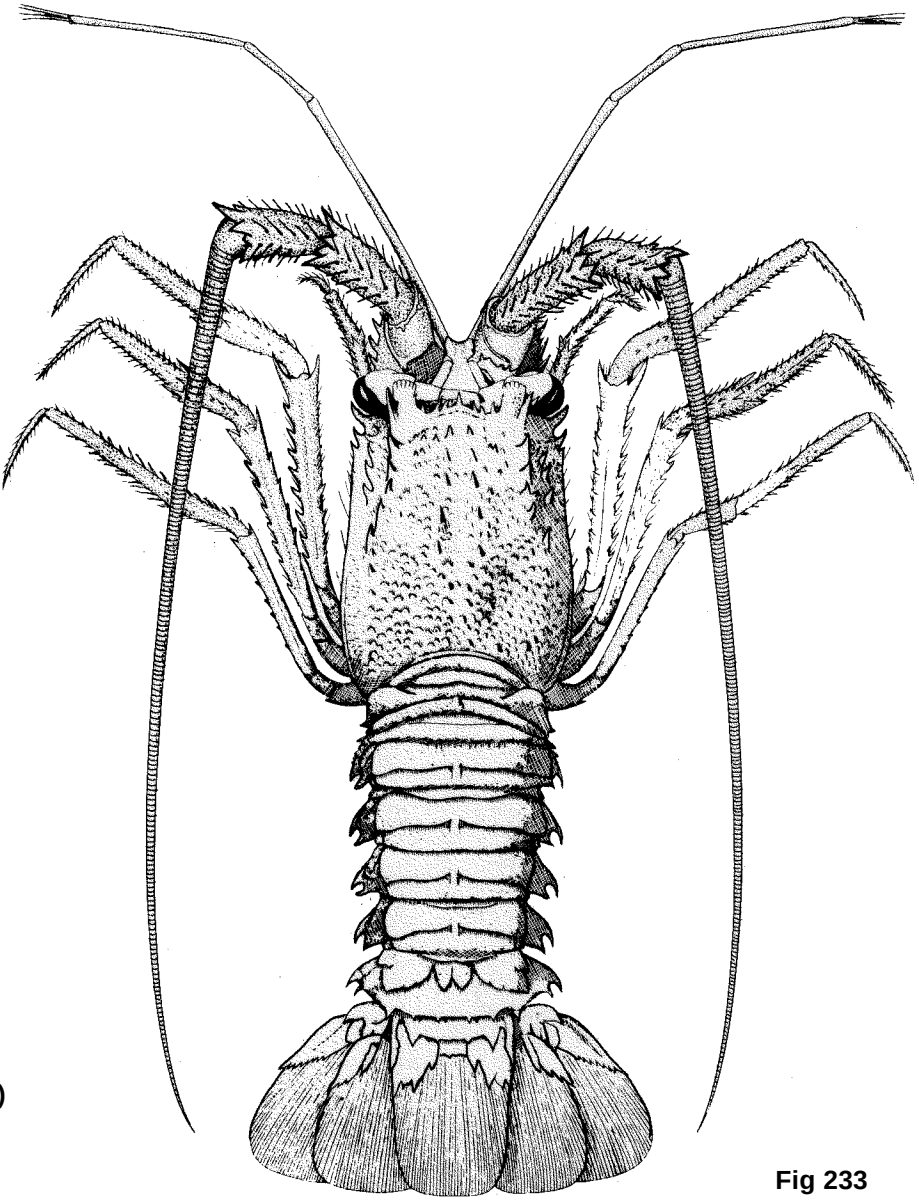


Fig 233

Geographical Distribution : Western Atlantic: from Carriacou Island, Grenadines, to off the mouth of the Amazon River, Amapá and Pará States, Brazil (Fig. 234).

Fig. 234

Habitat and Biology : The species has been taken in depths between 120 and 298 m, but there is a record from the littoral zone, and one from 4111-4122 m. The bottom is variously described as "sand and coral","sandy calcarenite", and "smooth, consisting of brown mud".

Size : Carapace lengths of 1.6 to 3.2 cm have been reported, the known maximum body length is 10 cm.

Interest to Fisheries :So far none. The species is evidently rare, and perhaps has a restricted range. Better knowledge of its occurrence and habits is required for deciding whether a future fishery will prove feasible.

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

PALIN Palinus 3

Palinustus unicornutus Berry, 1979

Fig. 235

Palinustus unicornutus Berry, 1979, Annals South African Museum, 78(3).93, figs 1,2,3G.

FAO Names : En - Unicorn blunthorn lobster.

Type : Type locality: "Due east of Boteleur Point, Natal (approximately 26º57'S 32º58'E). Depth 390 m"; holotype ovigerous female in SAM, No. A 15880 (in alcohol, condition good); paratype in SAM, No. A 15881 (in alcohol condition good).

Geographical Distribution : Off Natal, South Africa (off Boteleur Point, and off Park Rynie, ca. 30º19'S 30º56'E) (Fig. 236).

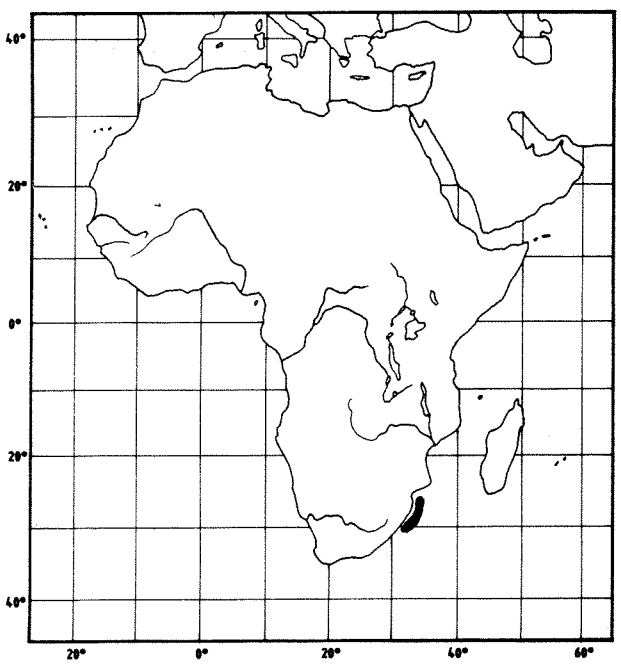
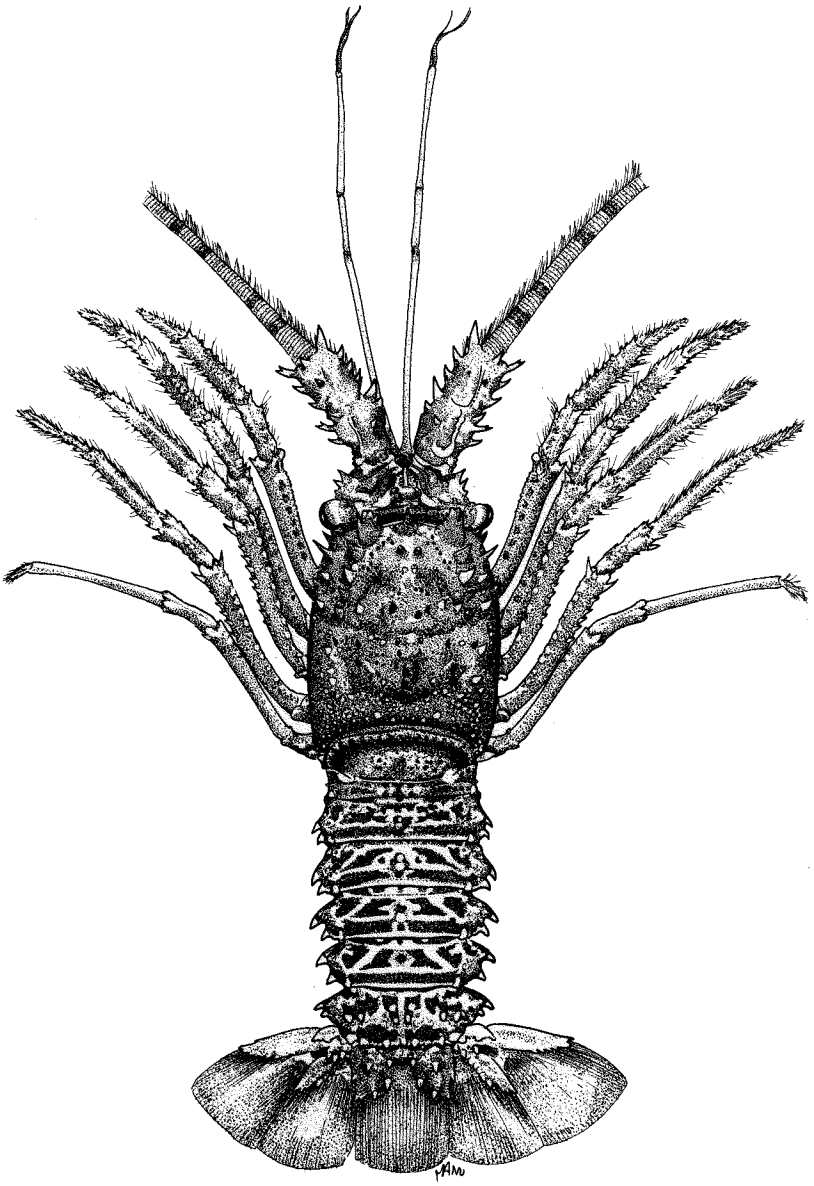


Fig. 236



(after Berry, 1979)

Fig. 235

Habitat and Biology : Depth range from 305 to 390 m.

Size : The two known specimens (both females) have a total body length of 14.2 cm (ovigerous female) and 13.4 cm, corresponding to a carapace length of 4.8 and 4.4 cm.

Interest to Fisheries : Since only 2 specimens are known, captured in lobster pots,it is clear that so far there is no fishery for the species.

Literature : Original publication.

PALIN Palinus 4

Palinustus waguensis Kubo, 1963

Fig. 237

Palinustus waguensis Kubo, 1963, Journal Tokyo University Fisheries, 49(1):63, figs 1-3.

FAO Names : En - Japanese blunthorn lobster.

Type : Type locality:"Shallow waters in the vicinity of Wagu, Mie Prefecture", Honshu, Japan; whereabouts of holotype male unknown.

Geographical Distribution : Indo-West Pacific region. The species so far is only known from Honshu Island, Japan, viz. from Wagu and Kii-nagashima, both Mie Prefecture, and from Sagami Bay. Sekiguchi & Okubo (1986) mentioned 15 specimens from the east and south coast of Kii peninsula (Mie and Yamagata prefectures) without giving precise localities. What is believed to be this species has been reported under the name ***P. mossambicus*** from S-W. India and the Philippines (Sulu Sea). In the Zoological Museum at Copenhagen there is a juvenile (cl 8 mm) from the Bay of Amboina (Moluccas, Indonesia). Specimens from the Andaman Sea near Ranong, Thailand, are present in Chulalongkorn University, Bangkok and RMNH (Fig. 238).

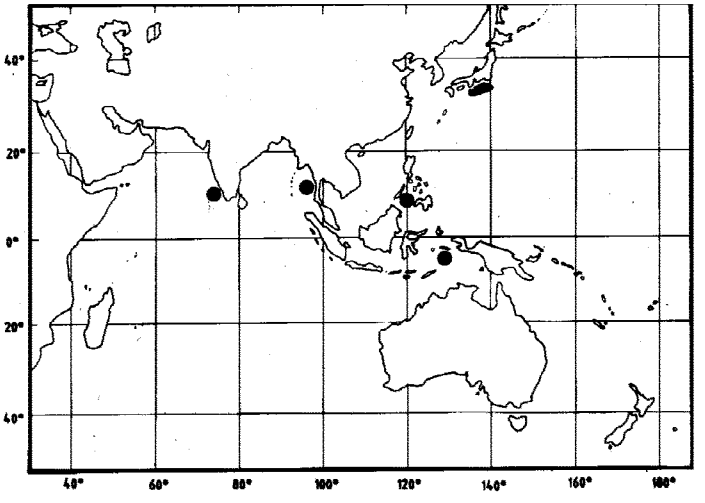
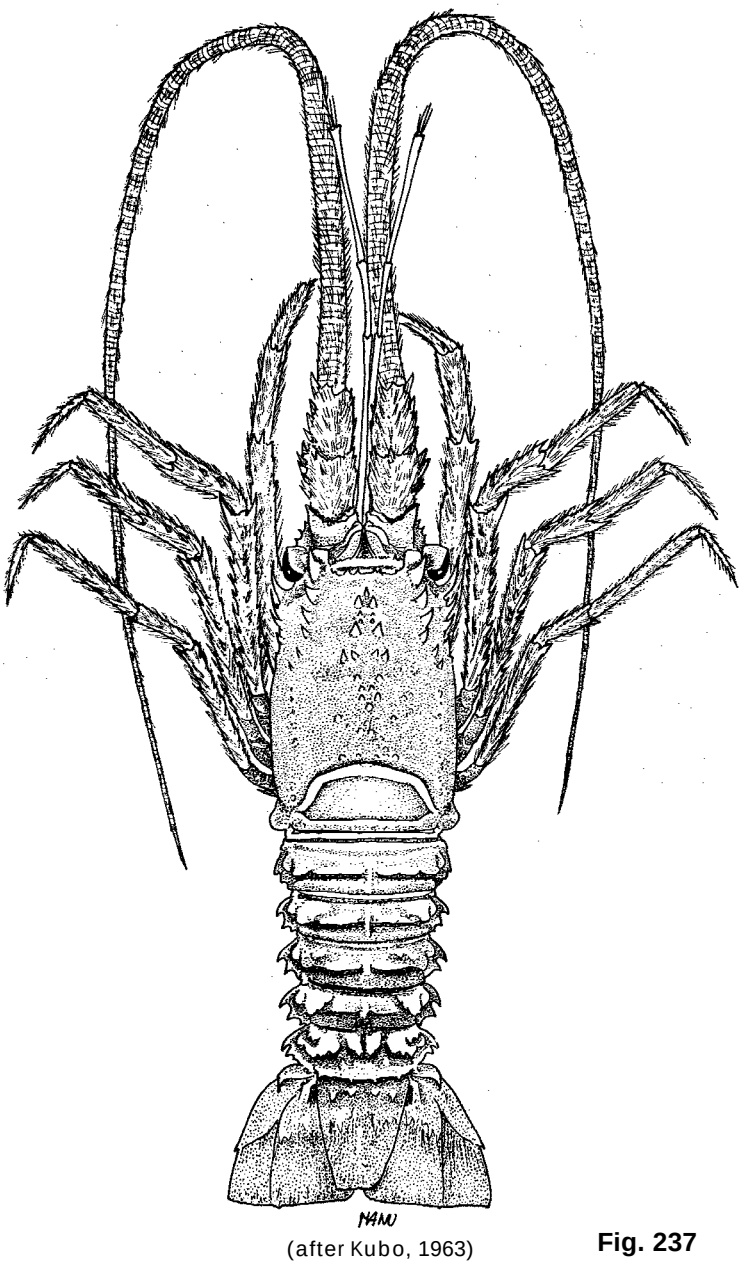


Fig. 238



(after Kubo, 1963)

Fig. 237

Habitat and Biology : Reported from rather shallow water in Japan, where it sometimes is caught in lobster trap nets. The specimens from India and the Philippines were taken in depths between 72 and 84 m, the juvenile from Amboina came from a depth of "ca. 100 fms" (about 180 m), from a stony bottom. Some data on the biology and body posture are published by Sekiguchi & Okubo (1986).

Size : Total body length 5 to 10 cm, carapace length 0.8 to 3.2 cm.

Interest to Fisheries : In Japan there is no commercial fishery for this relatively rare species, but fishermen obtaining specimens in their lobster nets (which in Japan can only be legally used from October to April), often give or sell these specimens to the public aquaria on the Japanese east coast. George (1973), however, reported that the species, he had indicated as ***P. mossambicus,*** has been obtained in large numbers from certain localities in India and that it may be the object of a fishery there (Kurian & Sebastian, 1982: 162).

Local Names : JAPAN: Wagu-ebi.

Literature : Berry, 1979:88,89, fig.3; Sekiguchi & Okubo, 1986: 19-26.

Remarks : The taxonomic status of this species vis à vis ***P. mossambicus*** is far from clear, and a closer study of the complex is highly desirable.

click for next page

Panulirus White, 1847

PALIN Panul

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

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

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

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

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

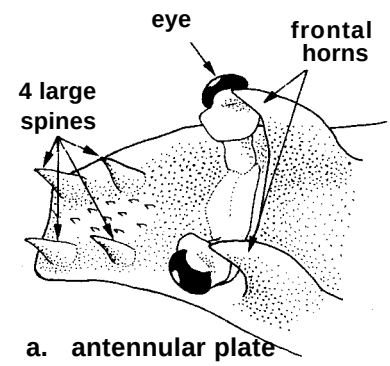
Key to Species:

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

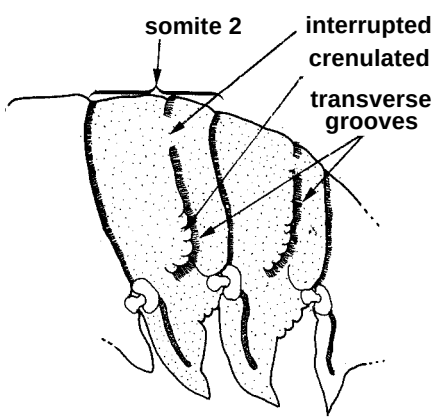
2a. Anterior margin of transverse groove of abdominal somites crenulated. Groove itself either complete or interrupted in the middle (Fig. 239b). Antennular plate with 4 equal, large, well separated spines, arranged in a square with additional very small spinules scattered in between (Fig 239a). Exopod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

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

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

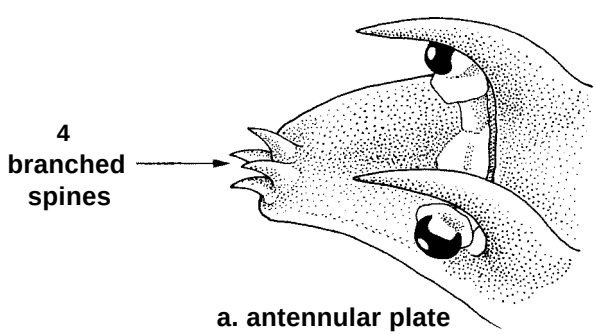


a. antennular plate

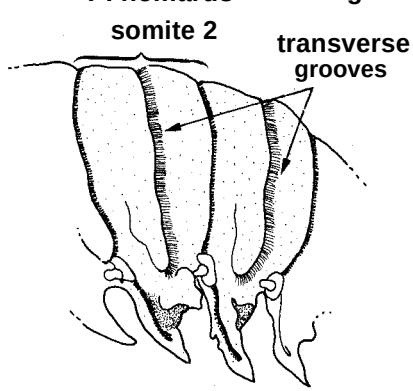


b. abdominal somites (lateral view)

P. homarus **Fig. 239**



a. antennular plate



b. abdominal somites (lateral view)

P. penicillatus **Fig. 240**

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

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

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

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

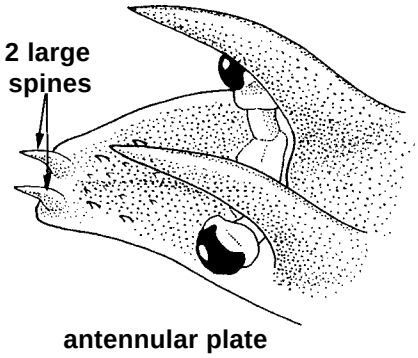
6b. Atlantic species (N.E. Brazil, Central Atlantic Islands from the Canary Islands to St. Helena). Exopod of third maxilliped reduced, without flagellum. Colour: body and especially the tail covered by distinct rounded whitish spots. Antennulae and legs streaked with yellowish or whitish longitudinal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

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

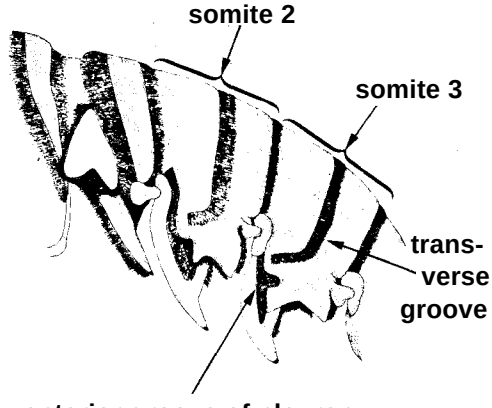
7a Transverse groove of abdominal somite 2 does nol join the groove along the anterior margin of the corresponding pleura (Fig. 243). Exopod of third maxilliped present, with flagellum. Colour: body dark purple with some greenish, not speckled. Irregular pale bands along posterior margin of abdominal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

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

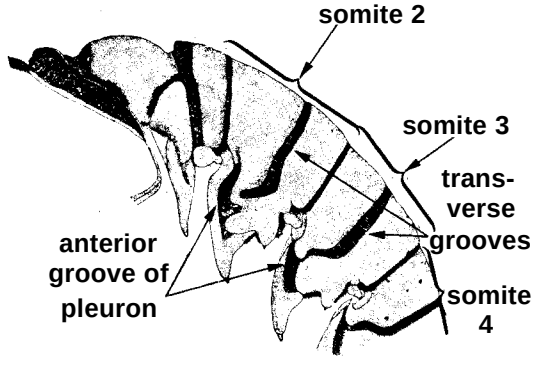
8a Anterior margin of pleuron of abdominal somite 2 with distinct teeth (Fig. 244). Exopod of third maxilliped present, with flagellum. Colour: carapace with yellowish, reddish and brownish colour, not spotted. Abdomen bright to dark purple with a very conspicuous transverse yellow band over the middle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



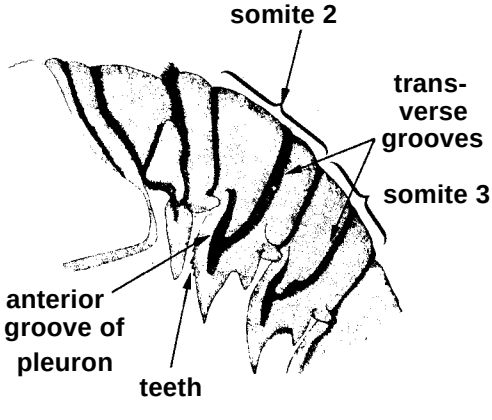
antennular plate
P. longipes **Fig. 241**



abdominal somites (lateral view)
P. japonicus **Fig. 242**



abdominal somites (lateral view)
P. pascuensis **Fig. 243**



abdominal somites (lateral view)
P. marginatus **Fig. 244**

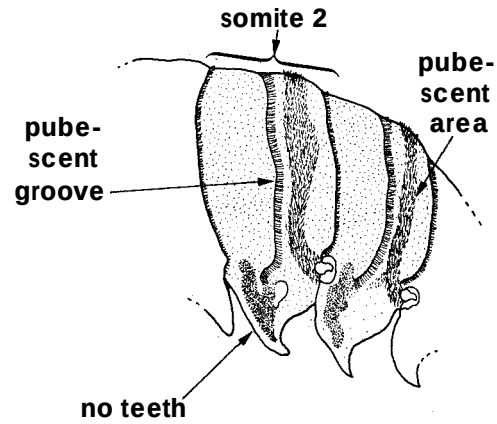
8b. Anterior margin of pleura of abdominal somite 2 without distinct teeth. Colour: abdomen without a transverse light coloured band (although sometimes the hairs of the transverse groove may give the impression of such a coloured band), but with more or less distinct light spots. Legs with longitudinal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

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

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

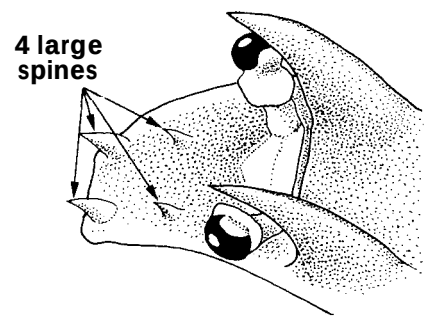
10a Indo-West Pacific. Exopod of third maxilliped present, with flagellum. Colour: body, and especially the abdomen covered with numerous distinct round spots. Legs with light longitudinal streaks, which sometimes end just before a single pale spot. Antennulae with longitudinal streaks .. ***P. longipes***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

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



abdominal somites (lateral view)
P. Cygnus
Fig. 245

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

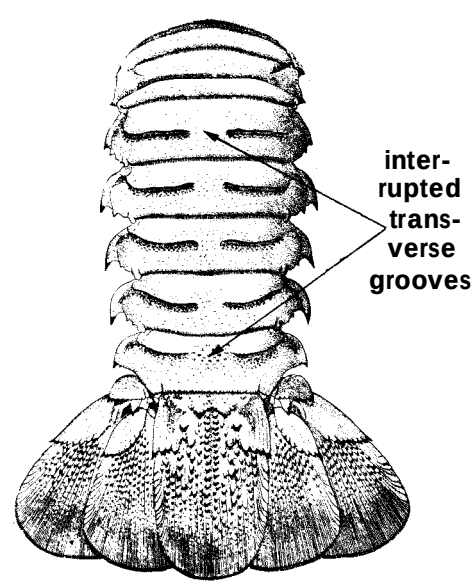


antennular plate

P. ornatus
Fig. 246

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

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



abdomen (dorsal view)
P. interruptus
Fig. 247

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

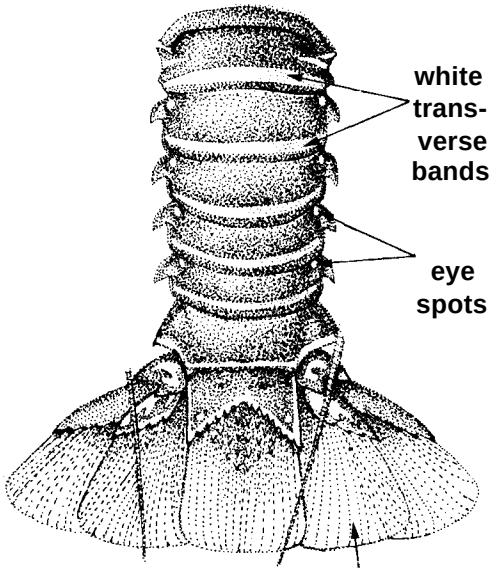
12b. Western Atlantic. Third maxilliped with an exopod provided with a flagellum. Colour: abdominal somites reddish or brownish, sometimes greenish, without transverse colour bands. A large eyespot of whitish or yellowish, surrounded by a dark colour is placed over the anterior end of the base of the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

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

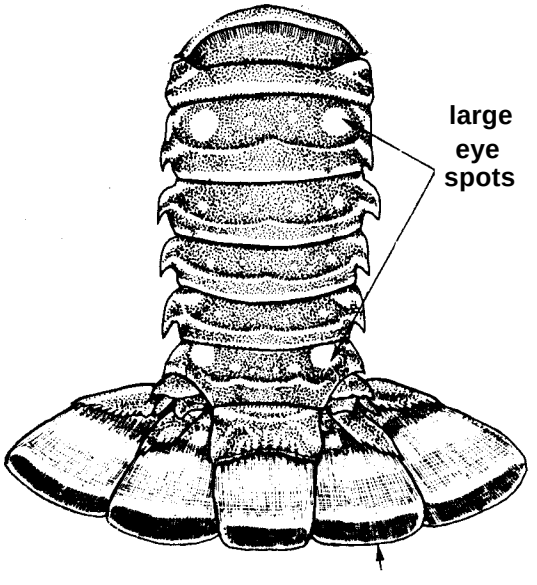
13a. Abdominal somites 1 to 6 with a distinct uninterrupted white transverse band along the posterior margin

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

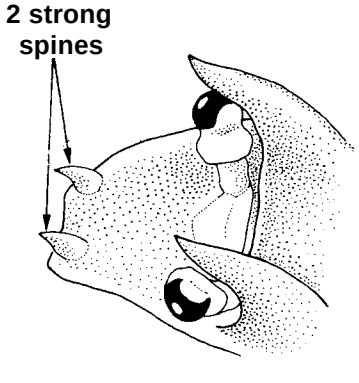
14b Antennular plate with 4 strong spines arranged in a quadrangle (Fig. 252a). The whitish transverse bands along the posterior margin of the abdominal somites very distinct because they have a dark band in front and just behind them (Fig. 251,252b)



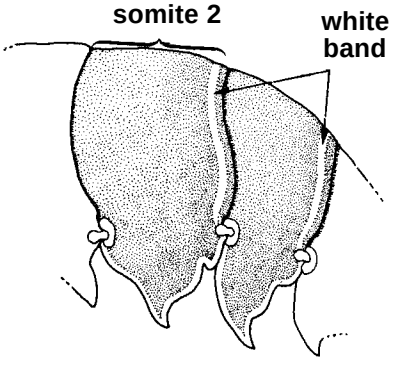
abdomen (dorsal view) ***P. regius*** **Fig. 248**



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

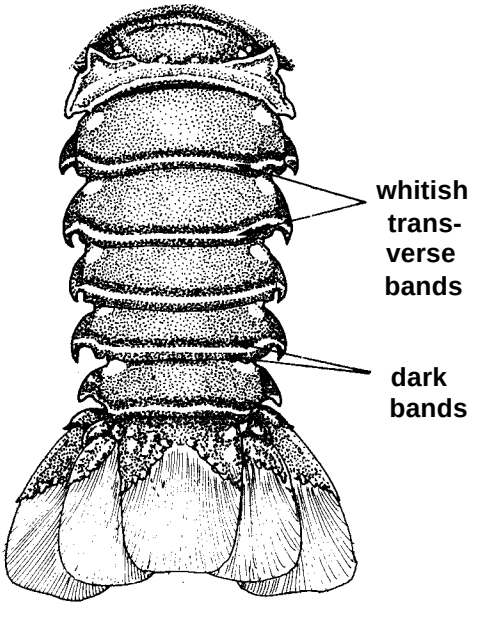


a. antennular plate



b. abdominal somites (lateral view)

P. polyphagus **Fig. 250**



abdomen (dorsal view)
P. gracilis **Fig. 251**

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

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

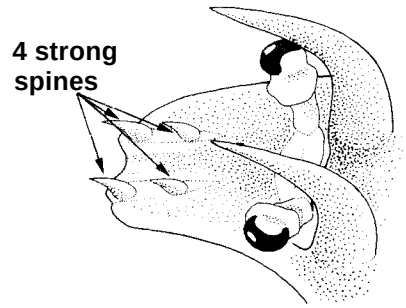
13b. Abdomen without distinct transverse bands on all somites, sometimes there is a line of pale spots there, or a narrow line is present on somites 1 to 3, but on somites 4 and 5 this is replaced by a row of spots. Antennular plate with 4 spines

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

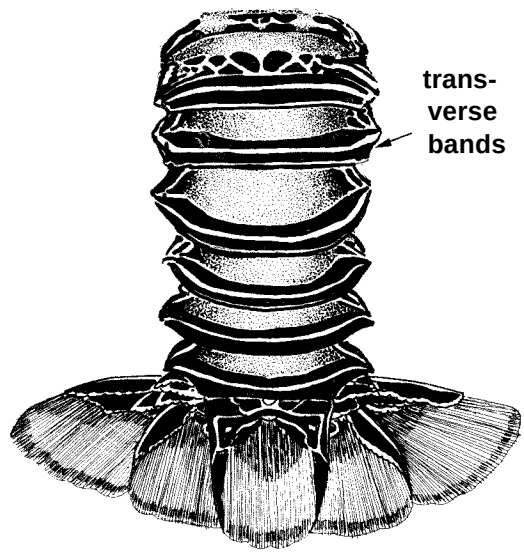
16b. Abdominal somites 1 to 6 without transverse whitish bands; if a row of spots is visible along the posterior margin, these spots are very minute and the rows are found on all somites

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

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

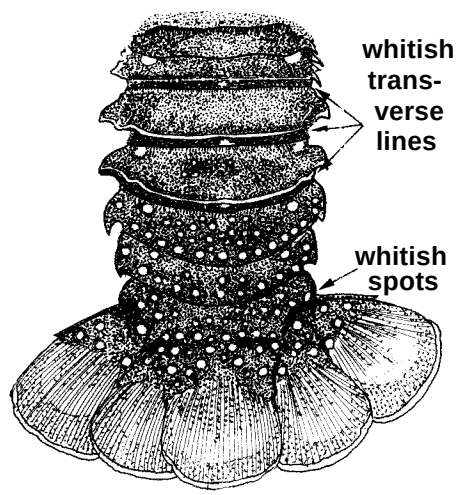


a. antennular plate (lateral view)



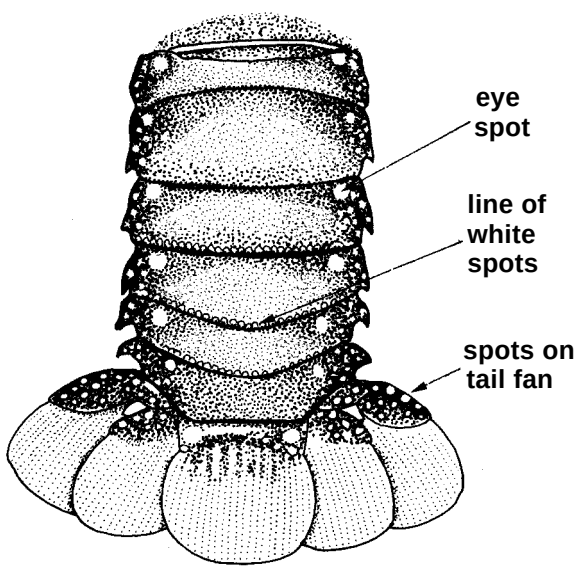
b. abdomen (dorsal view)

P. versicolor **Fig. 252**



abdomen (dorsal view)

P. inflatus **Fig. 253**

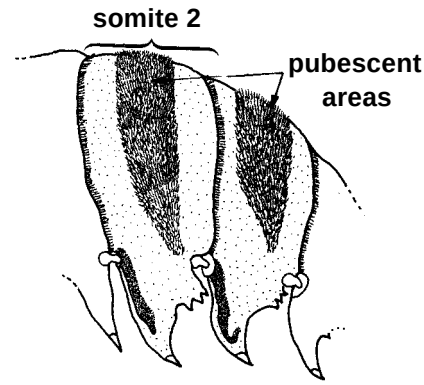


abdomen (dorsal view)

P. laevicauda **Fig. 254**

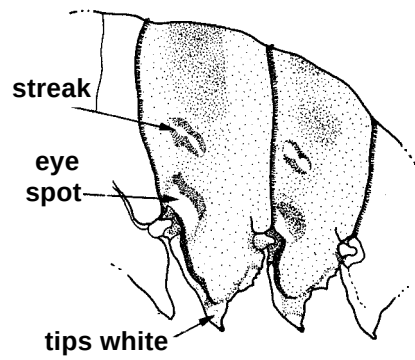
18a. Abdominal somites with a large pubescent area on each half of the dorsal surface (Fig. 255). The normal eyespot is present in the anterior half of the abdominal somites above the base of the pleura, but this spot is not accompanied by a light streak. Pleura without spots, but with a white line along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

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



abdominal somites (lateral view)

P. stimpsoni **Fig. 255**



abdominal somites (lateral view)

P. ornatus **Fig. 256**

Panulirus argus (Latreille, 1804) **Fig. 257** **PALIN Panul 1**

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

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

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

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

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

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

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

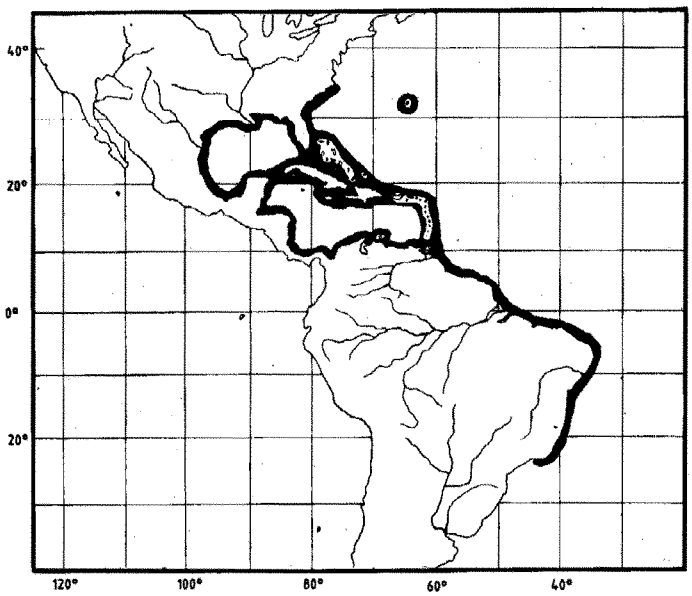


Fig. 258

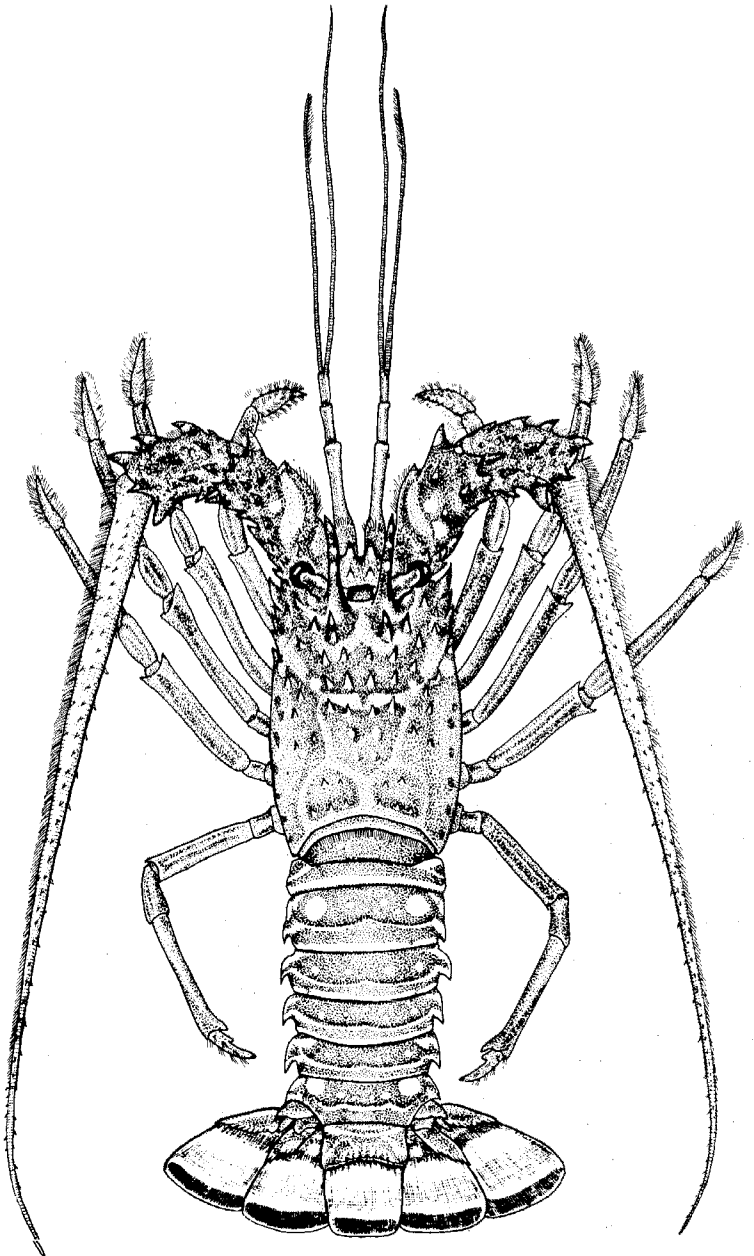


Fig. 257

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

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

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

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

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

Panulirus Cygnus George, 1962

Fig. 259

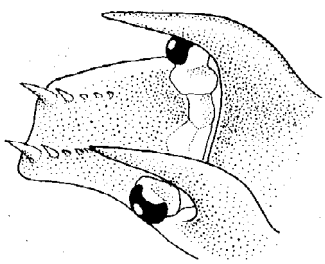
PALIN Panul 12

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

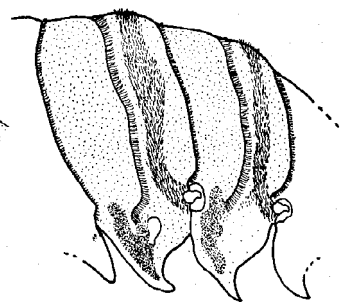
Synonyms: ***Panulirus longipes Cygnus*** **-** Chittleborough & Thomas, 1969. In the older literature concerning Western Australian lobsters, the present species has often incorrectly been given the name ***Panulirus longipes*** (A. Milne Edwards).

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

Type : Type locality:"Radar Reef, Rottnest Island, Western Australia (32ºOO'S 115º30'E), in reef pool at depth of 1 metre". Holotype male in WAM, no. 90-62.



antennular plate



abdominal somites (lateral view)

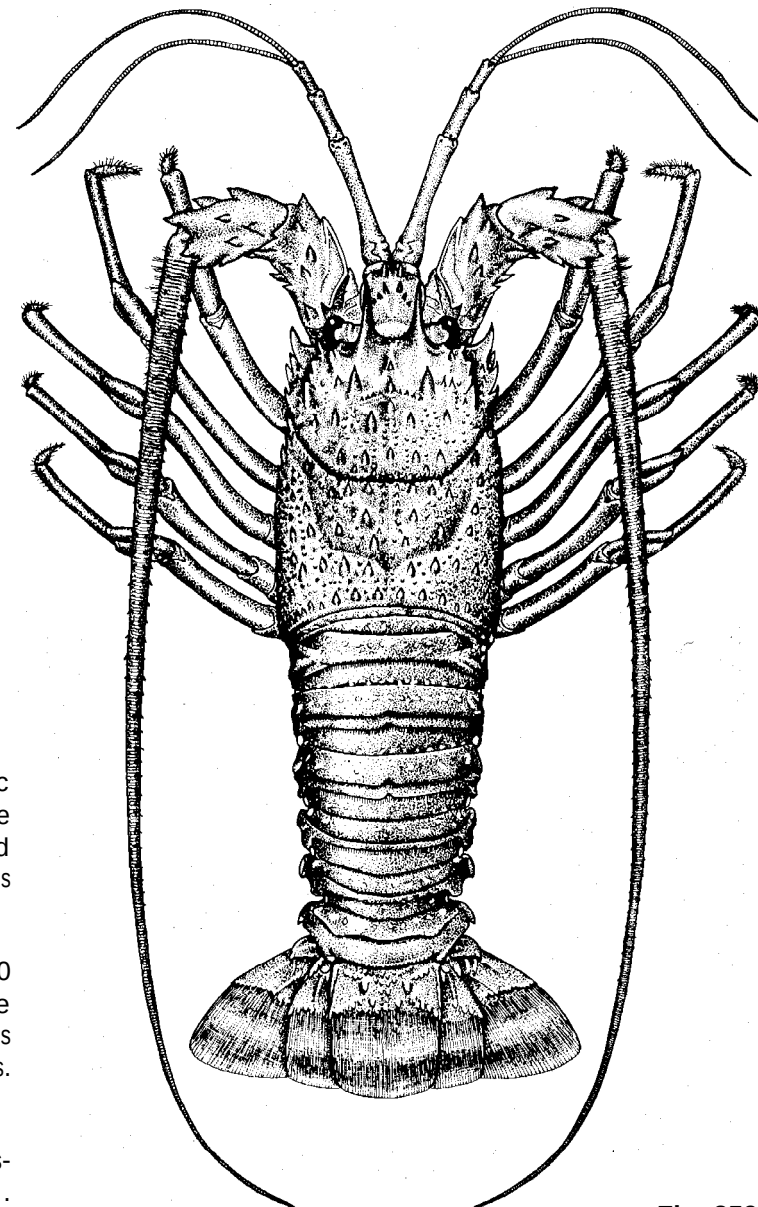


Fig. 259

Geographical Distribution : Indo-West Pacific region: restricted to Western Australia, namely on the west coast between Northwest Cape (21º48'S) and Hamelin Harbour (34º30'S) and at the offshore islands (Fig. 260).

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

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

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

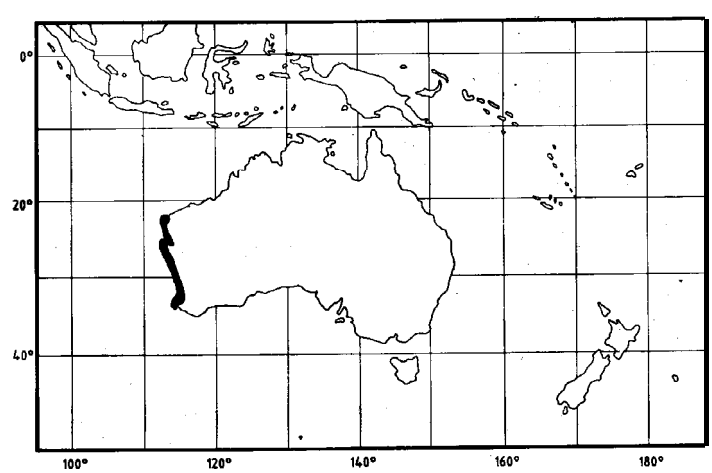


Fig. 260

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

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

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

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

Panulirus echinatus Smith, 1869

Fig. 261

PALIN Panul 4

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

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

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

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

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

Type locality of ***Panulirus guttatus brasiliensis:*** "Atóll das Roccas. - lattitude S.3º52'30" e longitude EM do Rio de Janeiro 9º20'26" - e Pernambuco". Whereabouts of type material unknown.

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

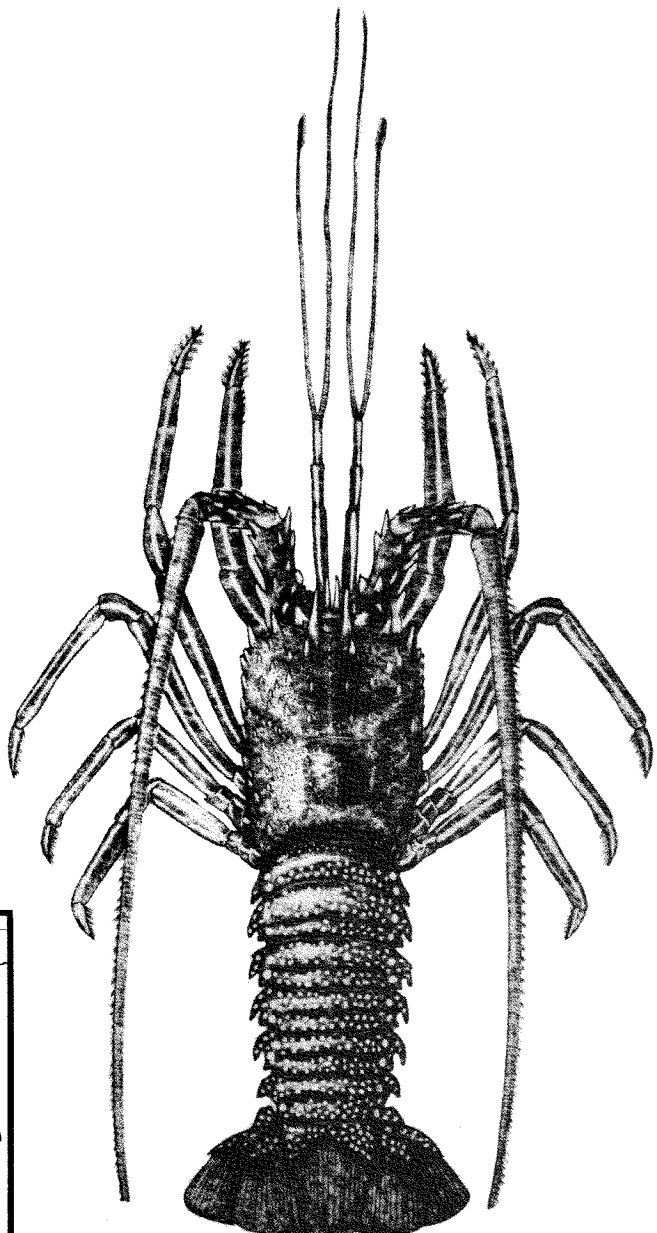


Fig. 261

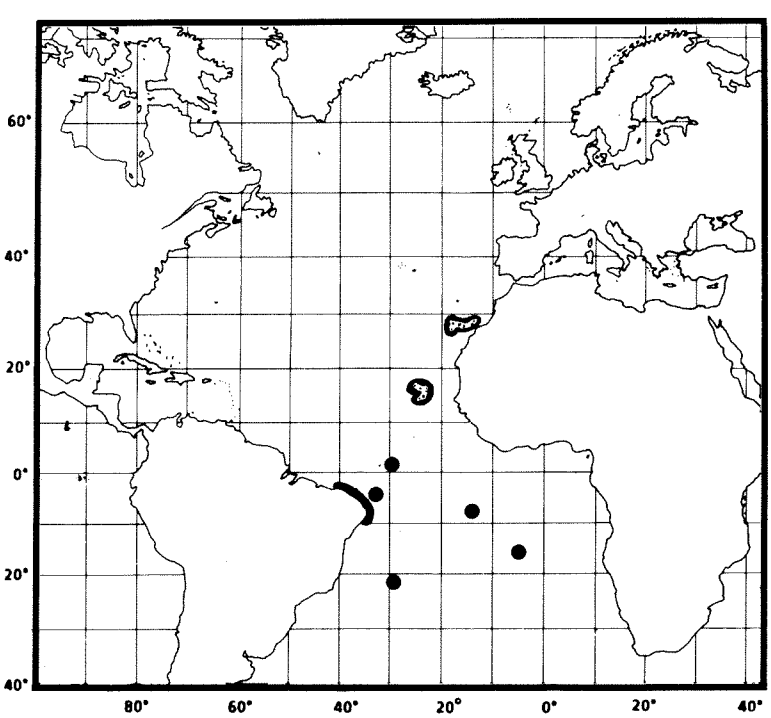


Fig. 262

Habitat and Biology : Depth range from 0 to 35 m. but usually not deeper than 25 m; in deep crevices in rocks, among boulders, etc. The animals are nocturnal.

Size : The carapace length varies from 3 to 19 cm (males) and 2 to 15 cm (females), the total.body iength from 7 to 39 cm (males) and 5 to 38 cm (females). Ovigerous females with carapace length 5 to 10 cm have been reported. In some areas the population consists of animals much smaller than in other areas.

Interest to Fisheries : The species is fished for throughout its range. In St. Helena it is reported to be of commercial importance. In the Cape Verde Islands it is the most abundant coastal lobster, and it might support a more intensive fishery. In Brazil it is fished and marketed in the states where it occurs, as well as at Fernando do Noronha and Atol das Rocas.

The species is caught with lobster traps, by diving and. by hand (at night with torches in shallow water). In Brazil it is often taken together with ***Panulirus argus*** or ***P. laevicauda.***

Local Names : BRAZIL: Lagosta pintada, Lagosta encarnadinha, iagosta roxa, Lagostinho, Potiquiquiya; CAPE VERDE ISLANDS: Lagosta vermelha; FRANCE: Langouste brune des lles du Cap Vet-t; ST HELENA: Long legs.

Literature : Fischer, Bianchi & Scott (eds), 1981 :vol. 5; Williams, 1986:20, fig. 47

Panulirus gracilis Streets, 1871 **Fig. 263** **PALIN Panul 13**

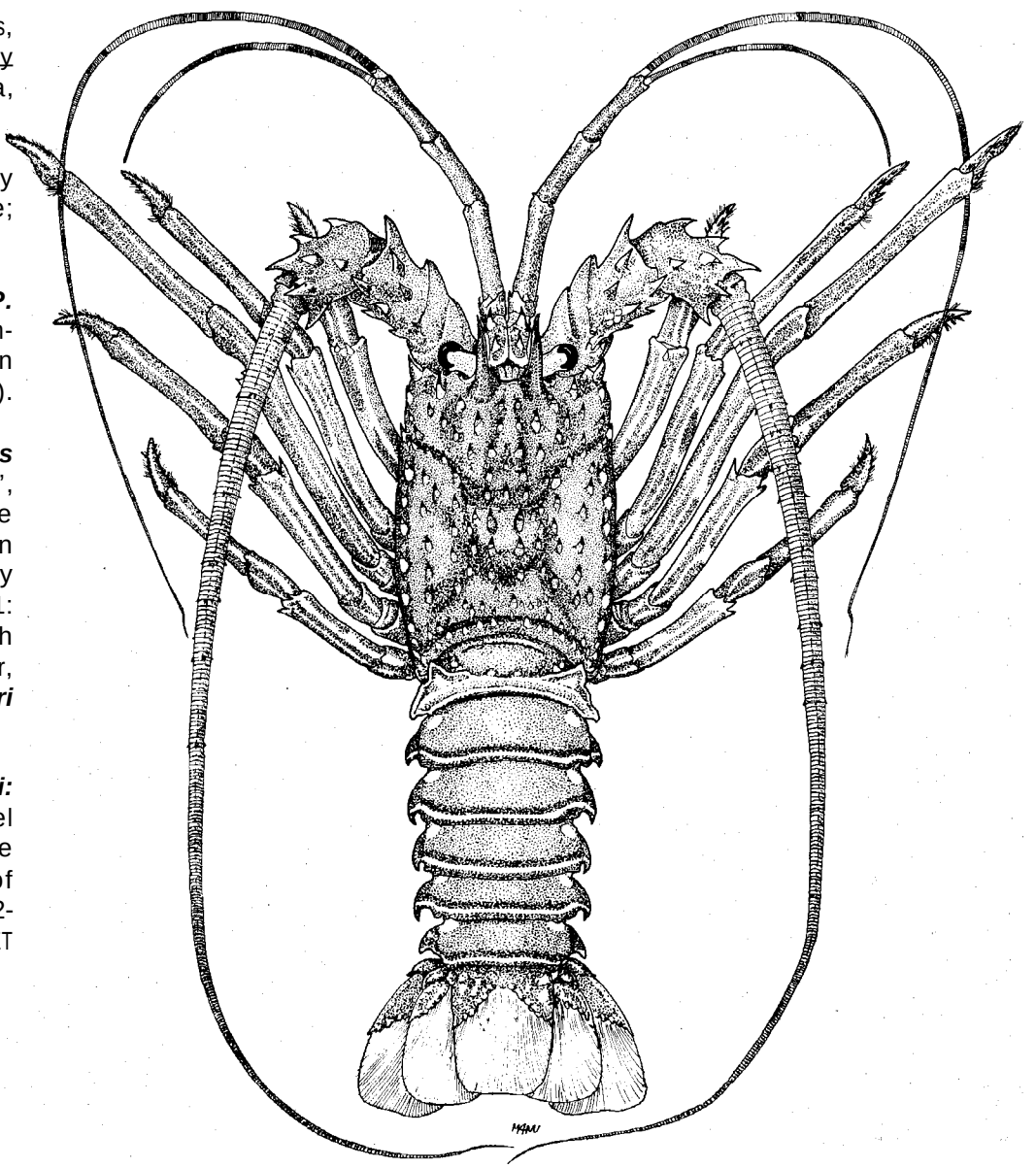
Panulirus gracilis Streets, 1871, Proceedings Academy Natural Sciences, Philadelphia, 1871: 225, pl 2, fig. 2.

FAO Names: En - Greenspiny lobster; **Fr** - Langouste verte; **Sp** - Langosta barbona.

Type : Type locality of ***P. gracilis:*** "Gulf of Tehuantepec, Mexico". Holotype in ANSP (not located in 1989).

Type locality of ***P. brevipes*** and ***P. paessleri:*** "Mazatlan", Mexico. The male syntype specimen from this locality in ZMH, no. 8074, is chosen by Holthuis & Villalobos (1961: 265) as the lectotype of both ***Palinurus brevipes*** Pfeffer, 1881 and ***Palinurus paessleri*** Pfeffer, 1897.

Type locality of ***P. martensii:*** "sulle coste Pacifiche del Darien" (= region of Golfo de San Miguel, Pacific coast of Panama; see E. Festa, 1909: 12-53, map). Syntypes in MZT no.Cr. 1185.



(combined after Holthuis & Vlllalobos, 1961, and Holthuis & Loesch, 1967) **Fig. 263**

Geographical Distribution : Eastern Pacific from Baja California (Mexico) to Paita (Peru), and the Galapagos Islands (Fig. 264).

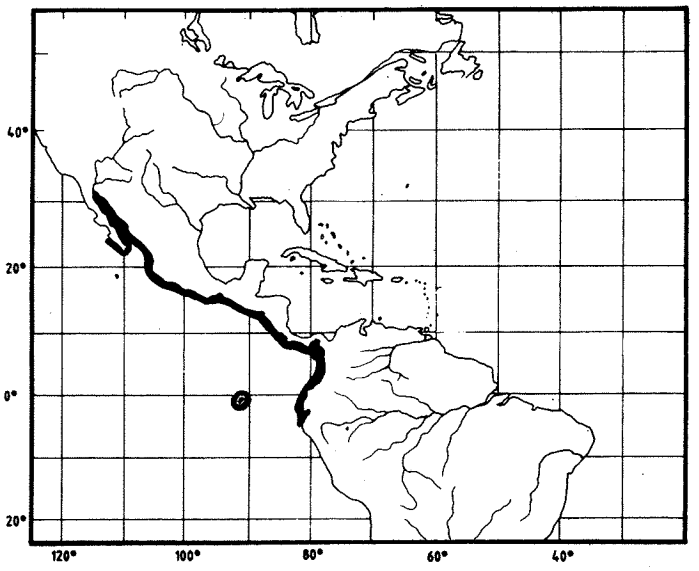


Fig. 264

Habitat and Biology : Inhabits shallow coastal waters (0 to 18 m); among rocks and in cracks and crevices. The animals are nocturnal.

Size : Maximum total body length 32 cm (males) and 30 cm (females); carapace length 1 to 13 cm (males), and 1 to 12 cm (females).

Interest to Fisheries : The species is fished for commercially throughout its range and is sold in local markets. It is taken with trammel nets, by hand or with lobster pots.

Local Names : ECUADOR: Langosta Verde; Blue lobster, Langosta azul (Galapagos Islands); MEXICO: Langosta Verde, Langosta güera, Langosta de playa, Langosta caribe; PANAMA: Langosta barbona; PERU : Langosta Verde.

Literature : Holthuis & Villalobos, 1961:252, figs; Holthuis & Loesch, 1967:220, pl. 9; Williams, 1986:24, figs 56,80 e-f.

Panulirus guttatus (Latreille, 1804)

Fig. 26

PALIN Panul 2

Palinurus guttatus Latreille, 1804, Annales Muséum Histoire Naturelle, Paris, 3:392.

Synonyms: ***Palinurus (Senex) guttatus*** - Pfeffer, 1881.

FAO Names : **En** - Spotted spiny lobster; **Fr** - Langouste tachetee; **Sp** - Langosta moteada.

Type : Type locality:"dans les mers des Grandes-Indes". Through the lectotype selection by Holthuis (1959: 126) the type locality is restricted to Suriname. Whereabouts of lectotype unknown.In MP are two dry specimens of this species (nos. Pa 440 and Pa 441) in a reasonable condition, labelled "Antilles", which may be syntypes.

Geographical Distribution : Western Atlantic: Bermuda, Bahamas, South Florida, Belize, Panama, Caribbean Arc from Cuba to Trinidad, Curaçao, Bonaire, Los Roaues, Suriname. (Fig. 266).

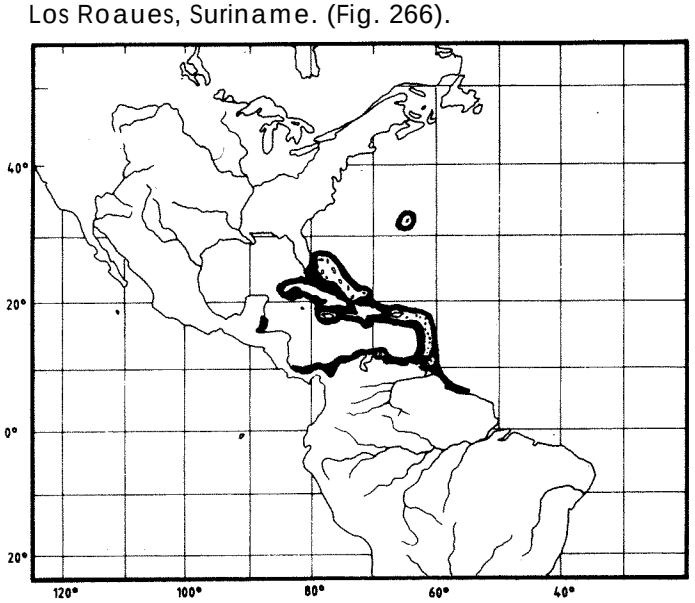


Fig. 266

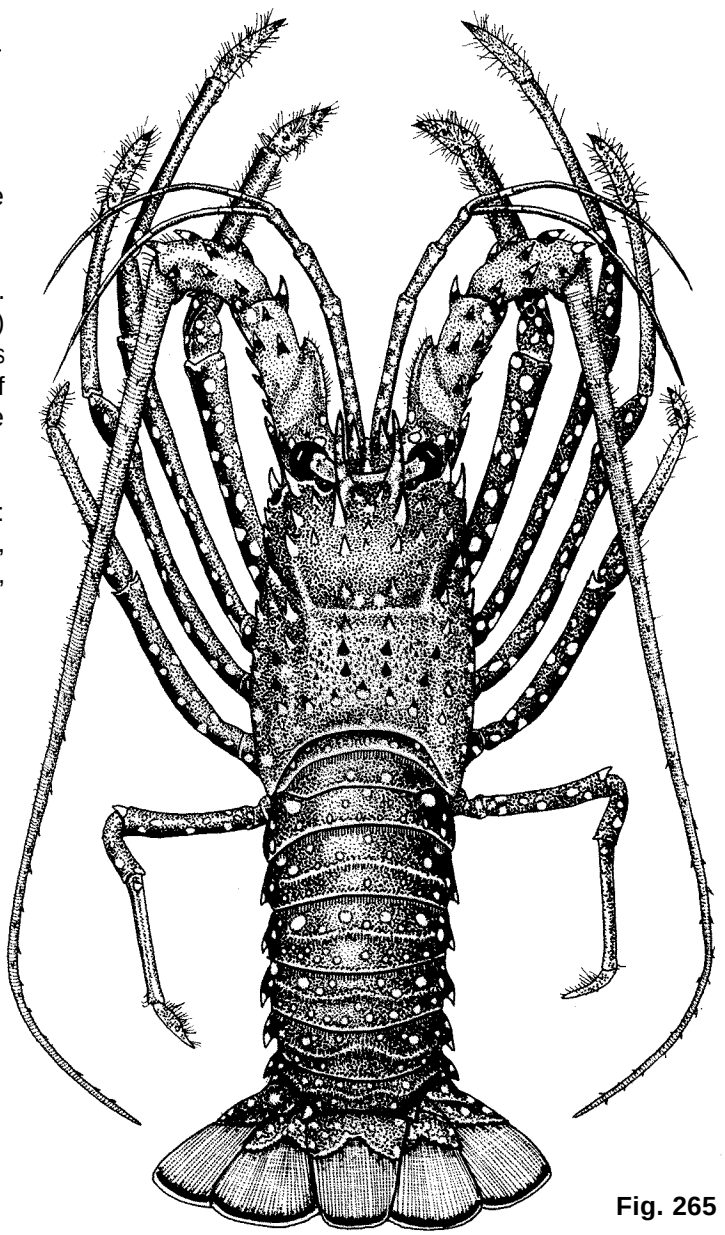


Fig. 265

Habitat and Biology : A shallow water species, inhabiting rocky areas, mainly in crevices.

Size : Maximum total body length about 20 cm, commonly to 15 cm

Interest to Fisheries : The species is taken throughout its range, but rather incidentally; there is no special fishery for it. It is taken by hand or speared and occasionally caught in traps, mostly those set for other species. Marketed fresh and mostly used for local consumption.

Local Names : BERMUDA: Guinea chick lobster, Star lobster, Spotted spiny lobster; CUBA: Langosta manchada, Langosta Verde; MARTINIQUE: Homard bissie, Homard brésilien; NETHERLANDS ANTILLES: Kreef spanjo, Kreef indjan (Curaçao, Papiamentu language), Spanish lobster (St. Martin), Sand lobster (St. Eustatius); USA: Spotted lobster, Guinea lobster, Rock lobster, Spotted crawfish, Spotted spiny lobster.

Literature : Fischer (ed), 1978:vol. 6; Williams, 1986: 19, figs 43,78o,79a.

Panulirus homarus (Linnaeus, 1758)

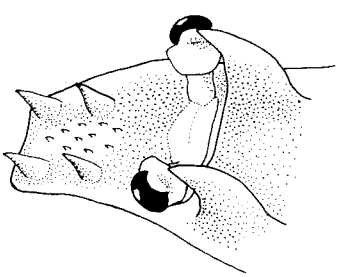
Fig. 267

PALIN Panul 6

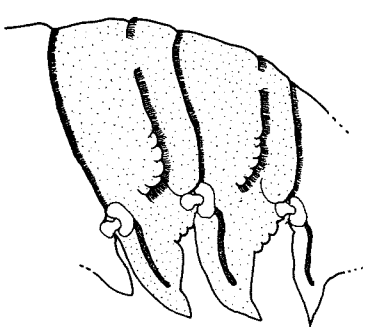
Cancer homarus Linnaeus, 1758, Systema Naturae, (ed. 10)1 :633.

Synonyms: ***Astacus homarus*** - Fabricius, 1775; **Palinurus homarus** - Fabricius, 1798; ***Palinurus dasypus*** H. Milne Edwards, 1837; ***? Palinurus spinosus*** H. Milne Edwards, 1837; ***Palinurus burgeri*** De Haan, 1841; ***Palinurus (Senex) buergeri*** - Pfeffer, 1881; ***Senex dasypus*** - Ortmann, 1891; ***Panulirus dasypus*** - Henderson, 1893; ***Panulirus buergeri*** - Ortmann, 1897; ***Panulirus burgeri megasculpta*** Pesta, 19 15; ***Panulirus homarus rubellus*** Berrry, 1974.

FAO Names : **En** - Scalloped spiny lobster; **Fr** - Langouste festonnee ; **Sp** - Langosta festoneada.



antennular plate



abdominal somites (lateral view)

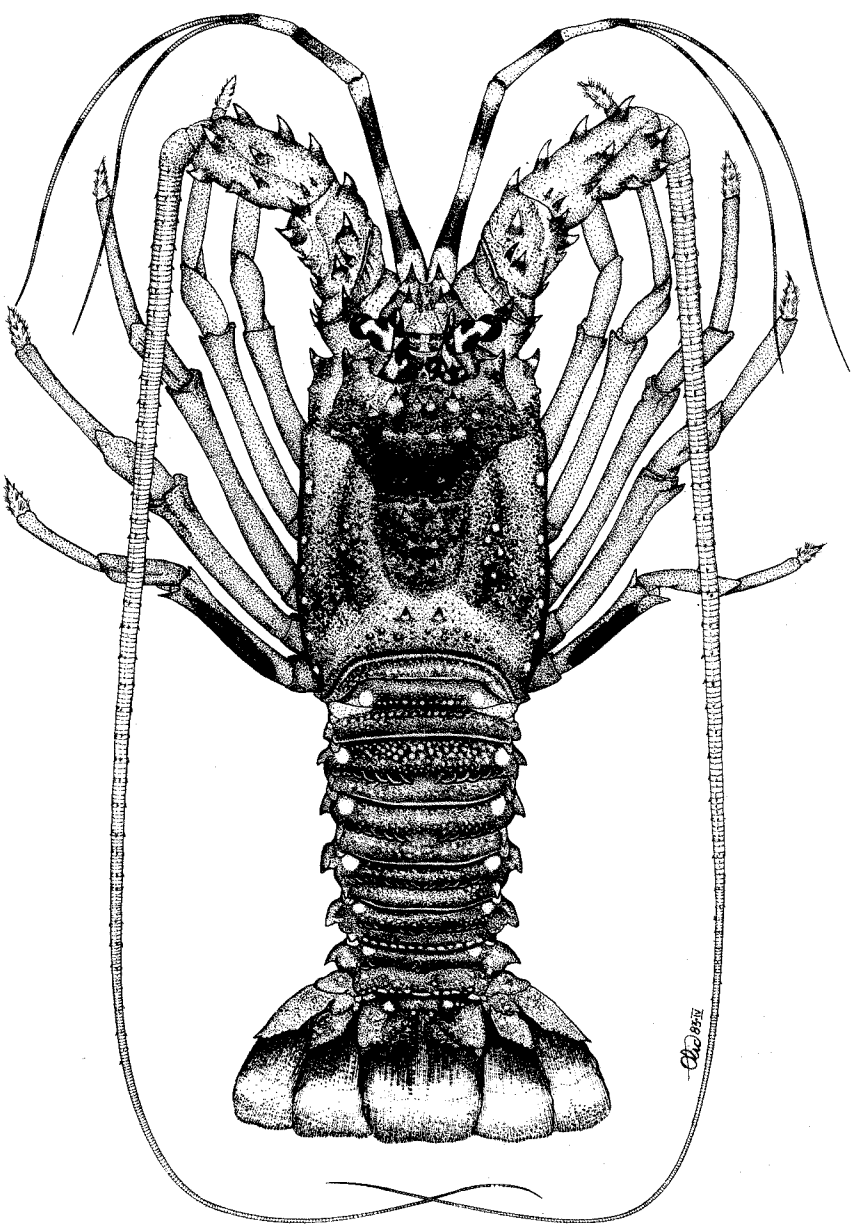


Fig. 267

Type : Type locality of ***Cancer homarus***:"Habitat in Mari Asiatico". Lectotype is the specimen figured by Rumphius (1705, Amboinsche Rariteitkamer: pl. I fig. A). The figure was drawn in Holland, as Rumphius had not provided an illustration himself. As noted in Rumphius' book (1705:3) the figure was prepared after a specimen in the collection of Henricus d'Acquet, then burgomaster of Delft. The specimen is now lost, but d'Acquet's collection of water colours of this material is still extant and held by the Koninklijk Instituut voor de Tropen (Royal Institute for the Tropics, formerly Colonial Institute) in Amsterdam. The figure of the lectotype of ***Cancer homarus*** has the following legend "9: Augusti 1698: Astacus Maximus Ambonensis egregie coloratus". The type locality of ***Cancer homarus*** thus definitely is Amboina, Moluccas, Indonesia.

Type locality of ***Palinurus dasypus:*** "Habite les mers de l'Inde". Type material in MP, no longer extant (not located in 1989).

Type locality of ***Palinurus burgeri:*** Japan, probably Nagasaki area. Holotype male in RMNH, no. D 21129.

Type locality of ***Panulirus burgeri megasculpta***: "Gischin (= Kischin) an der Südküste Arabiens" (= Qishn, South Yemen), 5 male, 2 female syntypes in NMW.

Type locality of ***Panulirus homarus rubellus:*** South Africa (Natal and Zululand), s. Mozambique and S.E. Madagascar. Syntypes in SAM, in RMNH, no. D 29843 (in alcohol, condition good), and in BM, no. 1928.12.1.326 and 1925.8.18.86-87 (in alcohol, condition fair)

Geographical Distribution : Indo-West Pacific region: East Africa to Japan, Indonesia, Australia, New Caledonia and probably the Marquesas Archipelago (Fig. 268). The nominotypical form (***Panulirus h. homarus***) is found throughout the range of the species; ***P. homarus megasculpta*** is only known from the northern Arabian Sea (Socotra, south coast of Arabia, perhaps west coast of India); ***P. h. rubellus*** inhabits S.E. Africa (Mozambique to Natal) and S.E. Madagascar.

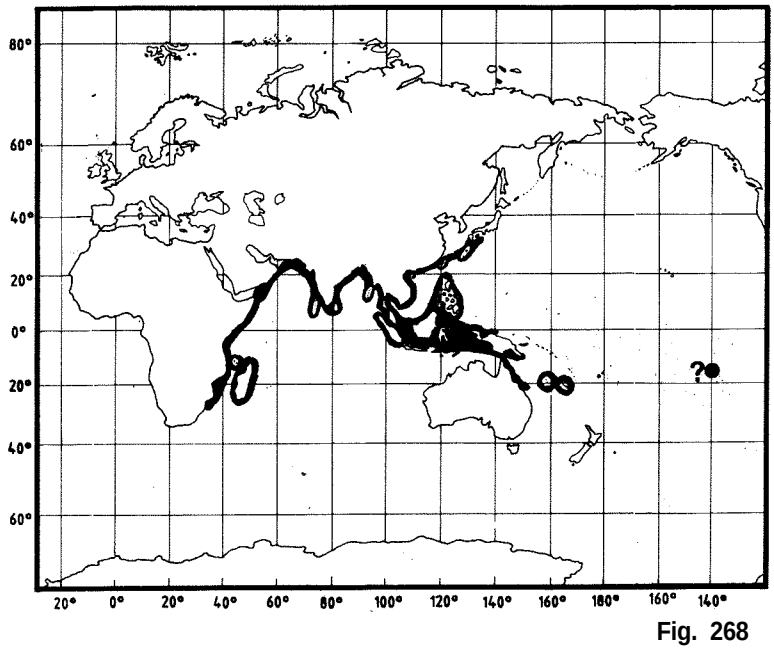


Fig. 268

Habitat and Biology : Inhabits shallow waters between 1 and 90 m depth, mostly between 1 and 5 m; among rocks, often in the surf zone, sometimes in somewhat turbid water. The species is gregarious and nocturnal.

Size : Maximum total body length 31 cm, carapace length 12 cm. Average total body length 20 to 25 cm.

Interest to Fisheries : In South Africa, until 1965 the exploitation of this species was "restricted to the efforts of Bantu children in the intertidal zone, and of divers in somewhat deeper waters" (Heydorn, 1969: I). In 1969, a company was formed for the exploitation of the species on a commercial basis. Although off the S.E. African coast (Natal) ***P. homarus*** is the most frequent of the ***Panulirus*** species, on the East African coast (Zanzibar, Kenya) it belongs to the less common lobsters. In S.E. Africa it is caught with baited lines, baited nets and traps. Off Somalia, the annual catch is about 120 tons. It is the most important contributing species to the lobster fishery off the Indian S.W. and s. coast (Kerala and Tamil Nadu), it is caught there with anchor hooks, traps and gill nets, and supports a lucrative freezing industry (Jones, 1967:1339). Gruvel (1911:33,34) remarked that the species (evidently ssp. ***rubellus***) "se prête . . à une exploitation industrielle intéressante" in S.E. Madagascar. In the Philippines the species"is abundantly caught by gill nets particularly after heavy rains" (Motoh, 1980:50,51). In Taiwan the species is common in the markets from spring to autumn (Chang, 1964:6, fig. 4; 1965:36,37). Also in Thailand the species is offered for sale in markets especially in the southern area. However, the fishery is mostly local, and the animals are marketed fresh or cooked, in some areas there is a minor export of frozen tails. In most places the species is caught by hand, with traps, gill nets, cast nets, baited lines etc. In Thailand, mounted specimens often in fancy glass cases, are sold to tourists (e.g. in Rayong).

Local Names : INDONESIA: Udang karang;JAPAN: Kebuka ise-ebi, Samehada ise-ebi; MOZAMBIQUE: Lagosta escamosa; PHILIPPINES: Banagan (also used for other species of the genus); THAILAND: Kung mangkon (also used for other species of the genus).

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:17, figs 38,78j.

Remarks: A possible synonym of **Panulirus *homarus*** is ***Palinurus spinosus*** H. Milne Edwards, 1837. That species was described as having 4 teeth on the antennular plate, a transverse groove on each abdominal somite as ***P. guttatus,*** 3 or 4 denticles on the posterior margin of the abdominal pleura, the abdomen with numerous small specks and no distinct lines or spots on the legs. The morphological characters would fit ***P. homarus, P. interruptus*** and ***P. regius,*** but the colour characters are most like those of ***P. homarus.*** For the time being ***P. spinosus*** is therefore regarded here as a probable synonym of the present species.The type material in MP is no longer extant (in 1989).

Panulirus inflatus (Bouvier, 1895)

Fig. 269

PALIN Panul 14

Palinurus inflatus Bouvier, 1895, Bulletin Museum Histoire Naturelle, Paris, 1:8.

Synonyms: ***Palinurus digueti*** Gruvel, 1911; a manuscript name cited by Gruvel, 1911, in the synonymy of ***P. inflatus*** of which name it is an objective synonym.

FAO Names : **En** - Blue spiny lobster; **Fr** - Langouste bleue; **Sp** - Langosta azul.

Type : Type locality of ***P. inflatus*** and ***P. digueti:*** "Basse Californie" (= Baja California, Mexico). Type specimens in MP, no. Pa 412 (27 cm long), Pa 446 (23 cm) both dry in rather good condition and labelled ***P. digueti.***

Geographical Distribution : Eastern Pacific region: west coast of Mexico from Baja California to Puerto Angel (Oaxaca) (Fig. '270); a record from San Diego, California, USA, needs verification.

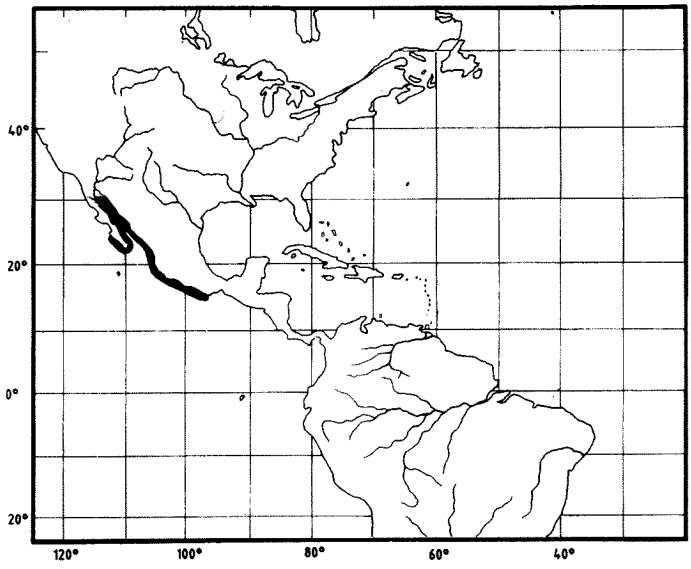


Fig 270

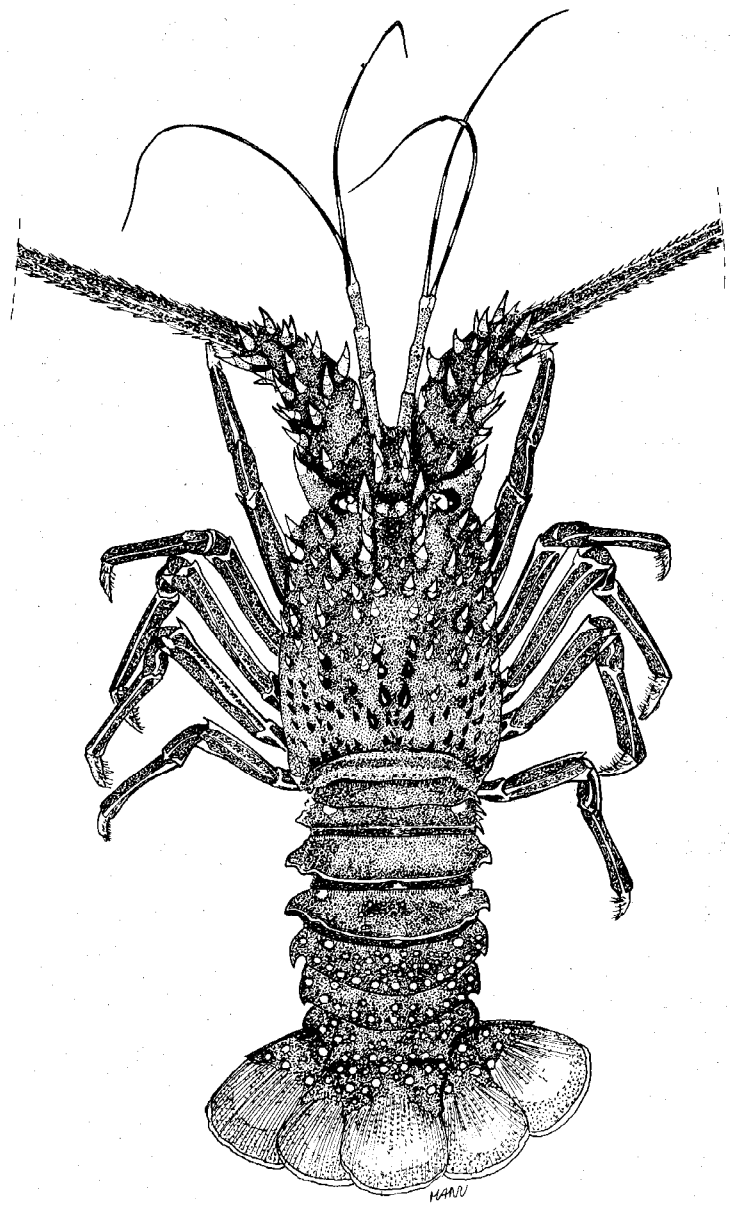


Fig. 269

Habitat and Biology : Sublittoral to 30 m deep; on rocky, rarely gravelly bottom.

Size : Maximum carapace length 15.5 cm, but usually not more than 12 cm; the corresponding total body lengths are respectively 38 and 30 cm

Interest to Fisheries : The species is of interest to fishery throughout its range, although mostly used for local consumption. It is caught by hand and with gill nets, and sold fresh or frozen.

Local Names : MEXICO: Langosta azul, Langosta caribe, Langosta cabezona, Langosta de roca, Langosta prieta; USA: Pinto lobster, Blue spiny lobster.

Literature : Holthuis & Villalobos, 1961:251-276; Williams, 1986:22, figs 53,80a-b.

Panulirus interruptus (Randall, 1840)

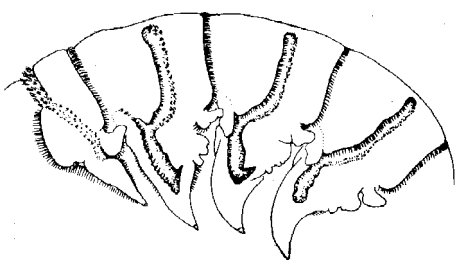
Fig. 271

PALIN Panul 15

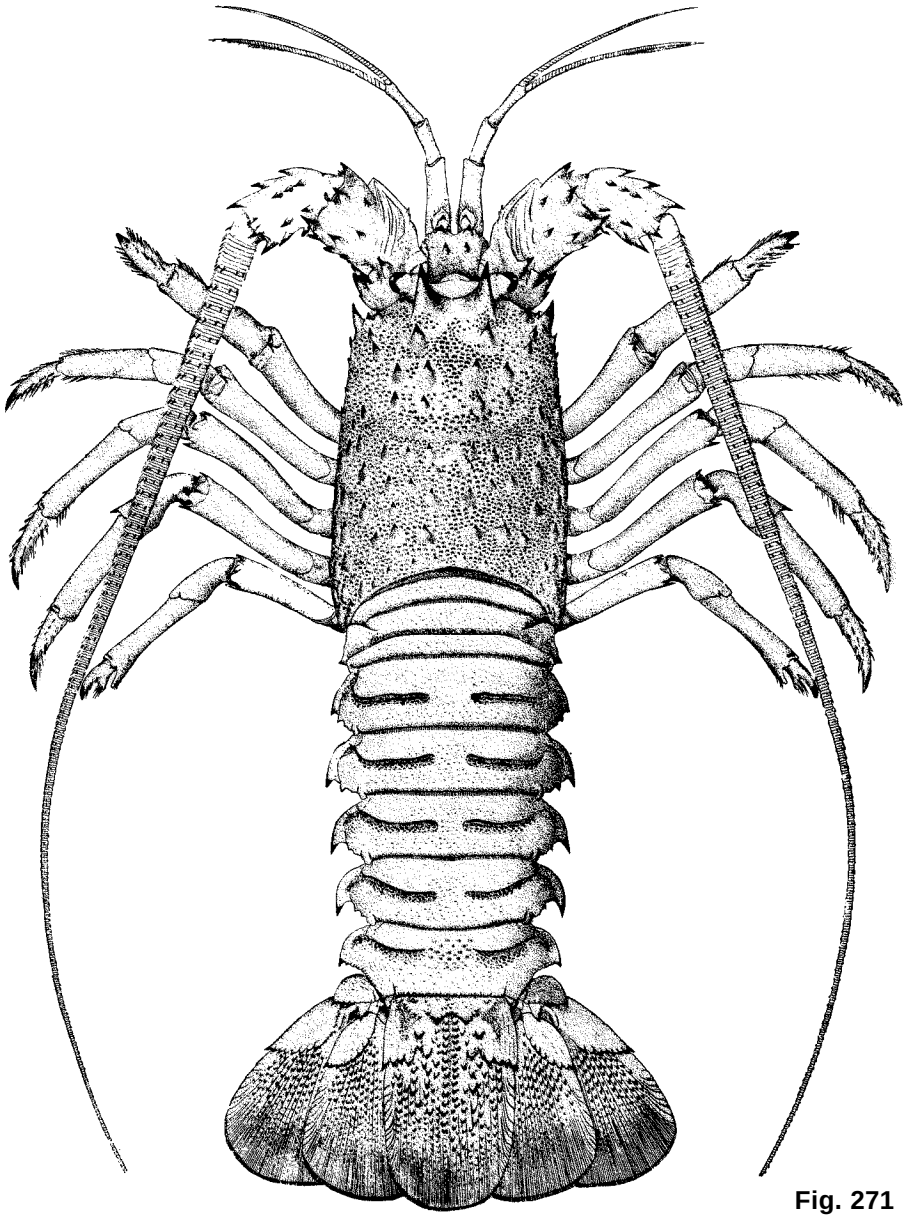
Palinurus interruptus Randall, 1840, Journal Academy Natural Sciences, Philadelphia, 8: 137

FAO Names : En - California Spiny lobster; **Fr** - Langouste mexicaine; **Sp** - Langosta mexicana.

Type : Type locality: "from Upper California, where it IS used as food by, the natives". T. Nuttall. who collected the type material visited Monterey, Santa Barbara, San Pedro and San Diego in California (March - May 1836); he was most active in Santa Barbara and San Diego, and one of these two localities in all probability is the true type locality. Two dry syntypes in ANSP, No. 4188 (condition poor to reasonable).



abdominal somites (lateral view)
(from Wlliams,1986)



(from Rathbun, 1884)

Fig. 271

Geographical Distribution : Eastern Pacific region: California, USA (from San Luis Obispo Bay southwards; there is a doubtful record from Monterey), to Baja California, Mexico (entire west coast); the species is also reported from the Gulf of California (Fig. 272).

Habitat and Biology : From the littoral zone (tide pools) to depths of about 65 m, being more frequent in the deeper waters; on rocky substrates. The species is nocturnal; spawning takes place from May to August.

Size : The maximum total body length reported is 60 cm, usually it does not exceed 30 cm. The legal size limit is a carapace length of 3.25 inch (= 8 cm), corresponding to a total length of about 20 cm

Interest to Fisheries : ***Panulirus interruptus*** is the economrcally most important lobster of the American west coast. In California it is taken almost exclusively with traps, also trammel nets are used, and occasionally they are obtained by trawling. The species is also taken by diving by sports fishermen;according to Frey (1971) "the sport catch . . . . . may equal 50% of the commercial catch". The total catches in 1976 were about 135 tons. The major fishing area is the west coast of Baja California.

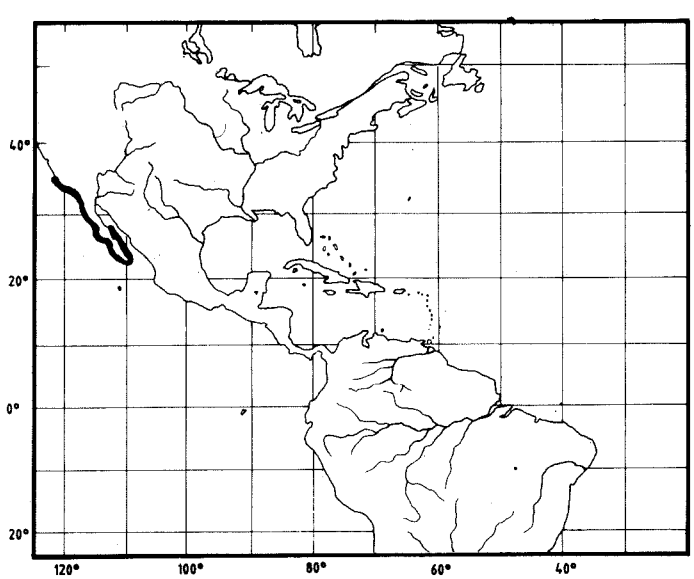


Fig. 272

The demandfor the lobster in California “is so great that imports from Mexico average about twice the California catch” (Frey,1971); of course the imported lobsters do not all need to be ***P. interruptus***. Protective measures as to season, size,bag limit, etc. are at present in force. Sold fresh, cooked and frozen. Best known as gourmet food, sometimes used as bait.

Local Names : MEXICO: Langosta colorada, Langosta roja; USA: California lobster, California marine crayfish, California spiny lobster, Red lobster.

Literature : Mitchell etal., 1969:121-131; Frey, 1971:19; Williams, 1986:21, figs 49 , 79 h-i.

Panulirus japonicus (Von Siebold, 1824) **Fig. 273** **PALIN Panul 16**

Palinurus japonicus Von Siebold, 1824, De Historiae naturalis in Japonia statu: 15. Namé placed on the Officialal List of Specific Names in Zoology in Opinion 507 (published in 1958).

Synonyms: ***Senex japonicus*** - Ortmann, 1891; ***Puer pellucidus*** Ortmann, 1891; ***Puerulus pellucidus*** - Calman, 1909.

FAO Names : En - Japanese spiny lobster; **Fr** - Langouste japonaise; **Sp** - Langosta japonesa.

Type : Type locality of ***Palinurus japonicus***: “Japonia”,Japan, probably near Nagasaki. Lectotype in RMNH, no. 60, selected by George & Holthuis, 1965: 10, in alcohol condition excellent; paralectotypes in BM, MP, RMNH, USNM.

Type locality of Puer pellucidus: “Japan, Kochi, 15-20 Faden” (= Kochi, Shikoku Island, Japan, 27-37 m). Two syntypes in MZS, preserved in alcohol, condition poor.

abdominal somites (lateral view)
(from George, & Holthuis. 1965)

Geographical Distribution : Western Pacific: Japan (south of 38º30’N to Ryukyu islands), Korea, East China Sea, China, Xiamen (= Amoy), Taiwan (Fig. 274).

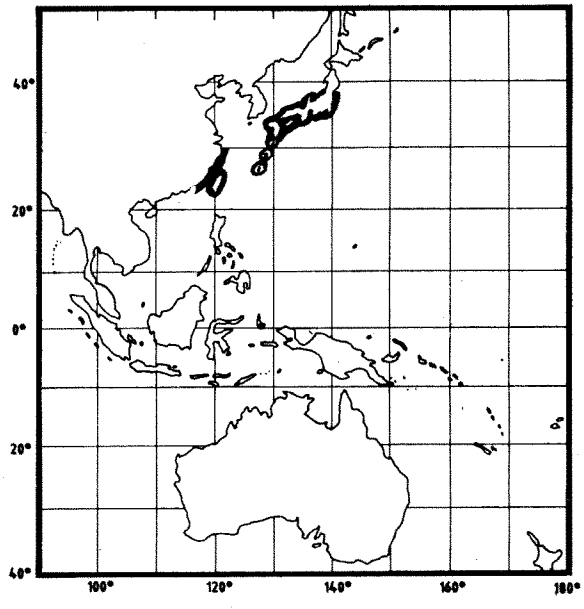


Fig. 274

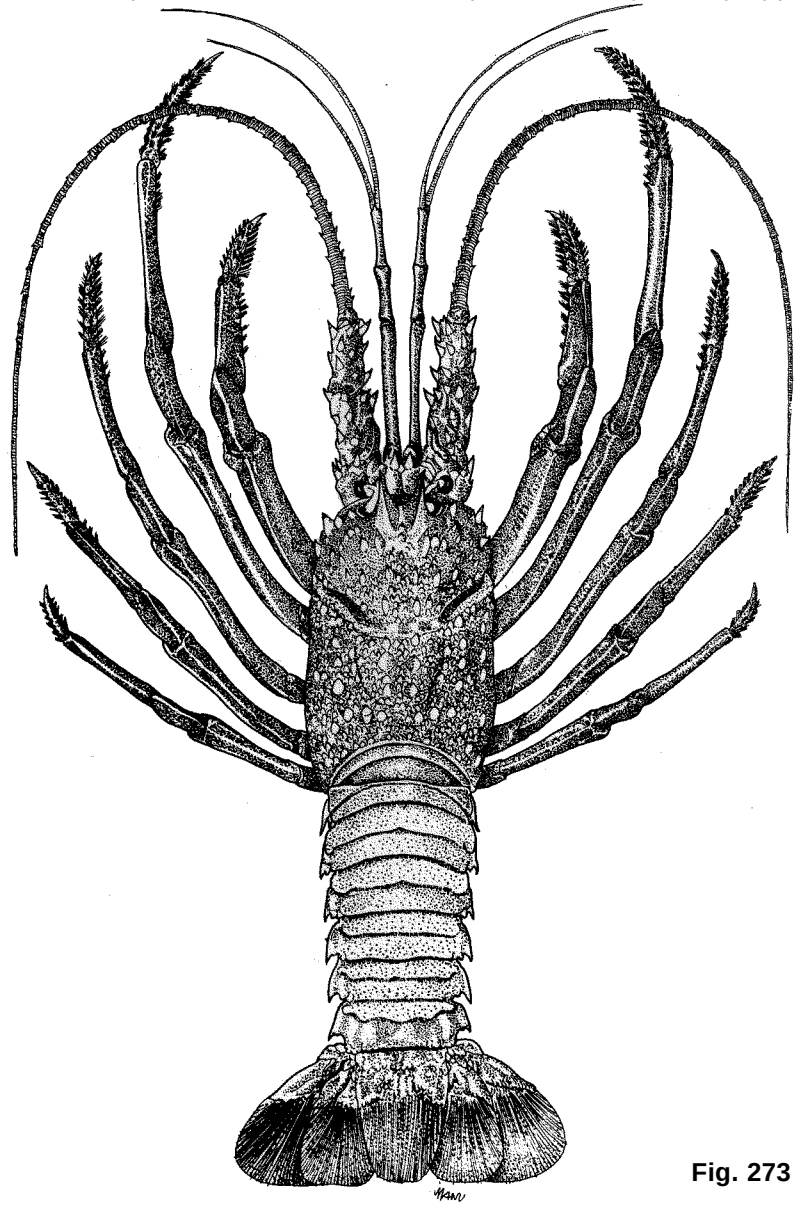


Fig. 273
(after George & Holthuis, 1965)

click for next page

Habitat and Biology : Inhabits shallow waters, between 1 and 15 m depth on rocky bottoms.

Size : Maximum total body length 30 cm; common length up to 25 cm.

Interest to Fisheries : ***Panulirus japonicus*** is fished for commercially in Japan. Longhurst (1970:286) reported the total annual catch of spiny lobsters in Japan to amount to 1 600 tons; by far the larger part of this is made up by the present species. The lobsters in Japan are sold fresh and frozen. The FAO Yearbook of Fishery Statistics reports for Japan no catches of ***P. japonicus***, but only for ***P. longipes***, viz. 1083 tons for 1987, 969 tons for 1988. However, as ***P. longipes*** is much less abundant than ***P. japonicus***, it is likely that these figures actually correspond to ***P. japonicus***, or to a combination of all Japanese spiny lobsters. In Taiwan, the species is found in markets throughout the year, but mostly so from March to October (Chang, 1965:41).

Local Names : JAPAN: Ise-ebi (official name), Japanese crayfish, No-ebi (for old specimens).

Literature : George & Holthuis, 1965:8-14, text-fig. 1a, pl. 1.

Panulirus laevicauda (Latreille, 1817)

Fig. 275

PALIN Panul 3

Palinurus laevicauda Latreille, 1817, Nouveau Dictionnaire d'Histoire naturelle, (ed. 2) 17:295.

Synonyms: ***Senex laevicauda*** - Von Ihering, 1897.

FAO Names : En - Smoothtail spiny lobster; **Fr** - Langouste indienne; **Sp** - Langosta Verde.

Type : Type locality: "M. Delalande fils l'a trouvé sur les côtes du Bresil": Pierre Antoine Delalande (1787-1828) arrived from France in Rio de Janeiro, Brazil on 1 June 1816, "He returned to France after a short voyage through the Province of Rio de Janeiro, carrying the collections obtained" (Papavero, 1971, pp.115, 116). The type locality thus may be restricted to Rio de Janeiro, Brazil. Type material in MP; no longer extant in 1989.

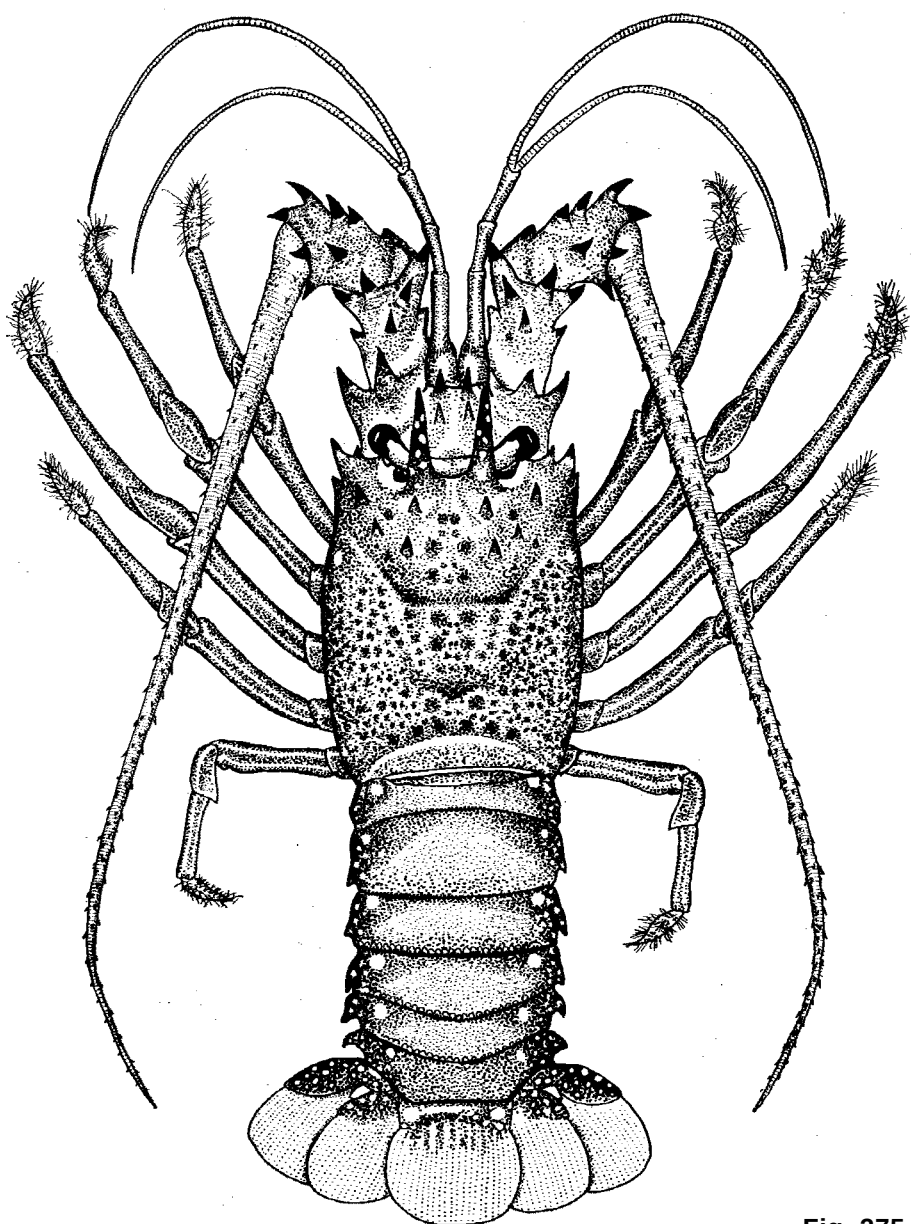


Fig. 275

Geographical Distribution : Western Atlantic: Bermuda and Florida to E. Brazil, including Yucatan and the Caribbean Sea (Fig. 276).

Habitat and Biology : Coastal waters, down to 50 m depth; substrate: rock or coral.

Size : Maximum total body length about 31 cm, common to 20 cm.

Interest to Fisheries : The species is caught throughout its range, but there is no special commercial fishery for it. Sometimes it is taken together with Panulirus argus. The yield of its fishery seems to be largest in Brazil.

Local Names : BERMUDA: Smooth-tailed spiny lobster; BRAZIL: Lagosta cabo Verde; MARTINIQUE: Grosses bresiliennes (for large specimens), Homard d'indien; USA: Brazilian lobster, Smooth-tailed crawfish.

Literature : Fischer (ed.), 1978: vol. 6; Williams, 1986:22, figs 52, 79 n-o.

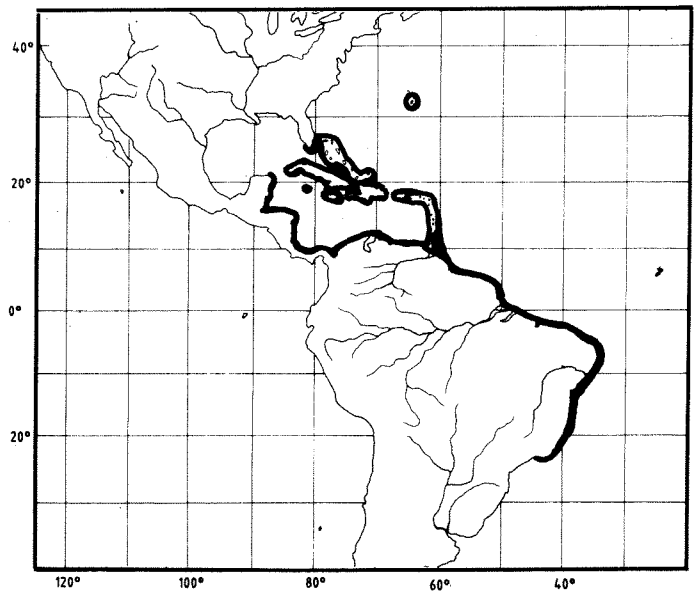


Fig. 276

Palinurus longipes (A. Milne Edwards, 1868) **Fig. 277** **PALIN Panul 7**

Palinurus longipes A. Milne Edwards, 1868, Nouvelles Archives Museum Histoire Naturelle, Paris, 4:87, pl. 21.

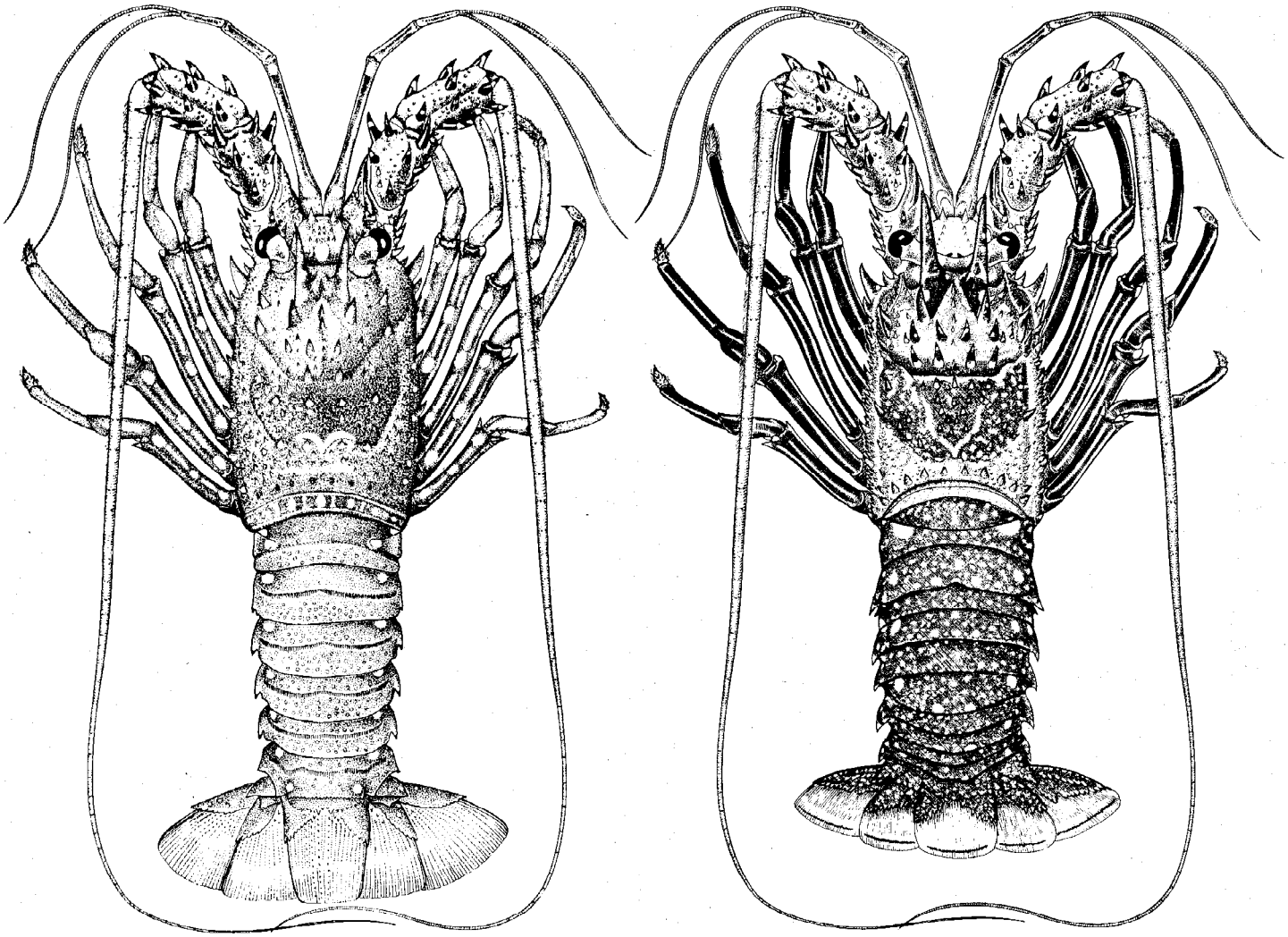
Synonyms: ***Palinurus femoristriga*** Von Martens, 1872; ***Palinurus longitarsus*** Lenz & Richters, 1881 (erroneous spelling of ***P. longipes***); ***Senex femoristriga -*** Ortmann, 1891; ***Panulirus bispinosus*** Borradaile, 1899; ***Panulirus japonicus longipes*** - De Man, 1916.

FAO Names: En - Longlegged spiny lobster; **Fr** - Langouste diablotin; **Sp** - Langosta duende.

Type : Type locality of ***P. longipes:*** "trouvée sur les côtes de l'île Zanzibar", through the lectotype selection by George & Holthuis (1965:25); the paralectotype came from "Maurice" (=Mauritius). Type material in MP, no longer extant in 1989.

Type locality of ***P. femoristriga:*** "Amboina", Moluccas, Indonesia. Holotype (or lectotype) female in ZMB, no. 1333, preserved in alcohol; could not be located in 1989.

Type locality of ***P. bispinosus:*** "Sandal Bay, Lifu, Loyalty Islands". Holotype male, ZMC, in alcohol, condition good.



a. ***P. longipes longipes*** b. ***P. longipes femoristriga*** (after George & Holthuis. 1965) **Fig. 277**

Geographical Distribution : Indo-West Pacific region: East Africa to Japan and Polynesia. Two subspecies can be recognized: ***P. l. longipes*** (Fig. 277a) is the western form occurring from East Africa to Thailand, Taiwan, the Philippines and Indonesia and the eastern subspecies ***P.l. femoristriga*** (Fig. 277b) inhabiting Japan, the Moluccas, New Guinea, eastern Australia, New Caledonia and Polynesia (Fig. 278). Intermediate forms have been observed, especially in the area of overlap between the two ranges.

Habitat and Biology : The species lives in clear or slightly turbid water at depths of 1 to 18 m (also reported from 122 m), in rocky areas and coral reefs. The animals are nocturnal and not gregarious.

Size : Maximum total body length 30 cm, average length 20 to 25 cm. Maximum carapace length 12 cm, average carapace length 8 to 10 cm. The smallest ovigerous female has a total length of 14 cm.

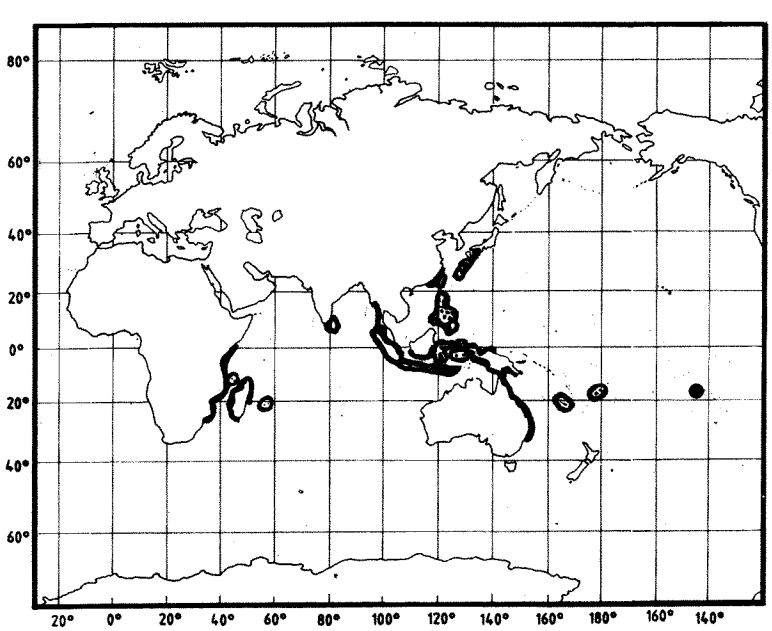


Fig. 278

Interest to Fisheries : The species is caught throughout its range, mostly by hand when diving or with spears, also with traps, tangle nets and lobster pots. In Taiwan it is also known to be taken as by-catch by trawls. Fishing is of local interest only The animals are sold fresh in the markets and directly to restaurants. The FAO Yearbook of Fishery Statistics reports for this species catches in Japan of 1083 tons in 1987 and 969 tons in 1988. As ***P. longipes*** is not particularly common in Japan, and as ***P. japonicus*** was not listed in those statistics it is likely that the figures refer to the latter species or to both.

Local Names : AUSTRALIA: Blue spot rock lobster, Coral crayfish, Painted crayfish, Red cray, Tropical rock lobster, Tropical spiny lobster; White whiskered rock lobster; JAPAN: Kanoko ise-ebi; MOZAMBIQUE: Lagosta de coral; NEW CALEDONIA: Langouste rouge; PHILIPPINES: Banagan (also used for other spiny lobster species), Coral crayfish, Marine crayfish, Marine rock lobster, Tropical rock lobster, Tropical spiny lobster; SOUTH AFRICA:, Long-legged crayfish; THAILAND: Kung mangkon (also used for other species of spiny lobster); TUVALU: Oula.

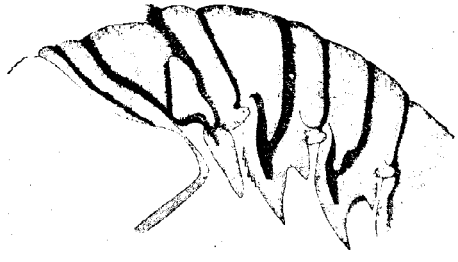
Literature : George & Holthuis, 1965:21-28, text-fig. le, pl. 5, Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:20, figs 46,79 f-g

Panulirus marginatus (Quoy & Gaimard, 1825) **Fig. 279** **PALIN Panul 17**

Palinurus marginatus Quoy & Gaimard, 1825, in L. de Freycinet, Voyage autour du monde sur les corvettes l'Uranie et la Physicienne, Zool.:537, pl. 81.

FAO Names : En - Banded spiny lobster; Fr - Langouste bordée.

Type : Type locality: "Iles Sandwich" (= Hawaiian islands). Type material no longer extant in MP in 1989.



abdominal somites (lateral view)
(from George & Holthuis, 1965)

Geographical Distribution : Only known from the Hawaiian Islands, including Pearl and Hermes Reef, and Lavsan Island (Fig. 280).

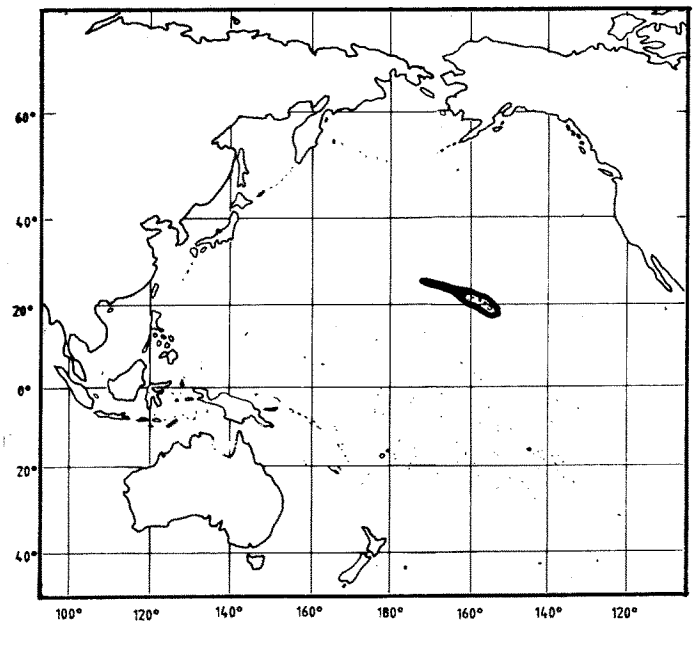
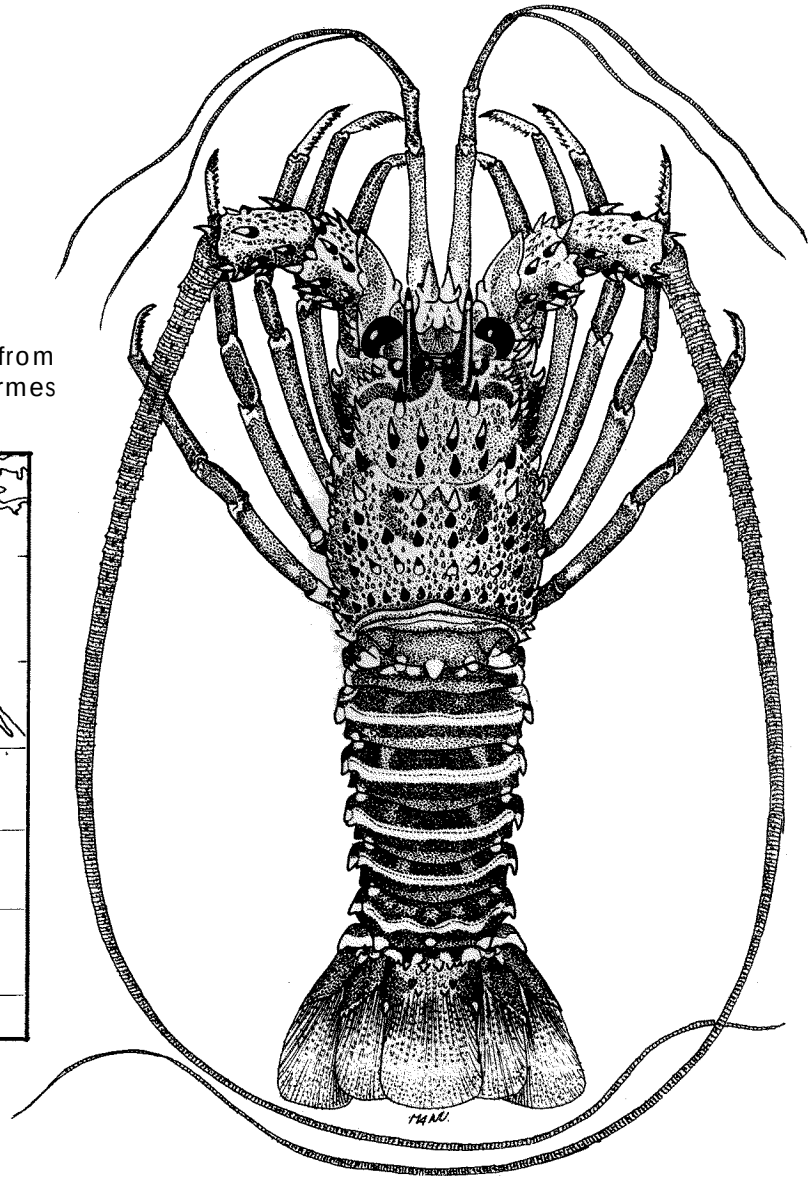


Fig. 280



(after George & Holthuis. 1965) **Fig. 279**

Habitat and Biology : The species has been reported from depths down to 143 m, but usually in shallow water, in well protected places on a rocky substrate, under rocks and in rock crevices. The animals are nocturnal.

Size : Total body length to 40 cm, carapace length to 12 cm.

Interest to Fisheries : Used as food throughout its range. Fished with traps or nets. Also taken by hand, in daytime by diving, at night with lights and spears. Sold fresh in local markets. The 1971 USA fishery statistics indicate a total of 5 725 pounds (= 2 600 kg) of lobsters caught in the Hawaiian Islands, of which 5 371 pounds in Oahu, 263 pounds in Maui, 70 pounds in Hawaii and 21 pounds in Lanai. Of these slightly more were caught in gill nets (3 253 pounds) than in traps (2 113 pounds) and 339 pounds were registered as fished by hand. These figures include the catches of ***P. penicillatus.***

Local Names : HAWAII: Ula (general name for spiny lobsters).

Literature : George & Holthuis, 1965: 14-17, text-fig 1 b, pl. 2; Williams, 1986:20, figs 45,79 d-e.

Panulirus ornatus (Fabricius, 1798)

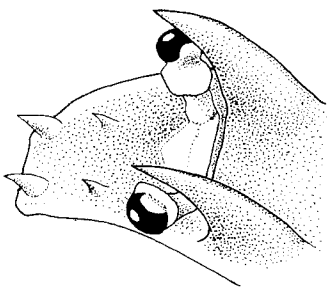
Fig. 281

PALIN Panul 8

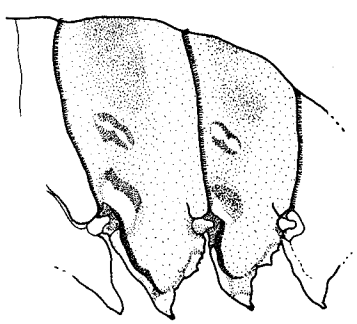
Palinurus ornatus Fabricius, 1798, Supplementum Entomologiae systematicae:400.

Synonyms: Palinurus sulcatus H. Milne Edwards, 1837; ***Panulirus sulcatus*** - White, 1847; ***Palinurus (Senex) sulcatus*** - Pfeffer, 1881; Senex ornatus - Lanchester, 1900.

FAO Names : En - Ornate spiny lobster; **Fr** - Langouste ornée; **Sp** - Langosta ornamentada.



antennular plate



abdominal somites (lateral view)

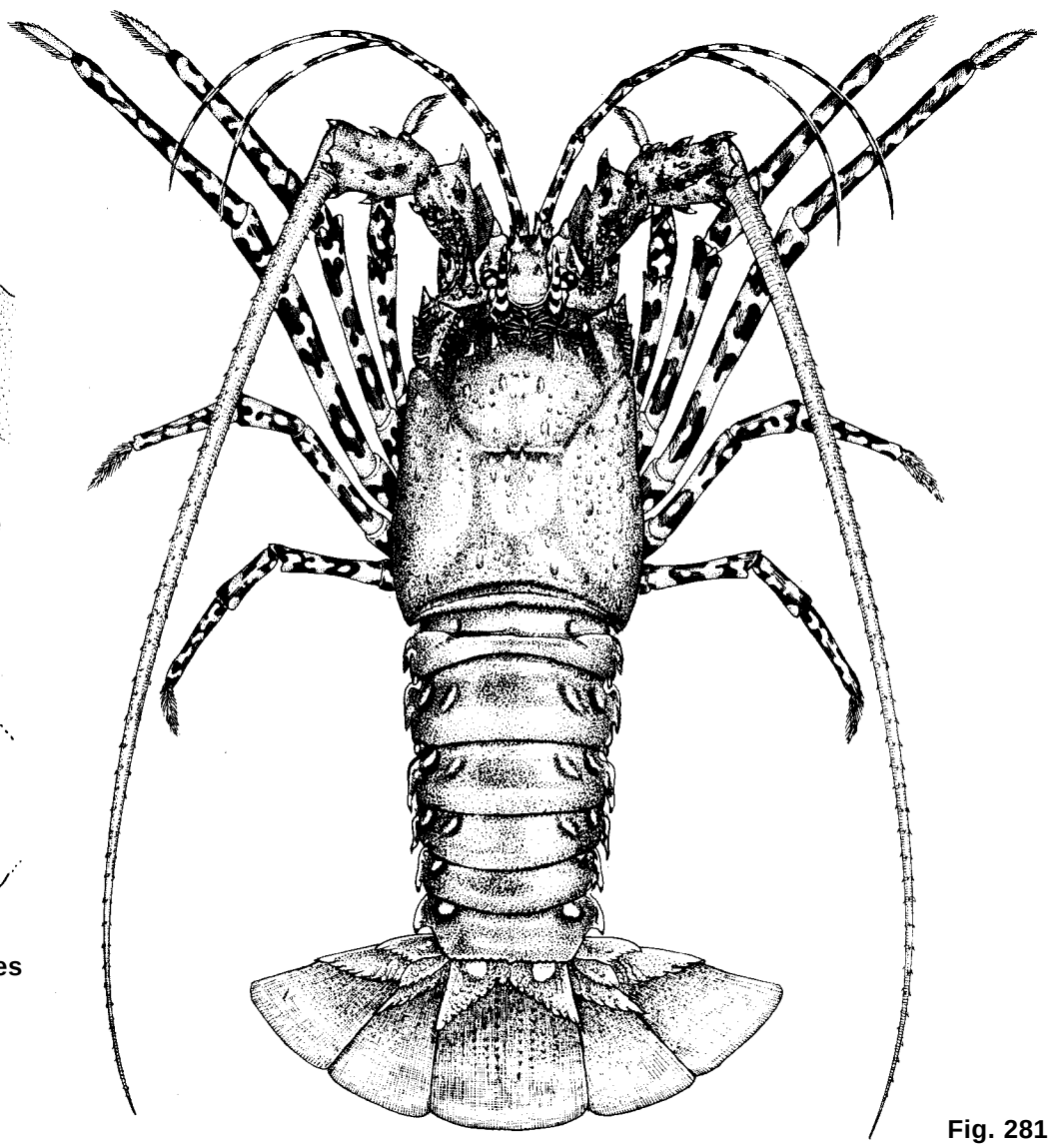


Fig. 281

Type : Type locality of ***P. ornatus***: "in Oceano Indico. Dom. Daldorff". I.K. Daldorff, a Danish officer, was stationed from 1790 to 1793 in Tranquebar, SE. India (1 lº02'N, 79º51'E) in which area he collected; he did not return to India until 1798. His material is from Tranquebar or the nearby region, which may be considered the restricted type locality. Lectptype in UZM, originally preserved dry, recently transferred to alcohol, condition reasonable.

Type locality of ***P. sulcatus***: "Habite les côtes de l'Inde". presumed type specimen in MP, no. Pa 448; a dry specimen in reasonable condition labelled "***Palinurus sulcatus*** Lmk. Indes".

Geographical Distribution : Indo-West Pacific region from the Red Sea and East Africa (south to Natal) to southern Japan, the Solomon Islands, Papua New Guinea, SW., W., N., N.E. and E. Australia, New Caledonia and Fiji. Recently (1988) a specimen was found on the coast of Israel in the E. Mediterranean (Fig. 282).

Habitat and Biology : In shallow, sometimes slightly turbid coastal waters, from 1 to 8 m depth, with a few records from depths as great as 50 m. On sandy and muddy substrates, sometimes on rocky bottom, often near the mouths of rivers, but also on coral reefs. The species has been reported as solitary or as living in pairs, but has also been found in larger concentrations.

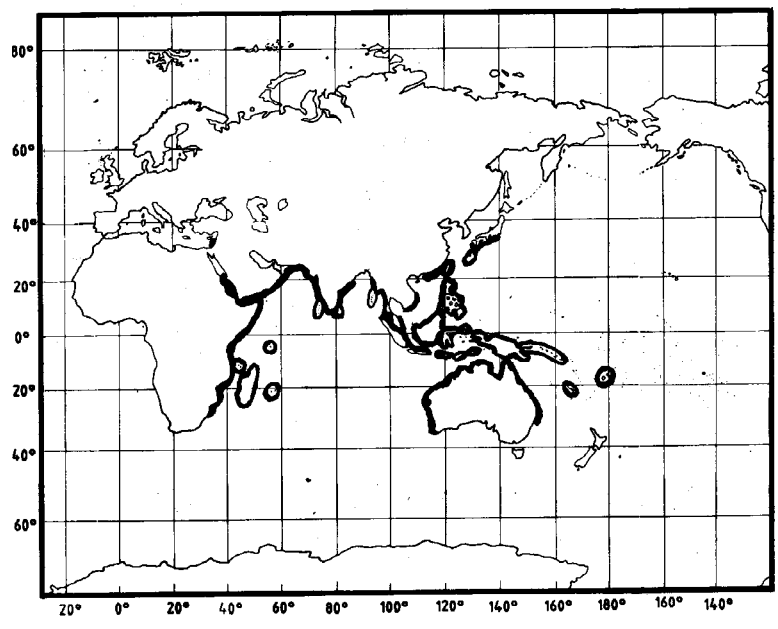


Fig. 282

Size : This is one of the largest of the ***Panulirus*** species and can attain a total body length of about 50 cm, but usually is much smaller (30 to 35 cm).

Interest to Fisheries : ***Panulirus ornatus*** is fished for throughout its range, but in most places only on a small scale. Taken mostly by hand by divers, or speared. Handnets are used also, but traps prove to be ineffective. Sold mostly fresh or frozen in local markets. In the Philippines a minor export activity has developed. In Australia a commercial fishery was developed since about 1966, it uses freezing installations ashore, as well as freezer boats; these operations cover the Torres Strait area, as well as N.E. Queensland, with an annual catch of over 120 tons tail weight around 1986 (Channells et al., 1987). Mounted dry specimens (sometimes in glass cases) are sold to tourists in several areas (e.g., in Thailand).

Local Names : AUSTRALIA: Coral crayfish, Ornate rock lobster, Painted cray, Tropical rock lobster; FIJI: Coral crayfish, Ornate rock lobster, Painted crayfish, Tropical rock lobster, Uraubola, Urautamata; JAPAN: Nishi ki-ebi; MOZAMBIQUE: Lagosta ornamentada; NEW CALEDONIA: Grosse langouste porcelaine; PAKISTAN: Kikat (Sindhi), Kikka (Baluchi); PHILIPPINES: Banagan; SOUTH AFRICA: Ornate crayfish, Ornate spiny lobster; THAILAND: Kung mangkon.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:22, figs 51,79 l-m.

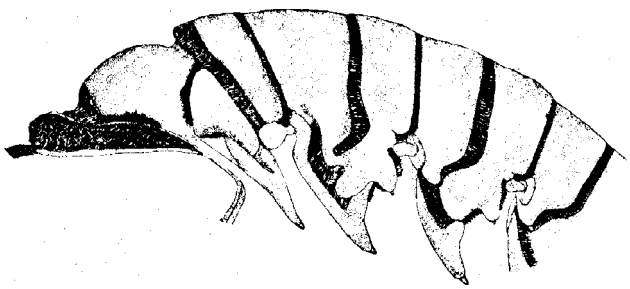
Panulirus pascuensis Reed, 1954 | **Fig. 283** | **PALIN Panul 18**

Panulirus pascuensis Reed, 1954, Scientia, Valparaiso, 21:121,136,figs1-9.

Synonyms: ***Palinurus paschalis*** (Philippi Ms.) Holthuis, 1972.

FAO Names : En - Easter Island spiny lobster

Type : Type locality of ***P. pascuensis***: "Isla de Pascua" (= Easter Island, southern Pacific). Holotype male in Museo de la Dirección General de Pesca y Caza de Chile, Valparaiso, Chile.



abdominal somites (lateral view)
(from George. & Holthuis 1965)

Geographical Distribution : Easter Island and Pitcairn Island, southern Pacific Ocean (Fig. 284).

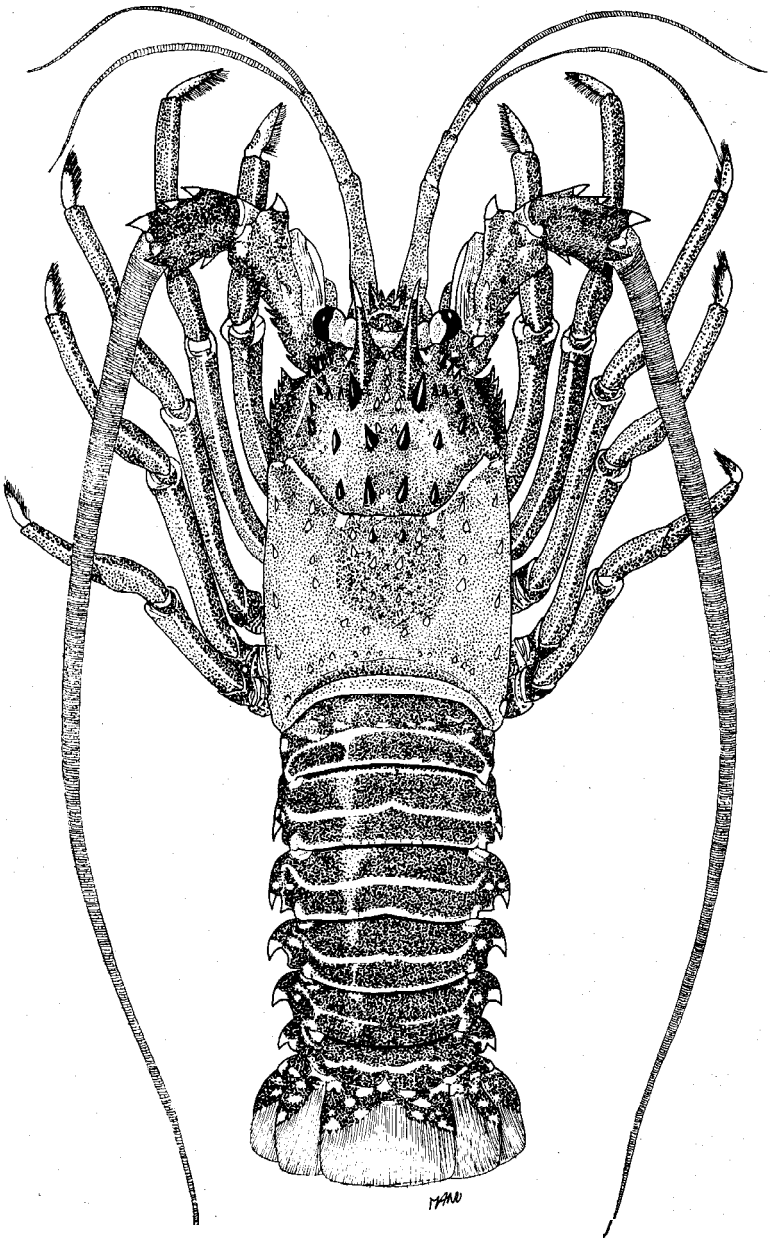
Habitat and Biology : Lives in shallow water (from 0 to 5 m depth) in crevices of a rocky substrate. Impregnated and ovigerous females have been taken in December.

Size : Reported carapace lengths of males 6 to 10 cm; females cl. 6 to 9.5 cm. This corresponds to total body lengths of about 15 to 25 cm (males), and 15 to 24 cm (females); the smallest ovigerous female has a cl. of 6 cm.

Interest to Fisheries : Both at Easter Island and at Pitcairn the species is mainly taken by hand or speared by divers in daytime, and with torch light at night; also gill nets and lobster pots are used. The lobsters are sold fresh for local consumption.

Local Names : CHILE: Langosta de Pascua, Ura (Easter Island).

Literature : George & Holthuis, 1965:17-19, text-fig. lc, pl.3; Holthuis, 1972:36-44, figs 1,2.



(after George & Holthuis, 1965) **Fig. 283**

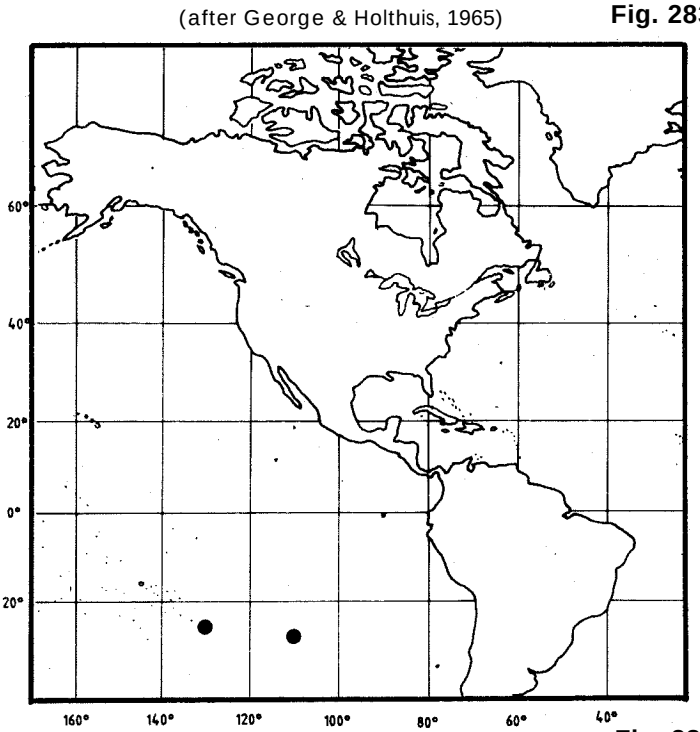


Fig. 284

click for next page

Panulirus penicillatus (Olivier, 1791)

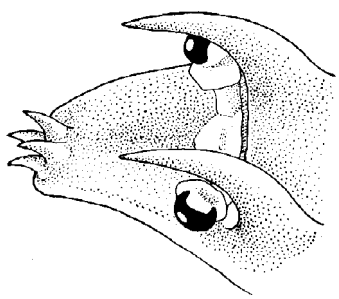
Fig. 285

PALIN Panul 9

Astacus penicillatus Olivier, 1791, Encyclopedie méthodique. Histoire naturelle, Insectes, 6:343.

Synonyms: ***Palinurus gigas*** Lamarck, 1801; ***Palinurus penicillatus*** - Olivier, 1811; ***Palinurus ehrenbergi*** Helter, 1861; ***Palinurus (Panulirus) ehrenbergi*** - Heller, 1865; ***Palinurus (Senex) penicillatus*** - Pfeffer, 1881; ***Cancer theresae*** Curtiss, 1938.

FAO Names : **En** - Pronghorn spiny lobster; **Fr** - Langouste fourchette; **Sp** - Langosta horquilla.



antennular plate

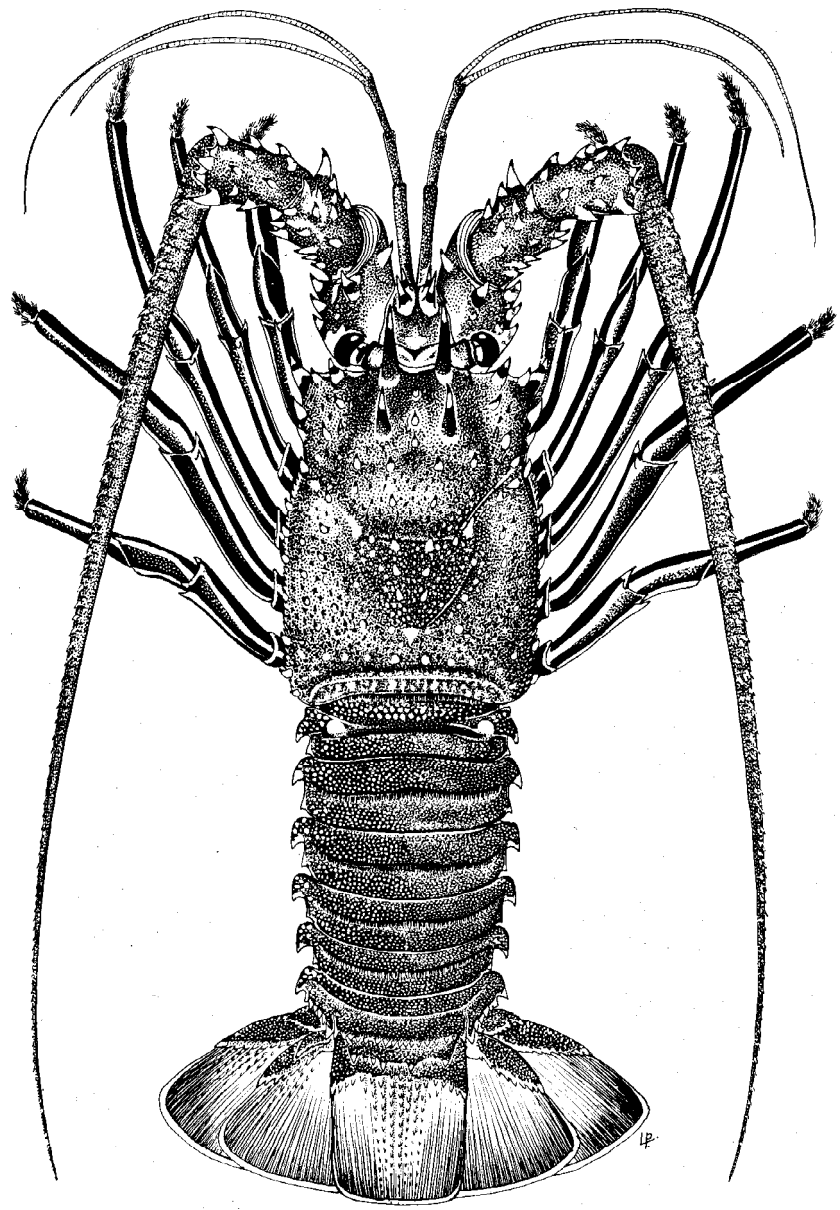


Fig. 285

Type : Type locality of ***A. penicillatus*** (and ***P. gigas,*** which is a replacement name for ***A. penicillatus***): unknown ("Elle se trouve . . . .."). Type material in Lamarck collection, in MP? In the Paris Museum there are 7 specimens of this species labelled "Mer des Indes", or without locality indication. One or more of these may belong to the type lot, but this cannot be made certain.

Type locality of ***P. ehrenbergi***: "Coseir" (= Quseir, Red Sea coast of Egypt). Type in NMW.

Type locality of ***Cancer theresae***: "At Tautira, in the barrier reef", Tahiti; whereabouts of type material unknown.

Geographical Distribution : Indo-West Pacific and Eastern Pacific regions: Red Sea, E. and S.E. Africa to Japan, Hawaii, Samoa and the Tuamotu Archipelago and further east to the islands off the west coast of America (Clipper-ton Island, Revillagigedo Archipelago, Cocos Island, Galapagos Archipelago) and in some localities near the continental coast of Mexico (Sinaloa, Nayarit and Guerrero) (Fig. 286).

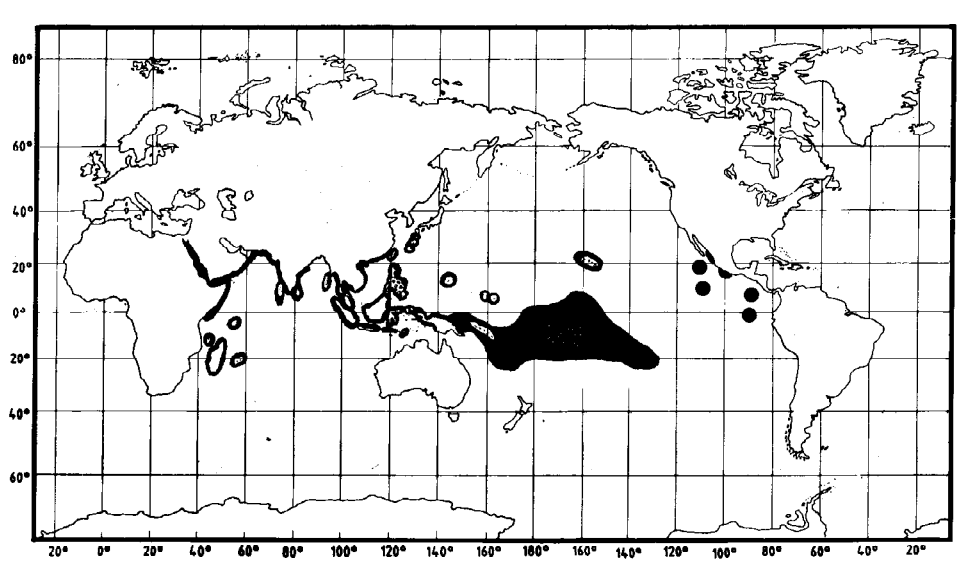


Fig. 286