

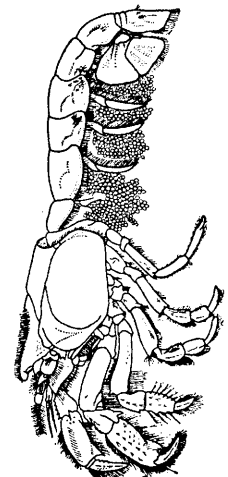
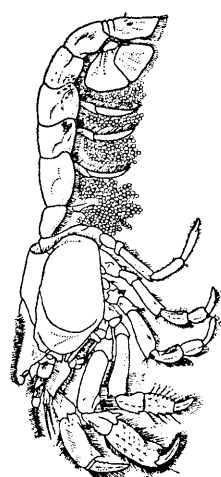
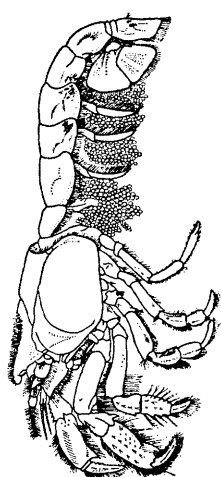
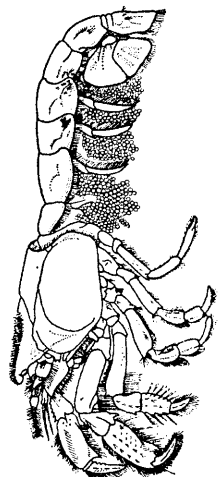
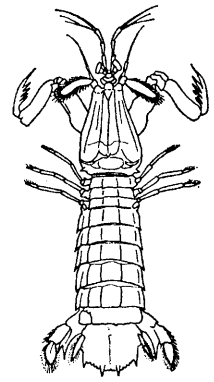
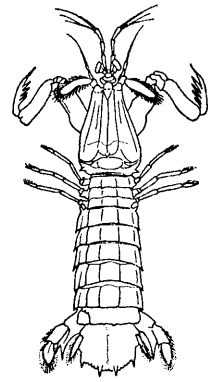
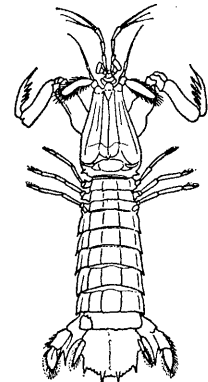
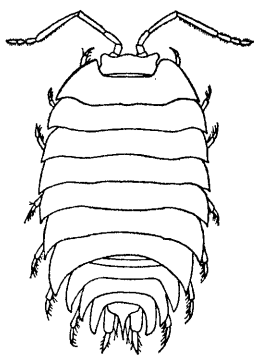
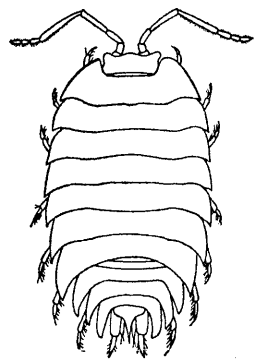
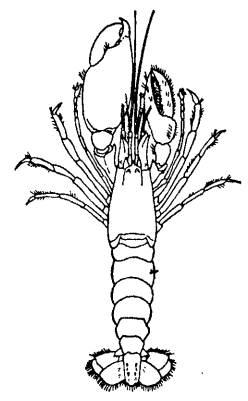
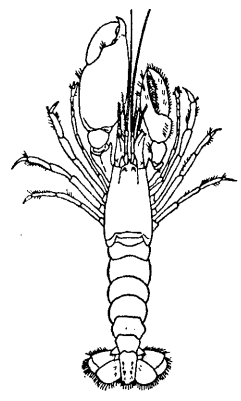
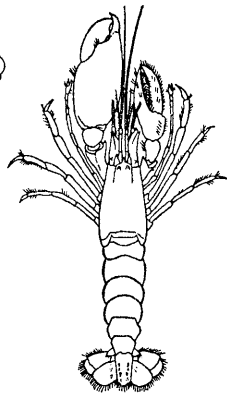
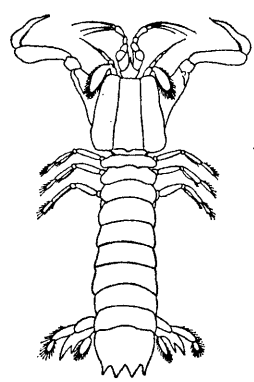
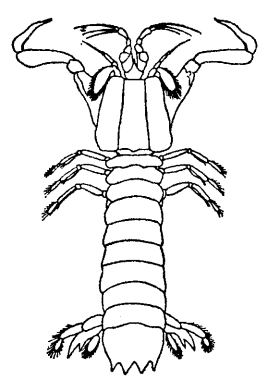
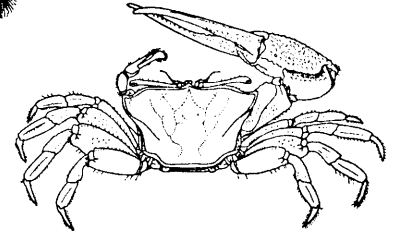
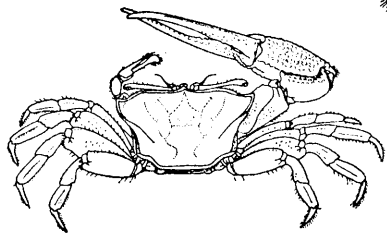
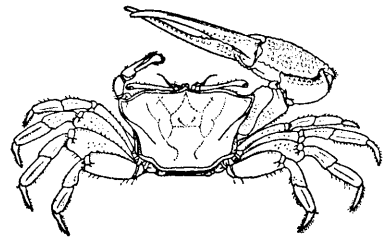
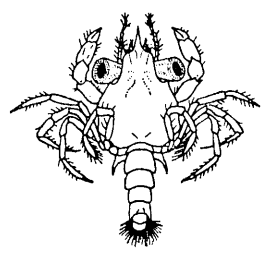
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editus a H.- E. Gruner et L. B. Holthuis

Waldo L. Schmitt John C. McCain

Edward S. Davidson

Decapoda I Brachyura I Fam. Pinnotheridae



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T.E. Comp. 21 Oct 99

Crustaceorum Catalogus

editus a

H.- E. Gruner et L. B. Holthuis

Pars 3

**Waldo L. Schmitt
John C. McCain
Edward S. Davidson**

**DECAPODA I
BRACHYURA I**

Fam. Pinnotheridae



Dr. W. Junk B.V. - Den Haag

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Introduction

'Utility ought to be the principal intention of every publication. Wherever this intention does not plainly appear, neither the books nor their authors have the smallest claim to the approbation of mankind'.

Preface, first edition *Encyclopedia Britannica*, 1768-1771.

This third part of the *Crustaceorum Catalogus* follows the precepts of the editors' original plan for the *Catalogus (Crustaceana, 1965, 8 (2): 222-224)*, amplified by Holthuis in his '*Stomatopoda I, Fam. Lysiosquillidae et Bathysquillidae (Catalogus Pars 1, 20-X-1967)*' and later supplemented in part by McCain and Steinberg in their '*Amphipoda I, Caprellidea I, Fam. Caprellidae (Catalogus Pars 2, 15-XII-1970)*'.

The present catalog of the Family Pinnotheridae is the result of the labor of many people. It is basically a compilation of the references contained in the pinnotherid sections of two extensive card files of the species of decapod, stomatopod, and 'schizopod' (mysid and euphausid) Crustacea of the world, now reposing in the Division of Crustacea, Natural History Museum, Smithsonian Institution. Both files were initiated by the senior author and were actively developed while he was curating the former Division of Marine Invertebrates (1914-1947).

In line with the preparation of a monographic account (more specifically referred to below) concerned with the American pinnotherid species, these card files were extended to include the known pinnotherid species through 1967-68. Providing a welcome check of that compilation were the pinnotherid portions of two earlier manuscript listings of crustacean species: one, compiled by the late Dr. Heinrich Balss (1886-1957), chief conservator of the Zoologische Staatssammlung, München, received from Dr. H.-E. Gruner; the other, by the late Alida M. Buitendijk (1903-1950), curator of Crustacea of the Rijksmuseum van Natuurlijke Historie, Leiden, made available by Dr. L. B. Holthuis.

Of the National Museum files, the first, on 3 x 5' cards, encompasses the species of the aforementioned taxa of Crustacea culled from the Zoological Record, beginning with the very first Crustacean section, pages 257-311 of '*The Record of Zoological Literature for 1864*' and running through the mid-nineteen-forties. Later (as noted above) all published pinnotherid references to 1968 (*Zoological Record* and *Biological Abstracts*) were added, plus a scattering of references to more recent publications.

The second of these Museum files, to be referred to as the 'picture file,' consists of stout bristol board cards, 9-1/4" x 11", on which are mounted the published illustrations (or photo copies thereof) of the types of the crustacean species included in the 3 x 5' file, together with the text of the original description of each. The original descriptions of the non-figured species are similarly mounted. Figures will be supplied for these as they become available. Likewise, all subsequently published specific information and illustrations are also mounted, a separate card for each species.

This picture card file was begun during the 'depression years' (the early 1930's) with aid received from the then Federal Works Progress Administration (W.P.A.) and continued to the nineteen-forties. More recently as noted for the 3 x 5 Zoological Record card file, the coverage for the pinnotherid species of this picture file was also extended through 1967-68.

The undertaking of this file was inspired by cards published by the Wagner Free Institute of Science of Philadelphia, on which were reproduced the original descriptions and illustrations of Devonian fossils. These cards constituted the first of a projected letter-sized card file of the '*Type Invertebrate Fossils of North America*.' This was an implementation of a proposal made by the late Dr. E. M. Kindle, of the Geological Survey of Canada, in '*A New View-Point in Paleontology*,' *Trans. Roy. Soc. Canada*, 25 (4): 31-37, 1931. That forward-looking project later had to be discontinued because of increasing publication costs, limited demand, and lack of funds.

Our comparable picture file of recent Crustacea, though comprising some 8,000 cards, is still not as complete as planned. Since its inception cards covering the species and literature of the porcellanid crabs have been added by Dr. Fenner A. Chace, Jr., and for the stomatopods to the nineteen-forties by the senior author of this compilation.

In effect, the crustacean picture file is an illustrated card catalog of the taxonomic literature of Crustacea, which was developed as a 'tool' for facilitating the Museum's systematic studies. As an 'in-house shop-tool,' its publication is neither necessary nor mandatory. Nevertheless, it is available for consultation in the Division of Crustacea. Though not offered at present, it may be possible to supply photo-copies, preferably on microfilm, of those cards at cost (of materials and labor).

Becoming aware of the existence of this card file, Dr. Holthuis, back in 1965, used his powers of persuasion to get us to adapt it for publication as a part of the proposed Gruner-Holthuis Crustaceorum Catalogus.

The initial draft of the compilation was the work of John C. McCain (June 9, 1964 to July 3, 1965), succeeded by Edward S. Davidson (June 13, 1966 to November 30, 1968) while they worked as scientific aides for the senior author on a monograph of 'The American Commensal Crabs (Family Pinnotheridae),' underwritten for a time by the National Science Foundation. In view of the very considerable part they played in drafting the initial compilation, Messrs. McCain and Davidson are gratefully recognized as co-authors of this third part of the Catalogus.

The extension of that drafted compilation beyond 1967 (the year that Mr. Davidson turned to the identification of the Museum's unworked pinnotherid collections) was continued by Miss Lucile McCain¹ and the senior author.

Miss McCain deserves especial thanks for the largely uncompensated secretarial services she devoted to the completion of this catalog and its comprehensive index. Involved in this labor of hers was the incorporation of a host of references that failed of inclusion in its initial draft, the elimination of numerous inconsistencies in the citation of references, and the correction of misspellings.

It is no more than fitting that, in recognition of her truly indispensable, gratuitous services, one of the two primary homonyms discovered in the course of the preparation of this catalog has been named for her: *Pinnotheres mccainae*, in place of *Pinnotheres rouxi* Rossignol, 1957 (p. 56), preoccupied by *Pinnotheres rouxi* H. Milne Edwards, 1853 (p. 84).²

The other primary homonym, by the way, is *Pinnotheres barbatus* Bürger, 1897 (p. 27), preoccupied by *Pinnotheres barbatus* Desbonne, 1867. T. Sakai, in 1967, felt that Bürger's species should be transferred to this then newly described genus *Orthotheres*. As the two names are primary homonyms, the junior of them, despite Dr. Sakai's transfer of it to another genus, also deserves a new name. To replace it, the specific name of *rathbunae* is proposed to honor the name and memory of Mary J. Rathbun, in her day dean of American carcinologists.²

We are greatly indebted to our colleagues in the Museum for a large measure of assistance:

Drs. Fenner A. Chace, Jr., and Horton H. Hobbs, Jr., and Henry Roberts regarding literature, the regles of the International Code of Zoological Nomenclature, and various editorial practices;

For the validation of the names of species and their authors and the classification of host species: Dr. Marian Pettibone for polychaete worms; Drs. Harald Rehder and Joseph Rosewater for mollusks; Dr. David Pawson and Miss Maureen Downey for echinoderms;

For the gender of generic names of the pinnotherid taxa, Mr. George C. Steyskal, of the Department of Entomology;

For running down the sources of questionable citation, of which there were more than a few, and obtaining the loan of original works not available in Washington, or facsimile copies thereof, from elsewhere, at home or abroad, we are very greatly indebted to Mr. Jack F. Marquardt, in charge of the Reference and Circulation Division of the Smithsonian Institution's Library within the Natural History Building, and the members of his staff for the unremitting and helpful attention

¹Unrelated to John C. McCain.

²The new names are the sole responsibility of the senior author (W. L. Schmitt).

given to our many problems.

Last, but not least, we thank Dr. Holthuis for his help during the last two months (April-May, 1972) of his most recent visit to Washington. He gave more than mere editorial attention to the completion of the manuscript: summarized for publication our carded records of hosts and of the geographic distribution of the pinnotherid species; reviewed the previously prepared copy of the taxa above the species level; helped mightily with the Index; and, finally, supplied the historical commentary introducing the many references to 'the watchman of the Pinna' — *Pinnotheres pinnotheres* (Linnaeus), made well known to the ancients by Aristotle, 384–322 B.C.

But for Dr. Holthuis' modest declination, we would have been happy to have acknowledged our appreciation of his services in the form of co-authorship.

In the Catalogus itself an effort has been made to cite every published reference to each known species. The names of all cited authors appear in capital letters to facilitate locating them in the often long lists of references.

Pagination of many reprints is often at variance with that of the volume in which the original text finally appeared. The differing page numbers of the reprint are given parenthetically.

Generally, the nature of the information, including mention of keys, supplied by any one reference parenthetically accompanies its citation. For primarily taxonomic contributions such parenthetical comment is obviously superfluous. Terminating each reference is noted the locality or area from which the material came if of zoogeographic significance. Also included are explanations of plates and figures, information which will enable students quickly to select the most useful of the references. This is an innovation believed to be original with us insofar as synonymies and catalogs of species are concerned. It has, meanwhile, been adopted and published by others.

In each reference to an original description, an endeavor has been made to indicate the kind of type(s), sex, type locality, and depository of the specimen(s) in question. Most museums (cf. abbreviations, p. 4) believed to have pinnotherid types in their possession were contacted. We are much indebted to them for their informative replies.

'Measurements' (metric) are given for each sex wherever available. If the measurements are of other than type specimens, the source is indicated in parentheses. In some early descriptions the unit of measurement used was the 'line' (English and American) or 'ligne' (French). For the convenience of students the metric and English equivalents for the former are $1/12$ inch (0.0833 inch) = 2.12 mm; for the latter $1/12$ pouce (0.0888 inch) = 2.256 mm.

'Habitat' of these commensal, sometimes parasitic, crustaceans is primarily a recording of host or hosts, if known, with the source parenthetically credited; where called for, the name of each host, if not current, is followed by the correct name in brackets. Also included, if mentioned by an author, are environment and associated organisms, character of bottom, and depth of water. Recorded depths are in each case accompanied by their bracketed equivalents in fms. (fathoms) or meters.

'Distribution,' or range, is given for all species except uniques, for which attention is directed to the type locality.

The index lists the family, generic, species, and subspecies names of the Pinnotheridae as adopted here, together with their synonyms. The type species mentioned for the genera are also referred to. But cross references to Geographic distribution, Habitat, and Remarks have generally been omitted. As to the host species, reference is made in the index to the taxa mentioned in the enumeration on pp. 7–14, where further reference to pinnotherid species associated with each host is found.

To simplify the index, all subgenera are treated as full genera, i.e., *Cancer* (*Pinnotheres*) *pisum* is not indexed as such, but as *Cancer pisum* and *Pinnotheres pisum*.

Appended to this Introduction are:

1. A list of institutions having pinnotherid types in their custody with abbreviations.

viations used in the text to refer to them. The only exception is the Indian Museum, which is not abbreviated, p. 4.

2. A list of the occurrence of pinnotherid species listed under the major zoogeographic or political areas from which they have been reported, pp. 4-7.

3. A systematic list of hosts with the pinnotherids reported from each, pp. 7-14.

Institutions with pinnotherid types

| | |
|---------------|--|
| AHF | Allan Hancock Foundation, Los Angeles, California, U.S.A. |
| AM | Australian Museum, Sydney, Australia |
| AMNH | American Museum of Natural History, New York, New York, U.S.A. |
| BM | British Museum (Natural History), London, England |
| BPBM | Bernice Pauahi Bishop Museum, Honolulu, Hawaii, U.S.A. |
| COIEC | Centre d'Océanographie de l'Institut d'Etudes Centrafricaines de Pointe Noire, Congo |
| CUMZ | University Museum of Zoology, Cambridge, England |
| DZSP | Museu do Departamento de Zoologia, Secretaria da Agricultura, São Paulo, Brazil |
| FMI | Fan Memorial Institute, Peking, China |
| IBUM | Instituto de Biología, Universidad Nacional Autónoma de México, México |
| Indian Museum | Indian Museum, Calcutta, India |
| MCZ | Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, U.S.A. |
| MGSB | Museo Geológico del Seminario de Barcelona, Barcelona, Spain |
| MHNM | Musée d'Histoire Naturelle, Marseille, France |
| MNHNP | Muséum National d'Histoire Naturelle, Paris, France |
| MZUS | Musée Zoologique de l'Université et de la Ville, Strasbourg, France |
| NMW | Naturhistorisches Museum, Wien, Austria |
| PANS | Academy of Natural Science, Philadelphia, Pennsylvania, U.S.A. |
| PM | Peabody Museum of Yale University, New Haven, Connecticut, U.S.A. |
| RMNH | Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands |
| SAM | South Australian Museum, Adelaide, South Australia |
| SDSNH | San Diego Society of Natural History, San Diego, California, U.S.A. |
| SMF | Naturmuseum Senckenberg, Frankfurt a/Main, Germany |
| USNM | U. S. National Museum, Washington, D. C., U.S.A. |
| UZM | Universitetets Zoologiske Museum, København, Denmark |
| ZIMB | II. Zoologisches Institut und Museum der Universität, Göttingen, Germany |
| ZMA | Zoologisch Museum, Amsterdam, Netherlands |
| ZMB | Zoologisches Museum der Humboldt Universität, Berlin, Germany |

Geographic distribution of Pinnotheridae

The geographic categories in the following list are not of equal zoogeographic importance. Several are chosen for practical purposes, e.g., if a small area, like the Palau Islands, is comparatively well studied, it is mentioned separately.

Since so many areas have been only very little explored for Pinnotheridae, the geographic listing given here, provides rather an indication of how well the Pinnotheridae of the various regions are known, than of how many species actually do occur there.

As relevant to our pinnotherid 'Habitat' and 'Distribution' paragraphs today as when published in 1932 are the remarks of Tseng-Jui Tu in the *Zoologischer Anzeiger*, 122 (7/8): 183:

'Was Verbreitung und Anpassungserscheinungen bei unseren Objekten anbelangt, so ist unsere Kenntnis darüber auch sehr lückenhaft. Immerhin lässt sich gegenwärtig mit Sicherheit sagen, dass diese Krabben überall in den tropischen und gemäßigten Zonen der Welt verbreitet sind. Es gibt Arten, die sowohl in den tropischen wie auch in den kälteren Gegenden vorkommen; z.B. kommt *Pinnotheres affinis* sowohl bei den Philippinen wie auch bei der Liautung-Halbinsel vor. Sie

leben fast ausschliesslich im Meere, aber man hat sie auch im Brackwasser gefunden (Bürger, S. 367). Das ist vielleicht ein Hinweis darauf, dass die Tiere allmählich auch ins Süßwasser einwandern können.

Über die Tiefe, in der sie sich gewöhnlich finden, wissen wir noch nichts Genaues. Aber sicher ist, dass eine Art, *Pinnotheres abyssicola*, in eine Tiefe von 786 m eindringt und eine andere Art, *P. occidentalis*, in einer Tiefe von 35–435 m vorkommt. Interessant ist, dass diese Tiere diesen aussergewöhnlichen Lebensbedingungen ohne weiteres angepasst sind, ohne irgendeine Veränderung in der Körperform erfahren zu haben.

East Atlantic. — Atlantic coast of Europe (Norway to Spain):

Asthenognathus atlanticus, *Pinnotheres ascidicola*, *Pinnotheres pectunculi*, *Pinnotheres pinnotheres*, *Pinnotheres pisum*.

Mediterranean and Black Sea:

Pinnotheres marioni, *Pinnotheres pinnotheres*, *Pinnotheres pisum*.

N.W. Africa (Morocco and Mauritania):

Asthenognathus atlanticus, *Pinnotheres pisum*.

Tropical West Africa (Senegal to Angola):

Asthenognathus atlanticus, *Pinnotheres leloeufti*, *Pinnotheres mccainae*, *Pinnotheres pinnotheres*, *Pinnotheres* sp. (A, B, C, D).

West Atlantic. — East coast of the United States (Massachusetts to Florida):

Dissodactylus borradalei, *Dissodactylus calmani*, *Dissodactylus crinitichelis*, *Dissodactylus mellitae*, *Dissodactylus primitivus*, *Fabia byssomiae*, *Parapinnixa beaufortensis*, *Parapinnixa bowieri*, *Pinnixa chaetoptera*, *Pinnixa cristata*, *Pinnixa cylindrica*, *Pinnixa floridana*, *Pinnixa lunzi*, *Pinnixa monodactylum*, *Pinnixa retinens*, *Pinnixa sayana*, *Pinnotheres maculatus*, *Pinnotheres ostreum*, *Pinnotheres pecteni*.

Gulf of Mexico and Caribbean:

Dissodactylus alcocki, *Dissodactylus borradalei*, *Dissodactylus calmani*, *Dissodactylus crinitichelis*, *Dissodactylus juvenilis*, *Dissodactylus mellitae*, *Dissodactylus rugatus*, *Dissodactylus stebbingi*, *Fabia byssomiae*, *Orthotheres serrei*, *Orthotheres strombi*, *Parapinnixa bowieri*, *Parapinnixa hendersoni*, *Pinnaxodes floridensis*, *Pinnixa arenicola*, *Pinnixa chacei*, *Pinnixa chaetoptera*, *Pinnixa cristata*, *Pinnixa cylindrica*, *Pinnixa faxoni*, *Pinnixa floridana*, *Pinnixa leptosynaptae*, *Pinnixa minuta*, *Pinnixa pearsei*, *Pinnixa retinens*, *Pinnixa sayana*, *Pinnixa vanderhorsti*, *Pinnotheres barbatus*, *Pinnotheres geddesi*, *Pinnotheres guerini*, *Pinnotheres hemphilli*, *Pinnotheres hirtimanus*, *Pinnotheres maculatus*, *Pinnotheres moseri*, *Pinnotheres ostreum*, *Pinnotheres shoemakeri*.

East coast of S. America (Brazil to Argentina):

Dissodactylus crinitichelis, *Fabia sebastianensis*, *Parapinnixa hendersoni*, *Pinnaxodes tomentosus*, *Pinnixa aidae*, *Pinnixa angeloi*, *Pinnixa brevipollex*, *Pinnixa chaetoptera*, *Pinnixa patagoniensis*, *Pinnixa rapax*, *Pinnixa sayana*, *Pinnixa transversalis*, *Pinnotheres globosus*, *Pinnotheres maculatus*, *Pinnotheres ostreum*.

East Pacific. — West coast of North America (Alaska to California):

Fabia canfieldi, *Fabia concharum*, *Fabia subquadrata*, *Opisthopus transversus*, *Parapinnixa affinis*, *Pinnixa barnharti*, *Pinnixa eburna*, *Pinnixa faba*, *Pinnixa franciscana*, *Pinnixa hiatus*, *Pinnixa littoralis*, *Pinnixa longipes*, *Pinnixa occidentalis*, *Pinnixa schmitti*, *Pinnixa tomentosa*, *Pinnixa tubicola*, *Pinnixa weymouthi*, *Pinnotheres holmesi*, *Pinnotheres nudus*, *Pinnotheres pugettensis*, *Pinnotheres taylori*, *Scleroplax granulata*.

West coast of Middle America and northern South America (Mexico to Ecuador):

Alarconia seaholmi, *Dissodactylus glasselli*, *Dissodactylus lockingtoni*, *Dissodactylus meyerabichi*, *Dissodactylus nitidus*, *Dissodactylus xantusi*, *Fabia concharum*, *Fabia granti*, *Fabia unguifalcula*, *Parapinnixa nitida*, *Pinnaxodes chilensis*, *Pinnixa abbotti*, *Pinnixa affinis*, *Pinnixa barnharti*, *Pinnixa felipensis*, *Pinnixa fusca*, *Pinnixa huffmani*, *Pinnixa occidentalis*, *Pinnixa pembertoni*, *Pinnixa petersi*, *Pinnixa plectrophoros*, *Pinnixa richardsoni*, *Pinnixa salvadorensis*, *Pinnixa tomentosa*, *Pinnixa transversalis*, *Pinnixa valerii*, *Pinnotheres angelicus*, *Pinnotheres clavapedatus*, *Pinnotheres jamesi*, *Pinnotheres lithodomi*, *Pinnotheres malaguena*, *Pinnotheres margarita*, *Pinnotheres mulmarum*, *Pinnotheres orcutti*, *Pinnotheres pichilinguei*, *Pinnotheres pubescens*, *Pinnotheres reticulatus*, *Pinnotheres trapeziformis*, *Pinnotheres* sp., *Scleroplax granulata*, *Tetria scabripes*.

Galapagos Islands:

Parapinnixa glasselli, *Pinnaxodes chilensis*, *Pinnixa darwini*, *Pinnixa transversalis*.

West coast of southern South America (Peru and Chile):

Dissodactylus nitidus, *Pinnaxodes chilensis*, *Pinnaxodes silvestrii*, *Pinnixa bahamondei*, *Pinnixa chiloensis*, *Pinnixa patensis*, *Pinnixa petersi*, *Pinnixa transversalis*, *Pinnixa valdiviensis*, *Pinnotherelia laevigata*, *Pinnotheres bipunctatus*, *Pinnotheres politus*. Species incertae sedis: *Leucosia pacifica*.

Indo-West Pacific. — General:

Pinnotheres rouxi, *Pinnotheres trapeziformis*.

Micronesia and Polynesia (including Gilbert Islands, New Caledonia, Hawaii, etc.):

Aphanodactylus edmondsoni, ? *Pinnotherelia laevigata*, *Pinnotheres globosus*, *Pinnotheres obesus*, *Pinnotheres* sp., *Tetrias fischeri*, *Xanthasia murigera*. The first of these species is the only one known at present from Hawaii.

New Zealand, inclusive of Chatham and Auckland Islands:

Pinnotheres latipes, *Pinnotheres novaezealandiae*, *Pinnotheres parvulus*, *Pinnotheres schauinslandi*, *Pinnotheres* sp.

Australia (inclusive of Australian New Guinea):

Fabia hickmani, *Pinnixa faba*, *Pinnotheres cardii*, *Pinnotheres edwardsi*, *Pinnotheres holothuriensis*, *Pinnotheres novaezealandiae*, *Pinnotheres obesus*, *Pinnotheres orientalis*, *Pinnotheres pernicola*, *Pinnotheres similis*, *Pinnotheres spinidactylus*, *Pinnotheres subglobosus*, *Pinnotheres villosulus*, *Pinnotheres* sp., *Xanthasia murigera*.

Indonesia (inclusive of West New Guinea):

Aphanodactylus sibogae, *Chasmocarcinops gelasimoides*, *Hapalonotus reticulatus*, *Ostracotheres cynthiae*, *Pinnotheres alcocki*, *Pinnotheres arcophilus*, *Pinnotheres consors*, *Pinnotheres edwardsi*, *Pinnotheres latissimus*, *Pinnotheres latus*, *Pinnotheres obesus*, *Pinnotheres onychodactylus*, *Pinnotheres palaensis*, *Pinnotheres quadratus*, *Pinnotheres semperi*, *Pinnotheres trichopus*, *Pinnotheres villosissimus*, *Pinnotheres villosulus*, *Pinnotheres* sp., *Tetrias fischeri*, *Xanthasia murigera*, *Xenophthalmus duplociliatus*, *Xenophthalmus pinnotheroides*.

Philippines:

Durckheimia caeca, *Orthotheres longipes*, *Orthotheres rathbunae*, *Pinnotheres affinis*, *Pinnotheres alcocki*, *Pinnotheres arcophilus*, *Pinnotheres cardii*, *Pinnotheres coarctatus*, *Pinnotheres exiguus*, *Pinnotheres flavus*, *Pinnotheres gracilis*, *Pinnotheres holothuriae*, *Pinnotheres impressus*, *Pinnotheres latissimus*, *Pinnotheres latus*, *Pinnotheres modiolicola*, *Pinnotheres nudifrons*, *Pinnotheres ormanni*, *Pinnotheres palaensis*, *Pinnotheres pectinicola*, *Pinnotheres pernicola*, *Pinnotheres rhombifer*, *Pinnotheres rotundatus*, *Pinnotheres similis*, *Pinnotheres tenuipes*, *Pinnotheres villosulus*, *Xanthasia murigera*, *Xenophthalmus latifrons*, *Xenophthalmus pinnotheroides*.

Palau Islands:

Durckheimia caeca, *Orthotheres laevis*, *Orthotheres turboe*, *Pinnotheres consors*, *Pinnotheres glaber*, *Pinnotheres glaberrimus*, *Pinnotheres latus*, *Pinnotheres palaensis*.

Japan and Taiwan:

Asthenognathus inaequipes, *Dissodactylozoa pelagica*, *Dissodactylozoa pinna*, *Dissodactylozoa tokyoensis*, *Durckheimia caeca*, *Orthotheres turboe*, *Ostracotheres subquadrata*, *Pinnaxodes major*, *Pinnaxodes mutuensis*, *Pinnixa balanoglossana*, *Pinnixa haematosticta*, *Pinnixa penultipedalis*, *Pinnixa rathbunae*, *Pinnixa tumida*, *Pinnotheres bidentatus*, *Pinnotheres boninensis*, *Pinnotheres cardii*, *Pinnotheres corbiculae*, *Pinnotheres cyclinus*, *Pinnotheres gordonii*, *Pinnotheres laquei*, *Pinnotheres latissimus*, *Pinnotheres parvulus*, *Pinnotheres pholadis*, *Pinnotheres sinensis*, *Pinnotheres sinensis atrinae*, *Pseudopinnixa carinata*, *Sakaina asiatica*, *Sakaina incisa*, *Sakaina japonica*, *Sakaina yokoyai*, *Tetrias fischeri*, *Tritodynamia horvathi*, *Tritodynamia intermedia*, *Tritodynamia japonica*, *Tritodynamia rathbunae*, *Xenophthalmus pinnotheroides*.

Honkong, China, Korea, Siberia:

Anomalifrons lightana, *Dissodactylozoa pinna*, *Dissodactylozoa singularis*, *Dissodactylozoa speciosa*, *Dissodactylozoa unicornis*, *Parapinnixa affinis*, *Pinnaxodes major*, *Pinnixa penultipedalis*, *Pinnixa rathbuni*, *Pinnixa tumida*, *Pinnotheres affinis*, *Pinnotheres cardii*, *Pinnotheres cyclinus*, *Pinnotheres dilatatus*, *Pinnotheres globosus*, *Pinnotheres gordonii*, *Pinnotheres haiyangensis*, *Pinnotheres obesus*, *Pinnotheres obscurus*, *Pinnotheres parvulus*, *Pinnotheres serrignathus*, *Pinnotheres sinensis*, *Pinnotheres tsingtaoensis*, *Tritodynamia horvathi*, *Tritodynamia intermedia*, *Tritodynamia rathbunae*, *Xenophthalmus obscurus*, *Xenophthalmus pinnotheroides*.

Thailand:

Asthenognathus hexagonum, *Chasmocarcinops gelasimoides*, *Mortensenella forceps*, *Pinnotheres affinis*, *Pinnotheres buergeri*, *Pinnotheres cardii*, *Pinnotheres glaberrimus*, *Pinnotheres gracilis*, *Pinnotheres kamensis*, *Pinnotheres kutensis*, *Pinnotheres lanensis*, *Pinnotheres nigrans*, *Pinnotheres parvulus*, *Pinnotheres quadratus*, *Pinnotheres siamensis*, *Xenophthalmus obscurus*, *Xenophthalmus pinnotheroides*.

Malaysia:

Durckheimia besutensis, *Pinnotheres arcophilus*, *Pinnotheres edwardsi*, *Pinnotheres globosus*, *Pinnotheres modiolicola*, *Pinnotheres obesus*, *Pinnotheres ormanni*, *Pinnotheres palaensis*, *Pinnotheres semperi*, *Pinnotheres similis*, *Pinnotheres socius*, *Pinnotheres spinidactylus*, *Pinnotheres winckworthi*, *Xanthasia whitei*, *Xenophthalmus obscurus*.

Indian subcontinent (Pakistan, India, Ceylon, Burma, inclusive of Maldives, Laccadive, Andaman, and Mergui Archipelagoes):

Chasmocarcinops gelasimoides, *Pinnotheres abyssicola*, *Pinnotheres alcocki*, *Pinnotheres borraidailei*, *Pinnotheres deccanensis*, *Pinnotheres edwardsi*, *Pinnotheres gracilis*, *Pinnotheres mactricola*, *Pinnotheres margaritiferae*, *Pinnotheres modiolicola*, *Pinnotheres placunae*, *Pinnotheres purpureus*, *Pinnotheres ridgewayi*, *Pinnotheres sanguinolariae*, *Pinnotheres setnai*, *Pinnotheres vicajii*, *Pinnotheres villosissimus*, *Pinnotheres* sp., *Tetrias fischeri*, *Xanthasia murigera*, *Xanthasia whitei*, *Xenophthalmus pinnotheroides*.

N.W. Indian Ocean (Red Sea, Gulf of Aden, Arabian Sea, Persian Gulf):

Durckheimia carinipes, *Ostracotheres affinis*, *Ostracotheres cynthiae*, *Ostracotheres spondyli*, *Ostracotheres tridacnae*, *Pinnotheres borraidailei*, *Pinnotheres coutierei*, *Pinnotheres lutescens*, *Pinnotheres maindroni*, *Pinnotheres pectinicola*, *Pinnotheres perezi*, *Pinnotheres pernicola*, *Pinnotheres pilumnoides*, *Pinnotheres purpureus*, *Pinnotheres tivelae*, *Xenophthalmus pinnotheroides*, *Xenophthalmus wolffi*.

East Africa (Kenya to Mozambique):

Pinnixa penultipedalis, *Pinnotheres borradailei*, *Pinnotheres globosus*, *Pinnotheres* sp., *Voelzkowia zanzibarensis*, *Xanthasia murigera*.

South Africa:

Ostracotheres tridacnae, *Pinnotheres doffeini*, *Pinnotheres* sp.

Western Indian Ocean (Madagascar, Mauritius):

Ostracotheres affinis, *Pinnixa brevipes*, *Pinnotheres* sp.

Fossil species. —

Parapinnixa miocenica, *Pinnixa eocenica*, *Pinnixa galliheri*, *Pinnixa heckeri*, *Pinnixa montereyensis*, *Pinnixa mytilicola*, *Pinnotheres* sp.

Hosts of Pinnotheridae

The following list indicates, in a systematic order, those invertebrate species with which Pinnotheridae have been found as commensals. The Pinnotherid species known to occur with each host are listed.

The nomenclature of the host species has been brought up to date, so far as this was possible, with the help of the staff of the U.S. National Museum, Washington, D.C. Special thanks are due to Dr. Harald A. Rehder and Dr. Joseph Rosewater for checking the names of the Mollusca, to Dr. Marian H. Pettibone for those of the Polychaeta, and to Dr. David Pawson and Miss Maureen Downey for those of the Echinodermata.

With each of the host names as accepted here, the synonyms used in Pinnotherid literature are given in parentheses.

Coelenterata**Order Ceriantharia:****Cerianthidae:**

Cerianthus sp.: *Pinnixa littoralis*

Brachiopoda**Order Testicardines:****Terebratulidae:**

Laqueus rubellus (Sowerby): *Pinnotheres laquei*

Mollusca**Class Amphineura, Subclass Polyplacophora:****Acanthochitonidae:**

Cryptochiton stelleri (Middendorff): *Opisthopus transversus*

Class Gastropoda, Subclass Prosobranchia:**Haliotidae:**

Haliotis asinina Linnaeus: *Pinnixa faba*

Haliotis cocoradiata (Reeve): *Pinnixa faba*

Acmaeidae:

Acmaea sp.: *Fabia granti*

Fissurellidae:

Megathura crenulata (Sowerby) (*Lucapina* c.): *Fabia canfieldi*, *Opisthopus transversus*

Trochidae:

Cittarium pica (L.) (*Turbo* p.): *Pinnotheres barbatus*

Turbinidae:

Atraea undosa (Wood): *Opisthopus transversus*

Turbo (*Marmarostrom*) *argyrostomus* (L.): *Orthotheres turboe*

Turbo intercostalis (Menke): *Pinnotheres* sp. Ganapati & Sastri, 1969

Calyptraeidae:

Calyptraea sp.: *Pinnotheres politus*

Crepidula sp.: *Fabia granti*
Crepidula dilatata (Lamarck): *Pinnotheres politus*
Crucibulum spinosum Sowerby: *Fabia granti*

Strombidae:

Strombus sp.: *Orthoheres serrei*, *Orthoheres strombi*
Strombus alatus Gmelin: *Orthoheres strombi*
Srombus pugilis Linnaeus: *Orthoheres strombi*

Naticidae:

Polinices lewisii (Gould): *Opisthopus transversus*

Fascioliariidae:

Pleuroploca sp.: *Orthoheres strombi*

Conidae:

Conus sp.: *Pinnotheres* sp. C. Monod, 1956
Conus papilionaceus Bruguière: *Pinnotheres* sp. C. Monod, 1956

Class Gastropoda, Subclass Opisthobranchia

Bullidae:

Bulla gouldiana Pilsbry: *Opisthopus transversus*

Aglajidae:

Navanax inermis (Cooper): *Opisthopus transversus*

Aplysiidae:

Aplysia sp. (*Tethys* sp.): *Pinnixa faba*
Aplysia vaccaria Winkler: *Opisthopus transversus*

Class Bivalvia

General [in bivalves]: *Pinnotheres socius*, *Tritodynamia horvathi*

Arcidae:

Anadara granosa (Linnaeus) (*Arca* g.): *Pinnotheres palaensis*
Anadara scapha (Chemnitz) (*Arca* s.): *Pinnotheres palaensis*
Anadara (*Scapharea*) *subrenata* (Lischke): *Tritodynamia horvathi*
Arca sp. (*Bysoarca* sp.): *Pinnotheres arcophilus*, *Pinnotheres consors*, *Pinnotheres glaberrimus*,
Pinnotheres obesus, *Pinnotheres palaensis*, *Pinnotheres quadratus*
Barbatia lima (Reeve): *Pinnotheres palaensis*

Glycymerididae:

Glycymeris sp. (*Pectunculus* sp.): *Pinnotheres orientalis*, *Pinnotheres pisum*
Glycymeris (*G.*) *glycymeris* (Linnaeus) (*Pectunculus flammulatus*): *Pinnotheres pectunculi*
Glycymeris (*Tucetona*) *auriflua* (Reeve) (*Pectunculus aurifluus*): *Pinnotheres rhombifer*

Mytilidae:

Lithophaga sp. (*Lithophagus* sp.): *Durckheimia besutensis*
Lithophaga aristata Dillwyn (*Lithodomus aristatus*): *Pinnotheres lithodomii*
Lithophaga attenuata (Deshayes): *Pinnotheres clavapedatus*
Modiolus sp. (*Modiola* sp.): *Opisthopus transversus*, ? *Pinnotheres globosus*, *Pinnotheres spinidactylus*,
Pinnotheres sp. Barnard, 1950
Modiolus americanus Leach (*M. tulipa*): *Pinnotheres maculatus*
Modiolus auriculatus Krauss (*Volsella auriculata*): *Pinnotheres sinensis*
Modiolus barbatus (Linnaeus) (*Modiola barbata*): *Pinnotheres pisum*
Modiolus capax (Conrad) (*Modiola c.*, *Volsella c.*): *Fabia concharum*, *Pinnotheres angelicus*
Modiolus difficilis (Kuroda & Habe): *Pinnaxodes major*, *Tritodynamia rathbunae*
Modiolus metcalfei Hanley (*Volsella m.*): *Pinnixa rathbunae*
Modiolus modiolus (Linnaeus) (*Modiola modiolus*, *Modiolus vulgaris*, *Mytilus modiolus*, *Volsella modiolus*): *Fabia concharum*, *Fabia subquadrata*, ? *Pinnaxodes mutuensis*, *Pinnotheres maculatus*,
Pinnotheres pinnotheres, *Pinnotheres pisum*
Modiolus neozelandicus (Iredale): *Pinnotheres novaezelandiae*
Modiolus nipponicus Oyama: *Pinnaxodes mutuensis*
Modiolus philippinarum (Hanley) (*Modiola p.*): *Pinnotheres modiolicola*, *Pinnotheres spinidactylus*
Musculus australis (Gray) (*Modiolaria a.*): *Pinnotheres subglobosus*
Mytilus sp.: *Pinnaxodes major*, *Pinnotheres alcocki*, *Pinnotheres margaritiferae*, *Pinnotheres pisum*,
Pinnotheres schauinslandi, *Pinnotheres* sp. Jones, 1950, *Xanthasia murigera*
Mytilus californianus (Conrad) (*M. californicus*): *Fabia subquadrata*
Mytilus crassitesta Lischke: ? *Ostracotheres subquadrata*, *Pinnotheres cardii*, *Pinnotheres gordonii*,
Pinnotheres sinensis

Mytilus edulis L.: *Fabia subquadrata*, *Opisthopus transversus*, *Pinnotheres maculatus*, *Pinnotheres ostreum*, *Pinnotheres pholadis*, *Pinnotheres pisum*, *Pinnotheres sinensis*
Mytilus edulis aoteanus Powell (*Mytilus planulatus*): *Fabia hickmani*, *Pinnotheres novaezelandiae*
Mytilus galloprovincialis Lamarck: *Pinnotheres pisum*
Mytilus grayanus Dunker (*Crenomytilus g.*): *Pinnaxodes major*, *Tritodynamia rathbunae*
Mytilus incurvatus Philippi: *Pinnotheres pisum*
† *Mytilus michelini* Math.: probable host of † *Pinnixa mytilicola*
Perna canalicula (Gmelin) (*Mytilus canaliculatus*): *Pinnotheres novaezelandiae*
Semimytilus algosus (Gould) (*Mytilus a.*): *Pinnotheres politus*

Pinnidae:

Atrina sp.: *Pinnotheres schauinslandi*
Atrina fragilis (Pennant) (*Pinna ingens*, *P. marina*, *P. pectinata*, *P. truncata*): *Pinnotheres pinnotheres*
Atrina p. pectinata (Linnaeus) (*A. japonica*, *Pinna chemnitzii*): *Pinnotheres sinensis atrinae*, *Pinnotheres villosulus*
Atrina pectinata zelandica Gray (*A. zelandica*): *Pinnotheres novaezelandiae*
Atrina rigida Solander: *Fabia sebastianensis*, *Pinnotheres maculatus*
Atrina seminuda Lamarck (*Pinna s.*): *Pinnotheres maculatus*
Atrina serrata Sowerby (*Pinna muricata*): *Pinnotheres maculatus*
Atrina vexillum (Born) (*Pinna nigrina*, *P. vexillum*): *Pinnotheres alcocki*, *Pinnotheres edwardsi*, *Pinnotheres latus*
Pinna sp.: *Ostracotheres tridacnae*, *Pinnotheres affinis*, *Pinnotheres borradalei*, *Pinnotheres doffleini*, *Pinnotheres edwardsi*, *Pinnotheres latipes*, *Pinnotheres latus*, *Pinnotheres orientalis*, *Pinnotheres parvulus*, *Pinnotheres* sp. Ward, 1967, *Xanthasia whitei*
Pinna bicolor Chemnitz (*P. atropurpurea*): *Pinnotheres alcocki*, *Pinnotheres cardii*
Pinna bullata Gmelin (unrecognizable species): *Pinnotheres ridgewayi*
Pinna muricata Linnaeus (*P. aequilatera*; ? *Pinna maritima*): *Pinnotheres globosus*, *Pinnotheres ridgewayi*
Pinna nobilis Linnaeus (*P. squamosa*, ? *P. saccata*): *Pinnotheres pinnotheres*, *Pinnotheres pisum*

Pteriidae:

Pinctada sp. (*Avicula* sp., *Meleagrina* sp.): *Pinnotheres trichopus*, *Pinnotheres* sp. Pesta, 1912, *Pinnotheres* sp. Barnard, 1950
Pinctada margaritifera (Linnaeus) (*Margaritifera vulgaris*, *Meleagrina margaritifera*): *Pinnotheres margaritiferae*, *Pinnotheres villosulus*
Pinctada mazatlanica (Hanley) (*Margaritophora fimbriata*): *Pinnotheres margarita*

Isoonomonidae:

Isoonomon sp. (*Perna* sp., *Perna perna*): *Pinnotheres maculatus*, *Pinnotheres pernicola*

Pectinidae:

Amusium pleuronectes (Linnaeus): *Chasmocarcinops gelasimoides*
Chlamys bifrons Lamarck: *Pinnotheres subglobosus*
Chlamys gibba (Linnaeus) (*Aequipecten gibbus*, *Pecten gibbus*): *Pinnotheres maculatus*
Chlamys hastata (Sowerby) (*Pecten hastatus*): *Pinnotheres affinis*
Chlamys irradians (Lamarck) (*Aequipecten irradians*, *Pecten irradians*): *Pinnotheres maculatus*
Chlamys magellanica (Gmelin) (*Pecten magellanicus*, *Pecten tenuicosta*, *Pecten tenuicostatus*, *Placopecten magellanicus*): *Pinnotheres maculatus*
Chlamys nipponensis Kuroda: *Pinnotheres pholadis*, *Pinnotheres sinensis*
Chlamys senatoria nobilis Reeve: *Pinnotheres pholadis*
Hinnites multirugosus (Gale): *Opisthopus transversus*
Pecten sp.: *Pinnotheres ostreum*, *Pinnotheres pecteni*
Pecten albicans (Schröter) (*Pecten laquetus*): *Pinnotheres parvulus*, *Pinnotheres pholadis*
Semipallium radulum (Linnaeus) (*Pecten radula*): *Pinnotheres pectinicola*

Spondyliidae:

Spondylus exilis Sowerby (*Spondylus gaederopus*): *Ostracotheres spondyli*
Spondylus tenellus Reeve: *Pinnotheres subglobosus*

Anomiidae:

Anomia ephippium Linnaeus: *Pinnotheres pisum*
Anomia lischkei Dautzenberg & Fischer: *Pinnotheres gordonii*
Anomia simplex d'Orbigny: *Pinnotheres maculatus*, *Pinnotheres ostreum*
Placuna placenta (Linnaeus) (*Placenta placenta*): *Pinnotheres placunae*, *Pinnotheres similis*
Placuna sella Gmelin: *Pinnotheres palaensis*

Limidae:

Acesta indica (Smith) (*Lima indica*): *Pinnotheres abyssicola*
Lima divaricata Dujardin: *Pinnotheres glaberrimus*
Lima sowerbyi Deshayes: *Durckheimia caeca*
Lima squamosa Lamarck: *Durckheimia caeca*

Ostreidae:

General (in oysters): *Pinnotheres geddesi* (mangrove oysters), *Pinnotheres gordonii*, *Pinnotheres guerinii*

Crassostrea sp.: *Ostracotheres subquadratus*
Crassostrea echinata (Quoy) (*Ostrea spinosa*): *Pinnotheres boninensis*, *Pinnozoea ostrea*
Crassostrea gigas (Thunberg) (*Ostrea gigas*): *Pinnotheres pholadis*, *Pinnotheres sinensis*
Crassostrea rhizophorae (Guilting): *Pinnotheres ostreum*, ? *Pinnotheres geddesi*
Crassostrea virginica (Gmelin) (*Ostrea virginica*): *Pinnotheres ostreum*
Ostrea sp.: *Pinnotheres affinis*, *Pinnotheres edwardsi*, *Pinnotheres geddesi*, *Pinnotheres purpureus*,

Pinnotheres similis

Ostrea angelica Rochebrune (*O. cumingiana*): *Pinnotheres angelicus*
Ostrea cuculata Born.: *Pinnotheres* sp. Awati & Rai, 1931
Ostrea denselamellosa Lischke: *Pinnotheres cardii*
Ostrea edulis Linnaeus (*Ostrea hippopus*): *Pinnotheres pinnotheres*; *Pinnotheres pisum*
Ostrea palmula Carpenter (*O. amara*): *Pinnotheres angelicus*
Ostrea tulipa Lamarck (*Ostrea gasar*): *Pinnotheres* sp. A. Monod, 1956
Ostrea vitrefacta Sowerby: *Pinnotheres* sp. Poisson, 1946

Trigoniidae:

Neotrigonia margaritacea (Lamarck): *Pinnotheres pisum*

Chamidae:

Chama macerophylla Gmelin (*Chama lazarus*): *Pinnotheres maculatus*
Chama reflexa Reeve: *Durckheimia caeca*

Kelliidae:

Kellia laperousii Deshayes: ? *Fabia concharum*

Carditidae:

Cyclocardia borealis (Conrad) (*Cardita borealis*): *Fabia subquadrata*
Cyclocardia ventricosa (Gould) (*Venericardia ventricosa*): *Fabia subquadrata*

Cardiidae:

Acanthocardia echinata (Linnaeus) (*Cardium echinatum*): *Pinnotheres pisum*
Acanthocardia paucicostata (Sowerby) (*Cardium paucicostatum*): *Pinnotheres marioni*
Cerastoderma edule (Linnaeus) (*Cardium edule*): *Pinnotheres pisum*
Clinocardium nuttalli Conrad (*Cardium corbis*): *Pinnixa faba*, *Pinnixa littoralis*, *Pinnixa* sp. Harrington & Griffin, 1898
Dinocardium robustum (Lightfoot) (*Trachycardium robustum*): *Opisthopus transversus*
Fragum unedo (Linnaeus) (*Cardium unedo*): *Pinnotheres cardii*
Laevicardium laevigatum (Linnaeus) (*Cardium laevigatum*): *Pinnotheres pisum*
Laevicardium norvegicum (Spengler) (*Cardium norvegicum*): *Pinnotheres pisum*
Ostrea undatopictum (Pilsbry) (*Cardium undatopictum*): *Pinnotheres gordonii*
Nemocardium pulchellum Gray: *Pinnotheres* sp. Dell, 1960
Parvicardium exiguum (Gmelin) (*Cardium exiguum*): *Pinnotheres pisum*
Serripes groenlandicus Bruguière: *Pinnixa littoralis*

Tridacnidae:

Tridacna crocea Lamarck: *Xanthasia murigera*
Tridacna gigas (Linnaeus): *Xanthasia whitei*
Tridacna squamosa Lamarck: *Xanthasia murigera*
Tridacna maxima (Röding) (*Tridacna elongata*): *Ostracotheres tridacnae*

Mactridae:

Lutraria sp.: *Pinnixa faba*
Mactra antiqua Spengler (*Coelomactra antiqua*): *Pinnaxodes major*
Mactra corallina (Linnaeus): *Pinnotheres pisum*
Mactra discors Gray: *Pinnotheres novaezelandiae*
Mactra mera Reeve: *Pinnotheres palaensis*
Mactra quadrangularis (Deshayes) (*Trigonella quadrangularis*): *Pinnotheres tsingtaoensis*
Mactra stultorum Linnaeus: *Pinnotheres pisum*
Mactra sulcatoria Deshayes: *Pinnotheres cardii*, *Pinnotheres pholadis*
Mactra violacea (Chemnitz) (*Coelomactra violacea*): *Pinnotheres mactricola*, *Pinnotheres modiolicola*
Mulinia sp.: *Pinnotheres mulinarum*
Resania lanceolata Gray: *Pinnotheres novaezelandiae*
Spisula aequilateralis Deshayes: *Pinnotheres novaezelandiae*
Spisula elliptica (Brown): *Pinnotheres pisum*
Spisula sachalinensis (Schrenck) (*Mactra sachalinensis*): *Pinnotheres cardii*, *Pinnotheres pholadis*
Spisula solida (Linnaeus) (*Mactra solida*): *Pinnotheres pisum*
Spisula subtruncata (Da Costa): *Pinnotheres pisum*
Tresus capax (Gould) (*Schizothaerus capax*): *Pinnixa faba*, *Pinnixa littoralis*
Tresus nuttalli (Conrad) (*Schizothaerus nuttalli*): *Opisthopus transversus*, *Pinnixa faba*, *Pinnixa littoralis*, *Pinnixa* sp. Harrington & Griffin, 1898

Solenidae:

Solen sp.: *Pinnotheres gracilis*

Cultellidae:

Sitiqua patula (Dixon): *Pinnixa littoralis*

Tellinidae:

Heteromacoma irus (Hanley) (*Macoma inquinata*): *Pinnixa faba*, *Pinnixa littoralis*
Macoma indentata Carpenter: *Pinnixa faba*, *Pinnixa littoralis*
Macoma nasuta (Conrad): *Pinnixa faba*, *Pinnixa littoralis*
Macoma secta Conrad: *Pinnixa faba*, *Pinnixa littoralis*, *Pinnixa schmitti*
Tellina nymphalis Lamarck: *Pinnotheres* sp. A. Monod, 1956

Donacidae:

Donax sp.: *Orthoheres rathbunae*, *Pinnotheres mccainae*, *Pinnotheres orientalis*.
Donax gouldii Dall (*Donax levigatus*): *Fabia concharum*

Psammobiidae:

Sanguinolaria diphos Linnaeus: *Pinnotheres sanguinolariae*
Sanguinolaria nuttallii Conrad: *Opisthopus transversus*

Trapeziidae:

Coralliophaga sp.: *Orthoheres laevis*

Glossidae:

Glossus humanus Linnaeus (*Jsocardia cor*): *Pinnotheres pinnotheres*

Corbiculidae:

Corbicula japonica Prime: *Pinnotheres corbiculae*
Polymesoda (*Geloina*) *coaxans* (Gmelin): *Pinnotheres coarctatus*, *Pinnotheres glaberrimus*

Veneridae:

Chamelea gallina Linnaeus (*Venus gallina*): *Pinnotheres pisum*
Circe sp.: *Pinnotheres consors*, *Pinnotheres rotundatus*
Cyclina chinensis Chemnitz: *Pinnotheres cyclinus*
Marcia optima (Gmelin) (*Katelysia o.*): *Pinnotheres gracilis*, *Pinnotheres modiolicola*
Megapitaria squalida (Sowerby): *Opisthopus transversus*
Meretrix casta (Chemnitz): *Pinnotheres* sp. Silas & Alagaraswami, 1967
Meretrix lamarckii Deshayes: *Pinnaxodes major*
Meretrix lusoria Chemnitz: *Pinnotheres pholadis*, *Pinnotheres sinensis*
Meretrix meretrix (Linnaeus): *Pinnotheres cardii*, *Pinnotheres cyclinus*
Paphia (*Protapes*) *gallus* (Gmelin): *Pinnotheres vicajii*, *Pinnotheres winckworthi*
Periglypta sp. (*Cytherea* sp.): *Pinnotheres alcocki*, *Pinnotheres globosus*, *Pinnotheres obesus*
Saxidomus giganteus Deshayes: *Fabia subquadrata*, ? *Pinnixa faba*, ? *Pinnixa littoralis*
Saxidomus purpuratus (Sowerby): *Pinnotheres parvulus*
Sunetta quadrata, nomen nudum (*Meroë quadrata*): *Pinnotheres globosus*, *Pinnotheres obesus*,
Pinnotheres parvulus
Tapes sp. (*Paphia* sp.): *Fabia concharum*, *Fabia subquadrata*, *Pinnixa faba*, *Pinnixa littoralis*
Tapes decussata Linnaeus: *Pinnotheres pisum*
Tapes japonica (Deshayes) (*Paphia* (*Tapes*) *philippinarum*, *Venerupis* (*Amygdala*) *japonica*,
Venerupis philippinarum): *Pinnaxodes major*, *Pinnotheres cyclinus*, *Pinnotheres gordonii*, *Pinnotheres*
latissimus, *Pinnotheres pholadis*, *Pinnotheres sinensis*
Tapes literata (Linnaeus): ? *Pinnotheres glaber*
Tapes turgida (Lamarck): *Pinnotheres glaber*
Tapes variegata Sowerby (*Paphia variegatus*): *Pinnotheres dilatatus*, *Pinnotheres gordonii*, *Pinnotheres*
sinensis
Tivela ponderosa (Philippi): *Pinnotheres tivelae*
Tivela stultorum (Mawe) (*Pachydesma crassatelloides*): *Fabia concharum*, *Fabia subquadrata*
Venerupis pullastra (Montagu) (*Tapes pullastra*): *Pinnotheres pisum*
Venus verrucosa Linnaeus: *Pinnotheres pisum*

Myidae:

Cryptomya californica (Conrad) (*Mya californica*): *Fabia concharum*
Mya sp.: *Pinnotheres borradalei*
Mya arenaria Linnaeus: *Fabia subquadrata*, *Pinnixa faba*, *Pinnixa littoralis*, *Pinnotheres maculatus*,
Pinnotheres pisum, *Pinnotheres pugettensis*, *Scleroplax granulata*
Platydon sp.: *Opisthopus transversus*

Gastrochaenidae:

Eufistulana mumia (Spengler) (*Fistulana clava*): *Tetrias fischeri*

Hiatellidae:

Hiatella arctica Linnaeus (*Byssomia distorta*, *Saxicava arctica*, *Saxicava distorta*): *Fabia byssomiae*
Panopea aldrovandi Ménard: *Pinnotheres* sp. B. Monod, 1956

Pholadidae:

Barnea sp.: *Pinnaxodes major*
Barnea mantilensis inornata Pilsbry: *Pinnotheres pholadis*

Barnea subtruncata (Sowerby) (*Barnea pacifica*, *Pholas pacifica*): *Fabia concharum*
Parapholas californica (Conrad) (*Pholas californica*): *Fabia concharum*
Pholas sp.: *Opisthopus transversus*, *Pinnotheres perezii*
Zirfaea sp.: *Opisthopus transversus*
Zirfaea pilsbryi Lowe: *Opisthopus transversus*

Laternulidae:

Laternula pechiliensis (Grabau & King) (*Anatinia peichihliensis*): *Pinnotheres haiyangensis*,
Pinnotheres tsingtaoensis

Lyonsiidae:

Entodesma saxicola (Baird) (*Lyonsia saxicola*): *Pinnixa faba*, *Pinnixa littoralis*

Annelida

Order Polychaeta Sedentaria

General ('in worm tubes'): *Fabia granti*, *Parapinnixa glasselli*, *Pinnixa tubicola* (calcareous and leathery tubes), *Tetris fisheri*

Arenicolidae:

Abarenicola affinis chiliensis Wells (*Arenicola assimilis affinis*): *Pinnixa chiloensis*
Abarenicola pacifica Healy & Wells (*A. vagabunda pacifica*): *Pinnixa schmitti*, *Pinnixa eburna*
Abarenicola vagabunda oceanica Healy & Wells (*Arenicola* v. o.): *Pinnixa eburna*
Abarenicola vagabunda vagabunda Healy & Wells (*Arenicola* v. v., *Arenicola claparedii*, *Arenicola pusilla*): *Pinnixa eburna*
Arenicola sp.: *Pinnixa pembertoni*, *Pinnotheres maculatus*
Arenicola cristata Stimpson: *Pinnixa cylindrica*, *Pinnixa sayana*, *Tritodynamia japonica*

Polynoidae:

Gattyana cirrosa (Pallas): *Asthenognathus atlanticus*
Grubeopolynoë tuta (Grube) (*Hololepidiella tuta*): *Pinnixa franciscana*
Halosydna sp.: *Pinnixa tubicola*

Maldanidae:

Axiohella rubrocincta (Johnson) (*Clymenella* r.): *Pinnixa longipes*
Clymenella sp.: *Pinnixa plectrophoros*

Chaetopteridae:

Chaetopterus sp.: *Pinnotheres ostreum*
Chaetopterus variopedatus (Renier) (*C. pergamentaceus*): *Opisthopus transversus*, *Pinnixa bahamondei*, *Pinnixa chaetopterana*, *Pinnixa darwini*, *Pinnixa rathbuni*, *Pinnixa tomentosa*, *Pinnixa transversalis*, *Pinnixa valvidiensis*, *Pinnotheres maculatus*, *Tritodynamia intermedia*, *Tritodynamia rathbunae*
Mesochaetopterus japonicus Fujiwara: *Tritodynamia rathbunae*

Onuphidae:

Diopatra sp.: *Pinnixa pearsei*
Diopatra cuprea (Bosc): *Pinnixa floridana*

Pectinariidae:

Pectinaria californiensis Hartman (*P. auricoma*): *Pinnixa longipes*

Terebellidae:

Amphitrite sp. (see also under *Terebella californica*): *Pinnixa schmitti*, *Pinnixa tubicola*
Amphitrite edwardsii (Quatrefages): *Asthenognathus atlanticus*
Amphitrite ornata (Leidy): *Pinnixa chaetopterana*
Amphitrite robusta Johnson: *Pinnixa franciscana*
Eupolymnia heterobranchia (Johnson) (*Lanice* h.): *Parapinnixa nitida*
Eupolymnia sp.: *Pinnixa tubicola*
Loimia sp.: *Aphanodactylus sibogae*
Loimia medusa (Savigny) (*L. montagui*): *Aphanodactylus edmondsoni*, *Parapinnixa affinis*,
Pinnixa penultipedalis, *Pinnixa rathbuni*, *Tritodynamia horvathi*
Pista elongata Moore: *Pinnixa longipes*, *Pinnixa schmitti*, *Pinnixa tomentosa*
Terebella californica Moore (*Amphitrite* sp.): *Parapinnixa affinis*

Sabellidae:

Potamilla sp.: *Pinnixa penultipedalis*

Sipunculida

General: *Pinnixa penultipedalis*

Echiurida

Echiuridae:

Echiurus sp.: *Pinnixa occidentalis*

Echiurus echiurus alaskensis Fisher (*E. pallasi*): *Pinnixa schmitti*
Urechis sp.: *Pinnixa schmitti*
Urechis caupo Fisher & MacGinitie: *Pinnixa franciscana*, *Pinnixa longipes*, *Scleroplax granulata*

Thalassemidae:

Thalassema hartmani Fisher: *Pinnixa lunzi*

Arthropoda

Order Crustacea Decapoda:

Callianassidae:

Callianassa californiensis Dana: *Pinnixa franciscana*, *Pinnixa schmitti*, *Scleroplax granulata*
Callianassa islagrande Schmitt: *Pinnixa chacei*
Callianassa jamaicensis louisianensis Schmitt: *Pinnixa chaetoptera*
Upogebia sp.: *Pinnixa franciscana*
Upogebia affinis (Say): *Pinnixa retinens*
Upogebia pugettensis (Dana): *Pinnixa schmitti*, *Scleroplax granulata*

Echinodermata

Class Echinoida

General: *Parapinnixa bouvieri* ('among ventral spines of rose sea urchin'), *Pinnotheres bipunctatus* (in sea urchins?)

Arbaciidae:

Tetrapygyus niger (Molina) (*Arbacia nigra*): *Pinnaxodes chilensis*

Echinidae:

Loxechinus albus (Molina) (*Echinus* sp., *Echinus albus*): *Pinnaxodes chilensis*

Strongylocentrotidae:

Strongylocentrotus purpuratus (Stimpson) (*Echinus purpuratus*): *Fabia subquadrata*

Echinometridae:

Caenocentrotus gibbosus (Valenciennes) (*Euryechinus imbecillis*, *Strongylocentrotus gibbosus*): *Pinnaxodes chilensis*

Brissidae:

Brissopsis lyrifera (Forbes): *Asthenognathus atlanticus*

Clypeastridae:

Clypeaster subdepressus (Gray): *Dissodactylus crinitichelis*, *Dissodactylus mellitae*, *Dissodactylus stebbingi*

Echinarachniidae:

Echinarachnius parma (Lamarck): *Dissodactylus mellitae*

Mellitidae:

Encope sp.: *Dissodactylus xantusi*
Encope californica Verrill: *Dissodactylus nitidus*, *Dissodactylus lockingtoni*
Encope emarginata (Leske): *Dissodactylus crinitichelis*
Encope grandis Agassiz: *Dissodactylus lockingtoni*, *Dissodactylus nitidus*
Encope michelini Agassiz: *Dissodactylus crinitichelis*, *Dissodactylus mellitae*
Encope micrapora Agassiz: *Dissodactylus nitidus*, *Dissodactylus lockingtoni*
Mellita longifissa Michelin: *Dissodactylus glasselli*, *Dissodactylus lockingtoni*, *Dissodactylus nitidus*, *Dissodactylus xantusi*
Mellita quinquesperforata (Leske) (*Mellita pentapora*, *M. testudinata*): *Dissodactylus mellitae*

Class Holothuroidea:

General (holothurians): *Pinnotheres flavus*, *Pinnotheres holothuriensis*, *Pinnotheres tenuipes*

Holothuriidae:

Actinopyga lecanora (Jaeger) (*Muelleria lecanora*): *Pinnotheres villosissimus*
Actinopyga mauritiana (Quoy & Gaimard): *Pinnotheres villosissimus*
Holothuria fuscocinerea Jaeger: *Pinnotheres ortmanni*, *Pinnotheres semperi*
Holothuria gallensis Pearson: *Pinnotheres pilumnoides*
Holothuria gyrifer (Selenka) (*H. monacaria*): *Pinnaxodes major*
Holothuria kefersteini (Selenka) (*H. inornata*): *Pinnotheres trapeziformis*
Holothuria maxima Semper: *Pinnotheres trapeziformis*
Holothuria riojai Caso (*Paraholothuria* r.): *Pinnixa barnharti*
Holothuria princeps Selenka (*Theelothuria* p.): *Pinnaxodes floridensis*
Holothuria scabra (Jaeger): *Pinnotheres deccanensis*, *Pinnotheres holothuriae*, *Pinnotheres semperi*

Stichopodidae:

Parastichopus californicus (Stimpson) (*Stichopus c.*): *Opisthopus transversus*
Parastichopus parvimensis (Clark) (*Stichopus p.*): *Opisthopus transversus*
Stichopus variegatus Stimpson: *Pinnotheres holothuriae*

Phyllophoridae:

Thyone sp.: *Pinnixa huffmani*

Cucumariidae:

Athyonidium chilensis (Semper) (*Eucyclus chilensis*): *Pinnaxodes silvestrii*

Synaptidae:

Leptosynapta crassipatina Clark: *Pinnixa leptosynaptae*

Caudinidae:

Caudina arenicola (Stimpson) (*Liosoma arenaria*, *L. arenata*, *Molpadia arenicola*): *Opisthopus transversus*, *Pinnixa barnharti*, *Pinnixa faba*
Paracaudina chilensis (Müller) (*Caudina chilensis*): *Pinnixa tumida*
Paracaudina chilensis ransonetii von Marenzeller: *Pinnixa tumida*

Hemichordata**Subphylum Enteropneusta:****Balanoglossidae:**

Balanoglossus misakiensis Kuwano: *Pinnixa balanoglossana*, *Tritodynamia rathbunae*

Chordata**Class Ascidiacea**

General (in ascidians): *Ostracotheres tridacnae*, *Pinnixa floridana* (in compound ascidian), *Pinnotheres holothuriensis*, *Pinnotheres moseri* (in black ascidian and sea squirts), *Pinnotheres taylori*

Cionidae:

Ciona intestinalis (Linnaeus) (*Ascidia canina*, *A. i.*): *Pinnotheres ascidicola*

Asciidiidae:

Ascidia mentula O. F. Müller (*Phallusia m.*): *Pinnotheres marioni*, *Pinnotheres pinnotheres*, *Pinnotheres pisum*
Ascidia paratropa (Huntsman): *Pinnotheres pugettensis*
Ascidia sydneyensis Stimpson (*Phallusia canaliculata*): *Pinnotheres dofeini*
Ascidia vermiformis (Ritter) (*Phallusia v.*): *Fabia concharum*
Ascidella aspersa (O. F. Müller) (*Ascidia aspersa*): *Pinnotheres pinnotheres*, *Pinnotheres pisum*
Phallusia mamillata (Cuvier): *Pinnotheres marioni*, *Pinnotheres pinnotheres*

Styelidae:

Polycarpa aurata (Quoy & Gaimard) (*Styela pneumonodes*): *Ostracotheres cynthiae*
Polycarpa oblecta Traustedt: *Pinnotheres moseri*
Styela gibbsii (Stimpson): *Fabia subquadrata*, *Pinnixa faba*

Pyuridae:

Halocynthia aurantia (Pallas) (*Tethyum aurantium*): *Pinnotheres pugettensis*
Halocynthia igaboja Oka (*Pyura okai*): *Pinnotheres pugettensis*
Microcosmus claudicans (Savigny): *Pinnotheres pinnotheres*
Pyura? sp. (*Cynthia* sp.): *Ostracotheres cynthiae*, *Pinnotheres pinnotheres*
Pyura savignyi (Philippi): *Pinnotheres pinnotheres*
Pyura stolonifera (Heller): *Pinnotheres dofeini*

PINNOTHERIDAE De Haan, 1833

Pinnotheridea De Haan, 1833, in Von Siebold, *Fauna Japonica*, Crust. (1): 5.

General works: Tesch, 1918, *Siboga Exped. Monogr.* 39c¹ (84): 244–290 (keys and lists of species). — Balss, 1956, in Bronn, *Klassen Ordnungen Tierreichs*, (ed. 2) 5 (1) (7): 1384–1386, 1414–1420, 1659–1661.

Keys: Bürger, 1895, *Zool. Jahrb. Syst.*, 8: 362–364 (part of the species of *Pinnotheres*). — Rathbun, 1918, *Bull. U.S. Nat. Mus.*, 97: 61–182 (American *Pinnotheri-*

dae). — Tesch, 1918, Siboga Exped. Monogr., 39c¹ (84): 244 (subfamilies), 245 (genera of Pinnothereliinae), 251–255 (species of *Pinnotheres*). — Gordon, 1936, Journ. Linnean Soc. London Zool., 40 (209): 167 (species of *Pinnotheres* with dactyli of the two posterior, longer than those of the two anterior legs). — Sakai, 1939, Stud. Crabs of Japan, 4: 582–606 (Japanese Pinnotheridae). — Barnard, 1950, Ann. S. African Mus., 38: 77–82 (South African Pinnotheridae). — Zariquiey Alvarez, 1968, Invest. Pesquera Barcelona, 32: 406–410 (European Pinnotheridae).

Regional works: America, general: Rathbun, 1918, Bull. U. S. Nat. Mus., 97: 61–182. — East coast of U.S.A.: Williams, 1965, Fish. Bull. U. S. Fish Wildlife Serv., 65 (1): 203–215. — East coast of South America: Rhigi, 1967, Papeis Avulsos de Zoologia, São Paulo, 20 (10): 99–116. — California, U.S.A.: Schmitt, 1921, Univ. California Publ. Zool., 23: 249–268. — Chile: Garth, 1957, Lunds Univ. Arsskr., (n. ser.) (2) 53 (7): 67–92.

East Atlantic: Europe: Bouvier, 1950, Faune de France, 37: 300–303; Zariquiey Alvarez, 1968, Invest. Pesquera Barcelona, 32: 406–410. — West Africa: Monod, 1956, Mém. Inst. Franç. Afrique Noire, 45: 375–386. — South Africa: Barnard, 1950, Ann. S. African Mus., 38: 77–82.

Indo-West Pacific: Red Sea: Nobili, 1906, Ann. Sci. Nat. Zool. Paris, (9) 4: 299–309. — India: Alcock, 1900, Journ. Asiat. Soc. Bengal, 69 (2): 337–342. — North China: Shen, 1932, Zool. Sinica, (A) 9 (1): 131–154. — Japan: Sakai, 1939, Studies Crabs Japan, 4: 582–606; Sakai, 1965, Crabs Sagami Bay: 175–183. — New Zealand: Scott, 1961, Trans. Roy. Soc. New Zealand, (Zool.) 1 (22): 303–309; Bennett, 1964, Bull. New Zealand Dept. Sci. Indust. Res., 153: 75–80.

Fossil species (*Parapinnixa*, *Pinnixa*): Rathbun, 1926, Bull. U. S. Nat. Mus., 138: 34, 35. — Rathbun, 1932, Journ. Washington Acad. Sci., 22 (14): 411–413. — Birstein, 1956, Bull. Soc. Natural. Moscou Geol., 31 (1): 68, 69. — Via Boada, 1966, Acta Geologica Hispanica, 1 (4): 1–4. — Zullo & Chivers, 1969, The Veliger, 12 (1): 72, 73.

Development: Orton, 1920, Nature, London, 106 (2669): 533. — Atkins, 1926, Journ. Mar. Biol. Assoc. U.K., (n. ser.) 14 (2): 475–492. — Aikawa, 1929, Rec. Oceanogr. Works Japan, 2 (1): 17–55. — Aikawa, 1933, Rec. Oceanogr. Works Japan, 5 (2): 210–221, 246–248. — Gurney, 1939, Ray Soc. London, 125: 109, 110 (for older literature). — Gurney, 1942, Ray Soc. London, 129: 227–279. — Stauber, 1945, Biol. Bull. Woods Hole, 88 (3): 269–291. — Atkins, 1955, Proc. Zool. Soc. London, 124 (4): 687–715. — Gohar & Al-Kholy, 1957, Publ. Mar. Biol. Sta. Al-Ghardaqa, 9: 153–160. — Prasad & Tampi, 1957, Journ. Zool. Soc. India, 9 (1): 23–25. — Atkins, 1958, Nature, London, 181 (4615): 533, 534. — Christensen & McDermott, 1958, Biol. Bull. Woods Hole, 114 (2): 146–179. — Christensen, 1959, Proc. Intern. Congr. Zool., 15: 267–270. — Goodbody, 1960, Nature, London, 185 (4714): 704–705. — Irvine & Coffin, 1960, Publ. Dept. Biol. Sci. Biol. Sta. Walla Walla Coll., 28: 1–24. — Costlow & Bookhout, 1966, Chesapeake Sci., 7 (3): 157–163. — Pearce, 1966, Pacific Sci., 20 (1): 3–35.

Commensalism, parasitism: Coupin, 1894, C.R. Acad. Sci. Paris, 99: 540–543. — Orton, 1921, Nature, London, 106 (2669): 533. — Tu, 1938, Zool. Anz., 122 (7/8): 177–186. — Stauber, 1945, Biol. Bull. Woods Hole, 88 (3): 264–294. — MacGinitie & MacGinitie, 1949, Nat. Hist. Marine Animals, (ed. 1) [ed. 2, 1968]: 312–316. — Rioja, 1950, Revista Mexicana Hist. Nat., 9 (1–4): 141–147. — Baer, 1952, Ecol. Animal Parasites: 69. — Caullery, 1952, Parasitism and Symbiosis: 80. — L. H. Hyman, The Invertebrates, 4: 243, 587, 588. — Dales, 1957, Mem. Geol. Soc. America, 67 (1) (15): 391–412. — Hopkins, 1957, Mem. Geol. Soc. America, 67 (1) (15B): 413–428. — Christensen & McDermott, 1958, Biol. Bull. Woods Hole, 144 (2): 146–179. — Christensen, 1958, Proc. Internat. Congress Zool., 15: 267. — Nicol, 1960, The Biology of Marine Animals: 229, 582–588 et seq. — Cheng, 1967, Adv. Marine Biol., 5: 43–46, 98–100, 315–335. — LaCall, 1969, Bull. Soc. Sci. Bretagne, 43: 221, 222. — Gotto, 1969, Marine Animals, Partnerships and other Associations: 27, 57, 59.

The family Pinnotheridae is divided into five subfamilies: Pinnotherinae (p. 16), Xenophtalminae (p. 98), Pinnothereliinae (p. 100), Asthenognathinae (p. 127), and Anomalifrontinae (p. 135), listed below. In conclusion are given the 'Species incertae' (p. 135), and a listing of 'Species incorrectly assigned to the Pinnotheridae' (p. 138).

Pinnotherinae De Haan, 1833

- Pinnotheridea De Haan, 1833, in Von Siebold, Fauna Japonica, Crust., (1): 5.
 Pinnothériens H. Milne Edwards, 1837, Hist. Nat. Crust., 2: 28.
 Pinnotherites Lucas, 1840, Hist. Nat. Crust.: 65.
 Pinnotheridae Bell, 1845, Hist. British Stalk-eyed Crust.: 119.
 Pinnotherinae H. Milne Edwards, 1852, Ann. Sci. Nat. Zool., Paris, (3) 18: 139 (103).
 Dissodactylidae Smith, 1870, Trans. Connecticut Acad. Arts Sci., 2: 172.
 Pinnotherinen Bürger, 1895, Zool. Jahrb. Syst., 8: 361.
 Pinnotheriden Adensamer, 1897, Ann. K. K. Naturh. Hofmus. Wien, 12: 105.
 Pinnoteridae Alcock, 1900, Journ. Asiat. Soc. Bengal, 69 (2): 293.
 Pinnothérides Coulon, 1907, Bull. Soc. Étud. Sci. Nat. Elbeuf, 26: 127 (21).
 Pinnotéridos Porter, 1911, Bol. Mus. Nacl. Santiago, 3 (2): 442.

The genera and species of Pinnotherinae are listed alphabetically below.

DISSODACTYLUS Smith, 1870

Dissodactylus SMITH, 1870, Trans. Connecticut Acad. Arts Sci., 2: 173. Type species, by monotypy: *Dissodactylus nitidus* Smith, 1870, Gender: masculine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, Smithsonian Miscell. Coll., 73 (3): 13–18; see also Direction 37, 1956, Opin. Decl. Int. Comm. zool. Nomencl., 1 (D) (2): 47–82) as name no. 297.

Echinophilus RATHBUN, 1900, Amer. Nat., 34 (403): 88. Type species, by monotypy: *Echinophilus mellitae* Rathbun, 1900. Gender: masculine.

Dissodactylozoa AIKAWA, 1933, Records Oceanogr. Works Japan, 5 (2): 130, 210. Type species, by present selection: *Echinophilus mellitae* Rathbun, 1900, Gender: feminine.

Hosts: Clypeastroid Echinoidea.

Distribution: West Atlantic (Massachusetts, U.S.A., to Brazil); East Pacific (Mexico to Peru).

Dissodactylus alcocki Rathbun, 1918

Dissodactylus alcocki RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 115, 124, 125, pl. 28 (♂) figs. 3 (ventral view and detached right leg), 4 (dorsal view and detached right leg), text-figs. 70 (♀ maxilliped), 81 (♂ leg) (♀ holotype: USNM 23447; type-locality: 'Gulf of Mexico, off Delta of Mississippi River, 29°24'30" N, 88°01'00" W...').

Measurements: Female, length 4.2 mm, width 5.8 mm.

Habitat: Yellow sand, with black specks, 35 fms [64 m].

Distribution: Known only from the type locality.

Dissodactylus borradailei Rathbun, 1918

Dissodactylus borradailei RATHBUN, 1918, Bull. U.S. Nat. Mus., 97: 115, 121–123, pl. 27 figs. 5 (♂ ventral view), 6 (♂ dorsal view), 7 (♀ ventral view), 8 (♀ dorsal view), text-fig. 68 (♀) a (maxilliped), b (leg) (♀ holotype: USNM 49230; type-locality: 'Miami, Florida').

Measurements: Male, length 3.5 mm, width 4.3 mm; female, length 6.2 mm, width 8.1 mm.

Habitat: Fine white sand with black specks, 30 fms [55 m].

Distribution: Miami, Florida, U.S.A.; Montego Bay Point, Jamaica.

Dissodactylus calmani Rathbun, 1918

Dissodactylus calmani RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 125–127, pl. 28 (♀) figs. 5 (ventral view), 6 (dorsal view), text-figs. 72 (♀ maxilliped), 73a (♀ right leg 4), 73b (♂ abdomen) (♀ holotype: USNM 49233; type-locality: 'Grecian Shoals, Hawk Channel, Florida'). — VOSS & VOSS, 1955, Bull. Mar. Sci. Gulf. Caribb., 5 (3): 226 (Soldier Key, Biscayne Bay, Florida).

Measurements: Male, length 4.6 mm, width 5.7 mm; female, length 5.5 mm, width 7.3 mm.

Habitat: from 2–4 fms [3.7–7.3 m] sand and gravel bottom (Rathbun); under rocks near shore (Voss & Voss).

Distribution: East coast of Florida, U.S.A.; Grecian Shoals and off Duck Key, Hawk Channel, Florida; Laveros Italianas, opposite Cayo Laveros, Northwest Cuba.

Dissodactylus crinitichelis Moreira, 1901

Dissodactylus crinitichelis MOREIRA, 1901, Arch. Mus. Nac. Rio de Janeiro, 11: 37, 38, pl. 3 (♂) figs. 1 (dorsal view), 2 (abdomen), 3 (cheliped), 4 (maxilliped) (syntypes: MNR; type-locality: '...Estado do Rio Grande do Sul, Brazil...'). — RATHBUN, 1933, Sci. Surv. Porto Rico Virgin Ids., 15 (1): 83, 84, fig. 76 (♂) a (dorsal view of carapace), b (endognath of maxilliped), c (chela), d (leg 4), e (leg 3) (Vieques, Porto Rico). — WASS, 1955, Quart. Journ. Florida Acad. Sci., 18 (3): 158, 160 ('About eight miles south of Alligator Point' [Florida]). — HULINGS, 1961, Quart. Journ. Florida Acad. Sci., 24 (3): 219 (listed).

Dissodactylus encopei RATHBUN, 1901, Bull. U. S. Fish Comm., 20 (2): 22, fig. 5 (♂) a (dorsal view of carapace), b (endognath of maxilliped), c (chela), d (leg 4), e (leg 3) (syntypes: USNM 23430; type-locality: 'Stann Creek, 38 miles south of Belize, British Honduras'). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 119–121, pl. 27 figs. 1 (♂ ventral view), 2 (♂ dorsal view), 3 (♀ ventral view), 4 (♀ dorsal view), text-fig. 67 (♂) a (dorsal view of carapace), b (leg 3), c (endognath of maxilliped), d (leg 4), e (chela) (west coast of Florida; Jamaica; Sabanilla, Colombia). — BOUVIER, 1917, Bull. Mus. Nat. Hist. Nat. Paris, 23 (5): 398 (compared with *Dissodactylus juvenilis*). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 245 (listed). — LUEDERWALDT, 1929, Rev. Mus. Paulista, 16: 54 (São Sebastião, Brazil). — WASS, 1953, Key Decapod Crustacea Alligator Harbor Area: 12 (key) — L. H. HYMAN, 1955, The Invertebrates, 4: 588 (host relationship). — WILLIAMS, McCLOSKEY & GRAY, 1968, Crustaceana, 15 (1): 56, 57, fig. 12 (♂ dorsal view) (from the continental shelf off the coast of North Carolina 'to a depth of 51 [52] meters'). — RODRIGUES, 1971, Trabalhos Oceanogr. Univ. Fed. Pernambuco, Recife [for 1967/69] 9/11: 260, 261 (São Sebastião, São Paulo, Brazil).

Measurements: Male, length 4.6 mm, width 6.6 mm, small male is correctly 2.7 mm wide; female, length 5.0 mm, width 9.0 mm (Rathbun, 1901).

Habitat: On echinoids: '...e parazita de uma especie de *Encope*, provavelmente, *Encope emarginata* (Leske)' (Moreira); 'Clings to the outside of the thick keyhole urchin, *Encope emarginata*, and probably also of *E. michelini* [Agassiz, the purple sand dollar], which replaces *emarginata* in the area between the Gulf of Mexico and Florida Keys and Yucatan... To a depth of 28 fms.' (Rathbun, 1901); from the sand dollar, *Encope michelini* Agassiz, and the sea biscuit, *Clypeaster subdepressus* (Gray); the latter was taken from '... an area of scattered sponges and coral heads in 30 to 35 feet [9 to 13 meters] (Wass); clinging to sand dollars *Encope emarginata* (Leske) and *E. michelini* Agassiz to a depth of 40 to 52 meters (Williams, McCloskey, & Gray).

Distribution: Off the coast of North Carolina, U.S.A.; northwest coast of Florida; Puerto Rico; Jamaica; British Honduras; Colombia; São Sebastião, São Paulo, Rio Grande do Sul, Brazil.

Dissodactylus glasselli Rioja, 1944

Dissodactylus glasselli RIOJA, 1944, Anales Inst. Biol. Mexico, 15 (1): 150, 155–159, figs. 7 (dorsal view), 8 (left chela), 9 (♂ gonopod), 10 (♂ abdomen), 16 (maxilliped), 17 (margin of 2nd segment of the flagellum of the maxilliped), 18 (leg 3), 19 (dactylus of leg 1), 20 (leg 4), 21 (dactylus of leg 4) (syntypes: IBUM; type-locality: 'Playa de San Benito, cerca de Tapachula, Chiapas', Mexico) (compared with *Dissodactylus mellitae*, *nitidus*, and 'smithi' [*D. nitidus*]). — RIOJA, 1950, Rev. Soc. Mexicana Hist. Nat., 11 (1–4): 145–147, fig. 2 (dactylus of leg 3) (discusses commensalism in Crustacea, mentions *D. glasselli*). — L. H. HYMAN, 1955, The Invertebrates, 4: 588 (host relationship). — BOTT, 1955, Senckenbergiana Biol., 36 (1/2): 62 (compared with *Dissodactylus meyerabichi*).

Measurements: Length 2.2–2.5 mm, width 2.5–3.0 mm (Rioja, 1944).

Habitat: Found on the echinoid, *Mellita longifissa* Michelin, in company with an ovigerous *D. nitidus*.

Distribution: Known only from the type locality.

Dissodactylus juvenilis Bouvier, 1917

Dissodactylus juvenilis BOUVIER, 1917, Bull. Mus. Nat. Hist. Nat. Paris, 23 (5): 397, 398. (♀ syntype: MNHNP; ♀ syntype: MCZ 9156; type-locality: '...Lat. N. 23°13', Long. O. 89°16', au nord du Yucatan.') (compared with *Dissodactylus*

encopei [*Dissodactylus crinitichelis*.] — A. MILNE EDWARDS & BOUVIER, 1923, Mem. Mus. Comp. Zool. Harvard Coll., 47 (4): 349, 350, pl. 9 (♀) figs. 3 (dorsal view), 4 (leg 4), text figs. 11 (♀ maxilliped), 12 (♀ abdomen) (original description republished; figures added).

Measurements: Female, length 7.0 mm, width 9.5 mm (Bouvier).

Distribution: Known only from the type locality.

Dissodactylus lockingtoni Glassell, 1935

Dissodactylus lockingtoni GLASSELL, 1935, Trans. San Diego Soc. Nat. Hist., 8 (14): 100–101, pl. 16 figs. 1 (♂ dorsal view), 2 (♀ maxilliped), 3 (♀ leg 1), 4 (♀ right chela), 5 (♂ abdomen), 6 (♀ abdomen) (♀ holotype: SDSNH 760; ♂ paratype: SDSNH 761; ♀ paratype: USNM 71339; ♂ and ♀ paratypes: MCZ 9324; type-locality: 'Punta Peñasco (Rocky Point), Sonora, Mexico.') (compared with *Dissodactylus nitidus*). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [2nd ed., emended, 1968]: 314 (biology, ecology). — L. H. HYMAN, 1955, The Invertebrates, 4: 588 (host relationship). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1415.

Measurements: Male, length 5.5 mm, width 5.8 mm; female, length 7.0 mm, width 7.5 mm (Glassell).

Habitat: 'Commensal on the ventral exterior surface of the following echinoids: *Mellita longifissa* Michelin, *Encope micropora* Agassiz, *E. grandis* Agassiz, and *E. californica* Verrill. It is usually found, when on the *Encope*, located in the proximal portion of the posterior interambulacral lunule. From this position to a point near the peristome or periproct of the echinoid, the crab clears the actinal spines, thus forming for itself a roadway but little wider than its outstretched ambulatory legs. *D. nitidus* Smith may also occupy the same echinoid with *D. lockingtoni*, but the former ranges over the entire ventral surface and has no fixed place of abode' (Glassell).

Distribution: San Felipe, Gulf of California, and Punta Peñasco (Rocky Point), Sonora, Mexico '...undoubtedly ranges throughout the Gulf of California' (Glassell).

Dissodactylus mellitae (Rathbun, 1900)

Echinophilus mellitae RATHBUN, 1900, Amer. Nat., 34 (403): 590 (syntypes: USNM 23434; type-locality: '...Pensacola, Florida'). — FOWLER, 1912, Ann. Rept. New Jersey State Mus., 1911: 595 (Cape Cod to Gulf of Mexico).

Dissodactylus mellitae RATHBUN, 1901, Bull. U. S. Fish Comm., 20 (2): 22 (compared with *Dissodactylus encopei* [*Dissodactylus criniticheles*]). — SUMNER, 1909, Science, New York, (n. ser.) 29 (756): 985 (Vineyard Sound). — SUMNER, OSBURN, & COLE, 1913, Bull. U. S. Bur. Fish., 31: 675 (Vineyard Sound, 'Fish Hawk' Sta. 7703 and 7579). — HAY & SHORE, 1918, Bull. U. S. Bur. Fish., 35: 444, pl. 36 fig. 1 (♀ dorsal view) (Beaufort, North Carolina). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 117–119, pl. 28 (♂) figs. 7 (ventral view), 8 (dorsal view and detached left leg), text-fig. 66a (♀ maxilliped), b (♂ leg) (Martha's Vineyard, Massachusetts; Narragansett Bay, Rhode Island; Beaufort, North Carolina; Charleston, South Carolina; Pensacola, Florida). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 245 (listed). — O. W. HYMAN, 1924, Proc. U. S. Nat. Mus., 64 (2497): 5 (larval stages), pl. 3 (first zoea) figs. 32 (antenna), 33 (mandible), 34 (maxillule), 35 (maxilla), 36 (maxillipeds 1 and 2), 37 (abdomen and telson) (Beaufort, North Carolina). — LÉBOUR, 1928, Proc. Zool. Soc. London, 1928: 553 (larval stages compared with those of four other pinnotherids in two other genera). — PEARSE, 1936, Journ. Elisha Mitchell Sci. Soc., 52 (2): 196 (Bird Island Shoal, North Carolina). — AIKAWA, 1937, Rec. Oceanogr. Works Japan, 9 (1): 151, 152 (larval characters). — GURNEY, 1938, Proc. Zool. Soc. London, (B) 108 (1): 79 (larval stages, listed). — PEARSE, HUMM & WHARTON, 1942, Ecol. Monographs, 12 (2): 186 (Beaufort, North Carolina). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [2nd ed., emended, 1968]: 314 (biology, ecology). — JOHNSON, 1952, Trans. Kansas Acad. Sci., 55 (4): 459–464 (behavior). — WASS, 1953, Key Decapod Crustacea Alligator Harbor Area: 12 (key). — L. H. HYMAN, 1955, The Invertebrates, 4: 588 (host relationship). — WASS, 1955, Quart. Journ. Florida Acad. Sci., 18 (3): 158 (Alligator Harbor, Florida). — MENZEL, 1956, Contrib. Florida State Univ. Oceanogr. Inst., 61: 44 (listed). — PEARCE, 1962, Biologist, 45 (1–2): 11–13 (adaptations). — WASS, 1965, Virginia Inst. Mar. Sci., Special Rept., 24 (3d revision, mimeographed): 41 (listed) (Kiptopeke Beach,

Chesapeake Bay, Virginia; in an earlier 1963 edition, p. 44, species was noted as 'Offshore [off Virginia].' — WILLIAMS, 1965, Fish. Bull. U. S. Fish Wildlife Serv., 65 (1): 209, 210, text-fig. 192 (dorsal view) (western part of Vineyard Sound, Massachusetts, to Charleston, South Carolina; western Florida). — COSTLOW & BOOKHOUT, 1966, Chesapeake Sci., 7 (3): 162, 163 (larvae). — PATTON, 1967, Mar. Biol. Assoc. India, Symp. Ser., 2 (3): 1236 (behavior). — GRAY, 1968, Journ. Elisha Mitchell Sci. Soc., 84: 444 (attraction to *Mellita quinquesperforata*). — GRAY, McCLOSKEY & WEIHE, 1968, Journ. Elisha Mitchell Sci. Soc., 84: 472-481, figs. 1-5 (commensalism with *Mellita quinquesperforata*). — ROGERS, 1968, Crustaceana, 14 (3): 318 (Galveston, Texas). — WILLIAMS, McCLOSKEY & GRAY, 1968, Crustaceana, 15 (1): 57 (from the continental shelf off North Carolina to a depth of 42 to 52 meters). — GOSNER, 1971, Guide Identif. mar. Invert. Cape Hatteras to Bay of Fundy: 551, fig. 21.62H (animal in dorsal view; walking leg).

Measurements: Male, length 3.0 mm, width 3.6 mm (Hay & Shore); female, length 3.3 mm, width 4.5 mm (Rathbun).

Habitat: On echinoids: *Mellita testudinata* [*Mellita quinquesperforata* (Leske)], *Echinarachnius parma* (Lamarck), 8.25 to 11.5 fms [15 to 21 meters] (Rathbun); *Mellita pentapora* [*M. quinquesperforata* (Leske)] (Hay & Shore); *Mellita quinquesperforata* (Leske), *Encope michelini* Agassiz, and *Clypeaster subdepressus* (Gray); the last named was taken from 'an area of scattered sponges and coral heads in 30 to 35 feet [9-13 meters] (Wass); the first two have also been taken in 40 to 52 meters (Williams, McCloskey, & Gray).

Distribution: Vineyard Sound, Massachusetts, U.S.A. to Pensacola, Florida; Galveston, Texas, U.S.A.

Dissodactylus meyerabichi Bott, 1955

Dissodactylus meyerabichi BOTT, 1955, Senckenbergiana Biol., 36 (1/2): 61, 62, pl. 8 (♂) fig. 13 a (dorsal view), b (ventral view), text-fig. 2 (♂) a (dactylus leg 4), b (dactylus leg 3), c (right maxilliped), d (right gonopod) (♂ holotype: SMF 2108; type-locality: 'El Salvador, Puerto el Triunfo') (compared with *Dissodactylus glasselli*).

Measurements: Male, length 3.0 mm, width 2.0 mm.

Distribution: Known only from the type locality.

Dissodactylus nitidus Smith, 1870

Dissodactylus nitidus SMITH, 1870, Trans. Connecticut Acad. Arts Sci., 2: 173 (♂ holotype: PM; type-locality: '...Panama'). — LOCKINGTON, 1877, Proc. Calif. Acad. Sci., 7: 155 (11) (Gulf of California). — RATHBUN, 1898, Proc. U. S. Nat. Mus., 21: 609 (off Abreojos Point, Lower California). — RATHBUN, 1910, Proc. U. S. Nat. Mus., 38: 545, pl. 48 fig. 6 (♀ dorsal view) (west of Mataballa, Bay of Sechura, Peru). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 116, 117, pl. 26 (♀) figs. 6 (ventral view), 7 (dorsal view), text-figs. (♀) 64 (maxilliped), 65 (leg 3) (♀ [allotype]: USNM 22113; type-locality: 'Off Abreojos Point, Lower [Baja] California...') (off Santa Maria Bay and off Abreojos Point, Baja California; Bay of Sechura, west of Mataballa, Peru). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 245, 285, 286 (listed). — RATHBUN, 1923, Bull. Amer. Mus. Nat. Hist., 48 (20): 629 (Santa Maria Bay, Baja California). — ICZN, 1925, Smithsonian. Miscell. Coll., 73 (3): 14 (Opinion 85; placement of the genus with *Dissodactylus nitidus* as the type, in the 'Official List of Generic Names in Zoology'). — GLASSELL, 1934, Journ. Wash. Acad. Sci., 24 (7): 472 (Concepcion Bay, Gulf of California). — GLASSELL, 1935, Trans. San Diego Soc. Nat. Hist., 8 (14): 101 (compared with *D. lockingtoni*). — STEINBECK & RICKETTS, 1941, Sea of Cortez: 472 (Concepcion Bay, Lower California). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [2nd ed., emended, 1968]: 314 (biology, ecology). — L. H. HYMAN, 1955, The Invertebrates, 4: 588 (host relationship). — BOTT, 1955, Senckenbergiana Biol., 36 (1/2): 60, 61, pl. 8 (♀) fig. 12 a (dorsal view), b (ventral view), text-fig. 1 (♀) a (dactylus), b (maxilliped) (Puerto el Triunfo, El Salvador). — ICZN, 1956, Opin. Decl. Int. Comm. zool. Nomencl., 1 (D): 13 (Direction 36; specific name placed on the 'Official List of Specific Names in Zoology' as Name No. 852). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1415 (mentioned). — DEL SOLAR, BLANCAS & MAYTA, 1970, Cat. Crust. Perú: 29 (listed) ('Bahia de Sechura (O. de Mataballa...)').

Dissodactylus smithi RIOJA, 1944, *Anales Inst. Biol. Mexico*, 15 (1): 149-155, figs. 1 (♀ dorsal view), 2 (leg 1), 3 (leg 3), 4 (gonopod), 5 (tip of gonopod), 6 (♂ abdomen) (♂♀ syntypes: IBUM; type-locality: '... Playa de San Benito, Chiapas' [Mexico]) (compared with *Dissodactylus lockingtoni*). — RIOJA, 1950, *Rev. Soc. Mexicana Hist. Nat.*, 11 (1-4): 145-147, figs. 1 (dactylus leg 4), 3 (dactylus leg 1) (discusses commensalism in Crustacea). — HOLTHUIS, 1954, *Zool. Verhandl. Leiden*, 23: 36 (El Cuco, San Miguel, El Salvador). — HOLTHUIS, 1954, *Comun. Inst. Trop. Invest. Cient. Univ. El Salvador*, 3 (4): 162 (listed). — L. H. HYMAN, 1955, *The Invertebrates*, 4: 588 (host relationship).

Measurements: Male, length 4.7 mm, width 5.1 mm (Smith); female, length 5.5 mm, width 6.0 mm (Rathbun, 1918).

Habitat: On echinoids: *Encope grandis* Agassiz, *Encope californica* Verrill (Steinbeck & Ricketts); *Mellita longifissa* Michelin (Rioja); to 5 1/2 fms [10 m] (Rathbun, 1918); may also be found on the above-named sea urchins, as well as on *Encope micropora* Agassiz along with *D. lockingtoni*, but, unlike the latter, 'ranges over the entire ventral surface and has no fixed place of abode' (Glassell, 1935).

Distribution: From Santa Maria Bay, Baja California, Mexico, to Bay of Sechura, Peru.

Dissodactylus primitivus Bouvier, 1917

Dissodactylus primitivus BOUVIER, 1917, *Bull. Mus. Nat. Hist. Nat. Paris*, 23 (5): 394-396 (compared with *Dissodactylus encopei* [*D. crinitichelis*] (♀ holotype: MCZ 9154; type-locality: 'Lat. N. 24°43', Long. O. 83°25'. Détroit de Floride'). — A. MILNE EDWARDS & BOUVIER, 1923, *Mem. Mus. Comp. Zool. Harvard Coll.*, 47 (4): 346-348, pl. 8 (♀) figs. 3 (chela), 4 (left leg 2), pl. 9 (♀) fig. 1 (dorsal view), text-fig. 8 (♀ maxilliped) (original description republished; figures added).

Measurements: Female (ovig.), length 7.0 mm, width 9.2 mm (Bouvier).

Distribution: Known only from the type locality.

Dissodactylus rugatus Bouvier, 1917

Dissodactylus rugatus BOUVIER, 1917, *Bull. Mus. Nat. Hist. Nat. Paris*, 23 (5): 369-396 (♀ holotype: MCZ 9163; type-locality: '...Dominique'). — A. MILNE EDWARDS & BOUVIER, 1923, *Mem. Mus. Comp. Zool. Harvard Coll.*, 47 (4): 238, 239, pl. 8 (♀) figs. 5 (chela), 6 (ambulatory dactylus), pl. 9 (♀) fig. 2 (dorsal view), text-fig. 9 (maxilliped) (original description republished; figures added).

Measurements: Female, length 4.0 mm, width 5.5 mm (Bouvier).

Distribution: Known only from the type locality, Dominica, West Indies.

Dissodactylus stebbingi Rathbun, 1918

Dissodactylus stebbingi RATHBUN, 1918, *Bull. U. S. Nat. Mus.*, 97: 123, 124, pl. 28 (♂) figs. 1 (ventral view), 2 (dorsal view), text-fig. 69 (♂ maxilliped) (♂ holotype: USNM 49232; type-locality: 'Sarasota Bay, Florida...'). — WASS, 1953, *Key Decapod Crustacea Alligator Harbor Area*: 12 (key). — WASS, 1955, *Quart. Journ. Florida Acad. Sci.*, 18 (3): 158, 160 (northwestern Florida). — MENZEL, 1956, *Contrib. Florida State Univ. Oceanog. Inst.*, 61: 44 (listed).

Measurements: Male, length 3.3 mm, width 4.3 mm (Rathbun).

Habitat: '...about 10 miles southeast of Alligator Point, in the open Gulf [of Mexico]... an area of scattered sponges and coral heads in 30 to 35 feet [9-10 meters ±] of water...' (Wass, 1955: 131); '...on the unde[r]side of sea biscuits [*Clypeaster subdepressus* (Gray), see Wass, 1955: 158]' (Wass, 1955: 160).

Distribution: Chesapeake Bay, Virginia, U.S.A.; northwestern Florida: Alligator Harbor and Sarasota Bay, U.S.A.

Dissodactylus xantusi Glassell, 1936

Dissodactylus xantusi GLASSELL, 1936, *Trans. San Diego Soc. Nat. Hist.*, 8 (21): 299-301, pl. 21 fig. 4 (♀ maxilliped) (♀ holotype, ♂ paratype: USNM 7154; ♂ and ♀ paratypes: SDSNH 790, 789; type-locality: 'Espiritu Santo Island, Gulf of California, Mexico') (also on east side of Peninsula from San Felipe Bay, Los Animas Bay, Coyote Cove, Concepción Bay, and on mainland side of Gulf at Punta Peñasco, Sonora, Mexico). — STEINBECK & RICKETTS, 1941, *Sea of Cortez*, 472, pl. 29 fig. 6 (dorsal view) (Concepcion Bay, Baja California). — MacGINITIE & MacGINITIE, 1949, *Nat. Hist. Mar. Anim.*, (ed. 1) [2nd ed., emended, 1968]: 314

(biology, ecology). — L. H. HYMAN, 1955, *The Invertebrates*, 4: 588 (host relationship). — BALSS, 1956, in Bronn, *Klassen Ordnungen Tierreichs*, (ed. 2), 5 (1) (7): 1415 (mentioned).

Measurements: Male, length 3.8 mm, width 4.9 mm; female, length 4.5 mm, width 6.1 mm (Glassell).

Habitat: Subtidal, found roaming over the undersurfaces of sand dollars, *Mellita longifissa* Michelin '...in close association with *D. nitidus* Smith...' (Glassell). With three species of *Encope* (MacGinitie & MacGinitie).

Distribution: Gulf of California, Mexico, ranging on the east side of Baja California from San Felipe to Espíritu Santo Island; found on the mainland at Punta Peñasco, Sonora, Mexico (Glassell).

DURCKHEIMIA De Man, 1889

Durckheimia DE MAN, 1889, *Zool. Jahrb. Syst.*, 4: 442. Type species, by original designation and monotypy: *Durckheimia carinipes* De Man, 1889. Gender: feminine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, *Smithson. Misc. Coll.*, 73 (3): 13–18; see also *Direction 37, 1956, Opin. Decl. Int. Comm. Zool. Nomencl.*, 1 (D) (2): 47–82) as name no. 298.

Dürckheimia TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 246. Erroneous spelling of *Durckheimia* De Man, 1889.

Pinnotheropsis KUBO, 1939, *Bull. Japanese Soc. Sci. Fish.*, 8 (2): 57. Type species, by original designation and monotypy: *Pinnotheropsis yokotai* Kubo, 1939 [*Durckheimia caeca*]. Gender: feminine.

Duerckheimia GUILNOT, 1966, *Mém. Inst. Fondamental Afrique Noire*, 77: 279. Erroneous spelling of *Durckheimia* De Man, 1889.

Hosts: Mollusca Bivalvia.

Distribution: Indo-West Pacific (Red Sea to Japan and Philippines.)

Durckheimia besutensis Serène, 1967

Durckheimia besutensis SERÈNE, 1967, *Bull. Mus. Nat. Hist. Nat. Paris*, (2) 38 (6): 819–823, pl. 2 (♀) fig. A (dorsal view), B (anteroventral view of front), text figs. (♀) 3 (dorsal view), 4 (anteroventral view of front), 5 (third maxilliped: A, endognath [endopodite], B, exognath [exopodite]) (compared with *Durckheimia caeca* and *carinipes*) (♀ holotype: MNHNP; type locality: Perenthian [Perhentian] Besar, east coast of Malaysia, 60° [06°] 55' N 102° 34' E).

Measurements: Female, length 7 mm, width 9 mm.

Habitat: From a bivalve, *Lithophagus* [*Lithophaga*], living in a colony of coral, *Coeloria*, from 4 meters.

Distribution: Known only from the type locality.

Durckheimia caeca Bürger, 1895

Durckheimia caeca BÜRGER, 1895, *Zool. Jahrb. Syst.*, 8 (2): 385, 386, pl. 9 (♀) fig. 33a (dorsal view), b (dactylus), pl. 10 fig. 31 (♀ maxilliped) (♀ holotype: ?depository; type-locality: 'Palaos Inseln') (compared with *Durckheimia carinipes*). — TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 246 (listed with diagnostic comment with *Durckheimia carinipes*). — BALSS, 1922, *Arch. Naturgesch.*, 88A (11): 140 (Japan; Philippine Islands). — SAKAI, 1955, *Bull. Biogeogr. Soc. Japan*, 16–19: 109 (synonymy with *Pinnotheropsis yokotai*). — SAKAI, 1956, *Crabs*: 50 (in species list; mentioned). — SERÈNE, 1967, *Bull. Mus. Nat. Hist. Nat. Paris*, (2) 38 (6): 822 (key, synonymy).

Pinnotheropsis yokotai KUBO, 1939, *Bull. Japanese Soc. Sci. Fish.*, 8 (2): 57–59, figs. 1 (♀ dorsal view), 2 a (♀ maxilliped), b (chela), c (cross section of merus of leg 3), d (cross section of propodus of leg 3), e (side view of carapace without legs), f (abdomen) (♀, ovig., holotype: ? depository; type-locality: 'near Huruye, Kitauramura, Miyazaki Prefecture [Japan]').

Measurements: Female (ovigerous), length 9.0 mm, width 10.25 mm (Bürger); female (ovig.), length 8.0 mm, width 9.0 mm (Kubo, 1939).

Habitat: In *Lima squamosa* Lamarck (Bürger); *Lima sowerbyi* Deshayes (Sakai, 1955, 1956); *Chama reflexa* Reeve (Sakai, 1955); in an algal-*Gelidium*-bed at 7 fms [12.8 m] (Kubo).

Distribution: Japan; Palau Islands; Philippine Islands.

Durckheimia carinipes De Man, 1889

Durckheimia carinipes DE MAN, 1889, Zool. Jahrb. Syst., 4: 442-443, pl. 10 (♀ ovig) fig. 12 a (frontal view), b (chela), c (leg), d (maxilliped) (♀ ovigerous, holotype: SMF 4516; type-locality: 'im Rothen Meere.') — NOBILI, 1906, Ann. Sci. Nat. (Zool.) Paris, (9) 3: 309 (listed). — LAURIE, 1915, Journ. Linn. Soc. London Zool., 31 (209): 415 (listed in zoogeographic table). — ICZN, 1925, Smithson. Miscell. Coll., 73 (3): 14 (Opinion 85; placement of genus with *Durckheimia carinipes* cited as the type, in the 'Official List of Generic Names in Zoology'). — ICZN, 1956, Opin. Decl. Int. Comm. zool. Nomencl., 1 (D): 13 (Direction 36; specific name placed on the 'Official List of Specific Names in Zoology' as Name No. 853). — SERÈNE, 1967, Bull. Mus. Nat. Hist. Nat. Paris, (2) 38 (6): 822 (key, synonymy).

Durckheimia carinipes TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 246, 287 (listed with brief diagnostic comment, along with *Durckheimia caeca*).

Durckheimia carinipes GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed).

Measurements: Female (ovigerous), length 8.25 mm, width 9.6 mm (De Man).

Distribution: Known only from the type locality.

FABIA Dana, 1851

Fabia DANA, 1851, Amer. Journ. Sci. Arts, (2) 12: 290. Type species, by monotypy: *Fabia subquadrata* Dana, 1851. Gender: feminine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, Smithson. Miscell. Coll., 73 (3): 13-18; see also Direction 37, 1956, Opin. Decl. Int. Comm. zool. Nomencl., 1 (D) (2): 47-82) as name no. 307.

Cryptophrys RATHBUN, 1893, Proc. U. S. Nat. Mus., 16: 250. Type species by monotypy: *Cryptophrys concharum* Rathbun, 1893. Gender: feminine.

Raphonotus RATHBUN, 1897, Proc. Biol. Soc. Washington, 11: 166. Replacement name for *Fabia* Dana, 1851, incorrectly thought to be invalidated by *Fabius* Duncan, 1837 (Lepidoptera). Gender: masculine.

Hosts: Mollusca Bivalvia and Gastropoda; Polychaeta.

Distribution: West Atlantic (Florida, U.S.A., to Brazil); East Pacific (Alaska, U.S.A., to Mexico).

Fabia byssomiae (Say, 1818)

Pinnotheres Byssomiae SAY, 1818, Journ. Acad. Nat. Sci. Phila., 1 (16): 451, 452 (♀ holotype: probably not extant; type-locality: '...North America...').

Pinnotheres byssomiae DEKAY, 1844, Zool. New York, 6: 13 (extra-limital). — GIBBES, 1850, Proc. Acad. Nat. Sci. Phila., 5: 24 (listed, 'Say's original specimen and label' in 'Philadelphia Cabinet'). — GIBBES, 1850, Proc. Amer. Ass. Adv. Sci., 3: 179. — MIERS, 1886, Rept. Sci. Results Voy. Challenger, 17 (49): 276 (listed).

Pinnotheres byssomyae COUES & YARROW, 1878, Proc. Acad. Nat. Sci. Phila., 1878: 323 (extra-limital).

Fabia byssomiae RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 105, 106, pl. 24 (♀) figs. 6 (dorsal view), 8 (ventral view) (southern coast U. S.; Tampa Bay, Florida; Santa Lucia Bay, Cuba).

Measurements: Female, length 6.4 mm, width 6.8 mm (Rathbun).

Habitat: In bivalves: *Byssomia distorta* [*Hiatella artica* Linnaeus] (Say); *Saxicava distorta* [*Hiatella artica* Linnaeus] (DeKay); *Saxicava arctica* [*Hiatella a.* Linnaeus] (Rathbun); 2 to 5 fms [3.7-9 m]

Distribution: Southern coast of the United States; Florida, U.S.A.; Cuba.

Fabia canfieldi Rathbun, 1918

Raphonotus subquadratus [not Dana, 1851] RATHBUN, 1904, Harriman Alaska Exped., 10: 186 (part: specimen from Monterey, California, fide Rathbun, 1918).

Fabia canfieldi RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 12, 101, 102, 106, pl. 24 (♀) figs. 5 (dorsal view), 7 (ventral view), text-fig. 57 (♀ maxilliped) (♀ holo-

type: USNM 3445; type-locality: 'Monterey, California...', U.S.A.). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 254–255, pl. 39 (♀) figs. 5 (dorsal view), 6 (ventral view, after Rathbun, 1918). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1420.

Measurements: Female, approximate width 7 mm (Rathbun, 1918).

Habitat: In the folds of the keyhole limpet, *Lucapina crenulata* [*Megathura crenulata* (Sowerby)] (Rathbun, 1904).

Distribution: Known only from the type locality.

***Fabia concharum* (Rathbun, 1893)**

Fabia subquadrata [not Dana, 1851] p.p. LOCKINGTON, 1877, Proc. California Acad. Sci., 7: 155 (11) (fide Rathbun, 1918). — p.p. HOLMES, 1900, Occ. Pap. California Acad. Sci., 7: 87 (fide Rathbun, 1918).

Cryptophrys concharum p.p. RATHBUN, 1893, Proc. U. S. Nat. Mus., 16: 250 (not the specimens from Puget Sound (USNM 17502), fide Davidson, 1968) (lectotype: USNM 17498; type-locality: 'False Bay, San Diego County, California'). — HOLMES, 1900, Occ. Pap. California Acad. Sci., 7: 96 (only the reference to Rathbun's, 1893, San Diego specimen: Holmes' description is based on *F. subquadrata*; the identity of his own San Diego specimen is unknown). — RATHBUN, 1900, Amer. Nat., 34 (403): 590 (listed). — ? RITTER, 1913, Proc. U. S. Nat. Mus., 45: 497 (in the ascidian *Phallusia vermiformis* Ritter; the specimen is figured by Rathbun, 1918, pl. 20 fig. 3, 4 and by Schmitt, 1921, pl. 38 fig. 1, 2, see below; Rathbun, 1918: 87, doubted the correctness of the identification of this specimen with the present species; the specimen, USNM 45611, is lost). — WILLIAMSON, 1915, Nordisches Plankton, 6: 562 (listed). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 246, 285 (listed).

Raphonotus lowei RATHBUN, 1900, Amer. Nat., 34 (403): 590 (♀ lectotype: USNM 23437; type-locality: 'San Pedro Bay [California]'). — RATHBUN, 1904, Harriman Alaska Exped., 10: 186, 187, fig. 93 a (♀ endognath of maxilliped), b (♀ chela) (San Pedro Bay and San Diego, California).

Fabia lowei RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 104–105, pl. 24 figs. 2 (♀ dorsal view), 4 (ventral view), text-fig. 55 a (♀ endognath of outer maxilliped), b (♀ left chela) (San Pedro Bay, Long Beach, Alamitos Bay, San Clemente Island, and San Diego, California). — SCHMITT, 1921, Univ. California Publ. Zool., 23: 254, pl. 39 figs. 3 (♀ dorsal view), 4 (♀ ventral view) (after Rathbun, 1918). — JOHNSON & SNOOK, 1927, Seashore Anim. Pacific Coast: 391 (Santa Monica to San Diego, California).

Pinnotheres concharum p.p. RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 86–87, pl. 20 figs. 3 (♀ dorsal view, USNM 45611), 4 (♀ ventral view, same specimen) (not pl. 20 figs. 5, 6, which is *F. subquadrata*) (USNM 17498, 25428, 50443 only; USNM 45611 is lost; specimen from Stewarts Point California not seen, fide Davidson, 1968). — p.p. SCHMITT, 1921, Univ. California Publ. Zool., 23: 252, pl. 38 figs. 1 (♀ dorsal view), 2 (♀ ventral view) (text based partly on this species and partly on *F. subquadrata*; pl. 38 figs. 3 and 4 show the latter species, figs 1 and 2 are of USNM 45611, a specimen (now lost) assigned doubtfully to the present species; fide Rathbun 1918). — GLASSELL, 1938, Trans. San Diego Soc. nat. Hist., 8 (33): 453 (in *Volsella capax* Conrad together with *Fabia lowei*). — HEWATT, 1946, Ecol. Monogr., 16 (3): 194, 200, 202, 204 (Santa Cruz Island; ecology). — LIE, 1968, Fiskeri Direkt. Skr., 14: 291, 314 (Puget Sound; ecology).

Fabia concharum DAVIDSON, 1968, Bull. S. California Acad. Sci., 67 (2): 87–88, fig. 1B (third maxilliped), C (right ♂ gonopod), E (immature ♀ abdomen), F (♂ abdomen).

Pinnotheres goncharum GLASSELL, 1934, Journ. Washington Acad. Sci., 24 (7): 301 (listed).

Pinnotheres concharum p.p. BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1418, 1420 (listed).

Measurements: Female, length 10.0 mm, width 12.5 mm (Rathbun, 1904); male, length 3.0 mm, width 2.9 mm (Davidson, 1968).

Habitat: In bivalves: *Pachydesma crassatelloides* [*Tivela stultorum* (Mawe)] (Lockington); *Tapes* (Holmes); *Pholas pacifica* [*Barnesia subtruncata* (Sowerby)] (Rathbun, 1900); *Mya californica* [*Crypiomya californica* (Conrad)], *Donax levigatus* [*Donax gouldii* Dall], *Modiola modiolus* [*Modiolus modiolus*

(Linnaeus)], *Pholas californica* [*Parapholas californica* (Conrad)], ? *Kellia laperousii* (Deshayes) (Rathbun, 1918); *Volseilla capax* [*Modiolus capax* (Conrad)] (Glassell, 1938); *Modiolus modiolus*, *Modiolus capax*, *Parapholas californica*, *Barnea pacifica* [*Barnea subtruncata* (Sowerby)], *Pachydesma crassatelloides* [*Tivela stultorum* (Mawe)], *Tapes*, *Donax levigatus* (*Donax gouldii* Dall)], *Mya californica* (Davidson, 1968). ? In Ascidia: *Phallusia vermiformis* [*Ascidia vermiformis* (Ritter)] (Ritter, 1913; Rathbun, 1918).

Distribution: Santa Monica to San Diego, California, U.S.A.

Fabia granti Glassell, 1933

Fabia granti GLASSELL, 1933, Trans. San Diego Soc. Nat. Hist., 7 (28): 342, pl. 26 (♀) figs. 1 (dorsal view), 2 (right chela), 3 (maxilliped) (♀ holotype: USNM 67512; type-locality: 'Magdalena Bay, Lower California, Mexico'). — GLASSELL, 1934, Journ. Washington Acad. Sci., 24 (7): 301 (Gulf of California) (listed). — GLASSELL, 1938, Trans. San Diego Soc. Nat. Hist., 8 (33): 452, pl. 33 fig. 2 (♂ dorsal view) (San Felipe, Gulf of California). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1421.

Measurements: Male, length 3.7 mm, width 3.5 mm (Glassell, 1938); female, length 6.0 mm, width 7.5 mm (Glassell, 1933).

Habitat: in a worm tube from 7 fms. [12.8 m] (Glassell, 1933); 'Found commensal in [the Gastropoda] *Crucibulum*, *Acmaea*, and *Crepidula*' (Glassell, 1938). The fact that, as the author remarks, the type specimen was 'taken in a worm tube does not truly indicate its host, but rather that the holotype was disturbed in the dredge material.' Also: '...found in a tide pool commensal with *Crucibulum spinosum* (Sowerby).'

Distribution: Gulf of California, Mexico.

Fabia hickmani Guiler, 1950

Fabia hickmani GUILER, 1950, Pap. Proc. Roy. Soc. Tasmania, 1949: 67-72, figs. (♀) 1 (abdomen, crab stage 1), 2 (abdomen, crab stage 2), 3 (abdomen, crab stage 3), 4 (mandible) (syntypes: depository unknown; type-locality: 'Pea crabs are very frequently found inhabiting mussels in the large beds of these Lamelli-branches in the estuary of the River Derwent and other places in Southern Tasmania. The mussel from which the specimens on which the present description is based is *Mytilus planulatus* Lam. The mussel beds are found at or about the tide level for 'low high' water. Most of the specimens were collected at Blackman's Bay but some came from the other side of the estuary at Bellerive, Ralph's Bay, and South Arm while specimens were collected outside the estuary at Dodge's Ferry and Dunalley. All these latter specimens were used for comparative purposes only.'). — GUILER, 1952, Records Queen Victoria Mus., Tasmania, 3: 40 (South Tasmania, listed).

Measurements: Male average width 4.5 mm; female, width between 2.25 and 4.0 mm.

Habitat: In the mussel *Mytilus planulatus* [*Mytilus edulis aoteanus* Powell].

Distribution: Southern Tasmania, Australia.

Fabia sebastianensis Rodrigues, 1971

Fabia sebastianensis RODRIGUES, 1971, Trabalhos Oceanogr. Univ. Fed. Pernambuco, Recife [for 1967/69], 1/11: 257-260, fig. 1 (third maxilliped), 2 (dorsum of carapace), 3 (cheliped) (♀ovigerous holotype, type-locality São Sebastião, São Paulo, Brazil) (compared with *Fabia subquadrata*).

Measurements: Carapace, ♀ holotype, 9 mm long, 10 mm wide.

Habitat: In *Atrina rigida* Solander.

Distribution: Known only from the type locality.

Fabia subquadrata Dana, 1851

Fabia subquadrata DANA, 1851, Proc. Acad. Nat. Sci. Phila., 5: 253 (7) (Holotype not extant; type-locality: 'in freto 'Puget' Oregoniae', Puget Sound). — DANA, 1852, U. S. Explor. Exped., 13 (text): 382-383. — DANA, 1855, U. S. Explor. Exped., 13 (atlas): 9, pl. 24 (♀) figs. 5 a (dorsal view), b (ventral view), c (frontal view), d (chela), e (dactylus) (Puget Sound). — STIMPSON, 1857, Journ. Boston Soc. Nat. Hist., 5: 470 (3) (Faralone Islands, California). — LOCKINGTON, 1877, Proc. Calif. Acad. Sci., 7: 155 (11) (part, fide Rathbun, 1918). — SMITH, 1880, Rept. Geol. Surv. Canada, 1878-79: 206B (Queen Charlotte Islands, British

Columbia). — NEWCOMBE, 1893, Bull. Nat. Hist. Soc. British Columbia, 4: 25 (Queen Charlotte Islands, British Columbia). — HOLMES, 1900, Occ. Pap. Calif. Acad. Sci., 7: 87-88 (part, fide Rathbun, 1918). — THOMPSON, 1901, Cat. Crust. Pycnog. Mus. Univ. Coll. Dundee: 6 (Vancouver, British Columbia, listed). — WILLIAMSON, 1915, Nordisches Plankton, 6 (1): 562 (listed). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 101, 102, 103, 104 (part, ♀♀ only, fide Wells, 1928), pl. 24 (♀) figs. 1 (dorsal view), 2 (ventral view), text-figs. 53 (♀) a (maxilliped), b (dorsal view), c (right chela), text-fig. 54 (♀) a (frontal view), b (dactylus) (Akutan Pass, Alaska; Vancouver Island, British Columbia; Oyster Bay, Washington; Pacific Grove and Laguna Beach, California). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 246 (listed). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 53: 253, 254, pl. 39 (♀) figs. 1 (dorsal view), 2 ventral view, text-fig. 150 (♀) a (chela), b (dorsal view) (after Rathbun, 1918). — ICZN, 1925, Smithson. Misc. Coll., 73 (3): 15 (Opinion 85; placement of genus with *Fabia subquadrata* as the type, in the 'Official List of Generic Names in Zoology'). — JOHNSON & SNOOK, 1927, Seashore Anim. Pacific Coast: 391, fig. 347 (♀ dorsal and ventral views) (general account). — SMITH, 1928, Canadian Field Naturalist, 42 (7): 164, 165 (Sidney, British Columbia). — WELLS, 1928, Publ. Puget Sound Mar. Sta., 6: 286-289, figs. 4 (♀ dorsal view), 5 (♀ ventral view), 6 (♀ left chela), 7 (♂ dorsal view), 8 (♂ ventral view), 9 (♂ left chela) (Flat Top Island, Brown Island, Cattle Point, and O'Neal Island, Washington). — CLEMENS, 1933, Check List Mar. Fauna Flora Canad. Pacific Coast: 52 (Canadian Pacific Coast, listed). — SJÖGREN, 1934, Zool. Jahrb. Anat. Ontog., 58 (1): 163, 165 ('Blutdrüse'). — RICKETTS & CALVIN, 1939, Between Pacific Tides, (ed. 1): 120, 121, fig. 57 (♂ dorsal and ventral views) (biology and ecology). — WELLS, 1940, Univ. Wash. Publ. Oceanog., 2 (2): 19-50 (Puget Sound) (biology, ecology). — HEWATT, 1946, Ecol. Monographs, 16 (3): 194, 200 (Santa Cruz Island, California, listed). — ICZN, 1956, Opin. Decl. Int. Comm. zool. Nomencl., 1 (D): 14 (Direction 36; specific name placed on the 'Official List of Specific Names in Zoology' as Name No. 861). — CHRISTENSEN & McDERMOTT, 1958, Biol. Bull. Woods Hole, 114 (2): 161, 171, 175 (= *Pinnotheres concharum*, mentioned). — IRVINE & COFFIN, 1960, Walla Walla [Washington] Coll. Publ. Dept. Biol. Sci., 28: 1-24, pl. 1 (zoea 1) figs. 1 (lateral view), 2 (telson and uropods), 3 (antenna), 4 (antennule), 5 (maxilla 2), 6 (maxilla 1), pl. 2 (lateral view, zoea 2), pl. 3 (lateral view zoea 3), pl. 4 (lateral view, zoea 4), pl. 5 (ventral view, megalopa), pl. 6 (megalopa) figs. 1 (cheliped), 2 (leg 4), 3 (antennule), 4 (antenna), pl. 7 (megalopa) figs. 1 (maxilliped 1), 2 (maxilliped 2), 3 (maxilliped), 4 (maxilla), pl. 8 (megalopa) figs. 1 (pleopod 4), 2 (pleopod 1), pl. 9 (pleopod 3, megalopa), pl. 10 (dorsal view, crab stage 1) (larval stages) (James Island and Burrows Bay, Skagit County, Washington). — PEARCE, 1962, Biologist, 45 (1-2): 11, 13, 14 (adaptations; larval stages, Puget Sound). — HART, 1962, Rept. Prov. Mus. Nat. Hist. Anthropol. British Columbia, 1961: W19 (Clayoquot, Vancouver Island). — COSTLOW & BOOKHOUT, 1966, Chesapeake Sci., 7 (3): 157, 162, 163 (larvae). — PEARCE, 1966, Pacific Sci., 20 (1): 3-33 (biology). — PEARCE, 1966, Some Contemporary Stud. Mar. Sci.: 565-589 (biology). — PATTON, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1239 (behavior). — BEONDÉ, 1968, Veliger, 10 (4): 375 (mentioned). — DAVIDSON, 1968, Bull. S. Calif. Acad. Sci., 67 (2): 85-87, fig. 1 A (third maxilliped), D (right ♂ gonopod), G (♀ abdomen), H (♂ abdomen). — RICKETTS & CALVIN, 1968, Between Pacific Tides (ed. 4, Hedgpeth revised): 186-188, 498, fig. 145 (♀ dorsal and ventral views) (biology, ecology).

Cryptophrys concharum RATHBUN, 1893, Proc. U. S. Nat. Mus., 16: 250 (part, USNM 17502 from Puget Sound only, fide Davidson, 1968) (the lectotype of *C. concharum* from False Bay, San Diego County, California, is a different species, *Fabia concharum*). — HOLMES, 1900, Occ. Pap. California Acad. Sci., 7: 96 (description based on some of Rathbun's (1893) specimens from Puget Sound; the identity of Holmes' own specimen from San Diego unknown, this specimen subsequently lost). — RATHBUN, 1904, Harriman Alaska Exped., 10: 188, pl. 7 fig. 6 (♀ dorsal view), text-fig. 94 (maxillipeds). — WEYMOUTH, 1910, Leland Stanford Jr. Univ. Publ., (Univ. Ser.) 4: 60. — TAYLOR, 1912, Contrib. Canadian Biol., 1906-1910: 191, 212 (in *Saxidomus gigantea*, Departure Bay, British Columbia; judging by the locality, this is *F. subquadrata*, rather than *F. concharum*).

Raphonotus subquadratus RATHBUN, 1904, Harriman Alaska Exped., 10: 186 (excepting specimens from Monterey, = *F. canfieldi*). — WEYMOUTH, 1910, Leland Stanford Jr. Univ. Publ., (Univ. Ser.) 4: 55, fig. 2 (♀ dorsal view) (part: not reference to Miss Rathbun's specimen in *Lucapina crenulata*, = *F. canfieldi*) (Monterey Bay, California). — TAYLOR, 1912, Contrib. Canadian Biol., 1906-1910: 191 (listed), 212 (Queen Charlotte Islands, shore; Houston Stewart Channel, Queen Charlotte Islands). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 285 (listed).

Pinnotheres concharum WAY, 1917, Publ. Puget Sound Mar. Sta., 1: 361 (citation of Holmes', 1900, description). — p.p. RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 86, pl. 20 fig. 5 (♀ dorsal view, USNM 18410) (pl. 20 figs. 3 and 4, USNM 45611, may be *F. concharum*) (USNM 49628, 39129, 17502, 18410, 23929 only; specimens from off Santa Cruz Island (USNM 45611) are lost, those from Stewarts Point, California, not seen, fide Davidson, 1968). — p.p. SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 252, pl. 38 figs. 3 (♀ dorsal view), 4 (♀ ventral view), (figs. 1 and 2, USNM 45611, may be *F. concharum*, see there). — CLEMENS, 1933, Check List Mar. Fauna Flora Canadian Pacific Coast: 52. — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [2nd ed., emended 1968]: 313 (feeding).

Pinnotheres concharum p.p. BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1418.

Measurements: Male, length 7.0 mm, width 7.3 mm (Wells, 1928); female, length 12.2 mm, width 14.3 mm (Dana).

Habitat: In the test of the echinoid, *Echinus purpuratus* [*Strongylocentrotus purpuratus* (Stimpson)] (Newcombe). In bivalves: *Mya arenaria* Linnaeus, *Mytilus edulis* Linnaeus (Rathbun, 1918); *Modiolus modiolus* (Linnaeus), *Mytilus californicus* [*Mytilus californianus* (Conrad)], *Venericardia ventricosa* [*Cyclocardia ventricosa* (Gould)], *Cardita borealis* [*Cyclocardia borealis* (Conrad)] (Wells, 1928); *Saxidomus giganteus* Deshayes (Smith, 1928); *Modiolus modiolus*, *Mytilus californianus*, *Venericardia ventricosa* [*Cyclocardia ventricosa* (Gould)], *Mya* [(*Arenomya*)] *arenaria*, *Mytilus edulis*, *Cardita borealis* [*Cyclocardia borealis* (Conrad)], *Saxidomus giganteus*, *Tapes*, *Pachydesma crassitelloides* [*Tivela stultorum* Mawe] (Davidson, 1968). In Tunicates: in branchial sac of tunicate, *Syela gibbsii* (Stimpson) (Wells, 1928); intertidal (Hewatt); to a depth of 45 fms [82.3m] (Rathbun, 1918); Pearce, 1966, found that in Puget Sound *Fabia* is a true parasite feeding on its common host there, *Modiolus modiolus* (Linnaeus).

Distribution: Alaska to San Diego, California, U.S.A.

Fabia unguifalcula Glassell, 1936

Fabia unguifalcula GLASSELL, 1936, Trans. San Diego Soc. Nat. Hist., 8 (21): 298, 299, pl. 21 fig. 2 (♀ maxilliped) (♀ holotype: SDSNH 788; type-locality: 'Punta Peñasco (Rocky Point), Sonora, Mexico'; ♀ paratype: USNM uncat.).

Measurements: Female (ovig.), length 4.0 mm, width 5.0 mm.

Habitat: '...the inter-tidal zone.'

Distribution: Known only from the type locality.

ORTHOTHERES Sakai, 1969

Orthotheres SAKAI, 1969, Proc. Biol. Soc. Washington, 82: 275. Type species, by original designation: *Orthotheres turboe* Sakai, 1969. Gender: masculine.

Hosts: Mollusca Bivalvia and Gastropoda.

Distribution: West Atlantic (Florida, U.S.A., West Indies); Indo-West Pacific (Philippines).

? *Orthotheres laevis* (Bürger, 1895)

Pinnotheres laevis BÜRGER, 1895, Zool. Jahrb. Syst., 8: 380, pl. 9 fig. 25 (♀ dorsal view), pl. 10 fig. 24 (♀ maxilliped) (♂ holotype: ZIMB 67/313, no longer extant; type-locality: 'Palaoos-Ins. [Palau Islands]'). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 255 (listed, key). — MIYAKE, 1939, Records Oceanog. Works Japan, 10 (2): 221, 241 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1201, 1216 (cataloged).

[? *Orthotheres*] *laevis* SAKAI, 1969, Proc. Biol. Soc. Washington, 82: 275 (tentative generic assignment).

Measurements: Female (ovig.), length 5.25 mm, width 6.5 mm (Bürger).

Habitat: In the bivalve, *Coralliophaga* sp.

Distribution: Known only from the type locality.

? *Orthoheres longipes* (Bürger, 1895)

Pinnotheres longipes BÜRGER, 1895, Zool. Jahrb. Syst., 8: 379, 380, pl. 9 fig. 31 (♀ dorsal view), pl. 10 fig. 22 (♀ maxilliped) (♀ holotype: ZIMB 67/314a; type-locality: '...Aibukit [Philippine Islands]'). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 255 (listed, key). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1201, 1216 (cataloged).

[? *Orthoheres*] *longipes* SAKAI, 1969, Proc. Biol. Soc. Washington, 82: 275 (tentative generic assignment).

Measurements: Female, length 8.0 mm, width 8.75 mm (Bürger).

Habitat: Not recorded.

Distribution: Known only from the type locality.

Orthoheres rathbunae Schmitt, new name

Pinnotheres barbatus [not Desbonne, 1867] BÜRGER, 1895, Zool. Jahrb. Syst., 8: 369, 370, pl. 9 fig. 8 (♀ dorsal view), pl. 10 fig. 8 (♀ maxilliped) (♀ holotype: ? depository; type-locality: 'Aibukit' [Philippine Islands]). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 253 (listed, key). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1196, 1216 (cataloged). — (see also present paper, p. 2).

Orthoheres barbatus SAKAI, 1969, Proc. Biol. Soc. Washington, 82: 244, 275 (generic assignment).

Measurements: Female, length 4.75 mm, width 5.25 mm (Bürger).

Habitat: In bivalve, *Donax* sp. (Bürger).

Distribution: Known only from the type locality.

Orthoheres serrei (Rathbun, 1909)

Pinnotheres Serrei RATHBUN, 1909, Bull. Mus. Hist. Nat. Paris, 2: 69, 70, fig. (♂ maxilliped) (♂ holotype: MNHNP; type locality: 'Porto-Rico').

Pinnotheres serrei RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 63, 65, 84, 85, pl. 19 figs. 1 (♀ dorsal view), 2 (♀ ventral view), 3 (♀ ventral view), 4 (♀ dorsal view), 5 (♂ ventral view), 6 (♂ dorsal view), 7 (♂ ventral view), text-fig. 41 (♂ maxilliped) (Cuba, Jamaica, Puerto Rico). — RATHBUN, 1933, Sci. Surv. Porto Rico Virgin Ids., 15 (1): 82 (Puerto Rico).

Pinnotheres serrei BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1420 (mentioned).

Orthoheres serrei SAKAI, 1969, Proc. Biol. Soc. Washington, 82: 275 (generic assignment).

Measurements: Male, length 3.0 mm, width 3.3 mm (Rathbun, 1909); female, length 8.7 mm, width 11.8 mm (Rathbun, 1918).

Habitat: 'Female commensal in [the gastropod] *Strombus*, male free-swimming at surface' (Rathbun, 1918).

Distribution: Cuba; Jamaica; Puerto Rico.

Orthoheres strombi (Rathbun, 1905)

Pinnotheres strombi RATHBUN, 1905, Proc. Acad. Nat. Sci. Phila., 1905: 371, 372, fig. (♀ maxilliped, dorsal and ventral views) (♀ holotype: PANS 1629; type-locality: '...Clearwater Harbor, Florida...'). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 63, 65, 90, pl. 20 (♀) figs. 1 (ventral view), 2 (dorsal view), text-fig. 45 (♀ endognath of maxilliped) (Clearwater Harbor, Florida). — WASS, 1955, Quart. Journ. Florida Acad. Sci., 18 (3): 158 (three miles SSW of Alligator Point, Florida). — MENZEL, 1956, Contrib. Florida State Univ. Oceanogr. Inst., 61: 46 (listed).

Orthoheres strombi SAKAI, 1969, Proc. Biol. Soc. Washington, 82: 275 (generic assignment).

Measurements: Female, length 6.6 mm, width 9.6 mm (Rathbun, 1905).

Habitat: Commensal in gastropods: *Strombus pugilis* Linnaeus (Rathbun); *Strombus alatus* Gmelin (Wass); *Strombus* and *Pleuroploca* (Menzel).

Distribution: Florida, U.S.A.: west and northwest coasts.

Orthoheres turboe Sakai, 1969

Orthoheres turboe SAKAI, 1969, Proc. Biol. Soc. Washington, 82: 244, 275-279, pl. 2 fig. 1 (♀ holotype, dorsal view), 2 (♂ allotype, dorsal view), text fig. 19a (3d maxilliped) (♀ holotype: USNM 125889; type-locality: Yoron Island, Amani Group [Amani Gunto Archipelago]).

Measurements: Female holotype, length 8.5 mm, width 13.0 mm; male allotype, length 5.0 mm, width 5.1 mm.

Habitat: Found in the stomach of a gastropod, *Turbo (Marmarostrom) argyrostomus* (Linnaeus).
Distribution: Amani Group [Amani Gunto Archipelago], Japan; Palao Island [Palau Islands].

OSTRACOTHERES H. Milne Edwards, 1853

Ostracotheres H. MILNE EDWARDS, 1853, Ann. Sci. nat. Zool., Paris, (3) 20: 219. Type species, by present designation: *Pinnotheres tridacnae* Rüppell, 1830. Gender: masculine.

Ostracotheres NOBILI, 1905, Bull. Mus. Nat. Hist. Nat. Paris, 11 (3): 164. Erroneous spelling of *Ostracotheres* H. Milne Edwards, 1853.

Hosts: Mollusca Bivalvia; Tunicata.

Distribution: Indo-West Pacific.

Ostracotheres affinis H. Milne Edwards, 1853

Ostracotheres affinis H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 220 (186), pl. 11 fig. [in explanation of plates] 11 (maxilliped) [in text erroneously cited as fig. 5 under genus heading] (holotype, ? sex, probably not extant; type-locality: 'Ile de France [Mauritius]'). — PAULSON, 1875, Stud. Crust. Red Sea: 76 (compared with *Ostracotheres tridacnae*). — LAURIE, 1915, Journ. Linn. Soc. London Zool., 31 (209): 415 (listed). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 262, 287 (listed). — GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution note).

Pinnotheres (Ostracotheres) affinis HILGENDORF, 1869, in Von der Decken, Reisen Ost-Afrika, 3: 110 (listed).

Ostracotheres affinis NOBILI, 1906, Ann. Sci. Nat. Zool. Paris, (9) 4: 300, 301 (Djibouti, French Somaliland).

Measurements: Female, length 6.0 mm, width 8.0 mm (Nobili).

Distribution: Mauritius, Djibouti, French Somaliland.

Ostracotheres cynthiae Nobili, 1905

Ostracotheres cynthiae NOBILI, 1905, Bull. Mus. Nat. Hist. Nat. Paris, 11 (6): 409 (16) (♀ lectotype: MNHNP; type-locality: 'Djibouti [French Somaliland]'). — NOBILI, 1906, Ann. Sci. Nat. Zool. Paris, (9) 4: 301, 302, fig. 9 (maxilliped) (Djibouti, French Somaliland).

Ostracotheres cynthiae LAURIE, 1915, Journ. Linn. Soc. London Zool., 31 (209): 415, 465, 466, pl. 45 (♂) fig. 3 (dorsal view), a (ventral view), b (abdomen); text-fig. 3 (♂ maxilliped) (Red Sea). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 262-264, 287 (Tual, Kei Islands, Indonesia). — MONOD, 1938, Mém. Inst. Égypte, 37: 145-147, figs. 25 A (♀ maxilliped), B (♀ leg 1), C (♀ leg 2), D (♀ leg 3), E (♀ leg 4), F (gonopod), 26A (fingers of ♀ cheliped) (third station cited in text based on date should be XXVII instead of XVII) (Gulf of Suez). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1420. — GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution noted).

Measurements: Though Nobili (1905) stated that he had a ♂ of about 7 mm, he remarked (1906), 'La femelle mesure environ 7 millimètres de longueur et de largeur' and that, of his two specimens, 'Le mâle est plus petit que la femelle...'. Dr. J. Forest (personal communication), who examined Nobili's specimens, found that both were females, of which the larger measured 7x7 mm and the smaller 3.7 x 4 mm. He requested that the larger be recorded as the lectotype.

Habitat: In tunicates: In branchial cavity of a *Cynthia* [= ? *Pyura* sp.] (Nobili, 1905); *Styela pneumonodes* [*Polycarpa aurata* (Ouoy & Gaimard)] (Tesch, 1918); 18-35 meters, sand bottom with some mud and rock (Monod).

Distribution: Gulf of Suez, Red Sea; Djibouti, French Somaliland; Tual, Kei Islands, Indonesia.

Ostracotheres spondyli Nobili, 1905

Ostracotheres spondyli NOBILI, 1905, Bull. Mus. Nat. Hist. Nat. Paris, 11 (3): 164 (syntypes: several MNHNP, 1 ♀ AM no. P5412, 1 ♀ RMNH no. D22681, 1 ♀ Indian Museum no. C253/1; type-locality: 'Golfe Persique'). — Nobili, 1906, Bull. Sci. France Belgique, (5) 40: 149, 150, pl. 5 (♀) fig. 24 (chela), a (maxilliped), pl. 6 fig. 33 (♀ dorsal view) (Persian Gulf).

Ostracotheres spondyli TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 262, 287 (listed). — PÉREZ, 1920, Compt. Rend. Soc. Biol. Paris, 83 (24): 1027, 1028 (Persian Gulf). — PÉREZ, 1920, Compt. Rend. Acad. Sci. Paris, 170 (26): 1615–1617 (Persian Gulf) (parasitized by an epicaridean). — STEPHENSEN, 1945, Danish Sci. Invest. Iran, 4: 185, 186, 210, 211 (Iranian Gulf [Persian Gulf]).

not *Ostracotheres spondylis* SAKAI, 1933, Botany and Zoology Tokyo, 1 (7): 977 (47), 981 (51), fig. 5 a (♀ dorsal view), b (third maxilliped) (Ise Bay, Japan). (= *O. subquadratus*).

Measurements: Female, length 9.0 mm, width 10.0 mm (Nobili, 1905).

Habitat: On the pearl banks of the Persian Gulf, in the Pintadine environment, one encounters very commonly a Spondyle, *Spondylus gaederopus* Linnaeus [the presently known range of *S. gaederopus* does not include the Persian Gulf; the host species there is undoubtedly *Spondylus exilis* Sowerby] (Pérez); 10 meters (Stephensen).

Distribution: Persian Gulf.

Ostracotheres subquadratus Sakai, 1939

Ostracotheres spondylis [not Nobili, 1905] SAKAI, 1933, Botany and Zoology Tokyo, 1 (7): 977 (47), 981 (51), fig. 5 (♀) a (dorsal view), b (third maxilliped) (Ise Bay, Japan).

Ostracotheres subquadrata SAKAI, 1939, Stud. Crabs of Japan: 596, 597, fig. 82 (♀) a (dorsal view), b (third maxilliped) (♀ holotype: ? depository; Momotori village, Ise Bay, Japan). — SAKAI, 1956, Crabs: 51 (of species list) (listed).

Ostracotheres subquadratus SAKAI, 1965, Crabs of Sagami Bay: 179 (English part), 78 (Japanese part), pl. 87 fig. 4 (♀ dorsal view) ('Kameki Reef,' and Onomichi, Japan).

Measurements: Female, length 8.0 mm, width 8.6 mm (Sakai, 1939).

Habitat: In a bivalve: possibly *Mytilus crassitesta* Lischke (Sakai, 1939); in the mantle cavity of *Crassostrea* [*Crassostrea*] (Sakai, 1965).

Distribution: Sagami Bay, Ise Bay, Island of Honshu, and Onomichi on the Inland Sea of Japan.

Ostracotheres tridacnae (Rüppell, 1830)

[Without a name] SAVIGNY, 1818, Descr. Égypte, Crust., atlas: pl. 7 fig. 1–1 (♀ dorsal view), 1–1' (carapace outline), 1–2 (ventral view of front and mouth), 1–3 (♂ abdomen), 1–4 (♀ abdomen), 1–5 (♀ ventral view with abdomen removed), 1a (epistome), 1b (first maxilliped), 1c (second maxilliped), 1d (third maxilliped, outer view), 1d' (third maxilliped, inner view), 1i (mandible, outer view), 1i' (mandible, inner view), 1j (antenna), 1m (♂ first pleopod), 1n (♂ second pleopod), 1o (maxilla), 1u (maxilla), 1v (antennule).

Pinnotheres veterum AUDOUIN, 1826, Descr. Égypte, Hist., nat. 1 (4): 88 (brief description).

Pinnotheres Tridacnae RÜPPELL, 1830, Beschr. Abbild. 24 Arten Krabben: 22–24, pl. 5 fig. 2 (♀ dorsal view and abdomen, ♂ abdomen), pl. 6 fig. 17 (maxilliped) (♂ lectotype: SMF 2719; type-locality: Red Sea). — HERKLOTS, 1861, Tijdschr. Entomol., 4: 131 (18) (listed).

Pinnotheres tridacnae KRAUSS, 1843, Südafrik. Crust.: 47 (coast of Natal, Union of South Africa). — DOFLEIN, 1904, Wiss. Ergeb. Deutschen Tiefsee Exped. 'Valdivia', 6: 124 (mentioned), 210, 226 (eyes).

Ostracotheres Savignyi H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 219 (185), pl. 11 fig. 10 (maxilliped) ('Mer Rouge'). — HELLER, 1861, Verhandl. Zool. Bot. Ges. Wien, 11: 20 (18) (listed). — ADENSAMER, 1897, Ann. K. K. Naturhist. Hofmus., 12: 108 (Red Sea).

Ostracotheres Tridacnae H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool.

Paris, (3) 20: 219 (185) (Red Sea). — HELLER, 1861, Verhandl. Zool. Bot. Ges. Wien, 11: 20 (18) (listed). — HELLER, 1861, Sitzber. K. Akad. Wiss. Math.-Naturw. Kl., 43 (1): 371 (listed). — PAULSON, 1875, Stud. Crust. Red Sea: 76 (compared with *Ostracotheres affinis*) (Red Sea). — KOSSMAN, 1877, Zool. Ergeb. Reise Rothen Meeres, 1 (3): 62 (Red Sea). — COOKE, 1895, in Harmer & Shipley, Cambridge Nat. Hist., 3: 62 (mentioned in account of Crustacea associated with mollusks).

Pinnotheres (Ostracotheres) tridacnae HILGENDORF, 1869, in Von der Decken, Reisen Ost-Afrika, 3: 110 (listed).

Pinnotheres (Ostracotheres) Savignyi HILGENDORF, 1869, in Von der Decken, Reisen Ost-Afrika, 3: 110 (listed).

Ostracotheres tridacnae VAN BENEDEN, 1875, Commens. Parasit.: 28 (mentioned). — NEUMANN, 1878, Cat. Podophthalmen Crust. Heidelberg. Mus.: 25 (listed). — ADENSAMER, 1897, Ann. K. K. Naturhist. Hofmus., 12: 109 (Red Sea). — STEBBING, 1910, Ann. S. African Mus., 6 (4): 331 (listed). — LENZ, 1912, Arkiv Zool. K. Svenska Vetenskapsakad. Stockholm, 7 (29): 4 (listed). — LENZ & STRUNCK, 1914, Deut. Südpolar-Exped. 15 (3): 268, 283 (Simons Bay, Union of South Africa). — LAURIE, 1915, Journ. Linn. Soc. London, Zool., 31 (209): 415 (listed). — TESCH, 1918, Siboga Exped. Monogr. 39c¹ (84): 262, 287 (listed). — BALSS, 1924, Denkschr. Akad. Wiss. Wien, 99 (6): 14 (Red Sea). — CALMAN, 1927, Trans. Zool. Soc. London, 22 (2): 215 (Gulf of Suez). — RAMADAN, 1936, Bull. Fac. Sci. Egypt. Univ., 6: 36, 37 (Al Ghardaqa, Egypt). — GURNEY, 1928, Proc. Zool. Soc. London, (B) 108 (1): 78, 79, pl. 4 (zoea 1) figs. 38–41: 38 (lateral view), 39 (telson), 40 (maxillule), 41 (maxilla). — GURNEY, 1942, Ray Soc., 129: 278 (larval stages). — BARNARD, 1950, Ann. S. African Mus., 38: 82 (South Africa). — GOHAR & AL-KHOLY, 1957, Publ. Mar. Biol. Sta. Al-Ghardaqa, 9: 153–160, pl. 4 (larval stages) figs. 1 (lateral view, zoea 1), 2 (lateral view, zoea 2), 3 (lateral view, zoea 3), 4 (lateral view, zoea 4), 5 (dorsal view megalopa), 6 (chela, megalopa), pl. 5 figs. 7 (mandible, zoea 2), 8 (mandible, zoea 3), 9 (mandible, zoea 4), 10 (mandible, megalopa), 11 (maxilliped 1, zoea 1), 12 (maxilliped 1, zoea 2), 13 (maxilliped 1, zoea 3), 14 (maxilliped 1, zoea 4), 15 (maxilliped 1, megalopa), pl. 6 figs. 16 (antennule and antenna, zoea 4), 17 (antennule, megalopa), 18 (antenna, megalopa), 19 (maxillule, zoea 1), 20 (maxillule, zoea 2), 21 (maxillule, zoea 3), 22 (maxillule, zoea 4), 23 (maxillule, megalopa), 24 (maxilliped 2, zoea 1), 25 (maxilliped 2, zoea 2), 26 (maxilliped 2, zoea 3), 27 (maxilliped 2, zoea 4), 28 (maxilliped 2, megalopa), pl. 7 figs. 29 (maxillae, zoea 1), 30 (maxillae, zoea 2), 31 (maxillae, zoea 3), 32 (maxillae, zoea 4), 33 (maxillae, megalopa), 34 (maxilliped, megalopa), 35 (pleopod 3, megalopa), 36 (telson, zoea 1), 37 (telson, zoea 2), 38 (telson, zoea 3), 39 (telson, zoea 4) (larval stages) (Al Ghardaqa, Egypt, Red Sea). — GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution noted).

Ostracotheres tridacnae NOBILI, 1906, Ann. Sci. Nat. Zool. Paris, (9) 3: 299, 300 (Suez; Red Sea; Obock, French Somaliland).

Ostracotheres savignyi TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 262 (synonym of *O. tridacnae*).

Measurements: Male, width 2.5 mm (Lenz, 1914). Sex?, length 15 mm (Barnard, 'according to Rüppel's figure').

Habitat: In bivalves: *Pinna*, *Tridacna elongata* [*Tridacna maxima* (Röding)] (Rüppel); in ascidians (Nobili).

Distribution: Gulf of Suez; Red Sea; Obock, French Somaliland; Natal; Simon's Bay, South Africa.

PARAPINNIXA Holmes, 1894

Pseudopinnixa HOLMES, 1894, Proc. California Acad. Sci., (2) 4: 565. Type species, by monotypy: *Pinnixa* ? *nitida* Lockington, 1876. Gender: feminine. Invalidated by *Pseudopinnixa* Ortmann, 1894 (Crustacea, Pinnotheridae).

Parapinnixa HOLMES, 1894, Proc. California Acad. Sci., (2) 4: 587. Replacement name for *Pseudopinnixa* Holmes, 1894. Gender: feminine.

Hosts: Polychaeta; ? Echinoidea.

Distribution: West Atlantic (North Carolina, U.S.A., to Brazil); East Pacific (California, U.S.A., to Galapagos Islands); North Pacific (Siberia, Sakhalin, Kuriles). Fossil: Miocene of California.

Parapinnixa affinis Holmes, 1900

Parapinnixa affinis HOLMES, 1900, Occ. Pap. Calif. Acad. Sci., 7: 95 (♂ holotype; ? depository; type-locality: 'Dead Man's Island, San Pedro, Calif. .'). — RATHBUN, 1904, Harriman Alaska Exped., 10: 188 (after Holmes). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 12, 107, 111 (after Holmes). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 285 (listed). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 255 (after Holmes, 1900 and Rathbun, 1918). — GLASSELL, 1933, Trans. San Diego Soc. Nat. Hist., 7 (27): 321-324 [describes and figures ♂ allotype], pl. 20 figs. 1 (♂ dorsal view), 2 (lateral view, zoea 1), 3 (♂ ventral view), pl. 21 figs. 1 (♂ right chela), 2 (♀ right chela), 3 (♂ maxilliped), 4 (frontal view), 5 (♀ abdomen), 6 (♂ abdomen) (Newport Bay, Anaheim Landing, San Diego, California). — RICKETTS & CALVIN, 1939, Between Pacific Tides, (ed. 1): 225 (biology, ecology) (Newport Bay, California). — BERKELEY & BERKELEY, 1941, Bull. S. Calif. Acad. Sci., 40 (1): 54 (southern California). — KOBJAKOVA, 1967, Explorations Fauna Seas USSR, 5 (13): 243 (Possjet Bay, S.E. Siberia). — RICKETTS & CALVIN, 1968, Between Pacific Tides, (ed. 4, Hedgpeth revised): 342, 498 (biology, ecology).

Measurements: Male, length 2.5 mm, width 4.1 mm; female, length 3.6 mm, width 6.0 mm (Glassell).

Habitat: In tubes of polychaetes: *Amphitrite* (Glassell) (this Glassell specimen has since been identified by Dr. M. H. Pettibone as *Terebella californica* Moore); *Loimia montagui* [*L. medusa* (Savigny)] (Berkeley & Berkeley); 35-40 m deep (Kobjakova).

Distribution: S. E. Siberia, S. Sachalin, Iturup, and California.

Parapinnixa beaufortensis Rathbun, 1918

Parapinnixa beaufortensis RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 107, 112-114, figs. 61 (♂ dorsal view with detached chela), 62 (♂ maxilliped), 63 (♂ ventral view) (♂ holotype: USNM 50170; type-locality: 'Off Beaufort, North Carolina; on fishing grounds, 1/4 mi. S. of Fishing Buoy (20 miles off Beaufort Inlet).') — HAY & SHORE, 1918, Bull. U. S. Bur. Fish., 35: 444, 445, figs. 19 (♂ dorsal view with detached chela), 20 (♂ ventral view).

Measurements: Male, length 1.0 mm, width 1.3 mm (Rathbun).

Distribution: Known only from the type locality.

Parapinnixa bouvieri Rathbun, 1918

Parapinnixa bouvieri RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 12, 107, 111, 112, pl. 25 figs. 4 (♀ chela and left legs 2-4), 5 (♂ ventral view), 6 (♂ dorsal view), 7 (♀ dorsal view), 8 (♀ ventral view), 9 (♀ right chela), 10 (♀ left chela and right legs 2-4); text-fig. 66 (♀ maxilliped) (♀ holotype: USNM 23441; ♂ paratype: MCZ 5744; type-locality: 'Off Cape Catoche, Yucatan [Mexico]... Albatross Sta. 2362, 22°08'30" N 86°53'30" W'. — RATHBUN, 1933, Sci. Surv. Porto Rico Virgin Ids, 15 (1): 83, fig. 75 (dorsal view with detached cheliped) (1-1/2 miles S. of Caña Gorda Island, near Guanica, Puerto Rico). — WILLIAMS, 1965, Fish. Bull. U. S. Fish Wildlife Serv., 65 (1): 208, 209, text-fig. 191 (♀ [ovig.] dorsal view) (Charleston, South Carolina, and Puerto Rico).

Measurements: Male, length 2.0 mm, width 3.5 mm; female, length 1.6 mm, width 3.1 mm (Rathbun, 1918).

Habitat: 'Found among ventral spines of a rose sea urchin,' 3 or 4 to 40 fms [5.5-73 m] (Williams).

Distribution: Charleston, South Carolina, to Yucatan, Mexico; Puerto Rico.

Parapinnixa glasselli Garth, 1939

Parapinnixa glasselli GARTH, 1939, Allan Hancock Pacific Exped., 5 (2): 24, 25, pl. 9 (♀) figs. 1 (dorsal view), 2 (maxilliped), 3 (abdomen), 3 (chela) (♀ holotype: USNM 77367; type-locality: '... Tagus Cove, Albemarle Island, Galapagos...'). — GARTH, 1946, Allan Hancock Pacific Exped., 5 (10): 497, pl. 84 (♀) figs. 1 (♀ dorsal view), 3 (♀ ventral view) (Tagus Cove, Albemarle Island, Galapagos Islands).

Measurements: Female, length 2.8 mm, width 6.5 mm (Garth, 1939).

Habitat: Worm tubes, 2-3 fms [3.7-5.5 m] (Garth, 1946).

Distribution: Known only from the type locality.

Parapinnixa hendersoni Rathbun, 1918

Parapinnixa hendersoni RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 109–110, pl. 26 figs. 1 (♂ frontal view), 2 (♂ dorsal view), 3 (♂ ventral view), 4 (♀ ventral view), 5 (♀ dorsal view), text-fig. 59 (♀ maxilliped) (off Santa Lucia and Ensenada de Cajon, off Cape Antonio, Cuba; West Coast of Florida) (♂ holotype: USNM 48710; type-locality: 'Los Arroyas, Cuba'). — RATHBUN, 1924, Bijdr. Dierk. Amsterdam, 23: 18 (Spanish Water, and Caracas Bay, Curaçao). — RIGHI, 1967, Papéis Avulsos Zool. São Paulo, 20 (10): 99, 100, figs. 7 (♂ abdomen), 8 (♂ third maxilliped) (Bahia, Brazil).

Measurements: Male, length 4.0 mm, width 8.3 mm (Rathbun, 1918); female, 4.5 mm, width 9.3 mm (Rathbun, 1924).

Habitat: 'Free-swimming, as all the specimens examined from Cuba were taken in plankton with a submarine light' (Rathbun, 1918).

Distribution: West coast of Florida; Cuba; Curaçao; Brazil.

† Parapinnixa miocenica Rathbun, 1932

Parapinnixa miocenica RATHBUN, 1932, Journ. Wash. Acad. Sci., 22 (14): 413, figs. 6 (dorsal view), 7 (ventral view), 8 (ventral view), 9 (dorsal view), 10 (dorsal view) (Miocene of California) (♀ [?] holotype: USNM 372853; type-locality: '...from top of hill with elevation of 610 feet about 1 mile W. of N. of Loma Alta and stratigraphically 700 feet approximately above the base of the type section of the Monterey formation [Miocene; Pacific Grove, California]') [Note: Of the six fossil specimens seen by the author three with ventral side uppermost are males; the others, including the holotype, with the dorsal side up, undoubtedly are males also]. — VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 2 (listed). — ZULLO & CHIVERS, 1969, The Veliger, 12 (1): 73 (mentioned).

Distribution: Also collected 'from top of Loma Alta above the base of the type section [Monterey formation, Miocene; Pacific Grove, California].'

Parapinnixa nitida (Lockington, 1876)

Pinnixa ? nitida LOCKINGTON, 1876, Proc. Calif. Acad. Sci., 7: 155, 156 (11, 12) (part, 'male' only, really a female, fide Rathbun, 1918) ([♀] holotype not extant; type-locality: '...Angeles Bay, Gulf of California...').

Pseudopinnixa nitida HOLMES, 1894, Proc. Calif. Acad. Sci., (2) 4: 566–568, pl. 20 (♀) figs. 8, 9: 8 (dorsal view), 9 (maxilliped) (Angeles Bay, Gulf of California).

Parapinnixa nitida HOLMES, 1894, Proc. Calif. Acad. Sci., (2) 4: 587 (proposed for preoccupied *Pseudopinnixa*). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 107–109, fig. 58 (♀) a (dorsal view), b (maxilliped) (after Holmes). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 285 (listed). — RATHBUN, 1923, Bull. Amer. Mus. Nat. Hist., 48 (20): 628, fig. 6 (♂ abdomen) (Pichilínque Bay, Gulf of California). — GLASSELL, 1933, Trans. San Diego Soc. Nat. Hist., 7 (27): 324, 326, 327 (♀), fig. 1 a (dorsal view), b (left maxilliped), 4 (left chela) (Magdalena Bay, Baja California and San Felipe, Gulf of California). — GLASSELL, 1934, Journ. Washington Acad. Sci., 24 (7): 301 (Gulf of California) (listed). — STEINBECK & RICKETTS, 1941, Sea of Cortez: 472 (Port San Carlos, Gulf of California). — RIOJA, 1945, Anales Inst. Biol. Mexico, 16 (2): 425–430, (♀) figs. 1 (dorsal view), 2 (maxilliped), 3 (outer border of merus of maxilliped), 4 (frontal view), 5 (chela), 6 (dorsal view), 7 (♀ abdomen) (La Paz, Gulf of California). — RIOJA, 1950, Rev. Soc. Mexicana Hist. Nat., 11 (1–4): 145–147, fig. 6 (♀ dorsal view) (discusses commensalism in Crustacea, mentions *P. nitida*).

Measurements: Male, length 2.6 mm, width 5.6 mm (Rathbun, 1923); female, length 5 mm, width 11 mm (Holmes).

Habitat: Found free living (Rathbun, 1923); '...free swimming at night, attracted to anchored boat by [electric] light hung overside...' (Steinbeck & Ricketts); 'In the tubes of the terebellid *Lamice heterobranchia* [*Eupolymania heterobranchia* (Johnson)] (Rioja, 1945).

Distribution: Magdalena Bay, Baja California; Port San Carlos, Sonora, Mexico; Gulf of California.

PINNAXODES Heller, 1865

Pinnaxodes HELLER, 1865, Reise 'Novara' Zool., 2 (3): 67. Type species, by original designation and monotypy: *Pinnaxodes hirtipes* Heller, 1865 (= *Pinnotheres chilensis* H. Milne Edwards, 1837). Gender: masculine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, *Smithson. Miscell. Coll.*, 73 (3): 13-18; see also *Direction* 37, 1956, *Opin. Decl. Int. Comm. Zool. Nomencl.*, 1 (D) (2): 47-82) as name no. 349.

Pinaxodes PORTER, 1906, *Rev. Chilena Hist. Nat.*, 10: 135. Erroneous spelling of *Pinnaxodes* Heller, 1865.

Hosts: Echinodermata (Echinoidea, Holothuroidea); Mollusca Bivalvia.

Distribution: West Atlantic (Florida, U.S.A., to Brazil); East Pacific (Galapagos Islands, Ecuador to Chile); N.W. Pacific (Siberia, Japan).

Pinnaxodes chilensis (H. Milne Edwards, 1837)

Pinnotheres chilensis H. MILNE EDWARDS, 1837, *Hist. Nat. Crust.*, 2: 33 ('Habite la côte de Valparaiso [Chile]'). — H. MILNE EDWARDS & LUCAS, 1844, in D'Orbigny, *Voy. Amér. Mérid.*, 6 (1) (text): 23. — H. MILNE EDWARDS & LUCAS, 1847, in D'Orbigny, *Voy. Amér. Mérid.*, 6 (1) (atlas): pl. 10 fig. 2 (♀ dorsal view), a (maxilliped) (Valparaiso, Chile). — NICOLET, 1849, in Gay, *Hist. Fisc. Polit. Chile*, 3: 155 (Chile). — SCHWABE, 1936, *Bol. Soc. Biol. Concepción*, 10: 125-136, figs. 1 (♀ dorsal, ventral, and frontal views), 2a (segmentation phase of egg), b (embryo outline phase), c (embryo before pigment formation), d, e (embryo just prior hatching), 3 (posterior view, zoea), 4a (eggs), b (lateral view, zoea), 5a (frontal view, zoea), b (buccal apparatus, zoea), 6 (maxilliped 1 and 2, zoea) (larval stages) (Isla Santa Maria and San Vicente, Chile). — TU, 1938, *Zool. Anz.*, 122 (7/8): 185 (mentioned in account of host relationships). — GARTH, 1957, *Lunds Univ. Arsskr.*, (n. ser.) (2) 53 (7): 70 (mentions Nicolet, 1849 above, in evaluating *Pinnaxodes chilensis* and *Pinnotheres bipunctatus* and *P. politus*). — PATTON, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1236 (behavior).

Fabia chilensis DANA, 1852, *U. S. Expl. Exped.*, 13 (text): 383 (near Valparaiso, Chile). — VAN BENEDEN, 1875, *Commens. Parasit.*: 31 (mentioned).

Pinnaxodes hirtipes HELLER, 1865, *Reise 'Novara' Zool.*, 2 (3): 68, pl. 6 (♀) fig. 2 (dorsal view), a (maxilliped) (2 ♀ syntypes: NMW; type-locality: 'Ecuador'). — VERRILL, 1867, *Amer. Journ. Sci. Arts*, 44 (30): 126 (Ecuador). — VERRILL, 1867, *Trans. Connecticut Acad. Arts Sci.*, 1 (2): 306 (Peru). — VERRILL, 1867, *Ann. Mag. Nat. Hist.*, (3) 20: 230 (reprint from *Amer. Journ. Sci. Arts*). — RATHBUN, 1898, *Proc. U. S. Nat. Mus.*, 21: 607, pl. 43 (♂) figs. 10 (maxilliped), 11 (abdomen) (Port Otway, Chile). — PORTER, 1909, *Rev. Chilena Hist. Nat.*, 13 (3): 248 (listed). — PORTER, 1909, *Act. Soc. Sci. Chile*, 19: 36, 37 (listed). — PORTER, 1911, *Bol. Mus. Nac. Santiago*, 3 (2): 445 (listed). — TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 247, 286 (listed). — ICZN, 1925, *Smithson. Miscell. Coll.*, 73 (3): 16 (Opinion 85, placement of genus with *Pinnaxodes hirtipes* as the type, in the 'Official List of Generic Names in Zoology'). — ICZN, 1956, *Opin. Decl. Int. Comm. Zool. Nomencl.*, 1 (D): 19 (Declaration 36; specific name placed on the 'Official List of Specific Names in Zoology,' as Name No. 900).

Fabia Chilensis VERRILL, 1867, *Amer. Journ. Sci. Arts*, 44 (30): 126 (Peru). — VERRILL, 1867, *Trans. Connecticut Acad. Arts Sci.*, 1 (2): 306 (Paita, Peru). — VERRILL, 1867, *Ann. Mag. Nat. Hist.*, (3) 20: 230 (reprinted from *Amer. Journ. Sci. Arts*). — VERRILL, 1869, *Amer. Nat.*, 3 (5): 246.

Pinnaxodes Chilensis VERRILL, 1869, *Amer. Nat.*, 3 (5): 246 (host infestation discussed). — VERRILL, 1870, *Trans. Connecticut Acad. Arts Sci.*, 2: 170-172 (Paita and Callao, Peru).

Pinnaxodes chilensis KINGSLEY, 1884, *Standard Nat. Hist.*, 2: 64 (mentioned in popular account). — CANO, 1889, *Boll. Soc. Nat. Napoli*, (1) 3 (3) (1): 93, 99, 248 (Chonos and Chiloe, Chile). — ORTMANN, 1894, *Zool. Jahrb. Syst.*, 7: 696, 697, pl. 23 fig. 8 (maxilliped) (San Lorenzo Island, Peru). — ADENSAMER, 1897, *Ann. K. K. Naturhist. Hofmus. Wien*, 12: 107 (Ecuador; Chiloe Island, Chile). — LENZ, 1902, *Zool. Jahrb. Suppl.*, 5: 764 (Coquimbo and Talcahuano, Chile). —

PORTER, 1909, Rev. Chilena Hist. Nat., 13 (3): 247-248 (Caldera to Talchahuano, Chile). — RATHBUN, 1910, Proc. U. S. Nat. Mus., 38: 587, 612 (listed). — CALMAN, 1911, Life of Crustacea: 218 (mentioned). — PORTER, 1911, Bol. Mus. Nacl. Santiago, 3 (2): 444-445 (Caldera to Talchahuano, Chile). — DOFLEIN & BALSS, 1912, Mitt. Naturh. Mus. Hamburg, 29: 39 (Puerto Montt, Chile). — DOFLEIN, 1914, in Hesse & Doflein, Tierbau und Tierleben, 2: 279 (host; biology). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 175-177, pl. 38 figs. 1 (♂ dorsal view), 2 (♂ ventral view), 3 (♂ left chela, inner view), 4 (♂ left chela, outer view), 5 (♂ leg), 6 (♀ ventral view), 7 (♀ dorsal view) (Pacasmayo, Peru; Bay of Tocopila, Chiloe Island, and Port Otway, Chile). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 247, 286 (listed). — BALSS, 1927, in Kükenthal & Krumbach, Handb. Zool., 3 (1): 967 (mentioned in general account of decapods). — CALMAN, 1927, Guide to Crust. Brit. Mus.: 73 (Chile). — PORTER, 1936, Comunicaciones Mus. Concepcion 1 (9): 152 (listed). — PORTER, 1937, Rev. Chilena Hist. Nat., 40: 338 (listed). — SCHMITT, 1939, Smithsonian Misc. Coll., 98 (6): 26 (Elizabeth Bay, Albemarle Island, Galapagos Islands). — GARTH, 1946, Allan Hancock Pacific Exped., 5 (10): 498-499, pl. 84 (♀) figs. 3 (dorsal view), 5 (ventral view) (Tagus Hill, Albemarle Island, Galapagos Islands). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1415 (listed). — GARTH, 1957, Lunds Univ. Arsskr., (n. ser) (2) 53 (7): 70, 85-88, 92, fig. 9 (♂) A (dorsal view), B (right chela), C (frontal view), D (right maxilliped), E (abdomen), F (gonopod) (mentions commensal habits) (coast of Chile). — BOSCHI, 1966, Mar. Biol. Ass. India Symp. Ser., 2 (1): 453 (Tierra del Fuego). — FENUCCI, 1967, Physis Buenos Aires, 27: 125-133, figs. 1 (♀ antenna), 2 (♀ antennula), 3 (♀ mandible), 4 (♀ maxillula), 5 (♀ maxilla), 6 (♀ second maxilliped), 7 (♀ third maxilliped), 8 (♂ abdomen), 9 (♂ first maxilliped), 10 (♂ chela), 11 (♂ first pleopod), unnumbered fig. (♂ dorsal and ventral views) (morphology, ecology, distribution). — GARTH, HAIG & YALDWIN, 1967, Trans. Roy. Soc. New Zealand, 8 (16): 183 (sea food delicacy; Punta Gaviota, Isla Chiloé, Chile). — DEL SOLAR, BLANCAS & MAYTA, 1970, Cat. Crust. Peru: 29 (listed; Pacasmayo, Calloa, Paita, Isla San Lorenzo, Isla Santa Rosa (near Pisco...), Pucusana, Lagunilla (South of Pisco and Ancón)).

Pinaxodes chilensis PORTER, 1906, Rev. Chilena Hist. Nat., 10: 135 (los Vilos, Chile). — RIOJA, 1950, Rev. Soc. Mexicana Hist. Nat., 11 (1-4): 145-147 (discusses commensalism in Crustacea, mentions *P. chilensis*).

Pinaxodes (Fabia) chilensis L. H. HYMAN, 1955, The Invertebrates, 4: 587 (host relationship).

Pinnotheres chilensis SCHWABE, 1941, Zeitschr. Fisch. Hilfswissensch., 39 (3): 343-345, fig. 11 (2♀♀, 1♂) (parasitic).

Measurements: Male, length 7.0 mm, width 7.6 mm (Rathbun, 1898); female, length 21.0 mm, width 23.0 mm (Heller, 1868); up to 1-1/2 inches [38.1 mm] in diameter (Garth et al., 1967).

Habitat: In echinoids: *Echinus* [*Loxechinus albus* (Molina)] (Dana); *Euryechinus imbecillis* [*Caenocentrotus gibbosus* (Valenciennes)] (Smith, 1869); *Strongylocentrotus gibbosus* [*Caenocentrotus g.* (Valenciennes)] (Ortmann); *Arbacia nigra* [*Tetrapygus niger* (Molina)], *Echinus albus* [*Loxechinus a.* (Molina)] (Lenz); *Caenocentrotus gibbosus* (Valenciennes), *Loxechinus albus* (Molina) (Rathbun, 1918, L. H. Hyman, and also del Solar et al.). To a depth of 1 fathom (1.83 meters) (Rathbun, 1918).

Distribution: Ecuador to Port Otway (Puerto Barroso, fide Garth et al., 1967) [vicinity of Golfo Tres Montes], Chile, Isla Chiloé; Tierra del Fuego; Galapagos Islands.

Pinnaxodes floridensis Wells & Wells, 1961

Pinnaxodes floridensis WELLS & WELLS, 1961, Bull. Mar. Sci. Gulf Caribb., 11 (2): 267-279, figs. 1 a (♂ dorsal view), b (♀ dorsal view), c (♀ frontal view), d (♀ abdomen, immature), e (♀ abdomen), f (♂ abdomen), 2 a (♀ left chela, outer view), b (♀ leg 3), c (♂ left chela, outer view), d (gonopod), e (♂ manus, left chela), f (♂ left maxilliped), g (♀ left maxilliped) (♀ holotype: USNM 112262; ♂ allotype: USNM 112263; ♀ paratypes: USNM 112264; type-locality: '...outer beach near Fort Walton Beach, Florida...'; also taken at East Pass, Florida). — PEARCE, 1962, Biologist, 45 (1-2): 11 (also discusses symbiosis in *Dissodactylus mellitae*, *Fabia subquadrata*, *Pinnixa faba* and *littoralis*, and *Pinnotheres ostreum*, *pisum*, and *pugettensis*). — PEARCE, 1966, Some Contemporary Stud. Mar. Sci.: 565, 586 (biology). — PEARCE, 1966, Pacific Sci., 20 (1): 18, 28 (mentioned).

Pinnaxodes floridanus PATTON, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1233 (behavior).

Measurements: Male allotype, length 8.0 mm, width 9.0 mm; female type, length 9.5 mm., width 11.0 mm.

Habitat: Inhabits the cloaca and respiratory tree of the holothurian *Theelothuria princeps* (Selenka) [*Holothuria princeps* Selenka] (Wells & Wells).

Distribution: Fort Walton Beach, Florida; East Pass, Choctawatchee Bay, Florida, U.S.A.

Pinnaxodes major Ortmann, 1894

Pinnaxodes major ORTMANN, 1894, Zool. Jahrb. Syst., 7: 697, 698, pl. 23 fig. 10 (♀ dorsal view), 10h (maxilliped 2), 10i (maxilliped), 10k (♂ and ♀ chelae), 10z (♂ abdomen) (syntypes: MZUS; type-locality: 'Japan, Tokiobai'). — ADEN-SAMER, 1897, Ann. K. K. Naturhist. Hofmus. Wien, 12: 107 (Japan). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 247, 286 (listed). — BALSS, 1922, Arch. Naturgesch., 88A (11): 140 (Vladivostok, U.S.S.R.; Cape Solotei (Sufren) [Gulf of Tartary, U.S.S.R.]). — YOKOYA, 1928, Sci. Rept. Tôhoku Imp. Univ., 3 (4) (2): 778 (off Yunoshima Island and Japan). — SAKAI, 1936, Crabs of Japan: 200–201, fig. 104 (♀) a (dorsal view), b (maxilliped), c (chela) (in Japanese). — SAKAI, 1939, Stud. Crabs of Japan: 593–595, fig. 80 (♀) a (dorsal view), b (maxilliped), c (chela) (Tateyama Bay, Momotori, and Seto, Japan). — URITA, 1942, Bull. Biogeogr. Soc. Japan, 12 (1): 64 (Enoura, Aniwa Bay, Otomari, and Sirutoru, Sakhalin). — SAKAI, 1956, Crabs: 50 (of species list) (mentioned). — SAKAI, 1965, Crabs of Sagami Bay: 178 (English pt.), 78 (Japanese pt.), pl. 87 fig. 3 (♀ dorsal view), text-fig. 24 (♂) a (pleopod), b (2nd pleopod). — KOBJAKOVA, 1967, Explorations Fauna Seas USSR, 5 (13): 244 (Cape Zolotoy, near Vladivostok and Possjet Bay, S. E. Siberia; west coast of Sachalin; S. Kuriles).

Pinnotheres (Pinnaxodes) major TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 247, 255, 286 (listed).

Pinnotheres major SAKAI, 1933, Botany and Zoology Tokyo, 1 (2): 978, 980, 981 (47, 50–51), fig. 4 (dorsal view) a (third maxilliped), b (chela) (mentioned). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1202 (mentioned).

Measurements: Male, length 10.5 mm, width 12.0 mm (Urita, 1942); female, length 11.0 mm., width 14.0 mm (Sakai, 1935).

Habitat: In bivalves: *Mytilus* (Yokoya, 1928); *Barnea* sp., *Vernerupis philippinarum* [*Tapes japonica* (Deshayes)] (Urita, 1942); *Meretrix lamarckii* Deshayes, *Coelomacra antiqua* [*Macra (Coelomacra) antiqua* Spengler] (Sakai, 1965); *Modiolus difficilis* (Kuroda & Habe), *Crenomytilus grayanus* [*Mytilus (Crenomytilus) grayanus* Dunker] (Kobjakova). Also in holothurians: *Holothuria monacaria* [*Holothuria gyrifer* (Selenka)] (Sakai, 1939).

Distribution: Mutsu Bay, Tokyo Bay, Ise Bay, and the Kii Peninsula, Japan; Vladivostok and Cape Solotei, Gulf of Tartary, U.S.S.R.

Pinnaxodes mutuensis Sakai, 1939

Pinnaxodes mutuensis SAKAI, 1939, Stud. Crabs of Japan: 595, fig. 81 a (♀ dorsal view), b (chela), c (gonopod). ('Asamusi M.B.S.' [Asamusi, Amori Bay (is a smaller bay within Mutsumi Bay), Honshu Island, Japan]). — SAKAI, 1956, Crabs: 50 (of species list) (mentioned).

Measurements: Female, length, 11.5 mm, width 14.0 mm.

Habitat: in the bivalve '*Volsella modiolus*' (?) (Sakai, 1939); 'ahibari (lark)-gai,' which is *Modiolus nipponicus* Oyama, probably the definitive identification of the 1939 host (Sakai, 1956).

Distribution: Known only from the type locality.

Pinnaxodes silvestrii (Nobili, 1901)

Pinnotheres Silvestrii NOBILI, 1901, Bull. Mus. Zool. Anat. Comp. R. Univ. Torino, 16 (402): 11, 12 (♀ holotype: Istituto e Museo di Zoologia della Università, Torino, Italy; type-locality: 'San Vicente [Chile]'). — NOBILI, 1902, Rev. Chilena Hist. Nat., 6 (4): 235–237 (San Vicente, Chile). — PORTER, 1906, Rev. Chilena Hist. Nat., 10 (1): 12 (listed).

Pinnaxodes meineri RATHBUN, 1904, Proc. Biol. Soc. Washington, 17: 162 (♂ holotype: UZM; type-locality: 'Valparaiso, Chile'). — RATHBUN, 1910, Proc. U. S. Nat. Mus., 38: 587 (listed). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97:

177, 178, pl. 25 figs. 1 (♀ ventral view), 2 (♀ dorsal view), 3 (♂ dorsal view), text-fig. 112 a (♀ maxilliped), b (♂ abdomen) (Valparaíso and Talcahuano, Chile). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 286 (listed).

Pinnotheres Silvestrii PORTER, 1909, Act. Soc. Sci. Chili, 19: 37 (listed). — PORTER, 1909, Rev. Chilena Hist. Nat., 13 (3): 249 (listed). — PORTER, 1911, Bol. Mus. Nac. Santiago, 3 (2): 445 (listed). — PORTER, 1936, Comunicaciones Mus. Concepcion, 1 (9): 152 (listed). — PORTER, 1937, Rev. Chilena Hist. Nat., 40: 388 (listed).

Pinnaxodes Meinerti PORTER, 1909, Rev. Chilena Hist. Nat. 13 (3): 248 (listed). — PORTER, 1909, Act. Soc. Sci. Chile, 19: 37 (listed). — PORTER, 1911, Bol. Mus. Nac. Santiago, 3 (2): 446 (listed). — PORTER, 1936, Comunicaciones Mus. Concepcion, 1 (9): 152 (listed). — PORTER, 1937, Rev. Chilena Hist. Nat., 40: 338 (listed).

Pinnotheres silvestrii RATHBUN, 1910, Proc. U. S. Nat. Mus., 38: 587 (listed). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 91 (taken from Nobili). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 286 (listed).

Pinnaxodes silvestrii GARTH, 1957, Lunds Univ. Arsskr., (n. ser.) (2) 53 (7): 88–89, 92, figs. 10 (♀) A (dorsal view), B (right chela), C (frontal view), D (right maxilliped), E (abdomen), 11 (♂) A (abdomen), B (left maxilliped), C (gonopod) (Montemar, San Vicente, and Talcahuano, Chile). — GARTH, HAIG, & YALDWYN, 1967, Trans. Roy. Soc. New Zealand, 8 (16): 183 (listed) (Punta Gaviota, Punta Pulga, Isla Chiloé, Chile). — DEL SOLAR, BLANCAS & MAYTA, 1970, Cat. Crust. Peru: 29 ('Laguna grande, extremo norte de bahia Independencia...').

Measurements: Male, length 6.8 mm, width 7.9 mm (Rathbun, 1904); female, length 12.0 mm, width 14.0 mm (Nobili, 1901).

Habitat: Living on a holothurian (Del Solar et al.); In the cloaca of the holothurian *Eucyclus chilensis* [*Athyoniidium chilensis* (Semper)] (Garth, 1957); 'The holothurian host is abundant in low tidal pools and crevices low down on shore, and in the sub-littoral, and reaches a length of one foot' (Garth, et al., 1967).

Distribution: Independencia Bay, Peru; Valparaíso to Talcahuano, and Isla Chiloé, Chile.

Pinnaxodes tomentosus Ortmann, 1894

Pinnaxodes tomentosus ORTMANN, 1894, Zool. Jahrb. Syst., 7: 697, pl. 23 (♀) fig. 9 (♀ dorsal view) i (maxilliped) (syntypes: MZUS; type-locality: 'Brasilien'). — ADENSAMER, 1897, Ann. K. K. Naturhist. Hofmus. Wien, 12: 108 ('Brasilien'). — MOREIRA, 1901, Arch. Mus. Nac. Rio de Janeiro, 11: 39 (listed). — RATHBUN, 1918, Bull. U.S. Nat. Mus., 97: 178, 179, fig. 13 (♀) a (maxilliped), b (dorsal view) ['...very likely a *Pinnotheres*'] (Brazil).

Distribution: Brazil.

PINNOTHERES Bosc, 1801–1802

Pinnotheres BOSCH, 1801–1802, Hist. nat. Crust., (ed. 1) 1: 59, 239. Type species, by selection by Latreille (1810, Consid. gén. Crust. Arachn. Ins.: 422): *Cancer pisum* Linnaeus, 1767. Gender: masculine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, Smithson. Miscell. Coll., 73 (3): 13–18; see also Direction 45, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (9): 233–242), as name no. 352.

Pinnotheres Latreille, 1802–1803, Hist. Nat. Crust. Ins., 6: 31.

Pinnotheres SAMOUELLE, 1819, Entomologists Useful Compendium: 86. Erroneous spelling of *Pinnotheres* Bosc, 1801–1802.

Pinnotheras COUCH, 1838, A Cornish Fauna, 1: 72. Erroneous spelling of *Pinnotheres* Bosc, 1801–1802.

Pinnothera DANA, 1851, Amer. Journ. Sci. Arts, (2) 12: 290. Erroneous spelling of *Pinnotheres* Bosc, 1801–1802.

Pinnitheres NARDO, 1869, Mem. del R. Ist. Veneto, 14: 228. Erroneous spelling of *Pinnotheres* Bosc, 1801–1802.

Pinnateres VON MARTENS, 1872, Arch. Naturgesch., 38 (1): 105. Erroneous spelling of *Pinnotheres* Bosc, 1801–1802.

Holothuriophilus NAUCK, 1880, Zeitschr. wiss. Zool., 34: 66. Type species, by original designation and monotypy: *Holothuriophilus trapeziformis* Nauck, 1880.

Gender: masculine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, *Smithson. Miscell. Coll.*, 73 (3): 13-18; see also *Direction* 37, 1956, *Opin. Decl. Int. Comm. Zool. Nomencl.*, 1 (D) (2): 47-82) as name no. 319.

Pinnotheres GIESBRECHT, 1882, *Mitt. Zool. Sta. Neapel*, 3: 295. Erroneous spelling of *Pinnotheres* Bosc, 1801-1802.

Pinnotheres FABER, 1883, *Fisher. Adriatic*: 253. Erroneous spelling of *Pinnotheres* Bosc, 1801-1802.

Holothuriaphilus STEBBING, 1893, *Hist. Crust.*: 101. Erroneous spelling of *Holothuriophilus* Nauck, 1880.

Arcotheres BÜRGER, 1895, *Zool. Jahrb. Syst.*, 8: 361. Type species, by selection by RATHBUN, 1918, (*Bull. U. S. Nat. Mus.*, 97: 62): *Pinnotheres palaensis* Bürger, 1895. Gender: masculine. (Manuscript name by Nauck, not recognized by Bürger, who placed it in the synonymy of *Pinnotheres* Bosc).

Zaops RATHBUN, 1900, *Amer. Nat.*, 34 (403): 588. Type species, by original designation and monotypy: *Pinnotheres depressum* Say, 1817 (= *Pinnotheres ostreum* Say, 1817). Gender: masculine.

Pinnozoea AIKAWA, 1933, *Rec. Oceanogr. Works Japan*, 5 (2): 130, 246. Type species, by present selection: *Cancer pisum* Linnaeus, 1767. Gender: feminine. Hosts: Mollusca Bivalvia and Gastropoda; Brachiopoda; Holothuroidea; Tunicata. Distribution: Cosmopolitan excepting the Arctic and Antarctic.

***Pinnotheres abyssicola* Alcock & Anderson, 1899**

Pinnotheres abyssicola ALCOCK & ANDERSON, 1899, *Ann. Mag. Nat. Hist.*, (7) 3 (13): 5, 14 (♀ holotype: Indian Museum 2167/10; type-locality: '...off the coast of Travancore [India]'). — ALCOCK, 1899, *Acct. Deep-sea Brachyura coll. Roy. Indian Surv. Ship 'Investigator'*: 81, 82 (Travancore, India). — ALCOCK, 1900, *Journ. Asiat. Soc. Bengal*, 69 (2, 3): 340 (Travancore, India). — HORNEILL & SOUTHWELL, 1909, *Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiarwar*, 1: 101, 102 (after Alcock & Anderson). — BALSS, 1956, in *Bronn, Klassen Ordnungen Tierreichs*, (ed. 2) 5 (1) (7): 1419 (listed).

Pinnotheres [*abyssicola*] ALCOCK, 1902, *Naturalist in Indian Seas*: 274 (Travancore, India).

Pinnotheres abyssicola DOFLEIN, 1904, *Wiss. Ergeb. Deutschen Tiefsee Exped. Valdivia*, 6: 194 (biology), 307 (listed). — TU, 1938, *Zool. Anz.*, 122 (7/8): 183 (host relationships and adaptations). — SILAS & ALAGARSWAMI, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1181, 1195 (ecology; cataloged).

Pinnotheres abyssicolus TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 248, 255 (listed, key).

Measurements: Female (ovig.), diameter 8.0 mm (Alcock & Anderson).

Habitat: In *Lima indica* [*Acesta indica* (Smith)] (Alcock, 1899); 430 fms. [786.9 meters] (Alcock & Anderson).

Distribution: Known only from the type locality.

***Pinnotheres affinis* Bürger, 1895**

Pinnotheres affinis BÜRGER, 1895, *Zool. Jahrb. Syst.*, 8: 365, 366, pl. 9 fig. 2 (♀ dorsal view), pl. 10 figs. 2 (maxilliped), 34 (♂ abdomen) (syntypes: ZIMB 67/539c; type-locality: Ubay [Philippine Islands]...). — RATHBUN, 1910, *K. Danske Videnskab. Selskab. Skrifter*, (7) 4 (4): 330 (Koh Chang, Thailand). — TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 248, 252 (listed, key). — TU, 1931, *Sci. Repts. Nat. Tsing Hua Univ.*, (B) 1 (3): 93 (Chefoo, Shantung Peninsula, China). — SHEN, 1932, *Zool. Sinica*, (A) 9 (1): 138-140, pl. 6 fig. 7 (♀ dorsal view); text-figs. (♀) 82 a (♀ dorsal view), b (♀ abdomen), text-fig. 83 a (endognath of maxilliped), b (exognath of maxilliped), c (♀ chela) (Chefoo, Shantung Peninsula, China). — ESTAMPADOR, 1937, *Philippine Journ. Sci.*, 62 (3): 435 (listed). — SHEN, 1937, *Bull. Fan Mem. Inst. Biol. Zool.*, 7: 169, 177, 178 (Chefoo, China). — SHEN, 1937 *Contrib. Inst. Zool. Peiping*, 3 (6): 308 (listed). — SUVATTI, 1938, *Check-list aquatic Fauna Siam*: 69 (listed). — TU, 1938, *Zool. Anz.*, 122 (7/8): 181-18 (Chefoo, Shantung Peninsula, China). — SUVATTI, 1950, *Fauna of Thailand*: 15,

(listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1195, 1216, 1223, 1226 (cataloged; taxonomy). — CHRISTENSEN & McDERMOTT, 1958, Biol. Bull. Woods Hole, 114 (2): 174 (behavior, mentioned).

Pinnotheres offinus TU, 1932, I'O Hsüeh [Science], Nanking, 16 (7): 1125-1128, figs. 1 (♀ ovig.), 2 (crab in host shell, *Pinna*), 3 (dorsal view), 4 (ventral view).

Measurements: Male, length 7.0 mm, width 7.5 mm (Bürger); female (ovig.), length 12.7 mm, width 13.5 mm (Shen, 1932).

Habitat: In bivalves: *Pinna* (Bürger); *Ostrea* (Tu); ? *Pecten hastatus* [*Chlamys hastata* (Sowerby)] (Shen, 1932); 20 fms [36.6 m] (Rathbun).

Distribution: Philippine Islands; Gulf of Siam; Shantung and Liaotung [fide Tu, 1938: 183 (in discussion)] Peninsulas, China.

Pinnotheres alcocki Rathbun, 1909

Pinnotheres parvulus [not Stimpson, 1858] DE MAN, 1887, Journ. Linn. Soc. London Zool., 22 (136): 105, 106 (3 ovigerous females, King Island Bay, Mergui Archipelago; Padang, Sumatra, Indonesia; compared with *Pinnotheres globosus*). — DE MAN, 1888, Arch. Naturgesch., 53 (1): 383, 384 (2♀, Noordwachter Island, Java Sea, Indonesia). — BÜRGER, 1895, Zool. Jahrb. Syst., 8: 376, 377, pl. 9 fig. 18 (♀ dorsal view), pl. 10 fig. 17 (♀ maxilliped) (3♀♀, Burias, Philippine Islands). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 547 (listed).

Pinnotheres parvulus [not Stimpson, 1858] ALCOCK, 1900, Journ. Asiat. Soc. Bengal, 69 (2, 3): 339 (includes comparison with *Pinnotheres purpureus*).

Pinnotheres alcocki RATHBUN, 1909, Proc. Biol. Soc. Washington, 22: 114 ('*Pinnotheres alcocki*, nom. nov. for *Pinnotheres parvulus* de Man, Bürger, and Alcock, not *Pinnotheres parvulus* Stimpson') (the syntypes of *Pinnotheres alcocki* are the specimens identified by De Man (1887, 1888), Bürger (1895), and Alcock (1900) as *Pinnotheres parvulus*, viz., 3 ovigerous females from King Island Bay, Mergui Archipelago (Indian Museum), specimens from Padang, Sumatra, Indonesia (RMNH no. D 313), 2 females from Noordwachter Island, Java Sea, Indonesia (ZIMB 67/655a), 3 females from Burias, Philippines (ZIMB 67/655b, c), and a specimen of which no locality is given, cited by Alcock (1900) (Indian Museum?). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 254 (listed, key). — SAKAI, 1935, Crabs of Japan: 197, pl. 56 fig. (♀ dorsal view). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 163, 167, 168, 172, 175, 176, fig. 5 (♀) a (maxilliped), b (chela), c (dactylus of legs 3-4) (compared with *Pinnotheres similis* and *P. tivelae*; asymmetry discussed; specimens from Mergui Archipelago which De Man considered to be *Pinnotheres parvulus* are here discussed under *Pinnotheres tivelae*). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1195, 1196 (cataloged, taxonomy).

Measurements: Female, length 8.5 mm, width 11.25 mm (Bürger).

Habitat: In bivalves: *Cytherea* [*Periglypta*], *Pinna atropurpurea* [*Pinna bicolor* Chemnitz], *Pinna vexillum* [*Atrina vexillum* (Born)] (De Man); *Mytilus* (Bürger).

Distribution: Mergui Archipelago, Philippine Islands, and Indonesia.

Pinnotheres angelicus Lockington, 1877

Pinnotheres angelica LOCKINGTON, 1877, Proc. Calif. Acad. Sci., 7: 154 (10) (type not extant; type-locality: '... Angeles Bay, Gulf of California').

Pinnotheres angelicus MIERS, 1886, Rept. Sci. Results Voy. Challenger, 17 (49): 276 (listed). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 72, 73, pl. 16 (♀) figs. 5 (ventral view), 6 (dorsal view), text-fig. 34 (♀ maxilliped) (San Josef Island, Gulf of California). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 285 (listed). — GLASSELL, 1934, Journ. Wash. Acad. Sci., 24 (7): 301 (Gulf of California) (listed). — GLASSELL, 1935, Trans. San Diego Soc. Nat. Hist., 8 (14): 99, 100, pl. 14 (♀) figs. 1 (dorsal view), 2 (chela), 3 (frontal view), 4 (maxilliped), 5 (ventral view), pl. 15 (♂) figs. 1 (dorsal view), 2 (chela), 3 (abdomen), 4 (chela, dorsal view), 5 (frontal view), 6 (palm of chela) (San Felipe, Gulf of California). — SCHWABE, 1936, Bol. Soc. Biol. Concepcion, 10: 126 (mentioned). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1196, 1221 (cataloged) (the ascription of this species to 'Vera Cruz, Coast of California' by these authors, following Tesch, 1918, is incorrect; the Vera Cruz [Veracruz] in ques-

tion is on the east, Gulf of Campeche, coast of Mexico, and, moreover, is the type locality of *Pinnotheres geddesi*).

Measurements: Male, length 2.7 mm, width 2.8 mm (Glassell); female, length 11.5 mm, width 15.0 mm (Lockington; cited as ♂, but Lockington states in discussion that all specimens were females).

Habitat: In oysters (Lockington); in the bivalve, *Modiola copax* [*Modiolus capax* Conrad] (Rathbun); 'Found in the mantle cavity of a small plicated oyster which is attached to rocks or mangrove roots, this oyster may prove to be either *Ostrea cumingiana* [*Ostrea angelica* Rochebrune], or *Ostrea amara* [*Ostrea palmula* Carpenter]... The male is undoubtedly free swimming and its capture at any time is highly problematical' (Glassell).

Distribution: Gulf of California, Mexico.

***Pinnotheres arcophilus* Bürger, 1895**

Pinnotheres arcophilus BÜRGER, 1895, Zool. Jahrb. Syst., 8: 371, pl. 9 fig. 10 a (♂ dorsal view), b (♂ abdomen), c (♀ dorsal view), pl. 10 fig. 10 (maxilliped) (syntype: ZIMB 67/954a; type-locality: 'Ubay [Philippine Islands]'). — LAN-CHESTER, 1900, Proc. Zool. Soc. London, 1900: 762 (Singapore, Malaysia). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 253 (listed, key). — PÉREZ, 1921, Compt. Rend. Acad. Sci. Paris, 173 (1): 61 (Lombok, Indonesia) (parasitism by an epicaridlan). — DE MAN, 1921, Bull. Biol. France Belgique, 55 (1): 260–265, pl. 8 figs. 1 (right maxilliped), 2 (left chela), 3 (right leg 1), 3a (dactylus, right leg 1), 4 (propodus and dactylus, left leg 2), 5 (right leg 3), 5a (dactylus, right leg 3), 6 (left leg 3), 7 (right leg 4) (Lombok, Indonesia). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 164 (asymmetry). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1196 (mentioned).

Pinnotherien PÉREZ, 1920, Compt. Rend. Acad. Sci. Paris, 170 (26): 1617 (Lombok, Indonesia) (parasitized by an epicaridean).

Measurements: Male, length 3.2 mm, width 3.2 mm (Bürger); female (ovigerous), length 8.5 mm, width 10.0 mm (Lanchester).

Habitat: In the bivalve *Arca* (Bürger).

Distribution: Philippine Islands; Indonesia; Malaysia.

***Pinnotheres ascidicola* Hesse, 1872**

Pinnotheres ascidicola HESSE, 1872, Ann. Sci. Nat. Zool. Paris, (5) 15 (2): 30–35 (biology) (coast of France).

Pinnotheres ascidicola MIERS, 1886, Rept. Sci. Results Voy. Challenger, 17 (49): 276 (listed). — STEBBING, 1893, Hist. Crust.: 101 (listed).

Pinnotheres ascidicola SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1196, 1219 (cataloged).

Habitat: Generally found alone, but sometimes in pairs, in the interior of the tunicates *Ascidia camina* [*Ciona intestinalis* (Linnaeus)] and sometimes *Ascidia intestinalis* [*Ciona intestinalis* (Linnaeus)]. The males, especially when young, are very agile and swim with ease (Hesse).

Distribution: Known only from the type locality. It is possible that Pinnotheridae from Ascidiarians identified as *Pinnotheres marioni*, *P. pisum* or *P. pinnotheres* belong to this species.

***Pinnotheres barbatus* Desbonne**

Pinnotheres barbata DESBONNE, 1867, in Desbonne & Schramm, Crust. Guadeloupe, 1: 44 (♀ and ♂ syntypes: probably not extant; type-locality: 'La Guadeloupe').

Pinnotheres barbatus RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 88, 89, pl. 19 figs. 8 (♂ dorsal view), 9 (♀ dorsal view), 10 (♂ ventral view), 11 (♀ ventral view), text-fig. 44a (♀ endognath of maxilliped), b (♂ abdomen) (St. Thomas, Virgin Islands). — RATHBUN, 1933, Sci. Surv. Porto Rico Virgin Ids., 15 (1): 82 (Guadeloupe; St. Thomas, Virgin Islands).

Measurements: Male, length 6.77 mm (Desbonne); male, length 7.6 mm, width 8.4 mm (Rathbun); female, length 13.54 mm (Desbonne); female, length 10.2 mm, width 12.7 mm (Rathbun).

Habitat: Often found in pairs in 'Pestomac' [? mantle cavity] of the gastropod, *Turbo pica* [*Cittrium pica* (Linnaeus)] (Desbonne).

Distribution: Virgin Islands; French West Indies.

Pinnotheres bidentatus Sakai, 1939

Pinnotheres bidentatus SAKAI, 1939, Stud. Crabs of Japan: 592 (3♀, 1♂ syntypes: ? depository; type-locality: 'Wakayama,' Kii Peninsula [Japan]). — SAKAI, 1956, Crabs: 50 (of species list) (mentioned). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1196, 1224 (cataloged).

Measurements: Female, length 4.4 mm, width 5.2 mm (Sakai).

Distribution: Known only from the type locality.

Pinnotheres bipunctatus Nicolet, 1849

Pinnotheres bipunctatum NICOLET, 1849, in Gay, Hist. Fisica Polit. Chile (text), 3: 155, 156. — NICOLET, 1854, in Gay, Hist. Fisica Polit. Chile, (atlas Zoologico) (Crustaceos): pl. 1 (♂) fig. 2 (dorsal view), a (dimensional diagram), b (maxilliped), c (abdomen) (type not extant; type-locality: '... San Carlos de Chiloe [Chile]'). — H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 219 (185) (listed). — RATHBUN, 1910, Proc. U.S. Nat. Mus., 38: 587 (listed). — PORTER, 1911, Bol. Mus. Nac. Santiago, 3 (2): 446 (mentioned in footnote). — TESCH, 1918, Siboga-Exped. Monogr. 39c¹ (84): 286 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1196, 1222 (cataloged).

Pinnotheres bipunctatus PHILIPPI, 1894, Anales Univ. Chile, 87: 4, 8 (listed). — RATHBUN, 1918, Bull. U.S. Nat. Mus., 97: 64, 66, 78, 79, pl. 159 (♂) figs. 10 (dorsal view), 11 (maxilliped), 12 (abdomen) (after Nicolet). — GARTH, 1957, Lunds Univ. Arsskr., (n. ser.) (2) 53 (7): 70, 92 (remarks on the validity of this species) (compared with *P. politus*; commensal habits of *Pinnaxodes chilensis* mentioned).

Measurements: Male, length 3.5 mm (Rathbun).

Habitat: Probably in sea urchins (Nicolet).

Distribution: Known only from the type locality.

Pinnotheres boninensis Stimpson, 1858

Pinnotheres Boninensis STIMPSON, 1858, Proc. Acad. Nat. Sci. Phila., 1858: 108 (♀ holotype: probably not extant; type-locality: 'Ad insulas Bonin [Japan]').

Pinnotheres boninensis MIERS, 1886, Rept. Sci. Results Voy. Challenger, 17 (49): 276 (listed). — STIMPSON, 1907, Smithsonian Misc. Coll., 49: 141, 142 (Bonin Islands). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 251, 286 (listed). — GEE, 1925, Lingnaam Agr. Rev., 3 (2): 163 (China Sea). — SAKAI, 1935, Crabs of Japan: 197, 198, pl. 56 fig. 1 (♀ dorsal view); text-fig. 102 (maxilliped) (in Japanese). — SAKAI, 1939, Stud. Crabs of Japan: 588, 589, pl. 69 fig. 1 (♀ dorsal view); text fig. 74a-d (left ambulatory dactyli, legs 1-4), a'-d' (do. right side) (Okinoshima, Simoda, coast of Mito, and Seto, Japan). — SAKAI, 1949, Illustrated Encycl. Fauna Japan: 666, fig. 1921 (♀ dorsal view). — SAKAI, 1956, Crabs: 50 (of species list) (mentioned). — UTINOMI, 1956, Sea Shore Anim. Japan: 88, pl. 45 fig. 2 (♀ dorsal view). — SAKAI, 1965, Crabs of Sagami Bay: 177 (Eng. pt.), 77 (Jap. pt.), pl. 87 fig. 1 (♀ dorsal view). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1196, 1225 (cataloged).

Measurements: Female, length 13.0 mm, width 15.0 mm (Utinomi).

Habitat: Restricted to *Crassostrea echinata* found on the rocks above high tide mark, '... obtained from the mantle cavity' (Sakai, 1965).

Distribution: Tokyo Bay, Sagami Bay, Izu Peninsula, Kii Peninsula; and Bonin Islands, Japan (Sakai, 1965).

Pinnotheres borraidailei Nobili, 1905

Pinnotheres Rouxi [not H. Milne Edwards, 1853] PAULSON, 1875, Stud. Crust. Red Sea: 75, 76, pl. 9 fig. 2 (♀) (dorsal view), a (frontal view), b (maxilliped), c (chela) (Red Sea).

Pinnotheres tenuipes [not Bürger, 1895] BORRAIDAILE, 1903, Fauna Geog. Maldive & Laccadive Archipelagoes, 1 (26,4): 431, 432, fig. 113 (♀) a (dorsal view), b (chela), c (maxilliped). (♀ holotype: CUMZ; type-locality: Minikoi [Minicoy, India]).

Pinnotheres Borradailei NOBILI, 1905, Bull. Mus. Nat. Hist. Nat. Paris, 11 (6): 410 ('Ce nom est proposé pour *P. tenuipes* Borr. nec Bürger'). — NOBILI, 1906, Ann. Sci. Nat. Zool. Paris, (9) 4: 306 (Perim Island, Red Sea; Djibouti, Somaliland).

Pinnotheres Borradailei LENZ, 1910, in Voeltzkow, Reise in Ostafrika, Wiss. Ergebn., 2 (3): 558, 576 ('Fundu Inseln...' [off west coast of Pemba Island, Tanzania, former German East Africa]).

Pinnotheres borradailei LAURIE, 1915, Journ. Linn. Soc. London Zool., 31 (209): 415 (listed). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 253, 287 (synonymy, listed, key). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1197 (cataloged).

Pinnotheres borradailei GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution noted).

Measurements: Female, length 12.0 mm, width 13.0 mm (Borradaile) [cited as cm, typographical error for mm]; female, length 11.5 mm, width 15.0 mm (Lenz).

Habitat: In *Mya* (Borradaile); in *Pinna* (Nobili, 1906; Lenz).

Distribution: E. Africa, Red Sea, Gulf of Aden, India.

Pinnotheres buergeri Rathbun, 1909

Pinnotheres buergeri RATHBUN, 1909, Proc. Biol. Soc. Washington, 22: 109. (♀ holotype: UZM; type-locality: Koh Kram [Thailand]). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 4 (4): 331, fig. 12 (♀) a (dorsal view), b (maxilliped) (South of Koh Kut and Koh Kram, Thailand). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 253 (listed, key).

Pinnotheres buergeri SUVATTI, 1938, Check-list aquatic Fauna Siam: 69 (listed). — SUVATTI, 1950, Fauna of Thailand: 159 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1197, 1223 (cataloged).

Measurements: Female, length 2.0 mm, width 2.0 mm (Rathbun, 1909).

Habitat: 30 fms [55 m] (Rathbun, 1909); 17–20 fms [31–36.6 m], mud (Rathbun, 1910).

Distribution: Gulf of Siam.

Pinnotheres cardii Bürger, 1895

Pinnotheres cardii BÜRGER, 1895, Zool. Jahrb. Syst., 8: 367, 368, pl. 9 figs. 4 (♀ dorsal view), 5 (♂ dorsal view), pl. 10 fig. 4 (maxilliped) (holotype: ZIMB 67/955, no longer extant; type-locality: '...Burias [Philippine Islands]'). — LANCHESTER, 1901, Proc. Zool. Soc. London, 1901 (2): 551 (suggests comparing this species with *Pinnotheres socius*). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 4 (4): 330, pl. 2 fig. 8 (♀ dorsal view) (between Koh Chuen and Koh Chang, Thailand). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 252 (listed, key). — RATHBUN, 1924, Arkiv Zool. K. Svenska Vetenskapskad. Stockholm, 16 (23): 14, 15, pl. 1 fig. 9 (♂ dorsal view); text-figs. 5 (♂ abdomen), 6 (♀ maxilliped) (Broome, Western Australia). — SAKAI, 1933, Botany and Zoology, Tokyo, 1 (2): 978, 980 (48, 50), fig. 3 (dorsal view) (mentioned). — MIYAKE, 1936, Ann. Zool. Japonenses, 15 (4): 510 (Kabira, Ryukyu Islands, Japan). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 546 (listed). — SUVATTI, 1938, Check-List aquatic Fauna Siam: 69 (listed). — SAKAI, 1949, Illustrated Encycl. Fauna Japan: 667, fig. 1923 (♀ dorsal view). — SUVATTI, 1950, Fauna of Thailand: 159 (listed). — SAKAI, 1956, Crabs: 50 (of species list) (mentioned). — MIYAKE, 1961, Rec. Oceanogr. Works Japan, Special Number 5: 174 (listed) (Sea of Ariaké [Ariakeno umi], Kyushu Island, Japan). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1197, 1216, 1223, 1224 (cataloged).

Measurements: Male, length 7.7 mm, width 8.0 mm (Rathbun, 1924); female, length 13.0 mm width 13.5 mm (Sakai, 1935).

Habitat: In bivalves: *Cardium unedo* [*Fragum unedo* (Linnaeus)] (Bürger); *Pinna bicolor* Chemnitz (Rathbun, 1924); *Ostrea denselamellosa* Lischke, *Macra sachalinensis* [*Spisula sachalinensis* (Schrenck)], *Macra sulcataria* Deshayes, *Mytilus crassitesta* Lischke (Sakai, 1939); in mantle cavity of *Meretrix meretrix* (Linnaeus) (Miyake); 15 fms. [27.5 m], mud (Rathbun, 1910).

Distribution: Gulf of Siam; Burias, Philippine Islands; Western Australia; Korea; Japan.

Pinnotheres clavapedatus Glassell, 1935

Pinnotheres clavapedatus GLASSELL, 1935, Trans. San Diego Soc. Nat. Hist., 8 (14): 97, 98, pl. 12 (♂) figs. 1 (dorsal view), 2 (right chela), 3 (right chela, dorsal view), 4 (frontal view), 5 (abdomen), pl. 13 (♀) figs. 1 (dorsal view), 2 (right chela), 3 (legs 1-4), 4 (maxilliped), 5 (frontal view) (compared with *Pinnotheres lithodomi*) (♀ holotype: SDSNH 756; ♂ paratype: SDSNH 756; ♂ paratype: USNM 7133; ♀ paratype: USNM 71338; 3 ♀ paratypes: MCZ 9325; type-locality: 'San Felipe [Golfo de California], Baja California, Mexico'). — SCHWABE, 1936, Bol. Soc. Biol. Concepcion, 10: 126 (mentioned).

Pinnotheres clavapedatus BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1419 (mentioned).

Measurements: Male, length 2.33 mm, width 2.5 mm; female, length 7.6 mm, width 12.4 mm (Glassell).

Habitat: In the boring mollusk, *Lithophaga attenuata* (Deshayes). Just below intertidal zone to 15 fms [27.5 m] (Glassell).

Distribution: 'Magdalena Bay to head of Gulf of California' (Glassell).

Pinnotheres coarctatus Bürger, 1895

Pinnotheres coarctatus BÜRGER, 1895, Zool. Jahrb. Syst., 8: 369, pl. 9 fig. 7 (♀ dorsal view), pl. 10 fig. 7 (maxilliped) (♀ holotype: ZIMB 67/308, no longer extant; type-locality: 'Zamboanga [Philippine Islands]'). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 253 (listed, key). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 546 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1197, 1216 (cataloged).

Pinnotheres coarctatus BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1419 (Philippines) (mentioned).

Measurements: Length 11.0 mm, width 13.5 mm (Bürger).

Habitat: From the shell of the bivalve, 'Cahebe [cabebe, *Polymesoda (Geloina) coxans* (Gmelin)], Süßwasser-Brackwasser' (Bürger). Dr. Harald Rehder, in a personal communication regarding the cabebe, says, '... a brackish water, marsh-living species, commonly sold in markets for human consumption.' (Cf. *Pinnotheres glaberrimus*.)

Distribution: Known only from the type locality.

Pinnotheres consors Bürger, 1895

Pinnotheres consors BÜRGER, 1895, Zool. Jahrb. Syst., 8: 377, pl. 9 fig. 20 (♀ dorsal view), pl. 10 fig. 18 (♀ maxilliped) (holotype: ZIMB 67/956, no longer extant; type-locality: 'Palaos-Ins...'). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 254, 260, 261, pl. 17 (♀) fig. 4 (dorsal view), a (maxilliped), b (left chela) (Dammer Island, N.E. of Timor, Indonesia). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 179 (compares *Pinnotheres winckworthi* with *Pinnotheres consors*). — MIYAKE, 1939, Records Oceanogr. Works Japan, 10 (2): 198, 241 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1197, 1216, 1225 (cataloged, taxonomy).

Measurements: Female, length 8.75 mm, width 10.5 mm (Bürger).

Habitat: In bivalves: *Circe* (Bürger); *Arca*, 40 m (Tesch).

Distribution: Palau Islands and Indonesia.

Pinnotheres corbiculae Sakai, 1939

Pinnotheres pholadis [not de Haan, 1835] URITA, 1926, Check-list Brachyura Kagosima Prefect., Japan: 18 (Sendai River, Satuma, Japan).

Pinnotheres corbiculae SAKAI, 1939, Stud. Crabs of Japan: 591, 592, fig. 77a (chela), b (maxilliped), fig. 78a (gonopod), b (maxilliped), c (chela) (♀ holotype; ? depository; type-locality: 'Nagasaki ? [Japan]'). — SAKAI, 1956, Crabs: 50 (of species list) (mentioned). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1197, 1224 (cataloged).

Measurements: Female, length 4.5 mm, width 5.5 mm (Sakai).

Habitat: In the mantle cavity of the bivalve, *Corbicula japonica* Prime (Sakai).

Distribution: Sendai River [Kayoshima Prefecture] and Nagasaki (?) [Nagasaki Prefecture], Japan.

Pinnotheres coutierei Nobili, 1905

Pinnotheres Coutierei NOBILI, 1905, Bull. Mus. Hist. Nat. Paris, 11 (6): 409, 410 (16, 17) (♀ holotype: MNHNP; type-locality: 'Djibouti [French Somaliland]') (considers it close to *Pinnotheres modiolicola*).

Pinnotheres Coutieri NOBILI, 1906, Ann. Sci. Nat. Zool. Paris, (9) 4: 305, 306, fig. 10 (♀ maxilliped) (Djibouti, French Somaliland) (compared with *P. modiolicola* and *P. arcophilus*).

Pinnotheres coutieri LAURIE, 1915, Journ. Linn. Soc. London Zool., 31 (209): 415 (listed). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 254, 287 (listed, key). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1197, 1222 (cataloged).

Pinnotheres coutieri GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution noted).

Measurements: Female, length 6.5 mm, width 8.5 mm (Nobili, 1905).

Habitat: Not recorded.

Distribution: Known only from the type locality.

Pinnotheres cyclinus Shen, 1932

Pinnotheres cyclinus SHEN, 1932, Zool. Sinica, (A) 9 (1): 135–137, pl. 6 fig. 5 (♀ dorsal view), text-fig. 80 (♀ dorsal view), text-fig. 81 (♀), a (maxilliped), b (abdomen), c (chela) (♀ holotype: FMI 12396; type-locality: 'Hsingtsun, Shantung Peninsula [China]'). — SHEN, 1937, Bull. Fan Mem. Inst. Biol. Zool., 7: 168, 177 (southern coast of the Shantung Peninsula, China). — SHEN, 1937, Contrib. Inst. Zool. Peiping, 3 (6): 308 (listed). — TU, 1938, Zool. Anz., 122 (7/8): 182, 183 (Chefoo, China). — SAKAI, 1939, Stud. Crabs of Japan: 587, 588, fig. 73 (♀ dorsal view) (coast of Miyazaki, Ariake Bay, Nagasaki, and Nishinomiya-Hyôgo-ken, Japan; Jeinan, Korea). — SEMITU, 1944, Annot. Zool. Japon., 22 (4): 175, (sex change in host). — SAKAI, 1949, Illustrated Encycl. Fauna Japan: 666, fig. 1920 (♀ dorsal view) (in Japanese). — SAKAI, 1956, Crabs: 50 (of species list) (mentioned). — MIYAKE, 1961, Rec. Oceanogr. Works Japan, Special Number 5: 165, 174 (listed) (Sea of Ariaké, Kyushu Island, Japan). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1191, 1198, 1224 (biology; cataloged).

Measurements: Female, length 13.5 mm, width 15.5 mm (Sakai).

Habitat: In bivalves: *Cyclina chinensis* Chemnitz (Shen, 1932); *Meretrix meretrix* [*Meretrix meretrix* (Linnaeus)] (Sakai); *Venerupis (Amygdala) japonica* [*Tapes japonica* (Deshayes)] (Miyake).

Distribution: Shantung Peninsula, Chefoo, China; Yellow Sea; Korea; Japan.

Pinnotheres deccanensis Chopra, 1931

Pinnotheres deccanensis CHOPRA, 1931, Records Indian Mus., Calcutta, 33 (3): 318–323, pl. 7 fig. 4 (♀ dorsal view), text-figs. 8 (♀ maxilliped), 9 (♀ chela), 10 (♂ dorsal view), 11 (♂ maxilliped), 12 (♂ abdomen) (1♂ and 10♀ syntypes: Indian Mus., C 1520/1; 'The species is described from a dozen specimens, 11 females and one male, found in the cloaca of *Holothuria scabra* Jäger... The exact provenance of the specimens is not recorded, but the host-species, [*Holothuria*] *scabra*, occurs quite commonly all around the coasts of 'the Madras Presidency') (compared with *Pinnotheres ortmanni*). — SANKARANKUTTY, 1966, Mar. Biol. Assoc. India Symp. Ser., 2 (1): 350, 360 ('Mandapam, Gulf of Mannar [India]'). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1179, 1198, 1217, 1227 (biology; cataloged; taxonomy). — JONES & MAHADEVAN, 1967, Journ. Mar. Biol. Assoc. India, 7 (2): 377–380 (host relationships).

Pinnotheres deccanensis BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1417 (mentioned).

Measurements: Male, length 9.7 mm, width 9.6 mm; female (ovigerous), length 12.5 mm, width 12.7 mm.¹

Habitat: in the cloaca of *Holothuria scabra* (Jaeger) (Chopra); in the respiratory tree of the same species of holothurian (Jones & Mahadevan).

Distribution: Madras and Kerala States, South India.

Pinnotheres dilatatus Shen, 1932

Pinnotheres dilatatus SHEN, 1932, Zool. Sinica, (A) 9 (1): 140-142, pl. 6 fig. 6 (♀ dorsal view), text-figs. (♀) 84 (dorsal view), 85a (fingers of chela), b (chela), c (abdomen), d (maxilliped) (♀ holotype: FMI 8757; type-locality: 'Hwangtao, Kiaochow Bay [Shantung Peninsula, China]'). — SHEN, 1937, Bull. Fan Mem. Inst. Biol. Zool., 7: 168, 177, 178 (Kiaochow Bay, China). — SHEN, 1937, Contrib. Inst. Zool. Peiping, 3 (6): 308 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1198, 1224 (cataloged).

Measurements: Female (ovigerous), length 5.0 mm, width 6.8 mm.

Habitat: in the bivalve, *Tapes variegata* Sowerby (Shen, 1932).

Distribution: Known only from the type locality.

Pinnotheres dofleini Lenz, 1914

Pinnotheres sp. DOFLEIN, 1904, Wiss. Ergeb. Deut. Tiefsee-Exped. Valdivia, 6: 124, 125, pl. 37 (♀) figs. 3 (dorsal view), 4 (ventral view), text-fig. 10 (maxilliped 2) (compared with *Pinnotheres tridacnae*) (Algoa Bay, South Africa). — STEBBING, 1910, Ann. S. African Mus., 6 (4): 330 (listed) (Algoa Bay, South Africa). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1212 (cataloged, taxonomy).

Pinnotheres dofleini LENZ, 1914, in Lenz & Strunck, Deut. Südpolar-Exped., 15 (3): 268, 269, 281, 282, pl. 12 figs. 17 (♂ dorsal view), 18 (♂ abdomen), 19 (chela) ('Simonsbai [South Africa]...'). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 251, 255 (listed, key). — BARNARD, 1947, Ann. Mag. Nat. Hist., (11) 13 (102): 362 (listed with synonymy). — BARNARD, 1950, Ann. S. African Mus., 38: 79, 80, fig. 16a (carapace), b (maxilliped), c (dactyl, leg 1), d (dactyl, leg 4), e (apex of ♂ abdomen in sternal groove, setae mostly omitted to show apex of gonopod), f (gonopod) (Simonstown, Algoa Bay, and False Bay, South Africa). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1198, 1215, 1220 (cataloged, taxonomy).

Pinnotheres ostrearius [not Rathbun, 1901] STEBBING, 1920, Ann. S. African Mus., 17 (3): 241 (part, specimen from St. James, South Africa).

Pinnotheres dofleini BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1420 (mentioned). — GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed).

Measurements: Male, length 5 mm, width 6 mm (Lenz); female (ovigerous), length 11.5 mm, width 13.5 mm (Doflein); female, length up to 16.0 mm, width to 19.0 mm (Barnard, 1950).

Habitat: In ascidians: *Phallusia canaliculata* [*Ascidia sydneiensis* Stimpson] (Lenz); *Pyura stolonifera* (Heller), and in the bivalve *Pinna* (Barnard, 1950); from about 40 meters (22 fms.) (Doflein).

Distribution: Cape of Good Hope, False Bay, and Algoa Bay, South Africa.

Pinnotheres edwardsi De Man, 1887

Pinnotheres Edwardsi DE MAN, 1887, Journ. Linn. Soc. London Zool., 22 (136): 5, 103, 104, pl. 6 (♀) figs. 6 (dorsal view), 7 (frontal view), 8 (maxilliped), 9 (chela) (♀ holotype: Indian Museum 8237/6; type locality: '...King Island Bay [Mergui Archipelago]'). — ALCOCK, 1900, Journ. Asiat. Soc. Bengal, 69 (2): 338 (Mergui Archipelago).

Pinnotheres edwardsi HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiawar, 1: 102 (listed).

Pinnotheres edwardsi TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 252, 258 (Tual, Kei Islands, Indonesia). — MONTGOMERY, 1931, Journ. Linn. Soc. London Zool., 37 (253): 450, 451 (Abrolhos Islands, off Geraldton, Western Australia). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 166 (referred to) (Siglap, Singapore). — CHUANG, 1961, On Malayan Shores: 189, pl. 94 fig. 4 (♀ dorsal view) (Singapore, Malaysia). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1198, 1214, 1219, 1221, 1222 (cataloged).

Measurements: Female, length 18.5 mm, width 18.5 mm (Tesch).

Habitat: In bivalves: *Ostrea* (De Man); *Pinna* (Gordon); *Atrina vexillum* (Born) (Chuang); 27 meters, *Lithothamnion*, sand and coral (Tesch).

Distribution: King Island Bay, Mergui Islands; Tual, Kei Islands, Indonesia; Singapore, Malaysia; Abrolhos Islands, off Geraldton, Western Australia.

***Pinnotheres exiguus* Bürger, 1895**

Pinnotheres exiguus BÜRGER, 1895, Zool. Jahrb. Syst., 8: 377, pl. 9 fig. 19 (♀ dorsal view), pl. 10 fig. 30 (♀ maxilliped) (syntypes: ZIMB 67/952, no longer extant; type-locality: '...Palapa auf der Insel Samar [Philippine Islands]'). — TESCH, 1918, Siboga-Exped. Monogr., 39c (84): 248, 254 (listed, key). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 547 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1198, 1216 (cataloged).

Measurements: Female, length 4.75 mm, width 5.5 mm (Bürger).

Distribution: Known only from the type locality.

***Pinnotheres flavus* Nauck, 1880**

Pinnotheres flavus NAUCK, 1880, Zeitschr. Wiss. Zool., 34: 23, 24, 66 (2 syntypes: ZIMB 67/297, no longer extant; type-locality: 'Philippinen'). — MIERS, 1886, Rept. Sci. Results Voy. Challenger, 17 (49): 276 (listed). — DE MAN, 1887, Zool. Jahrb. Syst., 2: 720, 721 (Philippine Islands). — BÜRGER, 1895, Zool. Jahrb. Syst., 8: 383, 384, pl. 9 fig. 29 (♀ dorsal view), pl. 10 figs. 29 (maxilliped), 35 (♂ abdomen) (Zamboanga and Ubay, Philippine Islands). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 251, 255 (listed, key). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 547 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1198, 1216, 1221, 1222 (cataloged).

Pinnotheres flavus BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1417 (mentioned).

Measurements: Male, length 8.25 mm, width 9.5 mm; female, length 9.5 mm, width 11.0 mm (Bürger).

Habitat: In a holothurian (Bürger).

Distribution: Zamboanga and Ubay, Philippine Islands.

***Pinnotheres geddesi* Miers, 1880**

? *Cancer* 1 BROWNE, 1756, Civil & Nat. Hist. Jamaica (ed. 1): 420, 421 (Jamaica). — BROWNE, 1789, Civil & Nat. Hist. Jamaica (ed. 2): 420, 421 (Jamaica).

Pinnotheres angelicus [not Lockington] MIERS, 1880, Journ. Linn. Soc. London Zool., 15: 86, 87 (Vera Cruz, Mexico).

Pinnotheres Geddesi MIERS, 1880, Journ. Linn. Soc. London Zool., 15: 86, 87 (4 ♀ syntypes: BM 80: 8; type-locality: '...Vera Cruz...Mexico...').

Pinnotheres STEBBING, 1893, Hist. Crust.: 101 (mentions Browne's *Cancer* 1 in a popular account).

Pinnotheres Maculatus [not Say, 1818] JARVIS, 1897, Jamaica Post (refers Browne's *Cancer* 1 to *P. maculatus*).

Pinnotheres ostrearius RATHBUN, 1901, Bull. U. S. Fish Comm., 20 (2): 20, fig. 3 (♀) a (chela), b (maxilliped) (♀ holotype: USNM 23767; type-locality: 'Mayaguez [Puerto Rico]...'). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1205, 1225 (cataloged).

Pinnotheres geddesi RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 70, 71, pl. 16 (♀) figs. 1 (ventral view), 2 (dorsal view), 3 (ventral view), 4 (dorsal view), text-fig. 23 (♀) a (chela), b (maxilliped) (Cuba; near Cabo Rojo, Mayaguez, Puerto Rico; Vera Cruz, Mexico). — RATHBUN, 1933, Sci. Surv. Porto Rico Virgin Ids., 15 (1): 82 (Puerto Rico).

Pinnotheres geddesi BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1419 (mentioned).

Not *Pinnotheres ostrearius* STEBBING, 1920, Ann. S. African Mus., 17: 241 (is partly *P. dofleini*, partly *P. sp.*, see Barnard, 1950, Ann. S. African Mus., 38: 79, 80).

Measurements: Female, length 9.0 mm, width 10.8 mm (Rathbun, 1918).

Habitat: In bivalves: in mangrove oysters [*Crassostrea rhizophorae* (Guilding)] (Browne); *Ostrea* (Balss).

Distribution: Vera Cruz, Mexico; ? Jamaica; Puerto Rico.

Pinnotheres glaber Bürger, 1895

? 'Een Krabbetje uit het geslacht van *Cancellus Anatum*' RUMPHIUS, 1705, Amboinsche Rariteitkamer: 26 ('a small crab, hardly as large as the nail of the little finger, with a convexly arched carapace, narrowing anteriorly, gray and soft; it had already eggs under the tail; it seemed to me to be a young Leucosid' (Endte Krabbetje = Duck Crab, a name used by Rumphius for *Leucosia* and other Leucosids) [free translation of the Dutch original text]; found in 'Letterschulpen' [*Tapes literata* (L.)] 'in Oigstmaand [August] 1683' at the island of Amboina, Moluccas, Indonesia) (same reference in the second, 1741, edition, where the year of collecting has been misprinted as 1638) (Rumphius' Pinnotherid may belong to the present species, but not enough details are given; all other Crustacea referred by Rumphius to *Pinnoter* or *Pinnophylax* are Pontoniid shrimps).

Pinnotheres glaber BÜRGER, 1895, Zool. Jahrb. Syst., 8: 379, pl. 9 fig. 23 (♀ dorsal view), pl. 10 fig. 21 (maxilliped) (syntype: ZIMB 67/304a; type-locality: Palaos-Inseln [Palau]). — TESCH, 1918, Siboga Exped. Monogr., 39c¹ (84): 248, 255 (listed, key). — MIYAKE, 1939, Rec. Oceanogr. Works Japan, 10 (2): 221, 241 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1199, 1216 (cataloged).

Measurements: Male, length 4.8 mm, width 5.0 mm; female, length 7.0 mm, width 9.0 mm (Bürger).

Habitat: In the bivalve, *Tapes turgida* (Lamarck) (Bürger); ? *Tapes literata* (L.) (Rumphius).

Distribution: Palau; ? Amboina, Moluccas, Indonesia.

Pinnotheres glaberrimus Bürger, 1895

Pinnotheres glaberrimus [not Bosc, 1801–02] BÜRGER, 1895, Zool. Jahrb. Syst., 8: 363, 366, pl. 9 fig. 3 (♂ dorsal view), pl. 10 fig. 3 (maxilliped) (syntypes, ZIMB 67/543, no longer extant; type localities: '... Zamboanga [Philippine Islands]... Palaosinseln... Ubay [Philippine Islands]'). — LENZ, 1901, Zool. Jahrb. Syst., 14: 468 (compared with *Pinnotheres schauinslandi*). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 4 (4): 330 (Koh Kam, Thailand). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 248, 252 (listed, key). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 546 (listed). — SUVATTI, 1928, Check-List aquatic Fauna Siam: 69 (listed). — MIYAKE, 1939, Records Oceanogr. Works Japan, 10 (2): 241 (listed). — SUVATTI, 1950, Fauna of Thailand: 159 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1199, 1216, 1223 (cataloged).

Pinnoter *glaberrimus* BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1419 (Philippines).

Measurements: Male, length 5.25 mm, width 5.25 mm (Bürger).

Habitat: In bivalves: '... aus Cabebe [cabebe, *Polymesoda* (*Geloina*) *coaxans* (Gmelin)], Süßwasser-Brackwasser, Zamboanga [Philippines],' in *Arca* from the Palau Islands, and in '*Lima divaricata*' [which is unidentifiable] from Ubay, Philippine Islands (Bürger); 5 fms [9 m], gravel (Rathbun). Harald Rehder, in a personal communication regarding the cabebe, says, '... a brackish water, marsh-living species, commonly sold in markets for human consumption.' (The cabebe also hosts *P. coarctatus*).

Distribution: Gulf of Siam; Zamboanga, Ubay [? Isla de], Philippine Islands; Palau Islands.

Pinnotheres globosus Lucas, 1853

Pinnotheres globosum LUCAS, 1853, in Jacquinot, Voy. Astrolabe et Zélée, 3: 58–60, pl. 5 (♀) fig. 21 (dorsal view), 22 (maxilliped), 23 (chela), 24 (abdomen), 25 (antenna), 26 (antennule) (♀ holotype: ? depository; type locality: [Singapore, Malaysia]). — H. MILNE EDWARDS, 1853, Ann. Sci. Nat. (Zool.), Paris, (3) 20: 219 (185), pl. 11 fig. 6 (maxilliped), a (dactylus, leg) (part, not synonymy) (Vavau [Vavau, Tonga Islands]). — CANO, 1889, Boll. Soc. Nat. Napoli, (1) 3 (3) (1): 93, 98, 247 (Puerto Lagunas, Patagonia). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 65, footnote ('... identity [of Cano's specimen] with *P. globosum* needs confirmation). — GARTH, 1957, Lunds Univ. Arsskr., (n. ser.) (2) 53 (7): 91 (also doubts Cano's American record).

Pinnoter *globosus* PETERS, 1853, Monatsber. Kön. Preuss. Akad. Wiss. Berlin, 1852: 589 (in bivalves, 'Mossambique').

Pinnotheres meleagrinae HILGENDORF, 1869, in Von der Decken, Reisen Ost-Afrika, 3: 110 (nom. nud., Mozambique; evidently the same material later assigned by Hilgendorf, 1878, to *Pinnotheres globosus*, see below).

Pinnotheres globosus A. MILNE EDWARDS, 1873, Nouv. Archiv. Mus. Hist. nat., Paris, 9 (2): 318, 319 (synonymy, part only) (New Caledonia). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 257 (in footnote states that he cannot follow H. Milne Edwards' decision to unite *Pinnotheres obesus* with *P. globosus*). — BARNARD, 1950, Ann. S. African Mus., 38: 80, 81 (distribution, taxonomy). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1199, 1204, 1219, 1220, 1221 (biology, cataloged, taxonomy).

Pinnotheres globosus HILGENDORF, 1878, Monatsber. K. Preuss. Akad. Wiss. Berlin, 1878: 809 (Mozambique). — HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiawar, 1: 102 [has '*P. globosus* = *P. obesus*, Dana') ('China Seas'). — GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution noted).

Measurements: Female, length 18.0 mm, width 20.0 mm (Lucas).

Habitat: In the bivalves: '... dans une grosse Modiole...' (Lucas); *Pinna maritima* [unknown, may be *Pinna muricata* Linné, *Pinna bicolor* Gmelin, or *Atrina vexillum* (Born)] (A. Milne-Edwards, 1873); perhaps in *Meretrix quadrata* [*Sunetta quadrata* nomen nudum] and *Cytherea* [*Periglypta*] sp., (Hornell & Southwell).

Distribution: Mozambique; Singapore, Malaysia; New Caledonia; Tonga Islands; China Seas. Patagonia (questioned by both Rathbun and Garth).

Pinnotheres gordonii Shen, 1932

Pinnotheres gordonii SHEN, 1932, Zool. Sinica, (A) 9 (1): 152-154, pl. 6 (♂) figs. 12 (dorsal view), 13 (ventral view), text-figs. 95 (♂ dorsal view), 96 (♂) a (frontal view), b (abdomen and sternum), 97a (maxilliped), b (chela), c (gonopod) (♂ holotype: FMI 8760; type-locality: 'Tsingtao [Shantung Peninsula], China') (also Liaotung Peninsula, China). — GORDON, 1936, Journ. Linn. Soc. London Zool, 40 (269): 171 (compared with *Pinnotheres spinidactylus*). — SHEN, 1937, Bull. Fan Mem. Inst. Biol. Zool., 7: 168, 178 (Tsingtao, China). — SHEN, 1937, Contrib. Inst. Zool. Peiping, 3 (6): 308 (listed). — SAKAI, 1939, Stud. Crabs of Japan: 592, 593, fig. 79a (♂ dorsal view), b (maxilliped) (Simoda, Coast of Aiti-ken, Ise Bay, and Hakata Bay, Japan). — SAKAI, 1956, Crabs: 50 (of species list) (mentioned). — SUGIURA, SUGITA & KIHARA, 1960, Bull. Japanese Soc. Sci. Fish., 26 (2): 89 (mentioned). — SUGIURA, KIHARA & SUGITA, 1960, Bull. Japanese Soc. Sci. Fish., 26 (6): 565-569 (ecology, parasitism). — MIYAKE, 1961, Rec. Oceanogr. Works Japan, Special number 5: 174 (listed) (Shidoko, and river mouth of Hama, Saga Prefecture, Sea of Ariaké [Ariakeno umi], Japan). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1181, 1185, 1187, 1199, 1224, 1225 (biology, cataloged).

Measurements: Male, length 5.0 mm, width 5.5 mm (Sakai).

Habitat: In bivalves: *Tapes variegata* Sowerby, sometimes from a kind of oyster (Shen, 1932); *Paphia philippinarum* [*Tapes japonica* (Deshayes)], *Paphia variegata* [*Tapes variegata* Sowerby], *Mytilus crassitesta* Lischke, *Anomia lischkei* Dautzenberg & Fischer, *Cardium undatopictum* [Laevicardium undatopictum (Pilsbry)], *Venerupis* [*Amygdala*] *japonica* [*Tapes japonica* (Deshayes)] (Sakai).

Distribution: Liaotung and Shantung Peninsulas, China; Japan.

Pinnotheres gracilis Bürger, 1895

Pinnotheres gracilis BÜRGER, 1895, Zool. Jahrb. Syst., 8: 368, pl. 9 fig. 6 (♀ dorsal view), pl. 10 fig. 6 (♀ maxilliped) (syntypes: ZIMB 67/542; type locality: 'Ubay [Philippine Islands]'). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 4 (4): 330 (Koh Kahdat, Thailand). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 253 (listed, key). — SUVATTI, 1938, Check List aquatic Fauna Siam: 69 (listed). — SUVATTI, 1950, Fauna of Thailand: 159 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1199, 1216, 1223 (catalogued). — GEORGE & NOBLE, 1970, Journ. Mar. Biol. Assoc. India, 10 (2): 392, fig. 1 (maxilliped), 2, 3 (♂ first pleopod) (Karwar and Kodibag, S.W. India).

Pinnotheres gracillis PILLAI, 1951, Bull. central Res. Inst. Univ. Travancore, (C) 2 (1): 26, 27 (mentioned in comparison with *Pinnotheres sanguinolariae* Pillai, 1951).

Measurements: Female, length 5.25 mm, width 6.75 mm (Bürger); females, width 4.5 to 6.5 mm; males, width 2.5 to 3.5 mm (George & Noble).

Habitat: In bivalves: *Solen* (Bürger); *Katelysia opima* [*Marcia opima* (Gmelin)] (George & Noble). 5-8 fms (9-14.5 m), sandy mud (Rathbun).

Distribution: S. W. India; Gulf of Siam and Philippine Islands.

***Pinnotheres guerini* H. Milne Edwards, 1853**

Pinnotheres Guerini H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 219 (185), pl. 11 fig. 9 (maxilliped) ([♂ ?] holotype: MNHNP; type-locality: 'Cuba'). — GUNDLACH, 1887, Ann. Soc. Españ. Hist. Nat., 16: 334 (124) (Puerto Rico).

Pinnotheres guerini VON MARTENS, 1872, Arch. Naturgesch., 38 (1): 105 (Cuba).

Pinnotheres guerini RATHBUN, 1901, Bull. U. S. Fish Comm., 20 (2): 20 (after von Martens). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 64, 65, 101, fig. 52 (maxilliped) (after H. Milne Edwards and von Martens). — RATHBUN, 1933, Sci. Surv. Porto Rico Virgin Ids., 15 (1): 83 (Cuba, Puerto Rico).

Measurements: Carapace nearly 1.5 times broader than long (von Martens).

Habitat: In oysters (Gundlach).

Distribution: Cuba and Puerto Rico.

***Pinnotheres haiyangensis* Shen, 1932**

Pinnotheres haiyangensis SHEN, 1932, Zool. Sinica, (A) 9 (1): 145-149, pl. 6 fig. 8 (♂ dorsal view), fig. 9 (♀ dorsal view), text-figs. 89 (♂) a, b, c (dorsal views), 90 a (maxilliped), b (chela), c (fingers of chela), d (gonopod), 91 a (♂ abdomen), b (♂ inner view of sixth and seventh segments of abdomen), c (♂ abdomen, lateral view), d (♀ abdomen), e (♀ abnormal abdomen) (♀ holotype: FMI 8616; type-locality: 'Hsingtsun, Shantung Peninsula [China]') (also Jungchen, Haiyang, Tingtzechiang, and Hwangtao, Shantung Peninsula). — SHEN, 1937, Bull. Fan Mem. Inst. Biol. Zool., 7: 168, 178 (Shantung Peninsula, China). — SHEN, 1937, Contrib. Inst. Zool. Peiping, 3 (6): 308 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1200, 1224 (cataloged).

Measurements: Male, length 3.7 mm, width 4.4 mm; female, length 5.0 mm, width 5.7 mm (Shen, 1932).

Habitat: In the bivalve, *Anatina peichihliensis* [*Laternula pechiliensis* (Grabau & King)] on a sandy beach at low water mark (Shen, 1932).

Distribution: Shantung Peninsula, China.

***Pinnotheres hemphilli* Rathbun, 1918**

Pinnotheres hemphilli RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 64, 65, 99, 100, pl. 23 (♂) figs. 1 (dorsal view), 2 (ventral view) (♂ holotype: USNM 6420; type-locality: 'Cedar Keys, Florida...').

Pinnotheres bempilli ARCHER, 1947, Alabama Conserv., 19 (6): 12 (mentioned in popular account).

Measurements: Male, length 2.3 mm, width 3.0 mm.

Distribution: Known only from the type locality.

***Pinnotheres hirtimanus* H. Milne Edwards, 1853**

Pinnotheres hirtimanus H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 219 (185) ([♀ ?] type: MNHNP specimen is the type (fide Rathbun, 1918); type-locality: 'Cuba'). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 64, 65, 101 (after H. Milne Edwards).

Distribution: Known only from the type locality.

***Pinnotheres holmesi* Rathbun, 1918**

? *Pinnotheres nudus* [not Holmes, 1895, fide Rathbun, 1918] WEYMOUTH, 1910, Leland Stanford Jr. Univ. Publ., (Univ. Ser.) 4: 53, fig. 1 (♀ dorsal view) (Monterey Bay, California).

Pinnotheres holmesi RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 12, 63, 65, 66, 68, 69, pl. 15 (♀) figs. 1 (dorsal view), 2 (ventral view), text-fig. 31 (♀ maxilliped) (♀ holotype: USNM 51000; type-locality: '? Pacific Grove, California). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 251, pl. 39 (♀) fig. 7 (dorsal view), fig. 8 (ventral view) (after Rathbun).

Measurements: Female (ovig.), length 7.2 mm, width 8.7 mm (Rathbun).

Distribution: ? Pacific Grove; Monterey Bay, California.

***Pinnotheres holothuriae* Semper, 1880**

Pinnotheres sp. SEMPER, 1862, Zeitschr. Wiss. Zool., 11: 105 ('Zugleich mit diesem Fische [*Fierasfer*] leben in der selben Holothurie zwei Species *Pinnotheres*') (part, Zamboanga [Island of Mindanao, Philippines]). — SEMPER, 1868, Reisen in Archipel der Philippinen, Wiss. Res., 1 (2): 96, 97 ('...noch 2 Arten der sonst in Muscheln lebenden Gattung *Pinnotheres*. Merkwürdiger Weise fanden sich beide Arten in derselben Holothurie, nämlich in *Holothuria scabra* Jäger...') [Note: This quotation is more or less a repetition of the preceding observation, to which is added the name of the supposed host species. Bürger (1895, below), who reported on the pinnotherids that Semper collected, including 3♂ 8♀ of the species in question, however, lists *Stichopus variegatus* Stimpson as the host, an identification accepted by other authors cited] (part, Zamboanga [Island of Mindanao, Philippines]).

Pinnotheres holothuriae SEMPER, 1880, Die Natürlichen Existenzbedingungen der Thiere, 1 (= Internat. Wissen. Bibliothek, 39): 98 [not 78]–100, figs. 21a (♀ frontal view), b (portion of respiratory tree of holothurian in which *Pinnotheres holothuriae* was found), 22 (zoaea), (syntypes: ZIMB 67/307 no longer extant; type locality: Zamboanga [Island of Mindanao, Philippines]). — SEMPER, 1881, Animal Life as affected by Natural Conditions of Existence [translation of foregoing], (Int. Sci. Series, 30): 80, 81 [with identical figs.], figs. 21, a, b, 22 [also published the same year as vol. 31, with identical pagination and figures, in the English edit. of the Internat. Sci. Series, but titled, 'The Natural Conditions of Existence as They Affect Animal Life,'; a third edition was published in 1883]. — BÜRGER, 1895, Zool. Jahrb. Syst., 8: 381, 382, pl. 9 fig. 27 (♀ dorsal view), pl. 10 fig. 26 (maxilliped), fig. 36 (♂ abdomen) ('parasit' in *Stichopus variegatus*) (Zamboanga, Philippine Islands). — DOFLEIN, 1904, Wiss. Ergeb. Deutschen Tiefsee Exped. Valdivia, 6: 244 (retrograde development of eyes). — DOFLEIN, 1914, in Hesse & Doflein, Tierbau und Tierleben, 2: 279 (host; biology). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 251, 255 (listed, key). — O. W. HYMAN, 1924, Proc. U. S. Nat. Mus., 64 (2497): 4, pl. 5 fig. 48 (first zoaea, lateral view) (repeats Semper's description and figure of first zoaea). — FLOERICKE, 1925, Wundertiere des Meeres: 8 (mentioned in popular work). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 547 (listed). — GURNEY, 1938, Proc. Zool. Soc. London, (B) 108 (1): 79 (larval stages). — TŪ, 1938, Zool. Anz., 122 (7/8): 184, 185 (mentioned in account of adaptations and host relationships). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1200, 1216, 1218 (biology, cataloged, taxonomy).

Pinnotheres holothuriae BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1417 (commensal in *Stichopus variegatus* Stimpson).

Pinnotheres pholothurias AIKAWA, 1937, Rec. Oceanogr. Works Japan, 9 (1): 152 (larval characters).

Measurements: Male, length 5.5 mm, width 5.75 mm (Bürger).

Habitat: In respiratory tree of holothurians: *Stichopus variegatus* Stimpson, *Holothuria scabra* (Jaeger) ?, see remark in first paragraph of the synonymy of the present species (Bürger).

Distribution: Zamboanga [Province, fide Estampador], Mindanao, Philippine Islands.

***Pinnotheres holothuriensis* Baker, 1907**

Pinnotheres holothuriensis BAKER, 1907, Trans. Proc. Rept. Roy. Soc. S. Australia, 31: 177, 178, pl. 23 fig. 3 (dorsal view), a (maxilliped) (syntypes: SAM;

type-locality: '...St. Vincent Gulf [South Australia]...'. — BALSS, 1956, in Bronns Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1417 (listed).

Ostracotheres (?) ('*Pinnotheres*') *holothuriensis* TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 287 (listed).

Pinnotheres holothuriensis HALE, 1927, Crust. S. Australia, (2): 174, fig. 175 (dorsal view). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1192, 1200, 1211, 1219 (biology, taxonomy, cataloged).

Measurements of type: Length 10.0 mm, of cheliped 11.0 mm (Baker).

Habitat: 'Specimens found inside holothurians and ascidians; those from ascidians are smaller, but without specific difference. This crab is able to swim, and probably does not spend all its time within the host'; holothurians dredged in 12 fms [22 m], ascidians from 5 fms [9 m] (Baker).

Distribution: South Australia.

Pinnotheres impressus Bürger, 1895

Pinnotheres impressus BÜRGER, 1895, Zool. Jahrb. Syst., 8: 380, pl. 9 fig. 24 (♀ dorsal view), pl. 10 fig. 23 (♀ maxilliped) (syntypes: ZIMB 67/953, no longer extant; type-locality: '...Aibukit [Philippine Islands]'). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 255 (listed, key). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1200, 1216 (cataloged).

Measurements: Female (ovig.), length 6.5 mm, width 7.8 mm (Bürger).

Distribution: Known only from the type locality.

Pinnotheres jamesi Rathbun, 1923

Pinnotheres jamesi RATHBUN, 1923, Bull. Amer. Mus. Nat. Hist., 48 (2): 625, 626, pl. 29 (♂) figs. 1 (dorsal view), 2 (ventral view); text-figs. (♂) 1 (maxilliped), 2 (abdomen) (♂ holotype: USNM 57005; type-locality: '...Pichilique Bay, Lower [Baja] California [Mexico]'). — GLASSELL, 1934, Journ. Washington Acad. Sci., 24 (7): 301 (Gulf of California) (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1200, 1223 (cataloged).

Measurements: Male, length 3.7 mm, width 3.7 mm.

Habitat: [Taken at the surface] by electric light (Rathbun).

Distribution: Known only from the type locality.

Pinnotheres kamensis Rathbun, 1909

Pinnotheres kamensis RATHBUN, 1909, Proc. Biol. Soc. Washington, 22: 110 (♂ holotype: UZM; type-locality: 'west of Koh Kam [Thailand]'). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 4 (4): 335, fig. 18 (♂ maxilliped) (West of Koh Kam, Thailand). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 252 (listed, key). — SUVATTI, 1938, Check-List aquatic Fauna Siam: 69 (listed). — SUVATTI, 1950, Fauna of Thailand: 159 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1200, 1223 (cataloged).

Measurements: Male, length 1.4 mm, width 1.5 mm (Rathbun, 1909).

Habitat: 5 fms [9 m] (Rathbun, 1910).

Distribution: Known only from the type locality.

Pinnotheres kutensis Rathbun, 1909

Pinnotheres kutensis RATHBUN, 1909, Proc. Biol. Soc. Washington, 22: 110 (♂ holotype: UZM; type-locality: 'South of Koh Kut [Thailand]'). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 4 (4): 335, 336, text-fig. 19 (♂) a (dorsal view), b (abdomen and gonopods), c (maxilliped) (compared with *Pinnotheres siamensis* under that species) (south of Koh Kut [Thailand]). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 252 (listed, key). — SUVATTI, 1938, Check-List aquatic Fauna Siam: 69 (listed) (Koh Kut, Koh Chuen [Thailand]). — SUVATTI, 1950, Fauna of Thailand: 159 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1200, 1223 (cataloged).

Measurements: Male, length 1.1 mm, width 1.02 mm (Rathbun, 1909).

Habitat: 17–20 fms [31–36.6 m], mud (Rathbun, 1909).

Distribution: Known only from the type locality.

Pinnotheres lanensis Rathbun, 1909

Pinnotheres lanensis RATHBUN, 1909, Proc. Biol. Soc. Washington, 22: 109 (♀ holotype: UZM; type-locality: 'Koh Lan, Gulf of Siam'). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 4 (4): 332, 333 (Koh Lan, Thailand). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 255 (listed, key). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 179 (compared with *Pinnotheres winckworthi*). — SUVATTI, 1938, Check-List aquatic Fauna Siam: 69 (listed). — SUVATTI, 1950, Fauna of Thailand: 159 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1201, 1223 (cataloged).

Measurements: Female, length 2.4 mm, width 2.7 mm (Rathbun, 1909).

Habitat: 30 fms [55 m] (Rathbun, 1909).

Distribution: Known only from the type locality.

Pinnotheres laquei Sakai, 1961

Pinnotheres laquei SAKAI, 1961, Crustaceana, 3 (2): 145, text-fig. 3 (♀) a (dorsal view), b (maxilliped) (Amadaiba, off the coast of Hayama, Sagami Bay, Japan). — SAKAI, 1965, Crabs of Sagami Bay: 177 (Eng. pt.), 77 (Jap. pt.), pl. 87 fig. 2 (♀ dorsal view), text-fig. 23 a (maxilliped), b (1st to 4th ambulatory legs with dactyli enlarged) (Sagami Bay, Japan).

Pinnotheres laquei SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1201, 1224 (cataloged, taxonomy).

Measurements: Female, length 3.8 mm, width 4.2 mm (Sakai).

Habitat: In the brachiopod, *Laqueus rubellus* (Sowerby) (Sakai, 1961).

Distribution: Known only from the type locality.

Pinnotheres latipes Lucas, 1853

Pinnotheres latipes LUCAS, 1853, in Jacquinet, Voy. Astrolabe et Zélée, 3: 57, 58, pl. 5 figs. 16 (dorsal view), 17 (maxilliped), 18 (chela), 19 (♂ abdomen), 20 (antennule) (♂ holotype: type not extant; type-locality: 'Raffles [Raffles]-Bay (côte nord-ouest de la Nouvelle-Zélande)'. — MIERS, 1876, Cat. Crust. New Zealand: 48, 49 (after Lucas). — FILHOL, 1885, Biblioth. École Haut. Étud. Sci. Nat., 30 (2): 50 (listed). — FILHOL, 1886, Miss. Ile Campbell passage de Vénus Zool., 3 (2): 394, 395.

Pinnotheres laticeps HUTTON, 1882, New Zealand Journ. Sci., 1 (6): 263 (confirms Filhol's belief that this species belongs to the fauna of Northern Australia).

Habitat: In a bivalve, *Pinna* (Lucas).

Distribution: Known only from the type locality, Raffles Bay, which is in Australia, fide Filhol 1885, who adds that the species is not known to occur in New Zealand.

Pinnotheres latissimus Bürger, 1895

? *Pinnotheres obesus* [not Dana, 1852] MIERS, 1880, Ann. Mag. Nat. Hist., (5) 5: 314, pl. 14 fig. 4 (♀ maxilliped) (Malaysia, no precise locality).

Pinnotheres latissimus BÜRGER, 1895, Zool. Jahrb. Syst., 8: 373, pl. 9 (♀) fig. 13 a (dorsal view), b (chela), pl. 10 fig. 13 (♀ maxilliped) (♀ holotype: ZIMB 67/382, no longer extant; type-locality: 'Manila [Philippine Islands]') (compared with *Pinnotheres palaensis*). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 254 (listed, key). — OHSHIMA, 1927, Bulteno Sci. Fak. Terk., Kjušu Univ., 2 (5): 374, 375, 378 (Hakata, Japan). — MIYAKE, 1935, Bulteno Sci. Fak. Terk., Kjušu Univ., 6 (3): 192–200, 201, pl. 3 figs. 1–6 (zoeal carapace and appendages), text-figs. 1 a–d (developing egg), 2 (pre-zoea), 3 (zoea 1), 4 (zoea 2) (larval stages, in part compared with those of *Pinnotheres holothuriae*, *maculatus*, *ostreum*, *pisum*, *veterum* [*Pinnotheres pinnotheres*], and '*Pinnozoa ostrea* Aikawa, 1933') (Hakata Bay, Japan). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 167, 168, 173, 176, 177, fig. 6 (♀) a (dorsal view), a' (anterior border of carapace), a'' (anterior border of carapace), b (chela), c–e (dactyli, legs 2–4) (asymmetry) (compared with *Pinnotheres obesus*, *palaensis*, and *similis*) (refers Miers' three female specimens

[see above] to *Pinnotheres latissimus*). — AIKAWA, 1937, Rec. Oceanogr. Works Japan, 9 (1): 152 (larval characters). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 547 (listed). — CHRISTENSEN & McDERMOTT, 1958, Biol. Bull. Woods Hole, 114 (2): 170 (mentioned). — SUGIURA, SUGITA, & KIHARA, 1960, Bull. Japanese Soc. Sci. Fish., 26 (2): 94 (mentioned). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1175, 1179, 1201 (biology, cataloged).

Measurements: Female (ovig.), length 9.6 mm, width 12.16 mm (Gordon).
Habitat: In the bivalve *Paphia* (*Tapes*) *philippinarum* [*Tapes japonica* (Deshayes)] (Miyake, 1935).

Distribution: Indo-Malayan Seas; Manila, Philippine Islands; Hakata Bay, Japan.

Pinnotheres latus Bürger, 1895

Pinnotheres latus BÜRGER, 1895, Zool. Jahrb. Syst., 8: 374, 375, pl. 9 fig. 16 (♀ dorsal view), pl. 10 fig. 15 (♀ maxilliped) (syntypes: ZIMB 67/310; type-localities: '...Burias [Philippine Islands]... Palaos-Inseln...'). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 254, 259, 260 (Sumba and Amboina, Indonesia). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 171 (asymmetry; compared with *Pinnotheres spinidactylus*). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 547 (listed). — MIYAKE, 1939, Records Oceanog. Works Japan, 10 (2): 221, 241 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1201, 1216, 1225 (cataloged, taxonomy).

Measurements: Female (ovigerous), length 12.75 mm, width 16.67 mm (Bürger).
Habitat: In bivalves: *Pinna* sp., and *Pinna nigrina* [*Arina vexillum* (Born)] (Bürger); 'Coral sand; near the shore mud,' to 40 m (21.87 fms) (Tesch).

Distribution: Indonesia; Philippine Islands; Palau Islands.

Pinnotheres leloeffi Crosnier, 1969

Pinnotheres leloeffi CROSNIER, 1969, Bull. Mus. Nat. Hist. Nat. Paris, (2) 41: 529, 531, fig. 1 (♂ carapace, dorsal view), 2 (♂ chela), 3-6 (♂ pereopods 2-5), 7 (♂ third maxilliped), 8 (♂ abdomen), 9 (♂ first pleopod), 10 (♂ second pleopod), 17 (♂ buccal cavity) (♂ holotype: MP; type locality: 'Côte d'Ivoire (Vridi), 5°14'N-4°02'W').

Measurements: Male, length 2.8 mm, width 3.7 mm.

Habitat: Depth 20 m, bottom: reddish sand.

Distribution: Only known from type locality.

Pinnotheres lithodomi Smith, 1870

Pinnotheres Lithodomi SMITH, 1870, Trans. Connecticut Acad. Arts Sci., 2: 169 (♀ holotype (ovig.): PM, not located; type-locality: Pearl Islands [Bay of Panama]) [Referred to by Verrill by implication, 1869, Amer. Nat., 3 (5): 245].

Pinnotheres lithodomi LOCKINGTON, 1876, Proc. Calif. Acad. Sci., 7: 10 (listed). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 64, 66, 73 (after Smith). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 286 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1201, 1225 (cataloged).

Measurements: Female, width about 4.0 mm (Smith).

Habitat: 'The only specimen seen was found in a specimen of *Lithodomus aristatus* Forbes and Hanley [*Lithophaga aristata* Dillwyn], which was in its excavation in the shell of a *Spondylus*...' (Smith); 'In *Lithophaga attenuata* Deshayes' (USNM Reg. No. 50630, det. M. J. Rathbun, unpublished record).

Distribution: Known from Magdalena Bay, Baja California, Mexico (USNM Reg. No. 50630) and Pearl Islands, Bay of Panama.

Pinnotheres lutescens Nobili, 1905

Pinnotheres lutescens NOBILI, 1905, Bull. Mus. Nat. Hist. Nat. Paris, 11 (6): 409 (♀ holotype: MNHNP; type-locality: 'Djibouti [French Somaliland, Gulf of Aden]'). — NOBILI, 1906, Ann. Sci. Nat. Zool. Paris, (9) 4: 304, 305, fig. 10 (♀ maxilliped) (Djibouti, Somaliland). — GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed) ('Mer Rouge,' [Gulf of Aden]).

Pinnotheres lutescens LAURIE, 1915, Journ. Linn. Soc. London Zool., 31 (209): 415 (listed). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 254, 287 (listed, key). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1202 (cataloged).

Measurements: Female, length 7.0 mm, width 8.9 mm (Nobili, 1906).

Distribution: Known only from the type locality.

Pinnotheres mactricola Alcock, 1900

Pinnotheres mactricola ALCOCK, 1900, Journ. Asiat. Soc. Bengal, 69 (2): 339, 340 (3♂, 4♀ syntypes: Indian Museum 3442/7: 7876–77/9; type locality: 'from the mouth of the R. Hooghly [Bengal, India]') ('Closely related to *P. cardii* Bürger.'). — ALCOCK & McARDLE, 1902, Illustr. Zool. Investigator, Crustacea, (10): pl. 62 figs. 4 (♂ dorsal view), 5 (♀) (dorsal view), a (frontal view), b (maxilliped). — HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiawar, 1: 102 (listed).

Pinnotheres mactricolus TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 252 (listed, key). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1202, 1214 (cataloged; taxonomy).

Pinnotheres mactricola BALSS, 1927, in Kükenthal & Krumbach, Handbuch Zool., 3 (8–9): 966, fig. 1065 (♀ dorsal view) (after Alcock).

Measurements: Female, diameter of carapace 6.0 mm (Alcock, 1900).

Habitat: In the bivalve, *Macra violacea* (Chemnitz) [*Macra (Coelomacra) violacea* (Chemnitz)] (Alcock, 1900).

Distribution: Known only from the type locality.

Pinnotheres maculatus Say, 1818

? *Cancer parasiticus* LINNAEUS, 1763, Amoenitates Acad., 6: 415 (description; 'Habitat in America intra Camam lazarum [*Chama lazarus* (Linnaeus)]').

? *Cancer Pinnophylax* LINNAEUS, 1767, Syst. Nat., (ed. 12) 1 (2): 1039 (abbreviated version of 1763 description; synonymy in part). — HOUTTUYN, 1769, Linné, Natuurl. Hist. (Dutch edition of Syst. Nat.), 13: 317 (translation of Linnaeus' 1763 description with additions; synonymy in part). — FABRICIUS, 1775, Syst. Ent.: 402 (definition; synonymy in part). — GMELIN, 1789, Linné, Syst. Nat., (ed. 13) 1 (5): 2964 (definition; synonymy in part).

? *Cancer pinnophylax* FABRICIUS, 1775, Syst. Ent.: 402 (definition, synonymy in part). — STATIUS MÜLLER, 1775, Linné, Natursystem (German edition of Syst. Nat.), 5 (2): 1100 (in part). — FABRICIUS, 1781, Spec. Ins., 1: 498 (definition; synonymy in part). — HERBST, 1783, Vers. Naturg. Krabben Krebse, 1: 104 (reference to Linnaeus, 1763; the references to pre-Linnean authors pertain mostly to *P. pinnotheres*, except for the one to Rumphius, which possibly deals with *P. glaber*), pl. 2 fig. 27 (identity of figured specimen unknown, = *P. pinnotheres*?). — FABRICIUS, 1787, Mant. Ins., 1: 317 (definition). — OLIVIER, 1791, Encyc. Méthod. Hist. Nat. Ins., 6: 143, 156 (definition; synonymy in part). — FABRICIUS, 1793, Ent. syst., 2: 444 (definition; synonymy in part). — HERBST, 1799, Vers. Naturg. Krabben Krebse, 3 (1): 36 (listed).

? *Pinnotheres pinnophylax* BOSC, 1801–02, Syst. Nat. Crust., (ed. 1) 1: 294 (definition), pl. 6 fig. 3 (dorsal view). — DESMAREST, 1830, Bosc, Hist. Nat. Crust., (ed. 2) 1: 243 (definition), pl. 6 fig. 3 (dorsal view).

? *Cancre pinnophylax* LATREILLE, 1802–1803, Hist. Nat. Crust. Ins., 6: 84 (considers the species closer to *Dorippe*).

Pinnotheres maculatum SAY, 1818, Journ. Acad. Nat. Sci. Phila., 1 (16): 450, 451 (1♂ 2♂♂ syntypes: BM 435; type-locality: 'Inhabits the muricated Pinna of our [U.S. east] coast'). — DEKAY, 1844, Zool. New York, 6: 13 (listed). — WHITE, 1847, List Crust. Brit. Mus.: 33 (listed). — GIBBES, 1848, in Tuomey, Rept. Geol. South Carolina: Appendix: xv (South Carolina). — GIBBES, 1849, in White, Statistics State of Georgia (Crust.): 21 (South Carolina). — LEIDY, 1855, Journ. Acad. Nat. Sci. Phila., (2) 3: 149 (17) (Point Judith, Rhode Island). — SMITH, 1869, Amer. Nat., 3 (5): 245 (in account of the parasitic habits of Crustacea). —

VERRILL, 1869, Amer. Nat., 3 (5): 245 (mentioned). — MIERS, 1886, Rept. Sci. Results Voy. Challenger, 17 (49): 276 (listed). — SMITH, 1891, Bull. U. S. Fish Comm., 9: 318 (parasitic). — MAYER, 1905, New York Aquar. Nat. Ser., 1: 105 (mentioned in popular account).

Pinnotheres maculatus GIBBES, 1850, Proc. Amer. Assoc. Adv. Sci., 3: 178 (15) (listed from the coast of New York and South Carolina). — STIMPSON, 1859, Ann. Lyc. Nat. Hist. New York, 7: 67, 68 (South Carolina). — VERRILL, 1873, Rept. U. S. Fish Comm., 1: 309, 434, 459 [reprinted, 1874 by Verrill & Smith: 15, 140, 165], pl. 1 fig. 2 (♂ dorsal view, erroneously labelled *Pinnotheres ostreum*) (mentioned, listed). — VERRILL, SMITH & HARGER, 1873, Rept. U. S. Fish Comm., 1: 546 [reprinted 1874 by Verrill & Smith: 252], pl. 1 fig. 2 (♂ dorsal view, erroneously labelled *Pinnotheres ostreum*) (New England, Cape Cod, to South Carolina). — COUES & YARROW, 1878, Proc. Acad. Nat. Sci. Phila., 1878 (2) 298 298 (Fort Macon, North Carolina). — KINGSLEY, 1878, Proc. Acad. Nat. Sci. Phila., 1878: 323 (8) (listed). — KINGSLEY, 1880, Proc. Acad. Nat. Sci. Phila., 1880: 402 (Beaufort and Morehead Depot, North Carolina). — FAXON, 1879, Bull. Mus. Comp. Zool. Harvard College, 5 (11): 265 (larval stages mentioned in footnote). — SMITH, 1880, Trans. Connecticut Acad. Arts Sci., 4: 263 (corrects error of naming his 1873 pl. 1 fig. 2, mistakenly labelled *Pinnotheres ostreum*). — RATHBUN, R., 1884, in G. B. Goode, Fisheries Fishery Industries U. S., 1 (5): 766 (♂ descr. is not that of *Pinnotheres ostreum*, as assumed by author), pl. 269 fig. 2 (mistakenly labelled *Pinnotheres ostreum*) (Newport, Rhode Island; Vineyard Sound, Massachusetts). — RATHBUN, R., 1893, Nat. Hist. Econ. Crustaceans; 766, pl. 269. (reprint of R. Rathbun, 1884). — RATHBUN, M. J., 1897, Ann. Inst. Jamaica, 1 (1): 36 (Kingston Harbor, Jamaica). — STEARNS, 1889, Ann. Rept. Smithsonian Inst., 1886 (1): 341 (mentioned). — BUMPUS, 1898, Science New York, (n. ser.) 8 (207): 853 (in account of breeding seasons at Woods Hole, Massachusetts). — ENDERS, 1905, Amer. Nat., 39 (457): 37-40 (Beaufort, North Carolina). — RATHBUN, 1905, Occ. Pap. Boston Soc. Nat. Hist., 7: 5 (Massachusetts, Rhode Island, Connecticut). — CARY & SPAULDING, 1909, Publ. Gulf Biol. Sta. Louisiana: 11 (Chandeleur Islands, Louisiana). — FOWLER, 1912, Ann. Rept. New Jersey State Mus., 1911 (2): 434-436, 595, pl. 136 (♂ dorsal and ventral views), pl. 137 (♀ dorsal and ventral views) (part, not reference to *Pinnotheres byssomiæ*) (Anglesea, Sea Isle City, Corson's Inlet, and Cape May, New Jersey). — SUMNER, OSBURN & COLE, 1913, Bull. U. S. Bur. Fish., 31: 337, 674, chart 119 (distribution in Vineyard Sound and Buzzards Bay). — PEARSE, 1913, Biol. Bull., Woods Hole, 24 (2): 102 (commensal with *Chaetopterus*). — HAY & SHORE, 1918, Bull. U. S. Bur. Fish., 35: 443, 444, pl. 35 fig. 10 (♂ and ♀ dorsal views) (Beaufort, North Carolina). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 74-78, pl. 17 figs. 3 (♂ dorsal view), 4 (♀ dorsal view), 5 (♂ ventral view), 6 (♀ ventral view), text-figs. 35 (♂ dorsal view), 36 (♀ maxilliped) (Marthas Vineyard, Massachusetts, to Matagorda Bay, Texas; Cabanas, Cuba; Kingston, Jamaica; St. Thomas, Virgin Islands). — O. W. HYMAN, 1924, Proc. U. S. Nat. Mus., 64 (2497): 4, 5, pl. 2 (zoea 1) figs. 19 (lateral view), 20 (frontal view), pl. 3 (zoea 1) figs. 21 (antennule), 22 (antenna), 23 (mandible), 24 (maxillule), 25 (maxilla), 26 (maxilliped 1), 27 (maxilliped 2), 28 (abdomen and telson) (larval stages) (Beaufort, North Carolina). — FISH, 1926, Bull. U. S. Bur. Fish., 41: 159, 160, figs. 59, 60 (surface collections of larvae). — LEBOUR, 1928, Proc. Zool. Soc. London, 1928: 553 (larval stages). — RICHARDS, 1929, Faunistic Surv. Mar. Invert. New Jersey, Thesis: Univ. Penn.: 90 (mentioned). — COWLES, 1930, Bull. U. S. Bur. Fish., 46: 355, 361 (Chesapeake Bay). — WELSH, 1932, Biol. Bull., Woods Hole, 63 (2): 310-326 (behavior of larvae) (Grassy Island, Woods Hole, Massachusetts). — RATHBUN, 1933, Sci. Surv. Porto Rico Virgin Ids., 15 (1): 82, fig. 74 (♂ dorsal view) (St. Thomas, Virgin Islands; Argentina). — PRATT, 1935, Man. Common Invert. Anim.: 465, fig. 636 (♂ dorsal view) (briefly diagnosed as in original, 1916, ed., p. 399, but fig. is numbered 637). — PEARSE, 1936, Journ. Elisha Mitchell Sci. Soc., 52 (2): 196 (Bogue Sound, North Carolina). — AIKAWA, 1937, Rec. Oceanogr. Works Japan, 9 (1): 152 (larval characters). — GURNEY, 1938, Proc. Zool. Soc. London, (B) 108 (1): 79 (larval stages) (listed). — RICHARDS, 1938, Anim. Seashore: 239, 240, pl. 27 fig. 8 (♀ dorsal view) (New Jersey). — ARCHER, 1948, Alabama Conserv., 19 (11): 8, 8

figs. (♀ dorsal and ventral views, ♂ dorsal view). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [ed. 2, 1968]: 316 (in popular account). — RIOJA, 1950, Rev. Soc. Mexicana Hist. Nat., 11 (1-4): 145-147 (discusses commensalism in Crustacea, mentions *P. maculatus*). — ZINN & RANKIN, 1952, Fauna Penikese Island: 8 (listed). — WASS, 1953, Key Decapod Crustacea Alligator Harbor Area: 11 (key). — WASS, 1955, Quart. Journ. Florida Acad. Sci., 18 (3): 158 (Alligator Harbor, Florida). — MENZEL, 1956, Contrib. Florida State Univ., Oceanog. Inst., 61: 46 (listed). — ATKINS, 1958, Nature, London, 181 (4615): 1087 (in account of British pinnotherids). — CHRISTENSEN & McDERMOTT, 1958, Biol. Bull., Woods Hole, 114 (2): 147 (footnote notes that Verrill & Smith, 1874, mislabelled figure 2, plate 1 as *Pinnotheres ostreum*; it depicts a *Pinnotheres maculatus* ♂; originally corrected by Smith, 1880): 170, 174 (mentioned). — McDERMOTT, 1961, Bull. Ecol. Soc. Amer., 42 (3): 82 (parasitic). — HULINGS, 1961, Quart. Journ. Florida Acad. Sci., 24 (3): 219 (mentioned). — TABB & MANNING, 1961, Bull. Mar. Sci. Gulf Caribb., 11 (4): 601 (Sandy Key Basin, Florida Bay, Florida). — TABB & MANNING, 1962, State of Florida Board Conserv. Tech Ser., 39: 45 (Sandy Key Basin, Florida Bay, Florida). — SASTRY & MENZEL, 1962, Biol. Bull., Woods Hole, 123 (2): 388-395 (behavior). — PEARCE, 1964, Biol. Bull. Woods Hole, 127: 384 (reproduction). — WASS, 1965, Special Sci. Rept. Virginia Inst. Mar. Sci., 24 (3d revision, mimeographed): 41 (listed) (as in an earlier 1963 edition: 'Collected twice by Cowles [1930] from off the mouth of Potomac and York Rivers'). — WILLIAMS, 1965, Fish. Bull. U. S. Fish Wildlife Serv., 65 (1): 203, 206-208, text-fig. 190 (♂ dorsal view, ♀ dorsal view) ('Off Marthas Vineyard, Massachusetts, to Mar del Plata, Argentina'). — COSTLOW & BOOKHOÛT, 1966, Chesapeake Sci., 7 (3): 157-163, figs. 1 A (side view, 1st zoea), B (ventral view, 1st zoea), C (antennule), D (antenna), E (maxillule), F (maxilla), G (1st maxilliped), H (2nd maxilliped), I (side view, 2nd zoea), J (ventral view, 2nd zoea, with appendages removed from right side), K (antennule), L (antenna), M (maxillule), N (maxilla), 2 A (3rd zoea, side view), B (ventral view), C (antennule), D (antenna), E (mandible), F (maxillule), G (maxilla), H (side view, 4th zoea), I (ventral view), J (antennule), K (antenna), L (mandible), M (maxillule), N (maxilla), 3 A (side view, 5th zoea), B (ventral view), C (antennule), D (antenna), E (mandible), F (maxillule), G (maxilla), H (side view, megalopa), I (dorsal view, appendages removed from right side), J (antennule), K (antenna), L (mandible), M (maxillule), N (maxilla), O (1st maxilliped), P (2nd maxilliped), Q (3rd maxilliped). — CERAME-VIVAS & GRAY, 1966, Ecology, 47: 263 (listed, North Carolina). — PEARCE, 1966, Some Contemporary Stud. Mar. Sci.: 565-589 (biology). — PEARCE, 1966, Pacific Sci., 20 (1): 16-33 (biology). — WELLS & WELLS, 1966, Crustaceana, 11: 53 (host of bopyrid isopod *Dactylokepon hunterae* Wells & Wells, N. Carolina). — PATTON, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1236, 1237 (behavior). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1175, 1178, 1182, 1183, 1186, 1187, 1202 (biology, cataloged, taxonomy). — EIDEMILLER, 1970, Quart. Journ. Florida Acad. Sci., 32 (4): 266-274. — GOSNER, 1971, Guide Identif. mar. Invert. Cape Hatteras to Bay of Fundy: 551. — RODRIGUES, 1971, Trabalhos Oceanogr. Univ. Fed. Pernambuco, Recife [for 1967/69], 9/11: 255, 256, fig. 4 (gonopod), 5 (third maxilliped) (Baraqueçaba [Guaqueçaba], Parana, S. Sebastião, São Paulo, [Praia da] Urca, Guanabara [Brazil]).

Pinnotheres ostreum [not Say, 1817] VERRILL, HARGER, & SMITH, 1873, Rept. U. S. Fish. Comm., 1: 546 (part, pl. 1 fig. 2, which is dorsal view of ♂ *Pinnotheres maculatus*) (reprinted 1874 by Verrill & Smith: 252 with identical fig. 2). — RATHBUN, 1893, Proc. U. S. Nat. Mus., 16: pl. 269 fig. 2 (♂ dorsal view) (after Smith).

Pinnotheres maculata ALLEE, 1922, Studies Mar. Ecol., 2: 70 (Massachusetts). — ALLEE, 1923, Biol. Bull., Woods Hole, 44 (5): 213 (listed). — GRAY, 1961, Biol. Bull., Woods Hole, 120 (3): 357 (Beaufort, North Carolina).

Pinnotheres maculatus BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1418 (mentioned).

Measurements: Male, length 8.4 mm, width 8.1 mm (Rathbun, 1918); female, length 16.0 mm width 17.25 mm (Hay & Shore).

Habitat: In bivalves: ? *Chama lazarus* [*Chama macerophylla* Gmelin] (Linnaeus, 1763) (see Rathbun, 1918, Bull. U. S. Nat. Mus., 97: 66); *Pinna muricata* [*Atrina serrata* Sowerby] (DeKay);

Mytilus edulis Linnaeus (Leidy; R. Rathbun); *Pecten tenuicostatus* [*Chlamys (Placopecten) magellanica* (Gmelin)] (Stearns; R. Rathbun); *Pinna semi-nuda* [*Atrina seminuda* (Lamarck)] (Enders); *Pecten magellanicus* [*Chlamys (Placopecten) magellanica* (Gmelin)], *Modiolus modiolus* Linnaeus (Sumner, Osburn, & Cole); *Modiolus tulipa* [*Modiolus americanus* Leach], *Mya arenaria* Linnaeus, *Pecten irradians* [*Chlamys (Aequipecten) irradians* (Lamarck)] (Rathbun, 1918); *Atrina rigida* Solander, *Pecten gibbus* [*Chlamys (Aequipecten) gibba* (Linnaeus)] (Wass); *Aequipecten gibbus* [*Chlamys (Aequipecten) gibba* (Linnaeus)] (Hulings); *Aequipecten irradians* [*Chlamys (Aequipecten) irradians* (Lamarck)] (Tabb & Manning); *Anomia simplex* d'Orbigny (McDermott); *Atrina rigida* Solander, *Perna Perna* (Linnaeus) [*Isognomon* sp.?], *Pecten tenuicosta* [*Chlamys (Placopecten) magellanica* (Gmelin)] (Rodriguez). In tubes of polychaetes: *Chaetopterus pergamentaceus* [*Chaetopterus variopedatus* (Renier)] (Enders); *Arenicola* (Allee); *Chaetopterus variopedatus* (Renier) (MacGinitie & MacGinitie; Rodrigues), Sandy, gravel, and shelly bottoms; rock (?) (Sumner, Osburn, & Cole); gravel, sand, shell and mud bottoms, surface to 21 fms [38.5 m] (Rathbun, 1918); 'The adults are found living as parasites in the mantle cavity of *Mytilus edulis* [Linnaeus], the edible mussel. Sixty-five per cent of the mussels collected from a bed near Grassy Island, Woods Hole [Massachusetts], were infested with these crabs so the adults were easily obtained' (Welsh). Surface to 25 fms [45.7 m] (Williams).

Distribution: Cape Cod to Texas, U.S.A.; Cuba; Puerto Rico (unpublished USNM records); Jamaica; Virgin Islands; Brazil; Uruguay; Argentina.

Remarks: Rathbun (1918, Bull. U. S. Nat. Mus., 97: 66) under *Pinnotheres ostreum* lists as a questionable synonym of that species *Pinnotheres pinnophylax* Bosc, 1801-02. Bosc, however, did not describe a new species, but only referred to *Cancer pinnophylax* Linnaeus, 1767, which itself is a junior objective synonym of *Cancer parasiticus* Linnaeus, 1763. Linnaeus (1763, 1767) described the species as being found in *Chama lazarus* L., which, as Miss Rathbun pointed out, more likely is *C. macrophylax* Gmelin, as Linné's material came from America. As Linnaeus described his species as being hairy, it is more likely that he had *Pinnotheres maculatus* rather than *P. ostreum*. Certainty on this point may never be obtained and it seems best to treat *Cancer parasiticus* as a dubious species.

Pinnotheres maindroni Nobili, 1905

Pinnotheres Maindroni NOBILI, 1905, Bull. Mus. Nat. Hist. Nat. Paris, 11 (6): 410 (♀ holotype: MNHNP; type-locality: 'Obock [Gulf of Aden, French Somaliland]'). — NOBILI, 1906, Ann. Sci. Nat. Zool. Paris, (9) 4: 306, 307, pl. 8 fig. 8 (♀ dorsal view), text-fig. 11 (♀ maxilliped) (Obock, Somaliland).

Pinnotheres maindroni LAURIE, 1915, Journ. Linn. Soc. London, Zool., 31 (209): 415 (listed). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 254, 287 (listed, key). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1202, 1222 (cataloged).

Pinnotheres maindroni GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution noted).

Measurements: Female, length 7.5 mm, width 10.0 mm (Nobili, 1905).

Distribution: Known only from the type locality.

Pinnotheres malaguena Garth, 1948

Pinnotheres malagueña GARTH, 1948, Bull. Amer. Mus. Nat. Hist., 92 (1): 53-55, fig. 5 (♂) a (dorsal view), b (right maxilliped), 4 (left chela) d (dactylus of left leg 2), e (left gonopod, f (abdomen) (♂ holotype: AMNH 10012; type-locality: '...Málaga Bay, Colombia...').

Pinnotheres malaguena SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1202, 1218 (cataloged).

Measurements: Male, length 2.6 mm, width 2.3 mm.

Habitat: 4-9 meters.

Distribution: Known only from the type locality.

Pinnotheres margarita Smith, 1869

Pinnotheres margarita SMITH, 1869, in Verrill, Amer. Nat., 3 (5): 245, footnote (♀ holotype: MNHNP; type-locality: '... Bay of Panama'). — SMITH, 1870, Trans. Connecticut Acad. Arts Sci., 2: 166-169 (Pearl Islands, Bay of Panama; La Paz, Mexico). — LOCKINGTON, 1877, Proc. Calif. Acad. Sci., 7: 154 (10) (Mulege Bay, Gulf of California, Mexico). — MIERS, 1886, Rept. Sci. Results Voy. Challenger, 17 (49): 276 (listed). — RATHBUN, 1910, Proc. U. S. Nat. Mus., 38: 587 (listed). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 91-93 (after Smith, 1870). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 285, 286 (listed). — GLASSELL, 1934, Journ. Wash. Acad. Sci., 24 (7): 301 (Gulf of California) (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1178, 1202, 1203, 1223, 1225 (biology; cataloged).

Measurements: Male, length 5.5 mm, width 6.1 mm (Smith, 1870); female, length 11.8 mm, width 13.8 mm (Smith, 1869).

Habitat: In the pearl oyster, *Margaritophora fimbriata* [*Pinctada mazatlanica* (Hanley)] (Smith, 1869).

Distribution: Mulegé Bay, Gulf of California; La Paz, Mexico; Bay of Panama.

***Pinnotheres margaritiferae* Laurie, 1906**

Pinnotheres margaritiferae LAURIE, 1906, in Herdman, Rept. Pearl Oyster Fish. Ceylon, 5: 424, 425, fig. 10 (♂) (dorsal and ventral views), a (maxilliped) (♂ holotype: BM 1907: 5: 22: 379; type-locality: 'Pearl Banks, Gulf of Manaar [Ceylon]'). — HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiawar, 1: 101, 102 (listed). — SOUTHWELL, 1911, Ceylon Mar. Biol. Repts., Colombo, 5 (19): 227, pl. 3 (♀) fig. 3 (dorsal view), a (ventral view) (Kondatchi Paar, Ceylon).

Pinnotheres margaritiferae TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 253 (listed, key). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 164 (asymmetry). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1179, 1203 (biology; cataloged).

Measurements: Male, length 5.25 mm; female, length 9.0 mm, width 10.0 mm (Southwell).

Habitat: In the bivalves: *Mytilus* sp. and occasionally *Margaritifera vulgaris* [*Pinctada margaritifera* (Linnaeus)] (Southwell).

Distribution: Ceylon.

***Pinnotheres marioni* Gourret, 1887**

Pinnotheres '(nov. spec. parasite de l'*Ascidia mentula*, O. F. Müller)' GOURRET, 1884, Ann. Mus. Nat. Marseille Zool., 2 (2): 15, 19, 20, pl. 2 fig. 12 (telson of zoea) (compared with *P. veterum* larvae). — Williamson, 1915, Nordisches Plankton, 6: 561, 563, fig. 515 (larval telson [of zoea] after Gourret).

Pinnotheres Marioni GOURRET, 1887, Compt. Rend. Acad. Sci. Paris, 104: 186, 187 (♂, ♀ syntypes: ? MHNM; type-locality: '...golfe de Marseille [France]'). — GOURRET, 1888, Ann. Mus. Hist. Nat. Marseille Zool., 3 (5): 11, 44 (listed).

Pinnotheres marioni SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1203, 1219 (cataloged, Gourret citation should read 1887 instead of 1886).

Habitat: In the bivalve, *Cardium paucicostatum* [*Acanthocardia paucicostata* (Sowerby)], and in the branchial cavity or in the cloaca of the ascidians, *Phallusia mamillata* (Cuvier) and *Phallusia mentula* [*Ascidia mentula* O. F. Müller].

Distribution: Known only from the type locality. See also under *P. ascidicola*, which may be synonymous.

***Pinnotheres mccainae* new name**

Pinnotheres rouxi [not H. Milne Edwards, 1853] ROSSIGNOL, 1957, in Collignon, J., M. Rossignol & Ch. Roux, Mollusques, Crustacés, Poissons Marins des côtes d'A.E.F. [Afrique Equatoriale Française]: 84-86, fig. 4 (♀), 4-1 (dorsal view), 4-2 (chela), 4-3 (maxilliped) (♀ ovig., holotype: COIEC; type locality: 'Pointe-Noire [Congo]'). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1208 (cataloged). — (cf. also present paper, p. 2).

Pinnotheres rouxi ROSSIGNOL, 1962, Trav. Centre. Océanog. Pointe Noire, 2 (5): 118 (listed).

Measurements: Female (ovigerous), length 6.0 mm, width 7.0 mm.

Habitat: In the bivalve, *Donax*.

Distribution: Known only from the type locality.

***Pinnotheres modiolicola* Bürger, 1895**

Pinnotheres modiolicola BÜRGER, 1895, Zool. Jahrb. Syst., 8: 370, pl. 9 fig. 9 (♀ dorsal view), pl. 10 fig. 9 (♀ maxilliped) (holotype: ZIMB 67/951a; type-locality: '...Philippinen...'). — LANCHESTER, 1900, Proc. Zool. Soc. London, 1900: 761, 762 (Singapore; China). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 546 (listed).

Pinnotheres modiolicolus TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 253 (listed, key). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1203 (mentioned). — GEORGE & NOBLE, 1970, Journ. Mar. Biol. Assoc. India, 10 (2): 392, fig. 4 (maxilliped), 5, 6 (first male pleopod) (Karwar and Kodibag, S. W. India).

Measurements: Female, length 8.25 mm, width 10.0 mm (Lanchester).

Habitat: In the bivalve: *Modiola philippinarum* [*Modiolus philippinarum* (Hanley)] (Bürger); *Mactra violacea* (Chemnitz) and *Katelysia opima* [= *Marcia opima* (Gmelin)] (George & Noble).

Distribution: S.W. India; Singapore; Malaysia; the Philippine Islands.

Pinnotheres moseri Rathbun, 1918

Pinnotheres moseri RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 64, 65, 91, 94, 95, pl. 21 (♀) fig. 3 (ventral view), 4 (dorsal view), text-fig. 47 (♀ maxilliped) (♀ holotype: USNM 23440; type-locality: '...Port Royal, Jamaica') (also from off St. Martins [Keys?] Reef, West Florida, and near Kingston, Jamaica). — GOODBODY, 1960, Nature, London, 185 (4714): 704, 705, fig. 1 (zoea) (abbreviated development). — HARTNOLL, 1964, Proc. Linn. Soc. London, 175 (2): 167 (larval stage). — PEARCE, 1966, Some Contemporary Stud. Mar. Sci.: 585 (biology). — PATTON, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1236 (behavior). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1175, 1203, 1219 (biology; cataloged).

Pinnotheres moseri BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1420 (mentioned).

Measurements: Female (ovigerous), length 9.0 mm, width 8.4 mm (Rathbun).

Habitat: Commensal in a black ascidian; also from sea squirts, dredged in 17 feet [5.5 m] from '...rocky bottom covered with grass and thin layers of sand and mud...' and from the branchial cavity of the ascidian, *Polycarpa obtecta* Traustedt (Rathbun).

Distribution: West Florida; Jamaica.

Pinnotheres muliniarum Rathbun, 1918

Pinnotheres muliniarum RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 64, 66, 81, 82, pl. 18 (♂) figs. 2 (dorsal view), 3 (ventral view), text-fig. 38 (♂ maxilliped) (♂ holotype: USNM 23443; type-locality: '...Lower [Baya] California [Mexico]'). — GLASELL, 1934, Journ. Wash. Acad. Sci., 24 (7): 301 (Gulf of California) (listed).

Measurements: Male, length 3.0 mm, width 3.6 mm.

Habitat: In the bivalve, *Mulinia* sp. (Rathbun).

Distribution: Known only from the type locality.

Pinnotheres nigrans Rathbun, 1909

Pinnotheres nigrans RATHBUN, 1909, Proc. Biol. Soc. Washington, 22: 110 (♀ holotype: UZM; type-locality: '...Koh Lan [Thailand]'). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 4 (4): 334, figs. (♀) 16 (dorsal view), 17 (maxilliped) (Koh Lan, Thailand). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 254 (listed, key). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 173 (compared with *Pinnotheres similis*). — SUVATTI, 1938, Check-List aquatic Fauna Siam: 69 (listed). — SUVATTI, 1950, Fauna of Thailand: 159 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1203, 1223 (cataloged).

Measurements: Female (ovigerous), length 6.8 mm, width 8.3 mm (Rathbun, 1909).

Habitat: Not recorded.

Distribution: Known only from the type locality.

Pinnotheres novaezelandiae Filhol, 1885

Pinnotheres pisum [not Linnaeus, 1767] HELLER, 1865, Reise Novara Zool., 2 (3): 67 (Pinipet, Auckland, New Zealand). — MIERS, 1876, Cat. Crust. New Zealand: 48 (New Zealand). — FILHOL, 1885, Biblioth. École Haut. Étud., Sci. Nat., 30 (2): 50 (listed). — FILHOL, 1886, Miss. Ile Campbell, passage de Vénus,

Zool., 3 (2): 394 (New Zealand). — ADENSAMER, 1897, Ann. K. K. Naturhist. Hofmus. Wien, 12: 105, 106 (part, specimens from New Zealand, Auckland, and Australia). — HUTTON, 1904, Index Faunae Novae Zealandiae: 250 (listed). — CHILTON, 1906, Trans. New Zealand Inst., 38: 265 (Channel Island, Hauraki Gulf, New Zealand). — FULTON & GRANT, 1906, Proc. Roy. Soc. Victoria, (n. ser.) 19 (1): 18 (Victoria, Australia). — CHILTON, 1911, Records Canterbury Mus., 1 (3): 295, 296 (mentioned). — THOMSON, 1913, Trans. Proc. New Zealand Inst., 45: 238 (New Zealand). — BORRADAILE, 1916, Nat. Hist. Rept. Brit. Antarct. Exped., 3 (2): 100, 101, fig. 12 (maxilliped) (D'Urville Island and Nelson, New Zealand). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 251, 287 (listed). — THOMSON & ANDERTON, 1921, Bull. New Zealand Brd. Sci. Art, 2: 101 (New Zealand). — GURNEY, 1924, Nat. Hist. Rept. Brit. Antarct. 'Terra Nova' Exped., Zool., 8 (3): 195 (larval stages, zoea) (North Cape, Bay of Islands, New Zealand; Melbourne Harbour, Australia). — CHILTON & BENNETT, 1929, Trans. Proc. New Zealand Inst., 59: 775, 776 (listed). — RICHARDSON, 1949, Tuatara, 2 (1): 30, 36, fig. 23 (♀ carapace) (New Zealand).

Pinnotheres Novae Zelandiae FILHOL, 1885, Biblioth. École Haut. Étud., Sci. Nat., 30 (2): 15, 16, 50 (syntype: MNHNP; type-locality: Massacre Bay, Strait of Cook [New Zealand] [typographical error in specific name on p. 15]). — FILHOL, 1886, Miss. Ile Campbell, passage de Vénus, Zool., 3 (2): 395, 396, 495, pl. 46 [on p. 395 is incorrectly cited as pl. 45] figs. 1 (♂ dorsal view), 2 (♂ maxilliped), 3 (♂ chela), 4 (♀ dorsal view), 5 (♀ abdomen), 6 (♂ abdomen and sternum) (figures added to 1885 description).

Pinnotheres novae-zelandiae LENZ, 1901, Zool. Jahrb. Syst., 14: 467, 480, pl. 32 (♀) figs. 11 (chela), 12 (cheliped), 13 (carapace), 14 (maxilliped) (French Pass, Elmsly Bay, New Zealand) (compared with *Pinnotheres schauinslandi*). — CHILTON & BENNETT, 1929, Trans. Proc. New Zealand Inst., 59: 775, 776 (listed).

Pinnoteres pisum HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattivar, 1: 102 (part, reference to New Zealand).

Pinnotheres novae-zelandiae HUTTON, 1904, Index Faunae Novae Zealandiae: 250 (listed). — CHILTON, 1911, Records Canterbury Mus., 1 (3): 295, 296 (50 miles east of Wreck Reef, 6 miles east of Jones' Head, and 23 miles southwest of Akoroa, New Zealand). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 251, 287 (listed). — YOUNG, 1929, Trans. Proc. New Zealand Inst., 60 (1): 152 (listed). — GÜLLER, 1952, Records Queen Victoria Mus. Tasmania, 3: 40 (East coast of Flinders Island, Tasmania) (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1175, 1203, 1207 (life history discussion).

Pinnotheres novaezelandiae RATHBUN, 1923, Biol. Res. Fish. Exped. 'Endeavour', 5 (3): 98, 99, pl. 16 fig. 2 (♀ dorsal view), text-fig. 2 (♀ left maxilliped) (East coast of Flinders Island, Bass Strait, Tasmania). — POWELL, 1947, Native Anim. New Zealand: 39, 40 (mentioned in popular account). — SCOTT, 1961, Trans. Roy. Soc. New Zealand, Zool., 1 (22): 304, 305, 307, 308, figs. 1 (dorsal view), 4 (♀ right chela), 6 (left mandible) (reviews New Zealand Pinnotheridae and includes comparison with *Pinnotheres pisum*). — DELL, 1963, Native Crabs, Nature in New Zealand: 50, 2 figs. (♀ dorsal and ventral view) (popular account). — BENNETT, 1964, Bull. New Zealand Dept. Sci. Indust. Res., 153: 76–79, figs. 84 (♀ abdomen), 85 (♂ abdomen), 88 (maxilliped), 92 (zoea, lateral view), 93 (zoea, telson) (New Zealand; Chatham Islands; South and Western Australia). — DELL, 1968, Rec. Dominion Mus., 6 (3): 26 (listed). — TAKEDA & MIYAKE, 1969, Ohmu, 2 (8): 180 (synonymy, measurements, distribution).

Measurements: ♀ Female, length 10.0 mm, width 10.3 mm (Lenz).

Habitat: In bivalves: *Mytilus planulatus* [*Mytilus edulis aoteanus* Powell] (Chilton & Bennett); *Atrina zelandica* [*Atrina pectinata zelandica* Gray], *Modiolus neozelanicus* (Iredale), *Mytilus edulis aoteanus* Powell, *Perna canalicula* (Gmelin), *Resania lanceolata* Gray, *Spisula aequilageralis* [*Spisula aequilateralis* Deshayes] (Scott); *Mactra discors* Gray, *Mytilus canaliculatus* [*Perna canalicula* (Gmelin)]; 0–110 fms [0–200 m] (Bennett); 160 m (Takeda & Miyake).

Distribution: Australia, Tasmania, New Zealand, Chatham Islands.

Pinnotheres nudifrons Bürger, 1895

Pinnotheres nudifrons BÜRGER, 1895, Zool. Jahrb. Syst., 8: 378, pl. 9 fig. 22 (♀ dorsal view), pl. 10 fig. 20 (♀ maxilliped) (syntypes: ZIMB 67/535 no longer ex-

tant; type-locality: 'Lapinig [Philippine Islands]'. — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 255 (listed, key). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1204, 1216 (cataloged).

Measurements: Female (ovigerous), length 6.0 mm, width 7.0 mm (Bürger).

Distribution: Known only from the type locality.

Pinnotheres nudus Holmes, 1895

Pinnotheres nudus HOLMES, 1895, Proc. California Acad. Sci., (2) 4: 563, 564, pl. 20 (♀) figs. 1 (carapace), 2 (abdomen), 3 (maxilliped), 4 (chela), 5 (leg 1) (type not extant; type-locality: 'Santa Cruz [California]'). — HOLMES, 1900, Occ. Pap. California Acad. Sci., 7: 86 (Monterey, California). — RATHBUN, 1904, Harriman Alaska Exped., 10: 185 (listed). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 64, 65, 66, 68, 83, 84, fig. 40 (♀), a (carapace), b (abdomen), c (maxilliped), d (left chela), e (leg 1) (after Holmes, 1895). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 285 (listed). — SCHMITT, 1921, Univ. California Publ. Zool., 23: 252, fig. 149 (♀) a (carapace), b (abdomen), c (maxilliped), d (left chela), e (leg 1) (after Holmes, 1895). — JOHNSON & SNOOK, 1927, Seashore Anim. Pacific Coast: 391 (general account). — PRATT, 1935, Man. Common Invert. Anim.: 465 (briefly diagnosed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1204, 1220, 1226 (cataloged).

Measurements: Female, length 20.0 mm, width 24.0 mm (Holmes, 1895).

Distribution: Monterey and Santa Cruz, California.

Pinnotheres obesus Dana, 1852

Pinnothera obesa DANA, 1852, U. S. Expl. Exped., 13 (text): 380. — DANA, 1855, U. S. Expl. Exped., 13 (atlas): 8, pl. 24 fig. 3 a (♂ dorsal view), b, c, (♀ carapace), d (ventral view of frontal region), e (♀ maxillipeds), f (♀ maxilliped), g (♀ seta of maxilliped), h (♂ abdomen), i (chela) (syntypes probably not extant; type locality: 'Feejee [Fiji] Islands') (compared with *Pinnotheres globosus*).

Pinnotheres obesa WOODWARD, 1886, Proc. Zool. Soc. London, 1886: 177 (mentioned).

Pinnotheres obesus [not Miers, 1880] WALKER, 1887, Journ. Linn. Soc. London Zool., 20: 111 (Singapore, Malaysia) (listed). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 252, 257, 258, pl. 17 (♂) fig. 3 (dorsal view with abdomen extended) a (maxilliped) (considers *Pinnotheres siamensis* from Gulf of Siam a possible synonym) (North coast of Ceram, Molucca Islands; also mentions Fiji Islands and Borneo). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 176 (compared with *Pinnotheres latissimus*). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1204 (mentioned).

Pinnotheres obesa FULTON & GRANT, 1906, Proc. Roy. Soc. Victoria, (n. ser.) 19 (1): 18 (Victoria, Australia).

Pinnotheres obesus HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiawar, 1: 102 ('*P. globosus* = *obesus*, Dana') ('China Seas').

Measurements: Male (figured specimen), length 6.3 mm, width 7 mm; female (type, 4½ x 6½ lines), length 10.1 mm, width 13.4 mm (Dana); male, length 3.0 mm, width 3.08 mm (Tesch).

Habitat: In bivalves: perhaps in *Meroe quadrata* [*Sunetta quadrata* nomen nudum] and *Cytherea* sp. [*Periglypta*] (Hornell & Southwell); *Arca*, 18 m (Tesch).

Distribution: Singapore, Malaysia; Borneo; Molucca Islands, Indonesia; Fiji Islands; China Seas; Victoria, Australia. [In a personal communication Dr. Isabella Gordon says that the only specimens of *Pinnotheres obesus* in the British Museum are from the Fiji Islands.]

Pinnotheres obscurus Stimpson, 1858

Pinnotheres obscurus STIMPSON, 1858, Proc. Acad. Nat. Sci. Phila., 1858: 108 (♀ holotype: probably not extant; type-locality: 'In portu 'Hong Kong)'). — MIERS, 1886, Rept. Sci. Results Voy. Challenger, 17 (49): 276 (listed). — STIMPSON, 1907, Smithsonian Misc. Coll., 49: 141 (Hongkong). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 254, 286 (listed). — GEE, 1925, Lingnaam Agr. Rev., 3:

152 (Hongkong). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2, (3): 1204, 1225 (cataloged).

Measurements: Female, length 8.38 mm, width 11.43 mm (Stimpson, 1858).

Distribution: Known only from the type locality.

Pinnotheres onychodactylus Tesch, 1918

Pinnotheres onychodactylus TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 253, 259, pl. 17 (♀) fig. 5 (dorsal view), a (maxilliped), b (propodus and dactylus of left leg 3), c (propodus and dactylus of left leg 4) (syntypes: 1♀ RMNH no. D 2159, 3 specimens ZMA; type-locality: 'between Gisser and Ceram Laut [Molucca Islands]'). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1204, 1225 (cataloged; taxonomy).

Measurements: Female (ovigerous), length 6.8 mm, width 8.8 mm.

Habitat: 18 meters, on reef.

Distribution: Known only from the type locality.

Pinnotheres orcutti Rathbun, 1918

Pinnotheres orcutti RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 64, 65, 66, 98, 99, pl. 22 (♂) figs. 5 (ventral view), 6 (dorsal view) text-fig. 50 (♂ endognath of maxilliped) (♂ holotype: USNM 49215; type-locality: 'Manzanillo, Mexico...'). — GLASSELL, 1938, Trans. San Diego Soc. Nat. Hist., 8 (33): 451, 452 (Tres Marias Islands and Tenacatita Bay, Mexico). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1204 (cataloged).

Measurements: Male, length 3.6 mm, width 3.1 mm (Rathbun); female (ovigerous), length 8.5 mm, width 8.1 mm (Glassell).

Distribution: Tres Marias Islands; Tenacatita Bay and Manzanillo, west coast of Mexico.

Pinnotheres orientalis Woodward, 1886

Pinnotheres orientalis WOODWARD, 1886, Proc. Zool. Soc. London, 1886; 177 (only mentioned, a nomen nudum) (Australia).

Habitat: In bivalves: *Pinna*, *Donax*, *Pectunculus* [*Glycymeris*].

Pinnotheres ortmanni Bürger, 1895

Pinnotheres ortmanni BÜRGER, 1895, Zool. Jahrb. Syst., 8: 384, 385, pl. 9 fig. 30 (♀ dorsal view), pl. 10 fig. 28 (♀ maxilliped) (♀ holotype, ovig.: ZIMB 67/340, no longer extant; type-locality: 'Aibukit [Philippine Islands]'). — LANCHESTER, 1900, Proc. Zool. Soc. London, 1900: 761 (Singapore, Malaysia). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 255 (listed, key). — CHOPRA, 1931, Records Indian Mus., 33 (3): 322, 323 (compared with *Pinnotheres deccanensis*). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1205, 1216 (cataloged).

Measurements: Female (ovigerous), length 14.0 mm, width 15.0 mm (Bürger).

Habitat: From the respiratory tree of *Holothuria fuscocinerea* Jaeger (Lanchester).

Distribution: Aibukit, Philippine Islands, and Singapore, Malaysia.

Pinnotheres ostreum Say, 1817

Pinnotheres ostreum SAY, 1817, Journ. Acad. Nat. Sci. Phila., 1 (1): 67, 68, pl. 4 fig. 5 (♀ dorsal view) (6 probable syntypes (from the United States and Virginia) in BM; type-locality: 'United States'; according to DeKay 1844, Say's specimen was from New Jersey). — GOULD, 1835, in Hitchcock, Cat. Anim. & Plants Massachusetts: 29 (Massachusetts). — THOMPSON, 1836, Entomol. Mag., 3 (6): 89, 90 (mentioned in account of metamorphosis and natural history of *Pinnotheres*). — GOULD, 1841, Rept. Invert. Massachusetts: 328 (Massachusetts). — DeKAY, 1844, Zool. New York, 6: 12, 13, pl. 7 fig. 16 (♀ dorsal view) (New York). — WHITE, 1847, List Crust. Brit. Mus.: 32 (United States, North America; Georgia; E. Florida). — GIBBES, 1848, in Tuomey, Report on the Geology of

South Carolina (Appendix): xv [15] (South Carolina). — GIBBES, 1849, in White, Statistics State of Georgia, (Crust.): 21 (South Carolina; listed). — GIBBES, 1850, Proc. Amer. Assoc. Adv. Sci., 3: 179 (15) (listed). — LEIDY, 1855, Journ. Acad. Nat. Sci. Phila., (2) 3: 149 (17) (Point Judith, Rhode Island; Absecom and Great Egg Harbor, New Jersey). — STIMPSON, 1859, Ann. Lyc. Nat. Hist. New York, 7: 67 ('Virginian province'). — SMITH, 1869, Amer. Nat., 3 (5): 244, 245, fig. 41 (♀ dorsal view) (general account). — VERRILL, 1869, Amer. Nat., 3 (5): 245, fig. 41 (? ♀, dorsal view). — VERRILL, 1873, Rept. U. S. Fish Comm., 1: 309, 367, 377, 434, 438, 451, 459 [reprinted, 1864, by Verrill & Smith: 15, 73, 83, 140, 144, 157, 167] (not pl. 1 fig. 2). — VERRILL, SMITH, & HARGER, 1873, Rept. U. S. Fish Comm., 1: 546 [reprinted, 1874, by Verrill & Smith: 252] (not pl. 1, fig. 2) (Massachusetts to South Carolina). — UHLER, 1879, Stud. Biol. Lab. Johns Hopkins Univ., 1 (3): 25 (Fort Wool, Virginia). — KINGSLEY, 1878, Proc. Acad. Nat. Sci. Phila., 1878: 323 (8) (listed). — KINGSLEY, 1880, Proc. Acad. Nat. Sci. Philadelphia, 1879: 402 (Beaufort, North Carolina). — SMITH, 1880, Trans. Connecticut Acad. Arts Sci., 4: 263 (listed in Crustacea of New England, but states he has not found it). — RYDER, 1881, Rept. Commr. Fish. Maryland, (Append. A): 24, 25 (Chesapeake Bay). — BIRGE, 1882, Amer. Nat., 16: 589-591, figs. (zoea 1) 1 (lateral view), 2 (frontal view), 3 (posterior view), 4 (antennule), 5 (mandible), 6 (labrum), 7 (maxilla 1), 8 (maxilla 2), 9 (maxilliped 1), 10 (maxilliped 2), 11 (tip of abdomen) (larval stages). — HYATT, 1882, Guides for Science Teaching, 7: 62, 66, 67, fig. 30 (♀ dorsal view [very crude]) (very brief account). — RATHBUN, R., 1884, in G. B. Goode, Fisheries Fishery Industries U. S., 1 (5): 766 (not description of male, p. 765, or pl. 269 fig. 2, which is of the male of *Pinnotheres maculatus*). — KINGSLEY, 1884, Standard Nat. Hist., 2 (2): 64, fig. 80 (♀ dorsal view) (general account). — HEILPRIN, 1888, Anim. Life of our Seashore: 87, fig. (♀ dorsal view) (mentioned in popular account). — LEIDY, 1888, Proc. Acad. Nat. Sci. Philadelphia, 1888: 333 (Beach Haven, New Jersey). — STEARNS, 1889, Ann. Rept. Smithsonian Inst., 1886 (1): 340, 341 (mentioned). — SMITH, 1891, Bull. U. S. Fish Comm., 9: 318 (mentioned). — DEAN, 1892, Bull. U. S. Fish Comm., 10: 351, 352 (ecology). — RATHBUN, R., 1893, Nat. Hist. Econ. Crustaceans: 765, 766 (not pl. 269 fig. 2) (reprint of Rathbun, R., 1884, with identical pagination and illus.). — ANON., 1900, Evening Star (Washington, D. C. newspaper) Friday, Sept. 21 (popular account). — WILSON, 1900, Amer. Nat., 34 (401): 352 (Beaufort, North Carolina) (listed). — GERSTAECKER & ORTMANN, 1901, in Bronn, Klassen Ordnungen Tierreichs, (ed. 1) 5 (2): 1259 (general account with *ostreum* misspelled, typographical error). — PAULMIER, 1905, Bull. New York State Mus., 91: 149 (New York City). — MAYER, 1905, New York Aquar. Nat. Ser., 1: 104, 105, fig. 72 (♀ ventral view) (mentioned in popular account). — RATHBUN, 1905, Occ. Pap. Boston Soc. Nat. Hist., 7: 4, 5 (Massachusetts, Rhode Island, Connecticut). — FOWLER, 1912, Ann. Rept. New Jersey State Mus., 1911 (2): 436-438, pl. 138 (♀ dorsal and ventral views) (New Jersey; Rehoboth, Delaware; Chesapeake Bay, Maryland; Chincoteague, Watchaugue, and Norfolk, Virginia; New York City). — STAFFORD, 1912, Contr. Canadian Biol., 1906-1910: 43 (mentioned). — SUMNER, OSBURN & COLE, 1913, Bull. U. S. Bur. Fish., 31: 674 (Massachusetts). — DOFLEIN, 1914, in Hesse & Doflein, Tierbau und Tierleben, 2: 279 (host; biology). — HAY & SHORE, 1918, Bull. U. S. Bur. Fish., 35: 543, pl. 35 fig. 9 (♀ dorsal view) (Beaufort, North Carolina). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 12, 63, 65, 66-68, 69, pl. 15 figs. 3 (♀ dorsal view), 4 (♀ ventral view), 5 (♂ ventral view), 6 (♂ dorsal view); text-fig. 30 (♀ maxilliped) (New York Bay; Chesapeake Bay; Rappahannock River and Lynn Haven, Virginia; Beaufort, North Carolina; Winyah Bay, Clam Creek, Charleston and Colleton River, South Carolina; Micco, Florida). — O. W. HYMAN, 1924, Proc. U. S. Nat. Mus., 64 (2497): 3, 4, pl. 1 figs. 1 (lateral view zoea 1), 2 (frontal view zoea 1), 3 (frontal view zoea 2), 4 (lateral view zoea 2), 5 (antennula zoea 1), 6 (antennula zoea 2), 7 (mandible zoea 1), 8 (mandible zoea 2), 9 (maxillule zoea 1), 10 (maxillule zoea 2); pl. 2 figs. 11 (maxilla zoea 1), 12 (maxilla stage 2), 13 (maxilliped 1 zoea 1), 14 (maxilliped 1 zoea 2), 15 (maxilliped 2 zoea 1), 16 (maxilliped 2 zoea 2), 17 (abdomen and telson zoea 1), 18 (abdomen and telson zoea 2) (larval stages) (Beaufort, North Carolina). — FISH, 1926, Bull. U. S. Bur. Fish., 41: 159 160, fig. 58 (surface collec-

tions). — LÉBOUR, 1928, Proc. Zool. Soc. London, 1928: 553 (larval stages compared with those of four other pinnotherids in two genera). — RICHARDS, 1929, Faunistic Surv. Mar. Invert. New Jersey; Thesis Univ. Pennsylvania: 90 (New Jersey). — COWLES, 1930, Bull. U. S. Bur. Fish., 46: 355, 361 (Chesapeake Bay). — PRATT, 1935, Man. Common Invert. Anim.: 465 (briefly diagnosed as in original, 1916, ed., p. 399). — PEARSE, 1936, Journ. Elisha Mitchell Soc., 52 (2): 196 (Piver's Island, North Carolina). — TU, 1938, Zool. Anz., 122 (7/8): 183 (mentioned in account of adaptations and host relationships). — GURNEY, 1938, Proc. Zool. Soc. London, (B) 108 (1): 79 (larval stages) (listed). — RICHARDS, 1938, Anim. Seashore: 239, pl. 25 fig. 8 (♀ dorsal view) (New Jersey). — STAUBER, 1942, Anat. Record, 84 (4): 495, 496 (establishes parasitic nature). — STAUBER, 1945, Biol. Bull. Woods Hole, 88 (3): 269-291, pl. 1 (♀) figs. 1 (dorsal view crab stage 1), 2 (dorsal view crab stage 2), 3 (ventral view crab stage 1), 4 (ventral view crab stage 2), pl. 2 (♀) figs. 5 (chela crab stage 1), 6-9 (legs 1-4 crab stage 1), 10 (chela crab stage 2), 11-14 (legs 1-4 crab stage 2), pl. 3 figs. 15 (♂ ventral view of sternum crab stage 1), 16 (♂ abdomen and gonopod crab stage 1), 17 (♀ pleopods 1 crab stage 2), 18 (♀ pleopods 2 crab stage 2), 19 (♀ pleopods 1 crab stage 3), 20 (♀ pleopods 2 crab stage 3), 21 (♀ pleopods 1 crab stage 4), 22 (♀ pleopods crab stage 4), pl. 4 figs. 23 (♀ crab stage 5 and ♂ crab stage 1 in oyster gill), 24 (oyster gill erosions) (larval stages). — ARCHER, 1947, Alabama Conserv., 19 (6): 7, 12, fig. (♀ dorsal and ventral views) (mentioned in popular account). — SANDOZ & HOPKINS, 1947, Biol. Bull. Woods Hole, 93 (3): 250-258, pl. 1 figs. 1 (lateral view zoea 1), fig. 2 (lateral view zoea 2), 3 (maxilliped 1 zoea 1), 4 (maxilliped 2 zoea 1), 5 (telson zoea 3), 6 (frontal view zoea 1), 7 (lateral view zoea 3) a (rostrum zoea 3), 8 (posterior view zoea 1), pl. 2 figs. 9 (maxilla 1 zoea 1), 10 (maxilla 1 zoea 2), 11 (maxilla 1 zoea 3), 12 (maxilla 2 zoea 1), 13 (maxilla 2 zoea 2), 14 (maxilla 2 zoea 3), 15 (dorsal view megalopa), 17 (pleopod 1 megalopa), 18 (right chela, dorsal view, megalopa), pl. 3 (crab stage 1) figs. 19 (antenna), 20 (dorsal view), 21 (antennule), 22 (right chela), 23 (ventral view) (larval stages). — FERGUSON & JONES, 1949, Amer. Midland Naturalist, 41 (2): 442 (Hampton Roads, Virginia). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [ed. 2, 1968]: 313 (biology, ecology). — RIOJA, 1950, Rev. Soc. Mexicana Hist. Nat., 11 (1-4): 145-147 (discusses commensalism in Crustacea, mentions *P. ostreum*). — KORRINGA, 1952, Quart. Rev. Biol., 27 (4): 346, 347 (parasitic). — JOHNSON, 1952, Trans. Kansas Acad. Sci., 55 (3): 349-464 (behavior). — FLOWER & McDERMOTT, 1952, Nat. Shell Fish. Assoc. Convention Address, 1952: 44-46 (ecology). — HEDGPETH, 1953, Publ. Inst. Mar. Sci. Univ. Texas, 3 (1): 202 (Cedar Bayou, Texas). — MANSUETI, 1955, Nature Mag., 48 (3): 125-127 (popular account). — DALES, 1957, Mem. Geol. Soc. Amer., 67 (1): 407 (ecology). — HOPKINS, 1957, Mem. Geol. Soc. Amer., 67 (1): 427 (parasitic). — ATKINS, 1958, Nature, London, 181 (4615): 1057 (mentioned in account of British pinnotherids). — HAVEN, 1958, Proc. Virginia Journ. Sci., (n. ser.) 8 (4): 301, 302 (parasitized). — CHRISTENSEN & McDERMOTT, 1958, Biol. Bull. Woods Hole, 114 (2): 146-179 (p. 147 footnote states that Verrill & Smith [1874, above] mislabelled figure 2, plate 1, *Pinnotheres ostreum*; it is a ♂ *Pinnotheres maculatus*, a correction previously made by S. I. Smith [1880, above]) (life history; biology). — HAVEN, 1959, Proc. Nat. Shellfish Assoc., 49: 77-86 (ecology). — GOODBODY, 1960, Nature, London, 185 (4714): 704 (mentioned). — SUGIURA, SUGITA & KIHARA, 1960, Bull. Japanese Soc. Sci. Fish., 26 (2): 93 (mentioned). — YONGE, 1960, Oysters: 118 (parasitic). — PASSANO, 1960, in Waterman, Physiology of Crustacea, 1: 522 (life history). — McDERMOTT, 1961, Bull. Ecol. Soc. Amer., 42 (3): 82 (parasitic). — WELLS, 1961, Ecol. Monographs, 31 (3): 248, 249, 256 (Newport River, North Carolina). — SASTRY & MENZEL, 1962, Biol. Bull. Woods Hole, 123 (2): 390 (mentioned). — WASS, 1965, Special Sci. Rept. Virginia Inst. Mar. Sci., 24 (3d revision, mimeographed): 41 (listed, as in earlier 1963 edition). — GALTISOFF, 1964, Fish. Bull. U. S. Fish Wildlife Serv., 64: 425 (ecology). — HOPKINS & SCANLAND, 1964, Bull. S. Calif. Acad. Sci., 63 (4): 175 (mentioned). — NAGABHUSHANAM, 1965, Current Sci., 34 (1): 22, 23 (salinity tolerance). — WILLIAMS, 1965, Fish. Bull. U. S. Fish Wildlife Serv., 65 (1): 203-206, text-figs. 187 (♀ dorsal view), 188A (Stage I ♀ dorsal view), B (Stage I ♀ ventral view), 189 (♂ dorsal view) (Salem, Massachusetts, to State of Santa Catarina,

Brazil). — PEARCE, 1966, *Pacific Sci.*, 20 (1): 3–33 (biology). — PEARCE, 1966, *Some Contemporary Stud. Mar. Sci.*: 565–589 (biology). — McDERMOTT, 1966, *Amer. Zool.*, 6 (3): 331 (parasitized). — COSTLOW & BOOKHOUT, 1966, *Chesapeake Sci.*, 7 (3): 157, 162, 163 (larval). — PATTON, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1233, 1237, 1239 (behavior). — McDERMOTT, 1967, *Amer. Zool.*, 7 (4): 772 (parasitized). — SILAS & ALAGARSWAMI, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1163, 1173–1179, 1181, 1183–1188, 1190, 1193, 1205 (biology; catalogued, taxonomy). — BEONDÉ, 1968, *Veliger*, 10 (4): 375, 377 (mentioned). — ANDREWS, TURGEON & HREKA, 1969, *Proc. Nat. Shellfish Assoc.*, 59: 1 (chemical 'Sevin' used to remove the species from oysters). — BEACH, 1969, *Crustaceana*, 17: 187–199 (Beaufort, North Carolina; occurrence, habitat, life cycle, biology). — GOSNER, 1971, *Guide Identif. mar. Invert. Cape Hatteras to Bay of Fundy*: 551 (mentioned).

Pinnotheres depressum SAY, 1817, *Journ. Acad. Nat. Sci. Phila.*, 1 (1): 68, 69 (♂ holotype not extant; type-locality: '...Egg Harbor [New Jersey]'). — KINGSLEY, 1878, *Proc. Acad. Nat. Sci. Phila.*, 1878: 323 (8) (listed). — MIERS, 1886, *Rept. Sci. Results Voy. Challenger*, 17 (49): 276 (listed).

Pinnotheres crassipes DESBONNE, 1867, in Desbonne & Schramm, *Crust. Guadeloupe*: 43, 44 (♀ holotype probably not extant; type-locality: 'Guadeloupe') (questionably synonymized by Rathbun, 1918).

Pinnotheres ostraeum COUES, 1871, *Proc. Acad. Nat. Sci. Philadelphia*, 1871: 123 (Fort Macon, North Carolina).

Pinnotheres ostrea WOOD, 1885, *Animate Creation*, 3: 449 (mentioned).

Zaops depressa RATHBUN, 1900, *Amer. Nat.*, 34 (403): 590 (listed). — FOWLER, 1912, *Ann. Rept. New Jersey State Mus.*, 1911: 433, 434, 595 (after Say).

Pinnotheres ostreum HORNELL & SOUTHWELL, 1909, *Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiarwar*, 1: 101, 102 (listed). — BALSS, 1956, in Bronn, *Klassen Ordnungen Tierreichs*, (ed. 2) 5 (1) (7): 1419 (mentioned).

Pinnotheres depressus RATHBUN, 1918, *Bull. U. S. Nat. Mus.*, 97: 64, 65, 79, 80, 427, pl. 17 (♀) figs. 1 (ventral view), 2 (dorsal view), text-fig. 37 (♂ maxilliped) (Beaufort, North Carolina; Cabanas, northwest Cuba). — WILLIAMS, 1965, *Fish. Bull. U. S. Fish Wildlife Serv.*, 65 (1): 205 ('Salem, Massachusetts to State of Santa Catarina, Brazil') (remarks that 'Say's *P. depressus* appears almost certainly to be the hard-stage male as described above and discussed below').

Pinnotheres ostrum AIKAWA, 1937, *Rec. Oceanogr. Works Japan*, 9 (1): 152 (larval characters).

Measurements: Male, length 1.3 mm, width 1.4 mm; female, length 12.0 mm, width 15.0 mm (Rathbun, 1918).

Habitat: In bivalves: *Ostrea virginica* [*Crassostrea virginica* (Gmelin)] (Say); *Ostrea parasitica* [*Crassostrea rhizophorae* (Guilding)] (Desbonne); *Anomia simplex* Orbnigny, *Mytilus edulis* Linnaeus (McDermott, 1961); 'Common in oysters taken from medium and high salinity waters' (Wass, 1963, 1965); *Crassostrea virginica* (Gmelin), *Pecten* spp., *Anomia simplex* Orbnigny, *Mytilus edulis* Linnaeus (Williams, 1965). With Polychaeta: also occasionally found in *Chaetopterus* tubes (Williams, 1965).

Distribution: Salem, Massachusetts, U.S.A., to State of Santa Catarina, Brazil; and from Cuba and Guadeloupe in the Caribbean area.

Pinnotheres palaensis Bürger, 1895

Pinnotheres palaensis BÜRGER, 1895, *Zool. Jahrb. Syst.*, 8: 372, 373, pl. 9 fig. 12 (♀ dorsal view), pl. 10 fig. 12 (♀ maxilliped) (syntypes: ZIMB 67/534, no longer extant; type-locality: '...Palaos-Inseln... Ubay [Philippine Islands]... Burias [Philippine Islands]'). — TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 249, 254, 259 (listed, key) (compared with *Pinnotheres onychodactylus*). — PÉREZ, 1921, *Compt. Rend. Acad. Sci. Paris*, 173 (1): 59–61 (Amboina, Indonesia) (parasitized by an epicaridlan). — DE MAN, 1921, *Bull. Biol. France Belgique*, 55 (1): 260–265, pl. 8 figs. 8 (right maxilliped), a (right maxilliped, anterior part), 9 (left chela), 10 (right leg 1), a (dactylus right leg 1), 11 (propodus and dactylus, right leg 2), 12 (right leg 3), 13 (left leg 3), a (dactylus left leg 3), 14 (right leg 4) (Amboina, Indonesia). — DE MAN, 1929, *Bijdr. Dierk. Amsterdam*, 26: 14–16, pl. 2 fig. 5 (♂ maxilliped, anterior part), a (♀ ovig. maxilliped, anterior part), b (♀ 'young', cheliped) (Indramaju, Java, Indonesia). — GORDON, 1936, *Journ. Linn. Soc.*

London Zool., 40 (269): 164, 176 (asymmetry). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 547 (listed). — MIYAKE, 1939, Records Oceanogr. Works Japan, 10 (2): 221, 241 (listed). — CHUANG, 1961, On Malayan Shores: 188, 189, pl. 94 fig. 1 (♀ dorsal view) (Singapore, Malaysia). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1205, 1216, 1221 (cataloged).

Pinnoteres palaensis BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1418 (mentioned).

Measurements: Male, length 5.25 mm, width 5.25 mm (De Man, 1929); female (ovigerous), length 8.6 mm, width 11 mm (De Man, 1929).

Habitat: In pelecypods *Arca scapha* [Chemnitz], *Byssosarca* [Arca], *Placuna sella* Gmelin (Bürger); *Arca granosa* [Anadara granosa (Linnaeus)] (De Man); *Barbatia lima*, *Anadara granosa* and *Mactra mera* (Chuang, 1961).

Distribution: Palau Islands; Ubay and Burias, Philippine Islands; Indonesia; Malaysia.

Pinnotheres parvulus Stimpson, 1858

Pinnotheres parvulus STIMPSON, 1858, Proc. Acad. Nat. Sci. Phila., 1858: 108 (♀ holotype probably not extant; type-locality: 'In mari Sinensi...'). — MIERS, 1886, Rept. Sci. Results Voy. Challenger, 17 (49): 276 (listed). — DE MAN, 1887, Journ. Linn. Soc. London Zool., 22 (136): 5, 105, 106. — ORTMANN, 1894, Zool. Jahrb. Syst., 7: 699, pl. 23 fig. 12 (♀ maxilliped) (Tokyo Bay, Japan). — DOFLEIN, 1902, Abhandl. Bayer. Akad. Wiss., 21 (3): 663 (Yokohama, Japan). — STIMPSON, 1907, Smithsonian Misc. Coll., 49: 142 (China Sea). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 4 (4): 331, 332, pl. 2 fig. 9 (♀ dorsal view), text-fig. 13 (♀ a) (chela), b (legs 1-4) (Lem Ngob, Thailand). — PARISI, 1918, Atti Soc. Ital. Sci. Nat., 57: 91 (Tokyo Bay, Japan). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 250, 254, 286 (listed, key). — MAKI, 1931, Trans. Nat. Hist. Soc. Formosa, 21 (112): 280, 281, figs. 1 (♀ dorsal view), 2 (chela), 3-6 (ambulatory legs), 7 (third maxilliped), 8 (antenna), 9 (♂ abdomen), 10 (♂ dorsal view). — SAKAI, 1933, Botany and Zoology, Tokyo, 1 (2): 978, 979 (48, 49), fig. 1 (♀ dorsal view). — SAKAI, 1935, Crabs of Japan: 195, 196, fig. 101 (♀ a) (dorsal view), b (maxilliped). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 171, 172, 175, 176 (in synonymy), 179 (compared with *Pinnotheres similis*, *spinidactylus*, *tivela*, and *winckworthi*). — SUVATTI, 1938, Check-List aquatic Fauna Siam, 69 (listed). — SAKAI, 1939, Stud. Crabs of Japan: 586, 587, fig. 72 (♀ a) (dorsal view), b (maxilliped), c (chela), d (dactylus of leg 3), e (dactylus of leg 4) (Tokyo Bay, Nagasaki, and Tosa Bay, Japan). — LIN, 1949, Quart. Journ. Taiwan Mus., 2 (1): 25, 26 (Anping, Taiwan, China). — SUVATTI, 1950, Fauna of Thailand: 160 (listed). — SAKAI, 1956, Crabs: 49 (of species list) (mentioned). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1164, 1205, 1214, 1216, 1221-1225 (compared with unnamed species; cataloged, taxonomy).

Pinnotheres parvulus HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiarwar, 1: 102 (New Zealand).

Measurements: Female, length 10.0 mm, width 11.0 mm (Sakai, 1939).

Habitat: In bivalves: *Meroë quadrata* [*Sunetta quadrata* nomen nudum] (Stimpson, 1858); *Saxidomus purpurata* [*Saxidomus purpuratus* (Sowerby)], *Pecten laquetus* [*Pecten albicans* (Schröter)] (Sakai, 1939); *Pinna* (Hornell & Southwell); 26 fms [47.5 m] (Stimpson, 1858).

Distribution: Gulf of Siam; New Zealand; China Sea; Japan, Taiwan.

Pinnotheres pecteni Hornell & Southwell, 1909

Pinnotheres pecteni HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiarwar, 1: 102 (listed; seems never to have been described; a nomen nudum).

Habitat: In the bivalve, *Pecten* sp.

Distribution: East coast of North America.

Pinnotheres pectinicola Bürger, 1895

Pinnotheres pectinicola BÜRGER, 1895, Zool. Jahrb. Syst., 8: 365, pl. 9 fig. 1 (♀ dorsal view), pl. 10 fig. 1 (maxilliped) (holotype: ZIMB 67/948, no longer extant; type-locality: 'Ubay [Philippine Islands]'). — LAURIE, 1915, Journ. Linn. Soc. London Zool., 31 (209): 415 (listed).

Pinnotheres pectinicola NOBILI, 1906, Ann. Sci. Nat. Zool. Paris, (9) 4: 303 (Djibouti, Somaliland).

Pinnotheres pectinicolus TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 252, 287 (listed, key). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1205, 1216, 1222 (cataloged).

Pinnotheres pectinicolus GUINOT, 1955, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution noted).

Measurements: Female, length 7.0 mm, width 8.0 mm (Bürger).

Habitat: In the bivalve, *Pecten radula* [*Sempallium radulum* (Linnaeus)] (Bürger).

Distribution: Philippine Islands; Gulf of Aden.

Pinnotheres pectunculi Hesse, 1872

Pinnotheres Pectunculi, HESSE, 1872, Ann. Sci. Nat. Zool. Paris, (5) 15 (2): 36–38 (♀ and ♂ types: ? depository; type-locality: France [coast of Brittany]).

Pinnotheres pectunculi MIERS, 1886, Rept. Sci. Results Voy. Challenger, 17 (49): 276 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1205 (cataloged).

Pinnotheres pisum forma *pectunculi* Bourdon, 1965, Decap. Stomatop. Inventaire Faune marine Roscoff: 32, 40 (Roscoff, France; percentage infestation of *Glycymeris glycymeris*; differences from *P. pisum* (:40)).

Habitat: In the bivalve, *Pectunculus flammulatus* [*Glycymeris glycymeris* Linnaeus] (Hesse). *Glycymeris glycymeris* Linnaeus (Bourdon).

Distribution: Coast of Brittany, France.

Pinnotheres perezi Nobili, 1905

Pinnotheres perezi NOBILI, 1905, Bull. Mus. Nat. Hist. Nat. Paris, 11 (3): 164 (♀ holotype: MNHNP; type-locality: 'Golfe Persique [Persian Gulf]'). — NOBILI, 1906, Bull. Sci. France Belgique, (5) 40: 147, pl. 5 (♀) fig. 25 (dorsal view), a (chela), b (maxilliped) (compared with *Pinnotheres villosulus* Guérin) (Iranian Gulf).

Pinnotheres perezi TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 253, 287 (listed, key). — STEPHENSEN, 1945, Danish Sci. Invest. Iran: 185, 210, 211 ('Iranian [Persian] Gulf, bank N. E. of the island of Arzana, 1♀ (type-locality, Nobili l.c.). Not found anywhere else.'). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1206, 1222 (cataloged).

Measurements: Female, length 7.0 mm, width 7.76 mm (Nobili, 1905).

Habitat: In the bivalve, *Pholas* (Nobili, 1905).

Distribution: Known only from the type locality.

Pinnotheres pernicola Bürger, 1895

Pinnotheres pernicola BÜRGER, 1895, Zool. Jahrb. Syst., 8: 375, 376, pl. 9 fig. 17 (♀ dorsal view), pl. 10 fig. 16 (♀ maxilliped) (syntypes: ZIMB 67/947; type-locality: Ubay [Philippine Islands]!). — NOBILI, 1899, Ann. Mus. Stor. Nat. Genova, (2) 20 (40): 264 (35) (Katau, New Guinea). — LAURIE, 1915, Journ. Linn. Soc. London Zool., 31 (209): 415 (listed).

Pinnotheres pernicola NOBILI, 1906, Ann. Sci. Nat. Zool. Paris, (9) 4: 303, 304 (Obock, French Somaliland).

Pinnotheres pernicolus TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 254, 287 (listed, key). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1206, 1216, 1222 (cataloged).

Pinnotheres pernicolus GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution noted).

Measurements: Female (ovig.), length 7.0 mm, width 11.0 mm (Nobili, 1899).

Habitat: In the bivalve, *Perna* [*Isognomon*] (Bürger).

Distribution: French Somaliland, Philippine Islands, New Guinea.

Pinnotheres pholadis de Haan, 1835

Pinnotheres pholadis DE HAAN, 1835, in Von Siebold, Fauna Japon., Crust.: 63, pl. 16 fig. 7 (♂ dorsal view and abdomen, ♀ a abdomen) (syntypes: RMNH, only mouth parts; type locality 'Japan', probably near Nagasaki); — HERKLOTS,

1861, Tijdschr. Entomol., 4: 18 (listed). — MIERS, 1886, Rept. Sci. Results Voy. Challenger, 17 (49): 276 (listed). — STEBBING, 1893, Hist. Crust.: 101 (listed). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 252, 286 (listed, key). — BALSS, 1922, Arch. Naturgesch., 88A (11): 139 (Tokyo, Sagami Bay, and Uraga Canal, Japan). — URITA, 1926, Check List Brachyura Kagosima Pref., Japan: 18, and map (listed) (Kagosima Prefecture, Japan). — YOKOYA, 1928, Sci. Rept. Tôhoku Imp. Univ., (4) 3 (4) (2): 773 (Yunoshima Island and Asadokoro, Japan). — YOKOYA, 1933, Journ. College Agr. Tokyo Imp. Univ., 12 (1): 208 (South of Atumi, Aiti-ken, Japan). — SAKAI, 1933, Botany and Zoology, Tokyo, 1 (2): 978-980 (48-50) (mentioned). — SAKAI, 1934, Sci. Rept. Tokyo Bunrika Daigaku, 1 (B): 316 (Nagasaki, Japan). — SAKAI, 1935, Crabs of Japan: 198, pl. 56 fig. 2 (♂ dorsal view). — SAKAI, 1939, Stud. Crabs of Japan, 4: 590, pl. 69 fig. 2 (♂ dorsal view), text-fig. 76 (gonopod) (Yokohama, Coast of Wakayama, and Kyûsyû, Japan). — SAKAI, 1949, Illustrated Encycl. Fauna Japan: 666, fig. 1922 (♂ dorsal view). — SAKAI, 1956, Crabs: 50 (of species list) (mentioned). — SAKAI, 1965, Crabs of Sagami Bay: 176 (Eng. pt.), 77 (Jap. pt.), pl. 86 fig. 3 (♂ dorsal view), fig. 4 (♀ dorsal view). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1206 (cataloged; taxonomy).

Pinnotheres pisoides ORTMANN, 1894, Zool. Jahrb. Syst., 7: 368, pl. 23 fig. 11 (maxilliped) (syntypes: MZUS; type-localities: Tokyo Bay and Nagasaki, Japan). — ADENSAMER, 1897, Ann. K. K. Naturhist. Hofmus. Wien, 12: 107 (Japan). — LENZ, 1901, Zool. Jahrb. Syst., 14: 468, pl. 32 fig. 19 (maxilliped) (figured and compared with *Pinnotheres schauinslandi*). — DOFLEIN, 1902, Abhandl. Bayer. Akad. Wiss., 21 (3): 663 (Yokohama, Japan). — BOUVIER, 1906, Bull. Mus. Hist. Nat. Paris, 12 (7): 483 (listed). — PARISI, 1918, Atti Soc. Ital. Sci. Nat., 57: 92 (Yokohama, Japan). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1206, 1224 (cataloged, taxonomy).

Pinnotheres pholades LENZ, 1901, Zool. Jahrb. Syst., 14: 468 (compared with *Pinnotheres schauinslandi*).

Pinnotheres cardii [not Bürger, 1895] SAKAI, 1934, Sci. Rept. Tokyo Bunrika Daigaku, 1 (B): 316 (Nagasaki, Japan). — SAKAI, 1936, Crabs of Japan: 198, 199, pl. 56 fig. 3 (♀ dorsal view). — SAKAI, 1939, Stud. Crabs of Japan: 589, 590, pl. 69 fig. 3 (♀ dorsal view), text-fig. 75 (maxilliped) (Tokyo Bay, Ise Bay, and Kyûsu, Japan; Keizyo, Korea).

Measurements: Male, length 7.5 mm., width 7.0 mm (Sakai, 1935).

Habitat: In bivalves: '*Subpallio Pholadis Japonicae* n. sp. viginiti et plura [20 plus] specimina' (De Haan) [*Pholadis japonica* is a nomen nudum; De Haan's specimens of this bivalve species are preserved in the Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands, and prove to be *Barnea mantlensis inornata* Pilsbry]; *Chlamys senatoria nobilis* Reeve, *Pecten laquetus* [*Pecten albicans* (Schroëter)], *Macra sachalinensis* [*Spisula sachalinensis* (Schrenck)] (Sakai, 1939, 1965); *Chlamys nipponensis* Kuroda, *Macra sulcataria* Deshayes, *Mytilus edulis* Linnaeus, *Ostrea gigas* [*Crassostrea gigas* (Thunberg)], *Meretrix lusoria* Chemnitz, *Tapes japonica* (Deshayes) (Sakai, 1965).

Distribution: Japan.

Pinnotheres pichilinqei Rathbun, 1923

Pinnotheres pichilinqei RATHBUN, 1923, Bull. Amer. Mus. Nat. Hist., 48 (20): 627, 628, pl. 30 (♂) fig. 1 (dorsal view), 2 (ventral view to show abdomen), 3 (ventral view to show chelae), text-figs. 3 (♀ left maxilliped), 4 (♂ right leg 1), 5 (♂ abdomen) (♂ holotype: USNM 57004; ♂ paratype: USNM 60034; type-locality: '...Pichilinqe Bay, Lower California...'). — GLASSELL, 1934, Journ. Wash. Acad. Sci., 24 (7): 301 (Gulf of California) (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1206, 1223 (cataloged).

Measurements: Male, length 4.4 mm., width 4.3 mm.

Habitat: Male taken by electric light [at surface, dipnet].

Distribution: Known only from the type locality.

Pinnotheres pilumnoides Nobili, 1905

Pinnotheres pilumnoides NOBILI, 1905, Bull. Mus. Nat. Hist. Nat. Paris, 11 (6): 410 (♀ holotype: MNHNP; type-locality: 'Djibouti [French Somaliland]'). — NOBILI, 1906, Ann. Sci. Nat. Zool. Paris, (9) 4: 307-309, fig. 12 (♀ maxilliped)

(Djibouti, Somaliland). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1417 (mentioned). — GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution noted).

Pinnotheres pilumnoides LAURIE, 1915, Journ. Linn. Soc. London Zool., 31 (209): 415, 466, 467 (Red Sea). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 251, 255, 287 (listed, key). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 165 (referred to). — RAMADAN, 1936, Bull. Fac. Sci. Egypt. Univ., 6: 36 (Red Sea). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1206, 1220, 1222 (cataloged).

Measurements: Female (ovigerous), length 12.25 mm, width 14.25 mm (Laurie).

Habitat: In *Holothuria gallensis* Pearson; and from sponges (Laurie).

Distribution: Red Sea and Gulf of Aden.

Pinnotheres pinnotheres (Linnaeus, 1758)

Bouš *Pinnotheres pinnotheres* (L.) and *P. pisum* (L.) are mentioned by the early and later classical authors. Aristotle (384–322 B.C.) (see d'Arcy W. Thompson, 1910, The works of Aristotle, 4: 547b) stated that 'In some of the testaceans white crabs are found, very diminutive in size' (line 25, 26). The present species was reported by Aristotle from *Pinna* and called *Pinna-guard* (lines 17 and 28), *πιννοφυλαξ*, *Pinnophylax*. Aristotle's account is to the point and scientifically correct. Oppian (around 170 A.D.) (see A. W. Mair, 1928, Oppian's *Haliectica*, 2: 299) gave a very romanticized and incorrect version of the relation between the crab and the *Pinna*, the source of which, according to Athenaeus (around 200 A.D.) (see C. D. Yonge, 1854, The *Deipnosophists* or Banquet of the learned of Athenaeus, 1: 148, 149), is book 5 of Chrysippus the Solensian's (ca. 280–206 B.C.) treatise on the Beautiful and Pleasure. Athenaeus cited Chrysippus as follows (Yonge, 1854: 148, 149): 'The pinna and the guard of the pinna assist one another, not being able to remain apart. Now the pinna is a kind of oyster, but the guard of the pinna is a small crab: and the pinna having opened its shell, remains quiet, watching the fish who are coming towards it; but the guard of the pinna, standing by when anything comes near, bites the pinna, so as to give it a sort of sign; and the pinna being bitten, closes its shell, and in this manner the two share together what is caught inside the pinna's shell.' This tale can be found with many earlier and later authors, the most famous and most cited of whom is Pliny (23–79 A.D.) (see J. Bostock & H. T. Riley's 1855 translation of The Natural History of Pliny, 2: 450, 451). It is not the place here to cite these rather numerous classic and mediaeval authors, whose works were usually printed centuries after they had been written, and who do not bring much news.

Pinnophylax Belon, 1553, De Aquatilibus: 401 (mentioned the crab as inhabiting *Pinna*). — p.p. Rondelet, 1558, Histoire entière des Poissons: 409–411 (described this species 'Les Cancres ... qui se trouvent dans la *Pinna*' as larger than *P. pisum* and more red than white; cited the stories of Oppian, Pliny and Athenaeus about the symbiosis of the species with *Pinna*), fig. (showing *Pinna* with *Pinnotheres* crawling out).

Cancer parvus p.p. Gesner, 1560, Icones animalium: 208 (gave the usual account of the pinna-guard, mentioned small crabs 'in *Mitulis gurgitum*, *Pinnis*, *Pectinibus* atque *Ostreis*' and gave the differences mentioned by Rondelet between the species from *Pinna* and that from the Oyster; only part of his text thus refers to the present species, the rest to *P. pisum*), fig. (copied from Rondelet). — p.p. Aldrovandus, 1606, De reliquis animalibus exanguibus libri quatuor (ed. 1): 212–215 (dealt with *P. pinnotheres* and *P. pisum*, citing many previous authors), fig. (copied from Rondelet) (ed. 2 in 1642, with same text and pagination).

Pinnother Sachs, 1665, Gammarologia: 97–100 (general account with citation of the accounts by the classical authors and their 'Fabula de *Pinnotheris consortio*'), pl. 6 fig. (copied from Rondelet).

Cancer species Hasselquist, 1757, Iter Palaestinum 1749–1752: 450 (mentioned). — Hasselquist, 1762, Reise Palästina 1749–1752: 487 (mentioned).

Cancer Pinnotheres LINNAEUS, 1758, Syst. Nat. (ed. 10), 1: 628 (types probably not extant: type-locality: 'Habitat in Mari Mediterraneo & Asiatico'). — LINNAEUS, 1767, Syst. Nat. (ed. 12), 1 (2): 1040 ('[M]ari Mediterraneo, Asiatico'). — STATIUS MÜLLER, 1775, Linné, Natursystem, 5 (2): 1102 (Mediterranean and Asiatic Seas). — BLUMENBACH, 1779 (2nd ed. in 1782, 12th ed. in 1830), Handbuch Naturgesch. Göttingen: 398 (general account). — HERBST, 1783, Vers. Naturg. Krabben Krebse, 1 (2–5): 103 (Mediterranean and Asiatic Seas). — FABRICIUS, 1787, Mant. Ins., 1: 317 (listed). — GMELIN, 1789, Linnaeus, Syst. Nat. (ed. 13), 1 (5): 2965 ('Asiatico'). — FABRICIUS, 1793, Ent. Syst., 2: 443 ('in mari asiatico'). — LENZ, 1856, Zool. Griechen Römer: 523 (mentioned).

Granchio minimo GINNANI & ZAMPIERI, 1762, Produzioni naturali che si trovano nel Museo Ginnani di Ravenna: (the authors refer to Aldrovandus' (1606) figure (see above) and thus the present species is meant; Nardo's (1869: 228) identification of Ginnani & Zampieri's Granchio minimo with *Pinnotheres pisum* is evidently incorrect).

Pinnotheres BASTER, 1765, Natuurk. Uitspanningen, 2: 22 (gives the old embellished version of the relation between the crab and its host). — BASTER, 1765, Opuscula subseciva, 2: 20 (Latin translation of the former).

Cancer pinnotheres FORSKÅL, 1775, Descr. Anim.: 88, 89 ('Smirnae & Constantinopoli [Izmir and Istanbul, Turkey]'). — FABRICIUS, 1781, Spec. Ins., 1: 497, 498 ('Mari Asiatico'). — OLIVIER, 1791, Encyc. Method., Hist. Nat., 6: 143, 155, 159 (Asiatic and Mediterranean Seas). — HERBST, 1799, Vers. Naturg. Krabben Krebse, 3 (1): 36. — BLUMENBACH, 1803, Man. Hist. Nat., 1: 517 (general account).

Pinnotheres or *Pinnophylax* CHEMNITZ, 1777, Naturforscher, 10: 16–37 (historical account). — CHEMNITZ, 1781, Naturbeschouwer, 2: 19 (Dutch translation of Chemnitz, 1777).

Cancer pinnoteres PETAGNA, 1792, Institut. Entomol., 1: 403.

Pinnotheres veterum BOSC, 1801–02, Hist. Nat. Crust., 1: 243 ('dans la Méditerranée et dans l'Inde'). — LEACH, 1815, Malacost. Podopht. Brit.: expl. of plate, pl. 15 fig. 1 (♀ dorsal view), 2 (♀ abdomen), 3 (♂ dorsal view), 4 (same, x 5), 5 (♂ abdomen) (Salcombe Estuary, England). — LATREILLE, 1818, Nouv. Dict. Hist. Nat., 26: 462 (brief description). — DESMAREST, 1823, Dict. Sci. Nat., Paris, 28: 239 (Mediterranean and Atlantic coasts of France and England). — DESMAREST, 1825, Consid. Gén. Class. Crust.: 119 (Mediterranean and Atlantic coasts of France and England). — LATREILLE, 1825, Encyc. Méthod. Hist. Nat., 10: 135, 136 (brief description). — RISSO, 1826, Hist. Nat. Princip. Produc. Europe Mérid., 5: 17 (southern European coast). — DESMAREST, 1830, in Bosc, Hist. Nat. Crust., (ed. 2) 2: 294 (Mediterranean Sea and India) — GUÉRIN-MÉNEVILLE, 1836, Expéd. Sci. Morée, Sci. Phys., 3: 31 (mentioned). — H. MILNE EDWARDS, 1837, Hist. Nat. Crust., 2: 32 (coast of Italy). — COSTA, O., 1840, Fauna Regno Napoli, Crost., (7) 3: 4 (Sea of Taranto, Italy). — LUCAS, 1840, Hist. Nat. Crust.: 66, pl. 3 fig. 1 (♀ dorsal view) (brief description). — PERTY, 1841, Allgem. Naturges., 3: 872 (mentioned). — DRAPIEZ, 1842, Dict. Classiq. Sci. Nat., 8: 685 (brief description). — KRASSOW & LEYDE, 1842, Lehrb. Zool., (ed. 2) 1: 256 (Mediterranean). — BELL, 1845, Hist. British Stalk-eyed Crust., (3): 126–128, figs. 1 (♂ dorsal view), a (♂ abdomen), 2 (♀ dorsal view), a (♀ abdomen), unnumbered fig. (♀ dorsal view and abdomen) (popular account). — LUCAS, 1846, Explor. Sci. Algérie, Hist. Nat. Anim., Zool., 1: 17 (Bay of Oran, Algeria). — NARDO, 1847, Sinonimia moderna Chiereghin: 3 (doubtful identification of *Cancer Pisum* of Chiereghin's manuscript). — COCKS, 1849, Cornwall Polytechn. Soc. Trans., 17: 80 (Falmouth, England). — WHITE, 1850, List Brit. Anim. British Mus., 4: 17 (Salcombe and Kingsbridge Estuaries, England). — GISTEL, 1851, Naturg. Thierreich (ed. 2): 158 (brief description). — GOSSE, 1855, Man. Mar. Zool. British Isles, 1: 159 (British Isles) (listed). — WHITE, 1857, Pop. Hist. Brit. Crust.: 55, 56 (Devonshire, England; Ireland). — KNIGHT, 1858, Pict. Mus. Animat. Nat., 2: 307 (popular account). — McANDREW, 1860, List British Mar. Invert. Fauna: 21 (Britain) (listed). — GRUBE, 1861, Ausflug Triest Quarnero: 124 (listed). — HELLER, 1863, Sitzungsber. K. Akad. Wiss. (Math.-Naturwiss.), 46 (1): 446 (listed). — HELLER, 1863, Crust. Südl. Europa: 118, 119 (Adriatic and Mediterranean Seas). — HELLER, 1864, Verhandl. Zool. Bot. Ges. Wien, 14 (1–2): 50 (Korcula Island, Yugoslavia). — GRUBE, 1864, Die Insel Lussin: 70 (Losinj Island, Yugoslavia). — LORD, 1867, Crab, Shrimp, Lobster Lore: 43 (mentioned). — CLAUß, 1868, Grundzüge Zool.: 237 (mentioned). — NARDO, 1869, Mem. R. Ist. Veneto, 14: 260 (reference to Heller, 1863). — PARFITT, 1871, Rept. Trans. Devonshire Assoc. Advan. Sci. Lit. Art, 4 (1): 188 (Devonshire, England). — HESSE, 1872, Ann. Sci. Nat. Zool., Paris, (5) 15 (2): 30, 36 (mentioned). — ANONYMOUS, 1876, Ceylon: 269 (general remarks). — STALIO, 1877, Atti R. Ist. Veneto Sci. Lettere Arti, (5) 3: 521 (Mediterranean). — NEUMANN, 1878, Cat. Podopht. Crust. Heidelberg Mus., 25 (listed). — STOSSICH, 1880, Boll. Soc. Adriatica Sci. Nat.

Trieste, 6: 193, 194 (Adriatic Sea). — ROLLAND, 1881, Faune Pop. France, 3: 228 (mentioned). — WOODWARD, 1882, Crustacea, in Cassell's Nat. Hist., 6: 202 (mentioned in popular account). — CARRINGTON & LOVETT, 1882, Zoologist, 6: 179, 180 (30 miles off Devon Coast, England). — SARS, 1883, Forh. Vidensk. Selsk. Krist., 18: 41 (west coast of Norway). — GOURRET, 1884, Ann. Mus. Hist. Nat. Marseille, (Zool.) 2 (2): 15, 21 (Gulf of Marseilles, France). — CARUS, 1885, Prodrum Faunae Mediterr., 1: 520 (Mediterranean Sea). — LEUNIS, 1886, Synopsis Naturreiche, 2: 646 (Mediterranean Sea). — GIARD & BONNIER, 1889, Compt. Rend. Acad. Sci. Paris, 109: 914 (parasitized). — OSORIO, 1889, Journ. Sci. Math. Phys. Nat. Lisboa, (2) 1: 57 (Buarcos, Portugal). — BOLIVAR, 1892, Anales Soc. Españ. Hist. Nat., 21: 128 (Barcelona, Spain). — STEBBING, 1893, Hist. Crust.: 101 (mentioned). — WALKER, 1893, Proc. Trans. Liverpool Biol. Soc., 7: 15 (mentioned). — NORMAN, 1894, Ann. Mag. Nat. Hist., (6) 13: 158 (Trondhjem Fjord, Norway; listed). — SUCKER, 1895, Fische Adria: 136 (mentioned). — HERDMAN, 1896, Rept. Brit. Assoc. Advan. Sci., 1867: 21 (listed). — ADENSAMER, 1897, Ann. K. K. Naturhist. Hofmus. Wien, 12: 106 (Adriatic Sea). — ADENSAMER, 1898, Denkschr. Akad. Wiss. Wien 65: 598, 599, 609 (Adriatic Sea). — A. MILNE EDWARDS & BOUVIER, 1899, Résultats Camp. Sci. Monaco, 13: 38 (Dogger Bank, North Sea; Sardinia, 'Porto-Conte'). — HERDMAN, 1900, Ann. Rept. Liverpool Mar. Biol. Comm., 14: 42 (listed) (off Aldrick, Isle of Man). — GRAEFFE, 1900, Arb. Zool. Inst. Univ. Wien und Zool. Sta. Triest, 13 (1): 76 (44) (Gulf of Triest). — DOFLEIN, 1904, Wiss. Ergeb. Deutschen Tiefsee Exped. Valdivia, 6: 307, 309 (listed). — PATTERSON, 1905, Nature in Eastern Norfolk: 329 (mentioned). — NORMAN & SCOTT, 1906, Crust. Devon and Cornwall: 5 (Salcombe, off Sidmouth, and Falmouth, England). — APPELLÖF, 1906, Meeresfauna von Bergen: 153, 154, 161, 179, 185, 186 (Bergen, Norway). — ZIMMERMANN, 1907, Zeitschr. Naturwiss., 78: 313 (listed). — SINEL, 1907, Trans. Guernsey Soc. Nat. Sci.: 215 (Channel Islands). — PIERON, 1907, C. R. Soc. Biol. Paris, 63: 518 (mentioned in account of autotomy). — COULON, 1907, Bull. Soc. Étud. Sci. Nat. Elbeuf, 26: 128 (22) (Marseille, France). — SCHLEGEL, 1911, Mém. Soc. Zool., Paris, 24: 25, 26 (Roscoff, France). — PESTA, 1912, Arch. Naturgesch., 78 (A) (1): 121 (Adriatic Sea). — DOFLEIN, 1914, in Hesse & Doflein, Tierbau und Tierleben, 2: 278, 279, fig. 226 (hosts; biology). — BLOHM, 1915, Wiss. Meeresunters., Kiel, (n. ser.) 17: 77, 80 84 (Christiania Fjord, Norway; Dogger Bank, North Sea). — WILLIAMSON, 1915, Nordisches Plankton, 6 (1): 562 (larval stages). — BUEN, 1916, Bol. R. Soc. Españ. Hist. Nat., 16: 356 (Balears Islands, Spain). — BOLIVAR, 1916, Bol. R. Soc. Españ. Hist. Nat., 16: 250 (Mallorca, Balears Islands, Spain). — SZÜTS, 1921, Allattani Közlemények, 18: 18 (mentioned), 47 (German abstract). — O. W. HYMAN, 1924, Proc. U. S. Nat. Mus., 64 (2497): 4, pl. 5 fig. 51 (abdomen and telson zoea 1) (larval stages). — ATKINS, 1926, Nature, London, 117 (2942): 415, 416 (color changes) — ATKINS, 1927, Journ. Mar. Biol. Assoc. United Kingdom, (n. ser.) 14 (3): 823 (color change). — LÉBOUR, 1928, Proc. Zool. Soc. London, 1928: 109, 110, 115-117, pl. 2 figs. 7 (lateral view, zoea 1), 8 (abdomen, zoea 1), 9 (lateral view, zoea 2), 10 (abdomen, zoea 2), 11 (dorsal view, megalopa) (larval stages). — AIKAWA, 1929, Records Oceanog. Works Japan, 2 (1): 24, pl. 4 fig. 35 (telson, zoea) (larval stages). — SEURAT, 1929, Bull. Sta. Océanog. Salammô, 12: 18, 35, 52 (ecology; Gulf of Gabès, Tunisia). — NOBRE, 1931, Crustáceos Decápodes e Stomatópodes Mar. Portugal, (ed. 1): 115, 116 (Buarcos, Portugal). — CARVALHO, 1933, Mem. Estud. Mus. Zool. Univ. Coimbra, (1) 66: 7 (Buarcos, Portugal). — MIRANDA Y RIVERA, 1933, Notas Res. Inst. Españ. Oceanogr., (2) 67: 55 (Barcelona, Mallorca, Ibiza, Spain). — NOBRE, 1936, Crustáceos Decápodes e Stomatópodes Mar. Portugal, (ed. 2): 69, 70 (Buarcos, Portugal). — AIKAWA, 1937, Rec. Oceanogr. Works Japan, 9 (1): 152 (larval characters). — MOORE, 1937, Proc. Trans. Liverpool Biol. Soc., 50: 140 ('larvae, probably this species', Isle of Man). — GURNEY, 1938, Proc. Zool. Soc. London, (B) 108 (1): 79 (larval stages; listed). — GURNEY, 1942, Ray Soc., 129: 278, 279, fig. 117 (zoea 1) a (abdomen), b (maxillule), c (maxilla), d (maxilliped 2) (larval stages). — DEMIR, 1954, Bogaz ve Adalar Sahillerinin Omurgasiz Dip Hayvanlari, (2): 430, pl. 8 fig. 9 (dorsal view) (Bosphorus area, Turkey). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser.,

2 (3): 1163, 1174, 1177, 1178, 1184, 1192, 1193, 1206, 1215, 1226 (biology, cataloged, taxonomy).

Pinnotheres des anciens LATREILLE, 1803, Hist. Nat. Crust. Ins., 6: 31.

Pinnotheres pinnae LEACH, 1814, Edinburgh Encyc., 7: 431 (Salcombe Estuary, England). — THOMPSON, 1842, Ann. Mag. Nat. Hist., 10: 285 (Ireland).

Pinnotheres Montagu LEACH, 1815, Malacost. Podopht. Brit.: expl. of plates, pl. 15 (♂), figs. 6 (dorsal view), 7 (dorsal view), 8 (abdomen) (Salcombe Estuary, England). — DESMAREST, 1823, Dict. Sci. Nat. Paris, 28: 239 (mentioned). — DESMAREST, 1825, Consid. Gén. Class. Crust.: 119 (brief description). — RISSO, 1826, Hist. Nat. Princip. Produc. Europe Mérid., 5: 17 (brief description). — LUCAS, 1840, Hist. Nat. Crust.: 66 (brief description). — HOPE, 1851, Cat. Crost. Italiani Mediterraneo: 5 (listed) ('Napoli'). — H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 218 (184) (perhaps a variety of *Pinnotheres pisum*). — HERKLOTS, 1861, Tijdschr. Entomol.: 131 (18) (listed).

Cancer (Pinnotheres) veterum LATREILLE, 1836, in Cuvier, Thierreich, 4: 122, 123.

Cancer (Pinnotheres) Montagu LATREILLE, 1836, in Cuvier, Thierreich, 4: 123.

Pinnotheres montagu H. MILNE EDWARDS, 1837, Hist. Nat. Crust., 2: 32, 33.

Pinnotheres Veterum COUCH, 1838, A Cornish Fauna, 1: 72 (Cornwall, England).

Pinnotheres Veterum HOPE, 1851, Cat. Crost. Italiani Mediterraneo: 5 (listed) ('Napoli'). — HERKLOTS, 1861, Tijds. Entomol., 4: 131 (18) (listed). — BATE, 1878, Journ. Roy. Inst. Cornwall, 2 (19): 467 (Cornwall, England).

Pinnotheres Pinnophylax H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 218 (184) (coast of Italy).

Pinnotheres pisum NARDO, 1869, Mem. R. Istituto Veneto, 14: 228 (incorrect identification of *Cancer parvus* of Aldrovandus).

Pinnotheres veterum GIESBRECHT, 1882, Mitt. Zool. Sta. Neapel, 3: 295 (Gulf of Naples).

Pinnotheres veterum FABER, 1883, Fish. Adriatic: 253 (Adriatic Sea).

Pinnotheres veterum HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiawar, 1: 102 (listed).

Pinnotheres voisin de Veterum DELAGE, 1881, Arch. Zool. Exp. Gén., 9: 157 (listed).

Pinnotheres pinnotheres PESTA, 1918, Decapodenf. Adria: 442-445, fig. 146 (♀ dorsal view) (biology) (compared with *Pinnotheres pisum*) (Adriatic Sea). — BALSS, 1922, in Michaelsen, Beitr. Meeresf. Westafrika, 3 (3): 79, 98 (Cameroon; Gabon). — BALSS, 1926, in Grimpe & Wagler, Tierwelt Nord- und Ostsee, 10 (2): 44 (distinguished from *Pinnotheres pisum*) (Oslo Fjord and Dogger Bank, North Sea). — MONOD, 1927, Faune Colon. Franç., 1: 609 (Cameroon). — MONOD, 1933, Bull. Comité Études Hist. Sci. Afrique Occidentale Franç., 15 (2-3): 533 (78) (Cameroon and Gabon). — MONOD, 1933, Bull. Soc. Sci. Nat. Maroc., 12 (4-6): 142, fig. 1B (♀ maxilliped), C (♀ leg 4), 2C (♀ chela) (Atlantic coast of Morocco). — VILELA, 1936, Bull. Soc. Portugaise Sci. Nat., 12 (27): 238 (listed). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1420 (mentioned). — RIEDL, 1963, Fauna Flora Adria, (ed. 1): 295, pl. 101 (dorsal view) [1970, (ed. 2): 328, pl. 108].

Pinnotheres sp. SZÜTS, 1921, Allattani Közlemenyek, 18: 19 (mentioned) (Adria). [Note: Author, however, may well have been referring to *Pinnotheres veterum* [*Pinnotheres pinnotheres*]: cf. German abstract, p. 47; see also SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1213 (cataloged)].

Pinnotheres pinnotheres BALSS, 1927, in Kükenthal & Krumbach, Handbuch Zool., 3 (9): 1022 (mentioned). — SCHWABE, 1936, Bol. Soc. Biol. Concepcion, 10: 126 (mentioned). — BOUVIER, 1940, Faune de France, 37: 302, 303, pl. 11 fig. 12 (♀ dorsal view), text-fig. 188a (maxilliped), b (chela), c (leg) (France). — ZARIQUIEY ALVAREZ, 1946, Publ. Biol. Mediter. Inst. Españ. Estud. Mediter., 2: 166 (Barcelona, Cadaqués, and the Baleares Islands, Spain). — CAPART, 1951, Résultat. Sci. Expéd. Océanog. Belge Côtes Africaines Atlantique (1948-49), 3 (1): 176 (Cameroon, Gabon). — ATKINS, 1954, Journ. Mar. Biol. Assoc. United Kingdom, (n. ser.) 33 (3): 618 (infected by *Leptolegnia marina* at Teignmouth, England). —

ATKINS, 1954, Journ. Mar. Biol. Assoc. United Kingdom, (n. ser.) 33 (3): 628, 632, 633, 635 (leg disposition of megalopa when swimming). — ATKINS, 1955, Proc. Zool. Soc. London, 124 (4): 687, 688, 700–714, fig. 8a (left antennule zoea 1), b (left antennule zoea 2), c (right antennule megalopa), d (right antenna megalopa), 9a (mandible zoea 1), b (mandible zoea 2), c (mandible megalopa), 10 (lateral view zoea 2), 11 (dorsal view megalopa), 12 (megalopa) a (cheliped), b (chela), c (leg 4), d (dactylus leg 4), 13 (megalopa) a (abdomen), b (abdominal segments 5–6 and telson), 15 (frontal view zoea 1), 17 (posterior part of abdomen showing eversion of mid- and hind-gut and caecum of zoea) (larval stages). — ZARIQUIEY ALVAREZ, 1956, Vie et Milieu, 6 (2): 405 (Bay of Cadaques, Spain). — ATKINS, 1958, Nature, London, 181 (4615): 108 (mentioned). — HOLTHUIS & GOTTLIEB, 1958, Bull. Res. Council Israel, 7 (B): 119 (listed). — CHRISTENSEN & McDERMOTT, 1958, Biol. Bull. Woods Hole, 114 (2): 150, 156, 169, 171, 174, 175 (mentioned). — TORTONESE, 1959, Conosci l'Italia, 3: 233 (Italy). — ATKINS, 1960, Proc. Zool. Soc. London, 133: 436, fig. 1 (megalopa, pleopods), 2 (♀ dactyli maxilliped), 3 (immature ♀, pleopods), 4 (♀ pleopods), 5 (♀ pleopods), 6 (♂ pleopods), 7, 8 (♂ abdomen, ventral view), 9 (♂, second pleopod) (development of pleopods). — GOODBODY, 1960, Nature, London, 185 (4714): 704 (mentioned). — LUTHER & FIEDLER, 1961, Unterwasserf. Mittelmeerküsten: 152, pl. 23 (dorsal view). — BRUCE, COLMAN & JONES, 1963, Mem. Liverpool Mar. Biol. Comm., 36: 176 (Isle of Man). — BOURDON, 1965, Decap. Stomatop. Inventaire Faune marine Roscoff: 33, 40 (region of Roscoff, Brittany, France). — GROTHERS, 1966, Field Studies, suppl. 2: 78 (Dale Fort area, Wales, in *Ascidia mentula*). — PEARCE, 1966, Pacific Sci., 20 (1): 3 (mentioned). — VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 1. — ALLEN, 1967, Crust. Euphaus. Decap. Fauna Clyde Sea Area: 70, 105, fig. (dorsal view). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1174, 1177, 1178, 1184, 1192, 1193, 1206, 1215, 1226 (biology, cataloged, taxonomy) (distribution erroneously includes N. W. American coast).

Pinnotheres (sp. ?) *veterum* MARINE BIOLOGICAL ASSOCIATION, 1931, Plymouth Mar. Fauna, (ed. 2): 219 (Plymouth, England).

Pinnotheres pinnotheres MONOD, 1956, Mém. Inst. Franç. Afr. Noire, 45: 376, 383 (West Africa).

Pinnotheres pinnotheres ZARIQUIEY ALVAREZ, 1968, Invest. Pesquera, Barcelona, 32: 406 (key), 409 (distribution), fig. 146b (maxilliped 2), f (ambulatory leg).

Measurements: Male, length 7.0 mm, width 8.0 mm; female, length 16.0 mm, width 17.0 mm (Carus).

Habitat: In bivalves: *Pinna saccata* [*Pinna* (?) sp., probably *P. rudis* Linnaeus or *P. nobilis* (Linnaeus)] (Forskål); *Pinna ingens* [*Atrina fragilis* (Pennant)] (Leach, 1814); *Pinna nobilis* Linnaeus (Risso); *Isocardia cor* [*Glossus humanus* (Linnaeus)] (Costa); *Modiola vulgaris* [*Modiolus modiolus* (Linnaeus)] (Cocks); *Ostrea edulis* Linnaeus (White, 1850); *Pinna squamosa* [*Pinna nobilis* (Linnaeus)] (Grube); *Pinna truncata* [*Atrina fragilis* (Pennant)] (Gourret, 1884); *Pinna marina* [*Atrina fragilis* (Pennant)] (Sincl); *Pinna pectinata* [*Atrina fragilis* (Pennant)] (Nobre, 1931). In tunicates: *Cynthia* sp. [*Pyura* sp.] (Delage, 1881); *Phallusia mentula* [*Ascidia mentula* O.F. Müller] (Giesbrecht); *Phallusia mamillata* (Cuvier) (Grube); *Ascidia mentula* O.F. Müller (Williamson; Szűts?); *Ascidia aspersa* (O.F. Müller) (Mar. Biol. Assoc.); *Pyura savignyi* (Philippi) and *Microcosmus claudicans* (Savigny) (Bourdon). 9–30 fms (16.5–55 m) (Grube, 1864); 51 fms [93 m] (Adensamer, 1898).

Distribution: North Sea; Atlantic coast of Europe; Mediterranean and Adriatic Seas; Gulf of Guinea.

Pinnotheres pisum (Linnaeus, 1767)

Aristotle (see remarks under *Pinnotheres pinnotheres*) mentioned the present species as well as *P. pinnotheres*. After reporting on the small white crabs found in testaceans (see d'Arcy W. Thompson, 1910, The works of Aristotle, 4: 547b lines 25, 26), Aristotle went on to say that 'they are most numerous in the trough-shaped mussel' (lines 26, 27) and 'are found also in the scallop and in the oyster' (lines 28, 29), showing that part of his material consisted of the present species. The fantastic story about the relation between the bivalve and the crab given and repeated by later authors, pertains to the *Pinna* and its 'guard', thus to *P. pinnotheres* (see under that species).

'Les Cancres qui se trouvent dans les Huitres' Rondelet, 1558, Histoire entière des Poissons: 410 (described these as smaller than those from *Pinna* and of white colour rather than pink, found in oysters) (Rondelet's figure, copied by numerous later authors, shows *P. pinnotheres*).

'Cancri parvi qui in Ostreis reperiuntur' Gesner, 1560, *Icones animalium* :208 (citation of Rondelet's, 1558 text; also mentioned the species from *Mytilus* and *Pecten*).

Cancer parvus p.p. Aldrovandus, 1606, *De reliquis animalibus exanguibus*, (ed. 1): 212-215 (dealt with both *P. pinnotheres* and *P. pisum*, citing many previous mostly classical, authors; the figure is that of *P. pinnotheres* copied from Rondelet) (ed. 2 in 1642 with same text and pagination).

Pinnother p.p. Sachs, 1665, *Gammarologia*: 97-100 (dealt with both *P. pisum* and *P. pinnotheres*, basing himself on previous authors; here too Rondelet's figure of the latter species is reproduced).

Cancer Nutrix SCOPOLI, 1763, *Entomol. Carniolica*: 410 ('*Pinnotheres pisum*?,' *vide* Nardo, 1869: 229; with footnote: 'Gmelin lo riguarda come il *C. minutus* L.' (the Gmelin identification is considered untenable by Dr. F. A. Chace, Jr., USNM [personal communication] because of the habitat mentioned by Scopoli: 'In *Ost. eis Edulibus frequens, qua nutrit, ut ait Populus*').

Cancellus Mytilorum albus BASTER, 1765, *Opuscula Subseciva*, 2: 20, 21, 25, 26, 46, pl. 4 fig. 1 (♀ dorsal view) (in *Mytilus*, province of Zeeland, the Netherlands) (synonymized by Bonnier, 1887: 230).

Cancellus Mytilorum fuscus BASTER, 1765, *Opuscula Subseciva* 2: 22, 23, 46, pl. 4 fig. 2 (♂ dorsal view) (in *Mytilus*, province of Zeeland, the Netherlands) (Bonnier, 1887: 230).

Mossel-Krabbetje BASTER, 1765, *Natuurk. Uitspanningen*, 2: 49 (found in the province of Zeeland, the Netherlands), pl. 4 fig. 1 (♀ dorsal view; a, natural size, A, enlarged), 2 (♂ dorsal view; a, natural size, A, enlarged).

Cancer Pisum LINNAEUS, 1767, *Syst. Nat.*, (ed. 12) 1 (2): 1039 (type probably not extant; type-locality: '... in Barbaria [north coast of Africa]'). — HOUTTUYN, 1769, *Linnaeus, Natuurl. Hist.*, 13: 318, 319 (Dutch translation of 1767 edition). — PENNANT, 1777, *Brit. Zool.*, (ed. 4) 4: 1, 2, pl. 1 fig. 1 (♀ dorsal and ventral views) (England). — GMELIN, 1788, *Linnaeus, Syst. Nat.*, (ed. 13) 1 (5): 2964 (Mediterranean Sea). — OLIVI, 1792, *Zool. Adriatica*: 44 (brief description, compared with *Cancer Pinnotheres* [*Pinnotheres pinnotheres*]). — FABRICIUS, 1798, *Suppl. Ent. Syst.*: 343 (British and Mediterranean Seas). — PENNANT, 1812, *Brit. Zool.*, (ed. 2) 4: 2-4, pl. 1 fig. 1 (♀ dorsal and ventral views) (England). — FISCHER, 1813, *Zoognosia Tab. Synop.*: 209 (listed).

Cancer pisum STATIUS MÜLLER, 1775, *Linné, Natursystem*, 5 (2): 1100, 1101 (Barbary Coast, North Africa). — FABRICIUS, 1781, *Spec. Ins.*, 1: 497 (Mediterranean Sea). — HERBST, 1783, *Vers. Naturg. Krabben Krebse*, 1 (2-5): 95, 96, pl. 2 fig. 21 (♀ dorsal view) (Mediterranean Sea). — FABRICIUS, 1787, *Mant. Ins.*, 1: 315 (brief description). — FABRICIUS, 1793, *Ent. Syst.*, 2: 441 (brief description). — PETAGNA, 1796, *Instit. Entomol.*, 1: ('in mare mediterraneo'). — HERBST, 1799, *Vers. Naturg. Krabben Krebse*, 3 (1): 31 (Adriatic Sea). — LATREILLE, 1810, *Consid. Gén. Ord. Nat. Anim. Crust. Arachn. Ins.*: 422 (listed). — ICZN, 1925, *Smithson. Misc. Coll.*, 73 (3): 16 (Opinion 85, '*Cancer pisum* Fabricius, 1775 = *C. pisum* Linnaeus, 1767' is placed as type of *Pinnotheres* in the 'Official List of Generic Names in Zoology'). — ICZN, 1956, *Opin. Decl. Int. Comm. Zool. Nomencl.*, 1 (D) (1): 37 (Direction 36; 'Annexe 1' reproduces the original proposal for the inclusion of the name in the 'Official List of Specific Names in Zoology' as the type of *Pinnotheres*. On p. 44, the Commission withdraws this proposal). — ICZN, 1956, *Opin. Decl. Int. Comm. Zool. Nomencl.*, 1 (D) (9): 235-242 (Direction 45; gives priority to *Pinnotheres* Bosc [1801-1802] over *Pinnotheres* Latreille [1802-1803] in the 'Official List of Generic Names in Zoology,' citing *Cancer pisum* Linnaeus, 1767, as the type. Thus the latter becomes Name No. 1035 on 'Official List of Specific Names in Zoology').

Pinnotheres or *Pinnophylax* CHEMNITZ, 1777, *Naturforscher*, 10: 16-39 (historical account of *Pinnotheres pisum*).

Cancer mytilorum albus HERBST, 1783, *Vers. Naturg. Krabben Krebse*, 1 (2-5): 101 (based on Baster's, 1765, *Cancellus Mytilorum, albus*) pl. 2 fig. 24 (♀ dorsal view). — COSTA, 1836, *Fauna Regno Napoli*: 2 (synonymizes this species with '*Pinnotheres Latreillii*').

Cancer mytilorum fuscus HERBST, 1783, *Vers. Naturg. Krabben Krebse*, 1

(2-5): 101, 102, (based on Baster's, 1765, *Cancellus Mytolorum fuscus*), pl. 2 fig. 25 (♀ dorsal view).

Cancer minutus, [non Linnaeus], DE WULFEN 1791, Nova Acta physico-medica. Acad. Caes. Leopold Carol. naturae curiosorum, Norimbergae, 8: 235-359 (species no. 61).

Cancer varians OLIVIER, 1791, Encyc. Method., Hist. Nat., 6: 143, 155 ('Il se trouve dans l'Océan').

Alpheus pisum WEBER, 1795, Nomencl. Entomol.: 91 (listed).

Pinnotheres pisum BOSC, 1801-1802, Hist. Nat. Crust., 1: 243 ('Se trouve dans les mers d'Europe'). — LATREILLE, 1802-1803, Hist. Nat. Crust. Ins., 6: 83 (mentioned). — LATREILLE, 1806, Gen. Crust. Ins., 1: 35 ('Habitat in Oceano'). — LEACH, 1815, Malacost. Podopht. Brit.: annotated explanation of plate 14 (♀), figs. 1 (dorsal view), 2 (dorsal view and maxilliped), 3 (abdomen) (England). — LAMARCK, 1818, Hist. Nat. Anim. s. Vert., 5: 231 (European Sea). — DESMAREST, 1823, Dict. Sci. Nat., Paris, 28: 238, pl. 11 fig. 3 (♀ dorsal view), a (♂ abdomen), b (♀ abdomen) (coasts of France and England). — DESMAREST, 1825, Consid. Gén. Class. Crust.: 118, pl. 11 fig. 3 (♀ dorsal view) a (♂ abdomen), b (♀ abdomen) (coasts of France and England). — BRÉBISSON, 1825, Mém. Soc. Linn. Calvados, 2: 235 (Calvados, N.W. France). — RISSO, 1826, Hist. Nat. Princip. Produc. Europe Mérid., 5: 16 (southern European Coast). — STARK, 1828, Elements Nat. Hist., 2: 149 (coasts of Europe). — BOUCHARD-CHANTEREAUX, 1833, Mém. Soc. Agric. Boulogne, 1832: 8 (Boulogne, France). — EMBLETON, 1835, Hist. Proc. Berwickshire Nat. Club, 1 (3): 70 (Holy [or Lindisfarne] Island, England). — THOMPSON, 1836, Entomol. Mag., 3 (6): 85-90, figs. 1 (lateral view zoea), 2 (anterior view zoea), 3 (♂ abdomen) (larval stages). — H. MILNE EDWARDS, 1837, Hist. Nat. Crust., 2: 31, 32, pl. 19 fig. 1 (♀ dorsal view) a (frontal view), b (antennae), c (maxilliped), d (maxilliped 2), e (maxilliped 1), f (♂ dorsal view) (coasts of France and England). — H. MILNE EDWARDS, 1838, Lamarck, Hist. Nat. Anim. s. Vert., (ed. 2) 2: 411 (European Sea). — H. MILNE EDWARDS, 1839, Lamarck, Hist. Nat. Anim. s. Vert., (ed. 3) 2: 406 (European Sea). — COSTA, O., 1840, Fauna Regno Napoli, Crust. (7): 3 (Naples, Italy). — LUCAS, 1840, Hist. Nat. Crust.: 66 (coasts of France and England). — THOMPSON, 1842, Ann. Mag. Nat. Hist., 10: 283-285 (Ireland). — HASSALL, 1842, Ann. Mag. Nat. Hist., 9: 134 (Dublin Bay) (listed). — BELL, 1845, Hist. British Stalk-eyed Crust., (3): 121-125, fig. (lateral and anterior views zoea), figs. 1 (♂ dorsal view), 2 (♂ dorsal view), 3 (♀ dorsal view), 4 (♀ dorsal view) (Dorset, England). — NARDO, 1847, Venezia e le sue laguna: 16, 17 (listed). — NARDO, 1847, Sinonimia moderna Chierighin: 3 (identifies with some doubt *Cancer Eubolinus* Chierighin MS. with the present species; short description, hosts: '*Pecten Jacobeus*' and '*Ostrea Edulis*'). — WHITE, 1847, List Crust. Brit. Mus.: 32 (Sandgate, Firth of Forth, and Torquay, England). — COCKS, 1849, Trans. Cornwall Polytechn. Soc.: 80 (Falmouth, England). — WHITE, 1850, List Brit. Anim. Brit. Mus., 4: 16, 17 (Scotland, Ireland, England). — GIBBES, 1850, Proc. Acad. Nat. Sci. Phila., 5: 29 (listed). — GISTEL, 1851, Naturgesch. Thierreich, (ed. 2): 158 (mentioned). — THOMPSON, 1851, Ann. Mag. Nat. Hist., (2) 7: 502 (spawning). — EYTON, 1852, Ann. Mag. Nat. Hist., (2) 10: 285 (Isle of Man) (listed). — GOSSE, 1855, Man. Mar. Zool. Brit. Isles, 1: 159, fig. 304 (♀ dorsal view) (British Isles). — KNIGHT, 1858, Pict. Mus. Animat. Nat., 2: 307 (mentioned). — WHITE, 1857, Pop. Hist. Brit. Crust.: 54, 55 (popular account). — McANDREW, 1860, List Brit. Mar. Invert. Fauna: 21 (Britain). — KINAHAN, 1861, Rept. Brit. Assoc. Adv. Sci., 30: 29, 31 (Dublin Bay, Ireland). — VAN BENEDEN, 1861, Mém. Acad. Roy. Belgique, 33: 135 (mentioned). — BATE, 1861, Rept. British Assoc. Adv. Sci., 30: 222 (listed). — HELLER, 1863, Sitzungsber. K. Akad. Wiss. Wien (Math.-Naturwiss.), 46 (1): 446 (listed). — HELLER, 1863, Crust. Südl. Europa: 117, 118, pl. 3 (♀) figs. 11 (dorsal view), 12 (maxilliped 3), 13 (maxilliped 2) (Adriatic and Mediterranean Seas). — GOËS, 1864, Oversigt Kgl. Vetenskapsakad. Forh., 1863 (3): 163, 164, 179 (Norway, Denmark, Belgium, Britain, and Mediterranean Sea). — LORD, 1867, Crab, Shrimp, Lobster Lore: 41-44, 2 figs. (dorsal view). — COSTA, 1867, Ann. Mus. Zool. R. Univ. Napoli, 4 (2): 41 (listed; Gulf of Naples, Italy). — CLAUS, 1868, Grundzüge Zool.: 237 (mentioned). — PARFITT, 1871, Rept. Trans. Devonshire Assoc. Advanc. Sci.,

Lit. Art., 4 (1): 188 (Devonshire, England). — FISCHER, 1872, Actes Soc. Linn. Bordeaux, 28 (4): 412 (10) (Gironde, France). — M'INTOSH, 1874, Ann. Mag. Nat. Hist., (4) 14 (83) (40): 349 (St. Andrews, Scotland). — MAITLAND, 1874, Tijdschr. Nederland. Dierkund. Ver., 1: 234 (listed). — METZGER, 1875, Jahresber. Comm. wiss. Unters. Deutsch. Meere, 2: 295 (North Sea). — DE BRITO CAPELLO, 1875, Journ. Sci. Math. Phys. Nat. Lisboa, 5 (18): 122 (Setubal, Portugal). — DE BRITO CAPELLO, 1876, Journ. Sci. Math. Phys. Nat. Lisboa, 5 (18): 270 (Setubal, Portugal). — STALIO, 1877, Atti R. Inst. Veneto Sci. Lettere Arti, (5) 3: 520 (Mediterranean). — DE FOLIN & PERIER, 1877, Fonds de la Mer, 3: 210 (listed). — BATE, 1878, Journ. Roy. Inst. Cornwall, 2 (19): 466 (Cornwall, England). — NEUMANN, 1878, Cat. Podopht. Crust. Heidelberg. Mus.: 25 (Mallorca, Spain). — LUCAS, 1880, Ann. Soc. Ent. France, (5) 10: cxvi (Atlantic coast of France). — STOSSICH, 1880, Boll. Soc. Adriatico Sci. Nat. Trieste, 6: 193 (Adriatic Sea). — DELAGE, 1881, Arch. Zool. Exp. Gén., 9: 157 (listed). — LESLIE & HERDMAN, 1881, Proc. Roy. Phys. Soc. Edinburgh, 6: 52 (Longniddry, England). — BARROIS, 1882, Cat. Crust. Echin. Concarneau: 17 (listed). — WOODWARD, 1882, in Cassell, Nat. Hist., 6: 202, fig. 8 (♀ dorsal view) (County Down and Youghal, Ireland). — CARRINGTON & LOVETT, 1882, Zoologist, 6: 178, 179 (England). — SARS, 1883, Forh. Vidensk Selsk. Kristiania, 1883 (18): 40 (Christiania Fjord [Oslo Fjord], Norway). — D'URBAN, 1884, Zoologist, (3) 8: 152 (South Devon Coast, England). — BELTRÉMIEUX, 1884, Ann. Soc. Nat. Sci. Charente-Inférieure, 20: 392 (listed). — KINGSLEY, 1884, Standard Nat. Hist., 2: 64 (popular account). — RATHBUN, R., 1884, in G. B. Goode, Fisheries Fishery Industries, U. S., 1 (5): 765 (not pl. 269, fig. 2) (mentioned). — HOEK, 1884, Tijdschr. Nederland. Dierkund. Ver., (suppl.) (2) 1: 544, 545 (mentioned). — KOEHLER, 1885, Bull. Soc. Sci. Nancy, (2) 7 (17): 87, 116 (Jersey, Channel Islands). — KOEHLER, 1885, Ann. Sci. Nat. Zool. Paris, (6) 20: 21, 59 (Channel Islands). — CARUS, 1885, Prodrum Faunae Mediter.: 520 (Mediterranean Sea). — PELSENEER, 1886, Bull. Mus. Roy. Hist. Nat. Belgique, 4: 215 (Belgium). — LEUNIS, 1886, Synopsis Naturreiche, 2: 646, fig. 599 (♀ dorsal view). — WALKER, 1886, Rept. Liverpool Mar. Biol. Committee, 1 [= Proc. Literary Philos. Soc. Liverpool. 40 (appendix)]: 225 (Liverpool Bay). — WOODWARD, 1886, Proc. Zool. Soc. London, 1886: 177 (mentioned). — BONNIER, 1887, Bull. Sci. N. France Belgique, (2) 18: 230, 231 (Bay of Concarneau, France). — HOEK, 1887, Tijdschr. Nederland. Dierkund. Ver., (2) 1: 94 (mentioned). — SCOTT, 1888, Ann. Rept. Fish. Board Scotland, 6 (3): 257 (Firth of Forth, Scotland). — GIARD & BONNIER, 1889, Compt. Rend. Acad. Sci. Paris, 109: 914 (parasitized). — OSORIO, 1889, Journ. Sci. Math. Phys. Nat. Lisboa, 2 (1): 57 (Setubal, Villa Real de Santo Antonio and Malha de Costa, Portugal). — HALLEZ, 1892, Rev. Biol. Nord France, 4: 278 (Calais, France). — BOLLIVAR, 1892, Anales Soc. Españ. Hist. Nat., 21: 128 (Valencia, Spain). — WALKER, 1892, Trans. Biol. Soc. Liverpool, 6: 96 (Irish Sea). — WALKER, 1892, Fauna of Liverpool Bay, 3: 50 (reprint of previous reference). — MEINERT, 1893, Vidensk. Udbytte Kanonb. Haugs Togter: 214. — RATHBUN, R., 1893, Nat. Hist. Econ. Crustaceans: 765, 766 (not pl. 269, fig. 2) (reprint of Rathbun, R., 1884, with identical pagination and illus.). — STEBBING, 1893, Hist. Crust.: 101 (popular account). — NORMAN, 1894, Ann. Mag. Nat. Hist., (6) 13: 148 (Trondhjem Fjord, Norway) (listed). — ORTMANN, 1894, Zool. Jahrb. Syst., 7: 699 (West coast of France; Naples, Italy; Lesina [Hvar Island], Yugoslavia). — LAMEERE, 1895, Man. Faune Belg., 1: 563 (Belgian coast). — SUCKER, 1895, Fische Adria: 136 (Adriatic Sea). — HERDMAN, 1896, Rept. Brit. Assoc. Advan. Sci., 66: 21 (listed). — OSTROUMOVA, 1896, Bull. Acad. Imp. Sci. St.-Petersbourg, 5 (1): 62 (listed). — ADENSAMER, 1897, Ann. K. K. Naturhist. Hofmus. Wien, 12: 105, 106 (part, not specimens from New Zealand, Auckland Is., and Australia) (Adriatic Sea, Cyprus, Greece, Sweden). — A. MILNE EDWARDS & BOUVIER, 1899, Résultats Camp. Sci. Monaco, 13: 38 (Gibraltar). — BONNIER, 1900, Trav. Sta. Zool. Wimereux, 8: 227 (parasitized). — GRAEFFE, 1900, Arb. Zool. Inst. Univ. Wien und Zool. Sta. Triest, 13 (1): 76 (44) (Gulf of Triest). — A. MILNE EDWARDS & BOUVIER, 1900, Expéd. Travailleur et Talisman, Crustacés Décapodes, 1: 115 (Nice, France). — THOMPSON, 1901, Cat. Crust. Pycnog. Mus. Univ. Coll. Dundee: 6 (British) (listed). — TODD, 1902, Journ. Mar. Biol. Assoc. United Kingdom,

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(n. ser.) 16 (1): 203-219 (parasitized). — AIKAWA, 1929, Records Oceanogr. Works Japan, 2 (1): 24, pl. 4 fig. 36 (telson zoea) (larval stages). — MERCIER & POISSON, 1929, Bull. Soc. Zool. France, 54 (4): 301-304, figs. 1 (♂ leg 4), 2 (♀ leg 4), 3 (♂ leg 4) (alteration of secondary sexual characters of the ♂ when parasitized by *Pinnotherion vermiforme*) (Calvados, France). — HUXLEY, 1931, Amer. Nat., 65: 289-295, tables 1 (measurements), 2 (relative growth). — MAR. BIOL. ASSOC., 1931, Plymouth Mar. Fauna, (ed. 2): 218, 219 (Plymouth, England). — NOBRE, 1931, Crustáceos Decápodos e Stomatópodos Portugal, (ed. 1): 113, 114, fig. 67 (♀ dorsal view) (Portugal). — HUXLEY, 1932, Problems of Relative Growth: 94, 95, fig. 53 (3 ventral views). — VATOVA, 1932, Note Inst. Italo-Germanico Biol. Mar. Rovigno, 4: 7 (listed). — CARVALHO, 1933, Mem. Estud. Mus. Zool. Univ. Coimbra, (1) 66: 7 (Vila Real de Santo António, Portugal). — MIRANDA Y RIVERA, 1933, Notas Res. Inst. Españ. Oceanog., (2) 67: 56 (Isla Cristina, Málaga, Valencia, and Mallorca, Spain). — MIRANDA Y RIVERA, 1933, Notas Res. Inst. Españ. Oceanog., (2) 68: 4 (Isla Cristina, Spain). — ATKINS, 1933, Proc. Zool. Soc. London, 1933: 358, 359 (*Pinnotherion vermiforme* infection) (Estuary of the Camel, Padstow, North Cornwall, England). — CALINESCU, 1934, Bull. Soc. Stud. Științe Nat. București, 4: 81, 82, figs. 12 (♀ dorsal view), 13 (♂ ventral view), 14 (♀ dorsal view), 15 (♀ ventral view), 16 (♀ dorsal view), 17 (♀ ventral view) (Black Sea; locality erroneously cited, fide Băcescu, personal correspondence). — USSING, 1934, Flora og Fauna, 3: 71 (mentioned) (Skagerak, Denmark; in *Modiolus*). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 164 (asymmetry). — NOBRE, 1936, Crust. Decáp. Stomatóp. Mar. Portugal, (ed. 2): 67, 68, pl. 26 fig. 63 (♀ dorsal view) (Portugal). — SCHWABE, 1936, Bol. Soc. Biol. Concepción, 10: 126 (mentioned). — VILELA, 1936, Bull. Soc. Portugaise Sci. Nat., 12 (27): 238 (listed). — AIKAWA, 1937, Rec. Oceanogr. Works Japan, 9 (1): 152 (larval characters). — WHITE, 1937, Liverpool Mar. Biol. Comm. Mem., 31: 11 (parasitic). — BĂCESCU, 1937, Bul. Soc. Natur. Romania, 11: 14 (listed) (erroneously cited from Black Sea, fide Băcescu, personal correspondence). — MOORE, 1937, Proc. Trans. Liverpool Biol. Soc., 50: 139 (Isle of Man). — GURNEY, 1938, Proc. Zool. Soc. London, (B) 108 (1): 79 (larval stages) (listed). — WILLIAMS & NEEDHAM, 1939, Proc. Zool. Soc. London, (A) 108 (4): 539-556, figs. 1 (♀ a (dorsal view), b (abdomen), 2 (♂ a (dorsal view), b (abdomen) (growth rates). — BOUVIER, 1940, Faune de France, 37: 301, 302, pl. 11 figs. 9 (♂ dorsal view), 10 (♀ dorsal view), 11 (maxilliped), text-fig. 187 (♂), a (dorsal view), b (maxilliped), c (chela), d (leg) (France). — LELOUP, 1941, Bull. Mus. Roy. Hist. Nat. Belgique, 17 (11): 14, 15 (Belgium, France, and England). — ZARIQUIEY ALVAREZ, 1946, Publ. Biol. Mediter. Inst. Españ. Estud. Mediter., 2: 165, 166 (Málaga, Valencia, Villanueva, Barcelona, Arenys, and the Balears Islands, Spain). — GILS, 1947, Bull. Soc. Nat. Belges, Bruxelles, 28: 88, 89, fig. 10 (♀ dorsal view) (general account). — BARNARD, 1950, Ann. S. African Mus., 38: 79, 80, fig. 16h (apex of abdomen, ♂, in sternal groove, setae partly omitted to show apex of first pleopod), i (first pleopod, ♂) (though expressing some doubt [?], the author believes that some European specimens in his Museum represent this species; cf. *Pinnotheres* sp. Barnard, 1950). — NEEDHAM, 1950, Proc. Roy. Soc. London, (B) 137 (886): 115-136 (transformation of ♀ abdomen). — VILELA, 1950, Bol. Soc. Portuguesa Cienc. Nat., (2) 3 (1): 128 (Ria de Faro, Portugal). — CAPART, 1951, Résultat. Sci. Exped. Oceanog. Belge Côtes Africaines Atlantique (1948-49), 3 (1): 175, 176 (Port Etienne, Mauritania). — CAULLERY, 1952, Parasitism & Symbiosis: 80 (parasitized). — BERNER, 1952, Bull. Soc. Zool. France, 77: 344-347 (biology). — ZARIQUIEY ALVAREZ, 1952, Crustáceos Decápodos recogidos por el Dr. Rutllant en Aguas de Melilla. Fauna Mogrebica: 47 (Melilla, Spanish Morocco). — PLESSIS, 1953, Bull. Mus. Hist. Nat., Paris, (2) 25 (6): 562 (viability of crab introduced into anemones). — ATKINS, 1954, Journ. Mar. Biol. Assoc. United Kingdom, (n. ser.) 33 (3): 628 (mentioned in account of leg disposition of the megalops when swimming). — ATKINS, 1954, Journ. Mar. Biol. Assoc. United Kingdom, (n. ser.) 33 (3): 721 (eggs infected by *Plectospira dubia*). — ATKINS, 1954, Journ. Mar. Biol. Assoc. United Kingdom, (n. ser.) 33 (3): 613-620 (infection by *Leptolegnia marina*; on the Cornwall-Devon border, S. Devon, Padstow and North Wales, England). — DEMIR, 1954, Bogaz ve Adalar Sahillerinin Omurgasız Dip Hayvanlari, (2): 430, fig. 178

(dorsal view) (Bosphorus area, Turkey). — ATKINS, 1955, *Trans. Brit. Mycol. Soc.*, 38 (1): 31–46 (parasitized). — ZARIQUIEY ALVAREZ, 1956, *Vie et Milieu*, 6 (2): 409 (Cabo de Creus and Isla de Massina, Spain). — ATKINS, 1955, *Proc. Zool. Soc. London*, 124 (4): 687–700, 713, 714, figs. 1 a (lateral view pre-zoea), b (lateral view zoea 1), c (lateral view zoea 2), 2 (zoea 1), a (molt), b (lateral view of abdominal segments 2 and 3 of molt), 3 a (lateral view zoea 3), b (abdomen zoea 4), c (telson megalopa), fig. 4 a–d (antennule and antenna zoea 1–4), e (antennule megalopa), f (antennae of 2 megalopa), g (mandibles zoea 1), h (mandible megalopa), fig. 5 (molt zoea 4) a (right lateral piece of carapace), b, c (central piece of carapace in 2 positions), d (abdomen), e (telson), 6 (dorsal view megalopa), 7 (megalopa), a (cheliped), b (fingers of chela), c (leg 4), d (dactylus leg 4) (larval stages) (Conway and Plymouth Sound, England). — BASSINDALE & BARRETT, 1957, *Proc. Bristol Natural. Soc.*, 29 (3): 286 (Dale Fort area, Wales). — FOREST & GUINOT, 1958, *Bull. Sea Fish. Res. Sta., Israel*, 15: 13 (Caesarea, Israel). — MacDONALD, 1958, *Ann. Mag. Nat. Hist.*, (12) 10 (117): 659 (Belfast Lock, Ireland). — ATKINS, 1958, *Nature*, London, 181 (4615): 1087 (England). — HOLTHUIS & GOTTLIEB, 1958, *Bull. Res. Council Israel*, 7 (B): 103, 104, 119 (Acre and Haifa Bay, Israel). — HOLTHUIS, 1958, *Strand Werk Gemeenschap Tabellenserie*, 18: 13, fig. 33 (♂ dorsal view) (key to Netherlands species). — CHRISTENSEN & McDERMOTT, 1958, *Biol. Bull. Woods Hole*, 114 (2): 146, 165, 167, 169, 170, 174–176 (mentioned). — CHRISTENSEN, 1959, *Proc. Internat. Congr. Zool.*, 15: 267–270, figs. 1 (dorsal view crab stage 1), 2 (dorsal view pre-hard stage) (larval stages) (Gulmar Fjord, Sweden; Frederikshavn, Denmark). — ATKINS, 1960, *Proc. Zool. Soc. London*, 133 (3): 446, fig. 10 (♀ pleopods), 11–13 (♂ pleopods) (development of pleopods). — GOODBODY, 1960, *Nature*, London, 185 (4714): 704 (mentioned). — SCOTT, 1961, *Trans. Roy. Soc. New Zealand, Zool.*, 1 (22): 304–307, figs. 2 (dorsal view), 3 (♀ right chela), 5 (left mandible) (review of New Zealand pinnotherids, includes a comparison with *Pinnotheres novaezelandiae*). — GREEN, 1961, *A Biology of Crustacea*: 120, 123, fig. 52 (drawing of entoniscid isopod taken from body cavity of crab) (mentioned as host of internal parasite, *Pinnotherion vermiforme* Giard & Bonnier). — LUTHER & FIEDLER, 1961, *Unterwasserf. Mittelmeerküsten*: 152 (mentioned). — CHRISTENSEN, 1962, *Nat. Verd. Copenhagen*: 1–7, figs. A (1st crab stage), B (intermediate crab stage), C (hard crab stage), D (adult crab). — PEARCE, 1962, *Biologist*, 45 (1–2): 14 (mentioned). — SALVAT, 1962, *Cahiers Biol. Mar.*, 3: 235, 241 (Arcachon, France; mentioned). — BRUCE, COLMAN & JONES, 1963, *Mem. Liverpool. Mar. Biol. Comm.*, 36: 174 (Isle of Man). — HOUGHTON, 1963, *Journ. Anim. Ecol.*, 32 (2): 253–257 (ecology). — RIEDL, 1963, *Fauna Flora Adria*, (ed. 1): 295, pl. 101 (dorsal view), col. pl. 4 [1970, ed. 2: 328, pl. 108, col. pl. 7]. — CHENG, 1964, *Biol. Anim. Parasites*: 494 (discussed under symbiotic Crustacea). — BOURDON, 1965, *Decap. Stomatop. Inventaire Faune Marine Roscoff*: 32, 40 (area of Roscoff, France). — FOREST, 1965, *Vie et Milieu*, 16 (1–B): 382 (listed). — HUARD & DEMEUSY, 1965, *C. R. Acad. Sci. Paris*, 263 (D): 1150–1152 (soft-shelled males in a population in Calvados, France). — GROTHERS, 1966, *Field Studies*, suppl. 2: 77 (Dale Fort area, Wales). — PEARCE, 1966, *Pacific Sci.*: 20 (1): 3–33 (biology). — PEARCE, 1966, *Some Contemporary Stud. Mar. Sci.*, 575, 584, 587 (biology). — COSTLOW & BOOKHOUT, 1966, *Chesapeake Sci.*, 7 (3): 157, 162, 163 (larval). — SNELI, 1966, *Fauna, Oslo*, 19: 100–109, figs. 1 (animal in mussel), 2 A–D (various crab stages in dorsal view), 3 (growth curve), 4 (distribution map) (occurrence in Norway). — VIA BOADA, 1966, *Acta Geologica Hispanica*, 1 (4): 1. — ALLEN, 1967, *Crust. Euphaus. Decap. Fauna Clyde Sea Area*: 30, 70, 105, fig. (dorsal view). — PATTON, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1233, 1237 (feeding, effect on host). — RICE, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1128 (light-pressure study of larvae). — KNIGHT-JONES & QASIM, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1135, fig. 1 (sketch of apparatus used) (response to hydrostatic pressure). — SILAS & ALAGARSWAMI, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1163–1190, 1227 (biology). — BEONDE, 1968, *Veliger*, 10 (4): 377 (mentioned). — HUARD & DEMEUSY, 1968, *Arch. Zool. expér. gén.*, 169: 403–444, figs. 1–14 (development and infestation of *Mytilus*). — LEGALL, 1969, *Bull. Soc. Sci. Bretagne*, 43 (3, 4): 221, 222 (commensalism). — SANKARANKUTTY, 1968, *Sarsia*, 31: 51,

fig. 5A-C (δ first pleopod). — ZARIQUIEY ALVAREZ, 1968, Invest. Pesquera, Barcelona, 32: 9, 16, 406 (key), 408 (diagnosis, distribution), fig. 7b (maxilla), 14f (δ first pleopod), 135 c (δ dorsal view), d (δ dorsal view), 136 a (maxilla), c (maxilliped 3), d (apex δ first pleopod), e (ambulatory leg). — CAMPBELL, 1969, Comp. Biochem. Physiol., 30: 803-812, figs. 1, 2 (carotenoid metabolism). — CHRISTIANSEN, 1969, Marine Invert. Scandinavia, 2: 88, fig. 36 (δ dorsal view), 37 (δ dorsal view), map 30 (distribution) (general account, with description). — GOTTO, R. V., 1969, Marine Animals ... Associations: 5, 7, fig. 23 ('pea crab' in host, *Mytilus edulis*) (ecology). — SEED, 1969, Journ. Zool. London, 158 (4): 413-420, figs. 1-3 (graphs) (incidence of *Pinnotheres* in *Mytilus edulis* and *M. galloprovincialis* in S.W. England). — WELLINGTON & HISCOCK, 1969, Austr. Journ. Sci., 31: 333 (Australia). — GRIFFIN, 1970, Australian Nat. Hist., 16 (9): 307 (mentioned in popular account; author in personal communication says identification is correct).

Pinnotheres mytilorum Latreille, 1802-03, Hist. Nat. Crust. Ins., 6: 83, 84, pl. 48 fig. 1 (δ dorsal view). — LATREILLE, 1806, Gen. Crust. Ins., 1: 35 (brief description). — LAMARCK, 1818, Hist. Nat. Anim. s. Vert., 5: 231 (European Seas). — LATREILLE, 1818, Nouv. Dict. Hist. Nat., 26: 461, 462 (mentioned). — LATREILLE, 1823, Thierreich, 3: 25 (Mediterranean). — H. MILNE EDWARDS, 1838, in Lamarck, Hist. Nat. Anim. s. Vert., (ed. 2) 5: 411 (European Seas). — H. MILNE EDWARDS, 1839, Lamarck, Hist. Nat. Anim. s. Vert., (ed. 3) 2: 406 (European Seas). — DRAPIEZ, 1842, Dict. Classiq. Sci. Nat., 8: 685 (mentioned). — HOPE, 1851, Cat. Crust. Italiani Mediterraneo: 5 (listed) ('Nizza'). — H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 217 (183), pl. 10 fig. 1 (δ and δ dorsal views), d (maxilliped 2), e (maxilliped 1) (coasts of France and England). — BELTRÉMIEUX, 1884, Ann. Soc. Nat. Sci. Charente-Inférieure, 20: 392 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1203, 1219, 1221 (cataloged, taxonomy).

Pinnotheres Pisum LEACH, 1814, Edinburgh Encyc., 7: 430 (mentioned). — DESMAREST, 1830, in Bosc, Hist. Nat. Crust., (ed. 2), 1: 294, 295 (European Seas). — HOPE, 1851, Cat. Crust. Italiani Mediterraneo: 5 (listed) ('Nizza'). — KNIGHT, 1856-58, Pict. Mus. Animat. Nat., 2: 307 (popular account). — HERKLOTS, 1861, Tijdschr. Entomol., 4: 131 (listed). — NARDO, 1869, Mem. R. Ist. Veneto, 14: 229, 233, 235, 239, 260 (mentioned). — MEINERT, 1890, Vidensk. Udbytte Kanonbaad. 'Hauchs' Togter, 3: 214 (brief description).

Pinnotheres Mytili LEACH, 1814, Edinburgh Encyc., 7: 430 (type probably not extant; type-locality: 'Kingsbridge estuary, near Gerston Point', England; dredged from oyster bed; also in the bivalve, *Mytilus modiolus* [*Modiolus modiolus* (Linnaeus)]).

Pinnotheres Mytilorum LEACH, 1814, Edinburgh Encyc., 7: 430 (Firth of Forth, Scotland). — RISSO, 1816, Hist. Nat. Crust. Environs Nice: 23, 24 (Nice, France). — LATREILLE, 1825, Encyc. Method. Hist. Nat., 10: 135 (brief description). — BRÉBISSON, 1825, Mém. Soc. Linn. Calvados: 235 (Calvados, N.W. France). — NAUCK, 1880, Zeitschr. Wiss. Zool., 34: 23 (gastric mill).

Pinnotheres Varians LEACH, 1814, Edinburgh Encyc., 7: 394, 430, 431 (Firth of Forth, Scotland).

Pinnotheres Modioli LEACH, 1814, Edinburgh Encyc., 7: 431 (Kingsbridge Estuary, England).

Pinnotheres Cranchii LEACH, 1815, Malacost. Podopht. Brit.: annotated explanation of plate 14 (δ) figs. 4 (dorsal view), 5 (abdomen) (Kingsbridge Estuary, England). — DESMAREST, 1823, Dict. Sci. Nat., 28: 238 (coast of England). — DESMAREST, 1825, Consid. Gén. Class. Crust.: 118 (coast of England). — BOUCHARD-CHANTEREAU, 1833, Mém. Soc. Agric. Boulogne, 1833: 9 (Boulogne, France). — EMBLETON, 1835, Hist. Proc. Berwickshire Nat. Club, 1 (3): 70 (Eyemouth, Scotland). — COSTA, O., 1840, Fauna Regno Napoli, Crost. (7) 1, 2 (Sea of Taranto, Italy). — HOPE, 1851, Cat. Crust. Italiani Mediterraneo: 5 (listed) ('Taranto'). — HERKLOTS, 1861, Tijdschr. Entomol., 4: 131 (18) (listed).

Pinnotheres varians LEACH, 1815, Malacost. Podopht. Brit.: annotated explanation of plate 14 (δ) figs. 9 (dorsal view), 10 (dorsal view), 11 (abdomen).

Pinnotheres Latreillii LEACH, 1817, Malacost. Podopht. Brit.: annotated

explanation of plate 14 (♀) figs. 6 (dorsal view), 7 (dorsal view), 8 (abdomen) (Firth of Forth, Scotland). — DESMAREST, 1823, Dict. Sci. Nat., 28: 238 (coast of England). — DESMAREST, 1825, Consid. gén. Class. Crust.: 118, 119 (coast of England). — RISSO, 1826, Hist. Nat. Princip. Produc. Europe Mérid., 5: 16, 17 (southern European coast). — COSTA, O., 1840, Fauna Regno Napoli, Crost. (7): 2 (Naples, Italy). — HOPE, 1851, Cat. Crost. Italiani Mediterraneo: 5 (listed) ('Napoli'). — HERKLOTS, 1861, Tijdschr. Entomol. 4: 131 (18) (listed).

Pinnotheres Cranchii SAMOUELLE, 1819, Entomol. Compend.: 87 (mentioned).

Cancer (Pinnotheres) Pisum LATREILLE, 1836, in Cuvier, Thierreich, 4: 121 (brief description).

Cancer (Pinnotheres) Cranchii LATREILLE, 1836, in Cuvier, Thierreich, 4: 121, 122 (brief description).

Cancer (Pinnotheres) Latreillii LATREILLE, 1836, in Cuvier, Thierreich, 4: 122 (brief description).

Cancer (Pinnotheres) varians LATREILLE, 1836, in Cuvier, Thierreich, 4: 122 (brief description).

Pinnotheres Pisum COUCH, 1838, A Cornish Fauna, 1: 72 (Cornwall, England).

Pinnotheres modiolae COSTA, O., 1840, Fauna Regno Napoli, Crost. (7): 4 (Adriatic Sea) (compared with *Pinnotheres* 'Cranchii,' 'Latreillii,' 'Montagui,' 'mytilorum', 'pisum', and 'Veterum').

Cancer Eubolinus (Chiereghin MS) NARDO, 1847, Sinonimia moderna Descrizione Crostacei Chiereghin: 3 (publication of Chiereghin's MS. name with short description; referred with doubt to *P. pisum*; 'entro del *Pecten Jacobeus* e dell' *Ostrea Edulis*). — NARDO, 1869, Mem. R. Ist. Veneto, 14: 239 (name cited as synonym of *Pinnotheres pisum*).

Pinnotheres pisum VAN DER HOEVEN, 1850, Handbuch Zool., 1: 650 (mentioned). — HESSE, 1871, Ann. Sci. Nat. Zool. Paris, (5) 15 (2): 30, 36, 37 (distribution and host relationship in France) (synonymy mentioned). — HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiawar, 1: 102 (part, not reference to New Zealand). — PESTA, 1918, Decapodenf. Adria: 440-442, fig. 145 (legs 1-4) (biology) (Adriatic Sea). — BALSS, 1926, in Grimpe & Wagler, Tierwelt Nord- und Ostsee, 10 (2): 44 (in key with *Pinnotheres pinnotheres*; distribution). — MONOD, 1933, Bull. Soc. Sci. Nat. Maroc., 12 (4-6): 143-146, figs. (♀), 1 a (maxilliped), d (leg 4), e (leg 4), 2 a (maxilliped), b (maxilliped), d (chela), 3 (outer views of chela), 4 (outer views of chela), 5 (outer views of chela) (Atlantic coast of Morocco). — VILELA, 1936, Bull. Soc. Portugaise Sci. Nat., 12 (27): 238 (listed). — MONOD, 1956, Mém. Inst. Franç. Afr. Noire, 45: 375 (summarizes earlier information) (Norway to Mauritania; Mediterranean). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1418, 1420, 1440 (mentioned).

Pinnotheres Modiolae HOPE, 1851, Cat. Crost. Italiani Mediterraneo: 5 (listed) ('Taranto').

Pinnotheres Mastrarum HOPE, 1851, Cat. Crost. Italiani Mediterraneo: 5 (nomen nudum) ('Napoli').

Pinnothera pisum DANA, 1853, U. S. Explor. Exped., 13 (2): 1568 (listed).

Pinnotheres modiolii BENEDEN, 1861, Mém. Acad. Roy. Belgique, 33: 136 (Belgium). — MAITLAND, 1874, Tijdschr. Nederland. Dierkund. Ver., 1: 234 (listed). — PELSENEER, 1886, Bull. Mus. Roy. Hist. Nat. Belgique, 4: 215 (Belgium). — PERKINS, 1928, Scot. Nat., 1928: 55 (key to crabs of Britain and North-East Atlantic).

Pinnitheres pisum NARDO, 1869, Mem. R. Ist. Veneto, 14: 228.

Pinnotherus pisum FABER, 1883, Fish. Adriatic: 253 (Adriatic Sea).

Pinnotheres latreillei WOODWARD, 1886, Proc. Zool. Soc. London, 1886: 177 (mentioned).

Pinnotheres cranchii PATTERSON, 1905, Nat. E. Norfolk: 239 (mentioned).

Pinnotheres primum POULSEN, 1949, Videnskab. Meddel. Dansk. Naturhist. Foren. Kobenhavn, 111: 123, 124 (Denmark).

Measurements: Male, length 5.5 mm, width 5.5 mm (Bouvier, 1940); female, length 11.0 mm width 12.7 mm (Lagerberg).

Habitat: In bivalves: *Mytilus modiolus* [*Modiolus modiolus* (Linnaeus)] (Leach, 1814); *Cardium laevigatum* [*Laevicardium laevigatum* (Linnaeus)] (Embleton, 1835); *Modiola barbata* [*Modiolus bar-*

batus (Linnaeus) (Costa, 1840); *Cardium edule* [*Cerastoderma edule* (Linnaeus)], *Cardium exiguum* [*Parvicardium exiguum* (Gmelin)], *Modiolus vulgaris* [*Modiolus modiolus* (Linnaeus)] (Thompson, 1842); *Mytilus edulis* Linnaeus (Bell, 1845); *Cardium echinatum* [*Acanthocardia echinata* (Linnaeus)], *Mytilus incurvatus* [*Mytilus incurvatus* Philippi] (Cocks, 1849); *Mactra solida* [*Spisula solida* (Linnaeus)] (Metzger, 1874); *Ostrea edulis* Linnaeus, *Ostrea hippopus* [*Ostrea edulis* Linnaeus] (Lucas, 1880); *Modiolus modiolus* (Linnaeus) (Leslie & Herdman, 1881); *Tapes decussata* Linnaeus, *Tapes pullastra* [*Venerupis pullastra* (Montagu)], *Mya arenaria* Linnaeus (Bonnier, 1887); *Pinna nobilis* (Linnaeus) (Ortmann, 1894); *Pinna squamosa* [*Pinna nobilis* (Linnaeus)] (Graeffe, 1900); *Laevicardium norvegicum* (Spengler) (Norman & Brady, 1909); *Venus Gallina* [*Chamelea gallina* (Linnaeus)] (Paolucci, 1909); *Anomia ephippium* Linnaeus (Miranda y Rivera, 1921); *Mytilus* (Thomson & Anderson), *Cardium norvegicum* [*Laevicardium norvegicum* (Spengler)], *Glycymeris* (Mar. Biol. Assoc., 1931); *Mactra stultorum* Linnaeus (Miranda y Rivera, 1933); *Mactra corallina* (Linnaeus) (Holthuis & Gottlieb, 1958); *Spisula solida* (Linnaeus) (Christensen, 1959); *Venus verrucosa* Linnaeus (Le Gall, 1968); *Mytilus edulis* Linnaeus, *Modiolus modiolus* (Linnaeus), *Spisula subtruncata* (Da Costa), *Spisula elliptica* (Brown), *Spisula solida* (Linnaeus) (Christiansen, 1969); *Mytilus galloprovincialis* Lamarck (Seed, 1969); *Neotrigonia margaritacea* (Lamarck) (Wellington & Hiscock). In ascidians: *Ascidia aspersa* [*Ascidella aspersa* (O. F. Müller)] (Costa, 1840); *Ascidia mentula* O. F. Müller (Mar. Biol. Assoc., 1931). Littoral (Monod, 1956); to a depth of 5 meters (Capart, 1951); 4–45 meters (Lagerberg).

Distribution: Norway, Scotland, England, France to Mediterranean, Adriatic, and Black Seas, to Cap Blanc, Mauritania [Spanish Sahara]; New Zealand (? cf. Bennett, 1964); Australia (cf. Wellington & Hiscock, 1969; Griffin, 1970).

Pinnotheres placunae Hornell & Southwell, 1909

Pinnotheres placunae HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiarwar, 1: 99–103, pl. 1 figs. 1 (♂ dorsal view), 2 (♂ ventral view), 3 (♂ right leg 4), 4 (♂ dactylus leg 4), 5 (♀ dorsal view), 6 (♀ ventral view), 7 (♀ right leg 3), 8 (♀ dactylus right leg 3), 9 (♀ right leg 4), 10 (♀ dactylus right leg 4) (compared with *Pinnot[h]eres globosus* and *P. margaritiferae*; also refers to habits and distribution of *Pinnot[h]eres ostreum* and *pisum* (syntypes: depository unknown; type- localities: Balapur and Rann Bays, Gulf of Kutch, India, abundant; rare in Tampalakam Bay, near Trincomalee, Ceylon).

Pinnotheres placunae TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 251 (listed). — CHHAPGAR, 1957, Journ. Bombay Nat. Hist. Soc., 54 (3): 503–505, 528, 536, pl. 12 (♀) figs. a (dorsal view), b (ventral view), c (leg 4), d (dactylus leg 4), e (maxilliped), (♂) f (dorsal view), b (ventral view), h (leg 4), i (dactylus leg 4), j (left gonopod), k (tip of left gonopod) (Bombay, India) (compared with *Pinnotheres similis*). — CHHAPGAR, 1957, Contrib. Taraporevala Mar. Biol. Sta., 1: 41, 42, 66, 74 (facsimile of text and plate of preceding reference except for pagination). — CHRISTENSEN & McDERMOTT, 1958, Biol. Bull. Woods Hole, 114 (2): 174 (mentioned). — CHHAPGAR, 1959, Records Indian Mus., 54 (1/2): 37 (indication of breeding season) (Bombay, India). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1207 (cataloged).

Measurements: Male, length 7.5 mm, width 9.5 to 10 mm; female, length 9 mm, width 11 mm (Hornell & Southwell).

Habitat: In the mantle cavity of *Placuna placenta* (L.), 1–3 fms (Hornell & Southwell).

Distribution: West coast of India and Ceylon.

Pinnotheres politus (Smith, 1870)

Ostracotheres politus SMITH, 1870, Trans. Connecticut Acad. Arts Sci., 2: 169, 170 (syntypes: 2 ♀ PM 458, 1 sp. MNHNP; type-locality: 'Callao Peru'). — ADEN-SAMER, 1897, Ann. K. K. Naturhist. Hofmus. Wien, 12: 109 (Castro, Chiloë Island, Chile). — LENZ, 1902, Zool. Jahrb. Suppl., 5: 765, pl. 23 (♀) fig. 9 (dorsal view), a (maxilliped) (Tumbes, Peru; Talcahuano and Puerto Montt, Chile). — PORTER, 1909, Rev. Chilena Hist. Nat., 13 (3): 249 (Arauco Bay, Chile). — PORTER, 1909, Act. Soc. Sci. Chili, 19: 37, 38 (Arauco Bay, Chile). — PORTER, 1936, Comunicaciones Mus. Concepcion, 1 (9): 152. — RATHBUN, 1910, Proc. U. S. Nat. Mus., 38: 545, 588, pl. 43 fig. 3 (♀ dorsal view) (Ancon Bay, Peru). — PORTER, 1911, Bol. Mus. Nac. Santiago, 3 (2): 447 (Arauco Bay, Chile). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 262, 286 (discussed, listed).

Pinnotheres politus RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 63, 65, 66, 71, 72, pl. 159 (♀) fig. 5 (dorsal view), text-fig. 33 (♀ maxilliped) (Ancon Bay, Peru; Talcahuano, Chile). — PORTER, 1936, Comunicaciones Mus. Concepcion, 1 (9): 152 (listed). — PORTER, 1937, Rev. Chilena Hist. Nat., 40: 338 (Talcahuano Bay, Chile). — GARTH, 1957, Lunds Univ. Arsskr., (n. ser.) (2) 53 (7): 67–70, 92, fig. 2

(♂) A (dorsal view), B (dactylus right leg 1), C (left chela), D (gonopod), E (right maxilliped), F (abdomen) (Gulf of Ancud, Seno Reloncavi, Arica, and Calbuco, Chile; Callao, Peru). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1207, 1218 (cataloged, taxonomy). — HAIG, 1968, Crustaceana, 15 (1): 27 (Peru). — DEL SOLAR, BLANCAS & MAYTA, 1970, Cat. Crust. Peru: 30 (listed) (Bahia de Ancón; Callao; Isla Galápagos near Pucusana).

Pinnotheres politus BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1420 (mentioned).

Measurements: Male, length 3.6 mm, width 3.7 mm (Garth); female, length 11.5 mm, width 14.0 mm (Lenz).

Habitat: In bivalves: *Mytilus algosus* [*Semimytilus algosus* (Gould)] (Smith); with *Crepidula dilatata* (Lamarck) on mussels (Rathbun, 1918); and under *Calyptiraea*, a gastropod with which it is believed commensal (Garth, 1957). Among boulders and stones in sand and mud with some hard clay; on jetty under stones (Garth, 1957).

Distribution: Ancon Bay, Peru to Castro, Chiloé Island, Chile.

Pinnotheres pubescens (Holmes, 1894)

Cryptophrys pubescens HOLMES, 1894, Proc. California Acad. Sci., 2 (4): 564, 565, pl. 20 (♀) figs. 6 (dorsal view), 7 (maxillipeds) (♀ holotype not extant; type-locality: 'Mulejé Bay, Gulf of California [Mexico]').

Pinnotheres pubescens RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 63, 65, 66, 87, 88, fig. 43 (♀), a (dorsal view), b (maxillipeds) (after Holmes). — GLASSELL, 1934, Journ. Washington Acad. Sci., 24 (7): 301 (Gulf of California) (listed).

Measurements: Female, length 9.75 mm, width 10.00 mm (Holmes).

Distribution: Known only from the type locality.

Pinnotheres pugettensis Holmes, 1900

Pinnotheres pugettensis HOLMES, 1900, Occ. Pap. Calif. Acad. Sci., 7: 86, 87 (♀ holotype, probably not extant; type-locality: 'in the branchial cavity of a species of *Cynthia* [ascidian, *Halocynthia*] from Puget Sound'). — RATHBUN, 1904, Harriman Alaska Exped., 10: 185 (Puget Sound). — TAYLOR, 1912, Contrib. Canadian Biol., 1906-1910: 191, 212 (Puget Sound; Departure Bay [Vancouver Island], British Columbia). — WILLIAMSON, 1915, Nord. Plankt., 6: 562 (listed). — WAY, 1917, Publ. Puget Sound Mar. Sta., 1 (30-31): 360 (Friday Harbor [San Juan Island], Washington). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 63, 65, 66, 82, 83, pl. 17 (♀) figs. 7 (ventral view), 8 (dorsal view), pl. 18 (♀) fig. 1 (infero-external view of right chela and superior view of left legs 1-4), text-fig. 39 (♀ endognath of maxilliped) (Departure Bay [Vancouver Island], British Columbia). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 285 (listed). — JOHNSON & SNOOK, 1927, Seashore Anim. Pacific Coast: 390, 391 (general account). — WELLS, 1923, Publ. Puget Sound Mar. Sta., 6: 285, 286, figs. 1 (♀ dorsal view), 2 (♂ ventral view), 3 (♀ left chela, outer view) (Friday Harbor, Washington). — CLEMENS, 1933, Check List Mar. Fauna Flora Canadian Pacific Coast: 52 (listed). — CHRISTENSEN & McDERMOTT, 1958, Biol. Bull. Woods Hole, 114 (2): 171 (mentioned). — PEARCE, 1962, Biologist, 45 (1-2): 11, 14 (adaptations). — PEARCE, 1966, Pacific Sci., 20 (1): 28 (mentioned). — PEARCE, 1966, Some Contemporary Stud. Mar. Sci.: 569, 586 (biology) (Puget Sound). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1184, 1207, 1220, 1226 (biology, cataloged).

Pinnotheres pugettensis BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1420 (mentioned).

Measurements: Female, length 10.0 mm, width 10.5 mm (Holmes).

Habitat: In branchial cavity of tunicates: *Halocynthia aurantia* (Pallas), *H. igaboja* Oka, *Ascidia paratropa* (Huntsman) (Pearce); *Pyura okai* Ritter [= *Halocynthia igaboja* Oka] (Taylor); *Tethyum aurantium* [*Halocynthia aurantia* (Pallas)] (Wells). Also reported (Wells) from a bivalve, the mussel, *Mya arenaria* L.; and in one instance a ♂ was found in the holdfasts of the basket grass, *Phyllospadix* (personal communication, Frank A. Pitelka); 15 fathoms [27.4 meters] (Taylor).

Distribution: Vancouver Island, British Columbia, to Puget Sound, Washington.

Pinnotheres purpureus Alcock, 1900

Pinnotheres purpureus ALCOCK, 1900, Journ. Asiat. Soc. Bengal, 69 (2): 339 (7♀♀ syntypes: Indian Museum 3711/10; type-locality: 'Andaman Islands'). — ALCOCK & McARDLE, 1902, Illustr. Zool. Investigator Crustacea, (10): pl. 62 (♀) fig. 6 (dorsal view), a (frontal view), b (maxilliped) (Andaman Islands). — NOBILI, 1906, Ann. Sci. Nat. Zool. Paris, (9) 4: 303 (Djibouti, Somaliland; Red Sea). — HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiawar, 1: 102 (listed). — GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution noted).

Pinnotheres purpureus BORRADAILE, 1903, Fauna Geog. Maldive Laccadive Archipelagos, 1 (26) (4): 431 (Felidu Atoll, Maldive Islands). — LAURIE, 1915, Journ. Linn. Soc. Zool. London, 31 (209): 415 (listed). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 253, 287 (listed, key). — SAKAI, 1933, Botany and Zoology, Tokyo, 1 (2): 978, 979 (48, 49), fig. 2 a (♀ dorsal view) b (third maxilliped). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1207, 1214, 1216, 1222, (cataloged; taxonomy).

Measurements: Female, length 7.0 mm, width 9.0 mm (Alcock).

Habitat: In the bivalve, *Ostraea* [*Ostrea*] (Alcock); dredged from 30 fms [55 m] (Borradaile).

Distribution: Red Sea; Gulf of Aden; Andaman and Maldive Islands.

Pinnotheres quadratus Rathbun, 1909

Pinnotheres quadratus RATHBUN, 1909, Proc. Biol. Soc. Washington, 22: 110 (♀ holotype: UZM; type-locality: 'Koh Chang [Thailand]'). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 4 (4): 333, fig. 15 (♀) a (maxilliped), b (chela) (Thailand). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 255, 261, pl. 17 (♂) fig. 2 (dorsal view with abdomen extended), a (maxilliped) (Labuan Pandan, Indonesia; Wunoh Bay, New Guinea). — SUVATTI, 1938, Check-List aquatic Fauna Siam: 70 (listed). — SUVATTI, 1950, Fauna of Thailand: 160 (listed). — CHHAPGAR, 1957, Journ. Bombay Nat. Hist. Soc., 54: 506, pl. 12 figs. l—m. — CHHAPGAR, 1957, Contrib. Taraporevala Mar. Biol. Sta., 1: 44, pl. 12 (♂) fig. 1 (dorsal view with abdomen extended), m (maxilliped) (facsimile of text and plate of preceding reference except for pagination). — CHHAPGAR, 1958, Records Indian Mus., 53 (1—2): 256, fig. 2 (♂), a (dorsal view with abdomen extended), b (maxilliped). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1207, 1208, 1223, 1225 (cataloged; taxonomy).

Measurements: Male, length 2.4 mm, width 2.75 mm (Tesch); female (ovigerous), length 5.2 mm, width 5.3 mm (Rathbun, 1909).

Habitat: In bivalves: *Arca* (Tesch) 1 fm [1.8 m] (Rathbun, 1909); 18 and 32 meters (Tesch).

Distribution: Gulf of Siam; east coast of Lombok, Indonesia; northwest coast of Waigeu Island, New Guinea.

Pinnotheres reticulatus Rathbun, 1918

Pinnotheres reticulatus RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 64, 65, 66, 93, 94, pl. 21 (♀) fig. 1 (ventral view), ♀ (dorsal view), text-fig. 46 (♀ maxilliped) (♀ holotype: USNM 18217; type-locality: 'Gulf of California: off San Josef Island, Lower [Baja] California, Mexico; lat. 25°02.15' N.; long. 110°43.30' W'). — GLASSELL, 1934, Journ. Washington Acad. Sci., 24 (7): 301 (listed).

Measurements: Female, length 9.7 mm, width 9.2 mm.

Habitat: 17 fms [31 m], sandy shale.

Distribution: Known only from the type locality.

Pinnotheres rhombifer Bürger, 1895

Pinnotheres rhombifer BÜRGER, 1895, Zool. Jahrb. Syst., 8: 374, pl. 9 fig. 15 (♀ dorsal view), pl. 10 fig. 14 (♀ maxilliped) (syntype: ZIMB 67/949a; type-locality: 'Übay [Philippine Islands]'). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 254, 259, (mentioned, listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1208, 1216 (cataloged; taxonomy).

Measurements: Female, length 7.5 mm, width 9.0 mm (Bürger).

Habitat: In the bivalve, *Pectunculus aurifluus* [*Glycymeris* (*Tucetona*) *auriflua* (Reeve)] (Bürger).

Distribution: Known only from the type locality.

Pinnotheres ridgewayi Southwell, 1911

Pinnotheres ridgewayi SOUTHWELL, 1911, Ceylon Mar. Biol. Repts., Colombo, 5 (19): 226-227, pl. 3 (♀) figs. 1 (ventral view), 2 (dorsal view), a (ventral view of abdomen) (3♀ syntypes: Indian Museum 8102/10; type-locality: 'Kondatchi Paar, Ceylon pearl banks').

Pinnotheres ridgewayi TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 251 (listed). — GRAVELY, 1927, Bull. Madras Govt. Mus. Nat. Hist., (n. ser.) 1 (1): 146, pl. 23 fig. 37 (♀ dorsal view) (Kutikal, India). — PRASAD & TAMPI, 1957, Journ. Zool. Soc. India, 9 (1): 22-25, fig. 1 (zoea) a (lateral view), b (antennule), c (first maxilla), d (second maxilla), e (first maxilliped), f (second maxilliped), g (telson) ('Mandapam Camp, South India'). — SANKARANKUTTY, 1966, Mar. Biol. Assoc. India Symp. Ser., 2 (1): 349, 350, 358, 360, figs. (♂) 23 (first male pleopod [gonopod]), 28 (abdomen) ('Mandapam in Palk Bay and Gulf of Mannar [India]'). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1177, 1183, 1208, 1219, 1223, 1225, 1227 (biology, cataloged).

Measurements: Female, length 13.0 mm, width 15.0 mm (Southwell).

Habitat: In bivalves: *Pinna bullata* Gmelin [an unrecognizable species] 'buried in muddy sand to a depth of 4 or 5 inches [102-127 mm] with byssus attached to very coarse quartz grains,' one ♀ in each of three mollusks (Southwell); *Pinna aequilatera* von Martens [*P. muricata* Linnaeus] (Silas & Alagarswami).

Distribution: Mandapam, Madras State, Palk Bay, Gulf of Mannar, India; Ceylon Pearl Banks, Ceylon.

Pinnotheres rotundatus Bürger, 1895

Pinnotheres rotundatus BÜRGER, 1895, Zool. Jahrb. Syst., 8: 378, pl. 9 fig. 21 (♀ dorsal view), pl. 10 fig. 19 (maxilliped) (holotype: ZIMB 67c/538a, no longer extant; type-locality: 'Burias [Philippine Islands]'). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 255 (listed, key). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 547 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1208, 1216 (cataloged).

Measurements: Female, length 11.0 mm, width 12.0 mm (Bürger).

Habitat: In the shell of the bivalve, *Circe* (Bürger).

Distribution: Known only from the type locality.

Pinnotheres rouxi H. Milne Edwards, 1853

Pinnotheres Rouxi H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 218 (184), pl. 11 fig. 7 (maxilliped) (♂ holotype: not extant; type locality: 'Mers de l'Inde'). — NAUCK, 1880, Zeitschr. Wiss. Zool., 34: 23, pl. 1 fig. 8 (gastric mill).

Pinnotheres rouxi HORNELL & SOUTHWELL, 1909, Rept. Govt. Baroda Mar. Zool. Okhamandal in Kattiawar, 1: 102 (listed).

Pinnotheres rouxi TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 252 Lower [Baja] California, Mexico). — GLASSELL, 1934, Journ. Washington Acad. (listed, key). — SILAS & ALAGARSWAMI, 1960, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1208 (cataloged).

Measurements: None recorded.

Habitat: Not recorded.

Distribution: Indian Ocean.

Pinnotheres sanguinolariae Pillai, 1951

Pinnotheres sanguinolariae PILLAI, 1951, Bull. Central Res. Inst., Univ. Travancore Nat. Sci., (C) 2 (1): 24-27, fig. 4 a (♀ dorsal view), b (♂ dorsal view), c (♀ maxilliped) (♀ and ♂ types; ? depository; type-locality: '...shallow regions of Ashtamudi Lake [Travancore, India], in the vicinity of the bar mouth') (compared with *Pinnotheres gracilis*, inadvertently spelled *gracillis* in text). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1209, 1223 (cataloged, taxonomy).

Measurements: Male, length 4.3 mm, width 5.2 mm; female (ovigerous), length 8.8 mm., width 10.9 mm.

Habitat: In the mantle cavity of the bivalve, *Sanguinolaria diplos* Linnaeus, just behind the foot and near the internal opening of the inhalant siphon.

Distribution: Known only from the type locality.

Pinnotheres schauinslandi Lenz, 1901

Pinnotheres schauinslandi LENZ, 1901, Zool. Jahrb. Syst., 14: 468, 469, 480, pl. 32 figs. 15 (dorsal view), 16 (chela), 17 (leg 4), 18 (maxilliped) (holotype deposited?); type locality: 'French Pass (Neuseeland)' (compared with *Pinnotheres glaberrimus*, *novae-zelandiae* [*novaezelandiae*], *pholades* [*pholadis*] and *pisoides* [*pholadis*]). — CHILTON, 1911, Records Canterbury Mus., 1 (3): 295–296 (validity of species questioned). — TESCH, 1918, Siboga Exped. Monogr., 39c¹ (84): 250, 251, 287 (listed). — CHILTON & BENNETT, 1929, Trans. Proc. New Zealand Inst., 59: 775, 776 (mentioned). — SCOTT, 1961, Trans. Roy. Soc. New Zealand, Zool., 1 (22): 302, 307 (validity of species questioned). — BENNETT, 1964, Mem. New Zealand Oceanog. Inst., 22: 79, 80, figs. 86 (♀ abdomen), 87 (♂ abdomen), 89 (maxilliped), 90 (♂ chela), 91 (front edge of carapace). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1209, 1221 (cataloged, taxonomy).

Habitat: In bivalves: *Mytilus* (Lenz); *Atrina*; and among a drift of bryozoa, *Flustrella binderi* [*Elzzeria binderi* (Busk)] (Bennett).

Distribution: New Zealand mainland and Stewart Island.

Pinnotheres semperi Bürger, 1895

Pinnotheres semperi BÜRGER, 1895, Zool. Jahrb. Syst., 8: 382, 383, pl. 9 fig. 28 a (♀ dorsal view), b (♂ abdomen), pl. 10 fig. 27 (maxilliped) (syntypes: ZIMB 67/946, no longer extant; type-locality: 'Java [Indonesia]'). — LANCHESTER, 1900, Proc. Zool. Soc. London, 1900: 761 (Singapore, Malaysia). — SCHENKEL, 1902, Verhandl. Naturforsch. Ges. Basel, 13 (3): 577 (Makassar, Celebes, Indonesia). — DOFLEIN, 1914, in Hesse & Doflein, Tierbau und Tierleben, 2: 279 (host; biology). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 251, 255 (listed, key). — CHOPRA, 1931, Records Indian Mus., 33 (3): 318 (compared with *Pinnotheres setnai*). — GORDON, 1934, Mém. Mus. Roy. Hist. Nat. Belgique, (hors sér.) 3 (15): 19, 20, fig. 9 (♀ maxilliped) (Sumatra, Indonesia). — CHUANG, 1961, On Malayan Shores: 189, pl. 94 figs. 2 (♂ dorsal view), 3 (♀ dorsal view) (Singapore, Malaysia). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1209, 1216, 1219 (cataloged).

Pinnotheres semperi BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1417 (mentioned).

Measurements: Male, length 7.75 mm, width 8.0 mm; female, length 10.5 mm., width 11.0 mm (Lanchester).

Habitat: In the cloaca of *Holothuria fursocinerea* Jaeger (Bürger); in the respiratory tree of *Holothuria scabra* (Jaeger) (Lanchester).

Distribution: Celebes, Sumatra, and Java, Indonesia; Singapore, Malaysia.

Pinnotheres serrignathus Shen, 1932

Pinnotheres serrignathus SHEN, 1932, Zool. Sinica, (A) 9 (1): 142–145, figs. 86 (♂ dorsal view), 87 a (maxilliped), b (fingers of chela), 88 a (♂ abnormal abdomen), b (gonopod) (♂ holotype: FMI 8759; type-locality: 'Chefoo, Shantung Peninsula [China]'). — SHEN, 1937, Bull. Fan Mem. Inst. Biol. Zool., 7: 168, 177, 178 (Shantung Peninsula, China). — SHEN, 1937, Contrib. Inst. Zool. Peiping, 3 (6): 308 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1209, 1224 (cataloged).

Measurements: Male, length 3.0 mm, width 3.6 mm (Shen).

Habitat: not recorded.

Distribution: Known only from the type locality.

Pinnotheres setnai Chopra, 1931

Pinnotheres setnai CHOPRA, 1931, Records Indian Mus., 33 (3): 214–218, pl. 7 fig. 3 (♀ dorsal view), text-figs. 5 (♀ maxilliped), 6 (♀ cheliped), 7 (♂ abdomen)

(65♂, 62♀ syntypes: Indian Museum C 1516/1; type-locality: 'off Viper Island, Port Blair, Andamans') (compared with *Pinnotheres semperi*). — JONES & MAHADEVAN, 1967, Journ. Mar. Biol. Assoc. India, 7 (2): 379 (host relationship). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1209, 1217 (cataloged).

Pinnotheres setnai BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1417 (mentioned).

Measurements: Male, length 9.0 mm, width 9.2 mm; female (ovigerous), length 12.8 mm, width 12.4 mm (Chopra).

Habitat: In the respiratory tree of a holothurian (Chopra); presumably *Actinopyga mauritiana* (Quoy & Gaimard) (Jones & Mahadevan).

Distribution: Viper Island and Dundas Point, Port Blair, Andaman Islands.

Pinnotheres shoemakeri Rathbun, 1918

Pinnotheres shoemakeri RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 64, 65, 95, 96, pl. 22 figs. 1 (♀ dorsal view), 2 (♂ dorsal view), 3 (♀ ventral view), 4 (♂ ventral view), text-fig. 48 (♂ endognath of maxilliped) (♂ holotype: USNM 49216; type-locality: 'St. Thomas [Virgin Islands]'). — RATHBUN, 1933, Sci. Surv. Porto Rico Virgin Ids., 15 (1): 83 (West Florida; St. Thomas, Virgin Islands).

Measurements: Male, length 3.7 mm, width 3.3 mm; female, approximate length 4.7 mm.

Distribution: West coast of Florida; St. Thomas, Virgin Islands.

Pinnotheres siamensis Rathbun, 1909

Pinnotheres siamensis RATHBUN, 1909, Proc. Biol. Soc. Washington, 22: 111 (♂ holotype: UZM; type-locality: 'south of Koh Kut [Thailand]') (includes comparison with *Pinnotheres kutensis*). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 4 (4): 336, fig. 20 (♂) a (dorsal view), b (abdomen), c (maxilliped) (Thailand) (includes comparison with *Pinnotheres kutensis*). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 249, 257, 258 (listed as a possible synonym of *Pinnotheres obesus*). — SUVATTI, 1938, Check-List aquatic Fauna Siam: 70 (listed). — SUVATTI, 1950, Fauna of Thailand: 160 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1209, 1223 (cataloged, taxonomy).

Measurements: Male, length 1.1 mm, width 1.05 mm (Rathbun, 1909).

Habitat: Mud, shells; 17–20 fms [31–36.5 m] (Rathbun, 1910).

Distribution: Gulf of Siam.

Pinnotheres similis Bürger, 1895

Pinnotheres similis BÜRGER, 1895, Zool. Jahrb. Syst., 8: 373, 374, pl. 9 fig. 14 (♀ dorsal view) (holotype: ZIMB 67/950, no longer extant; type-locality: 'Ubay [Philippine Islands]') (includes comparison with *Pinnotheres latissimus*). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 250, 254 (listed). — RATHBUN, 1924, Arkiv Zool. K. Svenska Vetenskapsakad. Stockholm, 16 (23): 15 (Cape Jaubert, 45 mi. WSW [Australia]). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 163, 167, 168, 172, 173, 175, fig. 3 (♀), a (dorsal view), b (outer maxilliped), c–e (dactylus of legs 2–4) (Siglap, Singapore) (compared with *Pinnotheres alcocki*, *latissimus*, *nigrans*, *parvulus*, *sinensis*, *spinidactylus*, and *tivela*) (asymmetry). — SAKAI, 1939, Stud. Crabs of Japan: 584 (compared with *Pinnotheres sinensis*). — CHHAPGAR, 1957, Journ. Bombay Nat. Hist. Soc., 54 (3): 504. — CHHAPGAR, 1957, Contrib. Taraporevala Mar. Biol. Sta., 1: 42 (facsimile of text and plate of preceding reference except for pagination) (compared with *Pinnotheres placunae*). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1210, 1216, 1219 (catalogued).

Measurements: Female, length 6.0 mm, width 9.0 mm. (Bürger). Rathbun, 1924, remarks, 'The proportions given by Bürger, 6 x 9 mm, are erroneous as they do not correspond with his illustration, enlarged three times, or with the statement on p. 373, *op. cit.*, '1/5 breiter als lang,' which would make the width 7.2 instead of 9.'

Habitat: In bivalves: *Ostrea* (Rathbun); *Placenta placenta* [should be *Placuna placenta* (Linnaeus)] (Gordon).

Distribution: Singapore, Malaysia; Philippine Islands; Cape Jaubert, Australia.

Pinnotheres sinensis Shen, 1932

Pinnotheres sinensis SHEN, 1932, Zool. Sinica, (A) 9 (1): 131–135, pl. 6 figs. 3 (♀ dorsal view), 4 (♂ dorsal view), text-fig. 78 a (♂ dorsal view), b (♀ dorsal view), text-fig. 79 a (exognath of maxilliped), b (endognath of maxilliped), c (♀ chela), d (♀ fingers of chela), 4 (♂ abdomen), f (inner view of sixth and seventh segments of ♂ abdomen), g (♀ abdomen), h (gonopod) (♀ holotype: FMI 8756; type-locality: 'Tsingtao, Shantung Peninsula [China]'). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 165, 171 (asymmetry) (compared with *Pinnotheres similis* and *spinidactylus*). — SHEN, 1937, Bull. Fan Mem. Inst. Biol. Zool., 7: 168, 177 (Kiaochow Bay, China). — SHEN, 1937, Contrib. Inst. Zool. Peiping, 3 (6): 308 (listed). — TU, 1938, Zool. Anz., 122 (7/8): 182, 183 (Chefoo, China). — SAKAI, 1939, Stud. Crabs of Japan: 584, 585, fig. 70 (♀) a (dorsal view), b (dactylus of leg 3), c–c' (dactylus of leg 4), d (maxilliped) (Honshu and Kyushu, Japan; Korea). — SEMITU, 1944, Annot. Zool. Japon., 22 (4): 175 (sex change in host). — SAKAI, 1949, Illustr. Encycl. Fauna Japan: 655, fig. 1919 (♀ dorsal view). — SAKAI, 1956, Crabs: 49 (of species list) (mentioned). — SUGIURA, SUGITA & KIHARA, 1960, Bull. Japanese Soc. Sci. Fish., 26 (2): 89–94 (parasitic) [This reference has provisionally been assigned by Silas & Alagarwami, 1967 (below) to the subspecies *Pinnotheres sinensis atrinae* immediately following]. — SAKAI, 1965, Crabs of Sagami Bay: 175 (Eng. pt.), 76 (Jap. pt.), pl. 86 figs. 1 (♂ dorsal view), 2 (♀ dorsal view), text-fig. 24c (distal portion of first ♂ pleopod). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1163, 1174, 1177, 1185, 1187, 1191, 1210, 1224, 1225 (biology, cataloged, taxonomy). — SUZUKI, 1967, Researches Crustacea, Tokyo, 3: 52–60, fig. 1 (pleopods normal female), 2 (1, fourth leg intersexual male; 2, fourth leg normal male; 3, chela intersexual male; 4, chela normal male), 3 (ventral view abdomen intersex and normal male), 4 (pleopods of intersex and normal male), pl. 6 fig. 1 (normal female), 2 (normal male), 3, 4 (intersex) (intersex with Sacculinid parasite (Order Cirripedia, Rhizocephala)).

Measurements: Male, length 3.4 mm, width 3.7 mm (Shen, 1932); female, length 12.0 mm, width 17.0 mm (Sakai, 1939).

Habitat: In bivalves: *Tapes variegata* Sowerby (Shen, 1932); *Ostrea gigas* [*Crassostrea gigas* (Thunberg)], *Paphia philippinarum* [*Tapes japonica* (Deshayes)], *Paphia variegata* [*Tapes variegata* Sowerby], *Mytilus crassirostris* Lischke, *Volsella auriculata* [*Modiolus auriculatus* Krauss] (Sakai, 1939); *Meretrix lusoria* Chemnitz, *Tapes japonica* (Deshayes), *Mytilus edulis* Linnaeus, *Chlamys nipponensis* Kuroda (Sakai, 1965). 'The abdomen of the female usually attacked by a *Sacculina*' (Shen, 1932).

Distribution: Liaotung and Shantung Peninsulas, China; Japan; Korea.

Pinnotheres sinensis atrinae Sakai, 1939

Pinnotheres alcocki SAKAI, 1935, Crabs of Japan: 197, pl. 56 fig. 4 (♀ dorsal view) ('Kii Peninsula,' see Sakai, 1939 below).

Pinnotheres sinensis atrinae SAKAI, 1939, Stud. Crabs of Japan: 585, 586, pl. 69 fig. 4 (♀ dorsal view), text-fig. 71 (♀) a (chela), b–e (dactylus of legs 1–4), e' (dactylus of leg 4 enlarged), f (maxilliped) (♀ holotype: ? depository; type-locality: Kii Peninsula [vicinity 'Seto Marine Biological Laboratory,' Shirahama, Wakayama Prefecture, Japan]). — SAKAI, 1956, Crabs: 49 (of species list) (mentioned). — SUGIURA, SUGITA & KIHARA, 1960, Bull. Japanese Soc. Sci. Fish., 26 (2): 89–94 [this reference is tentatively attributed to this subspecies by the immediately following authors; it concerns only the species proper (*Pinnotheres sinensis*)]. — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1210, 1224 (cataloged, taxonomy).

Measurements: Female, length 12.0 mm, width 14.0 mm (Sakai, 1939).

Habitat: In the bivalve, *Atrina japonica* [*Atrina pectinata* (Linnaeus)] (Sakai, 1939).

Distribution: Known only from the type locality.

Pinnotheres socius Lanchester, 1901

Pinnotheres socius LANCHESTER, 1901, Proc. Zool. Soc. London, 1901 (2): 551, pl. 33 fig. 3 (♀ maxilliped) (♀ ovigerous, holotype: CUMZ; type-locality: 'Pulau Bidan, Penang [Malaysia]') (figured but not described; suggests comparison with *Pinnotheres cardii*). — TESCH, 1918, Siboga-Exp. Monogr., 39c¹ (84): 250,

252 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1210, 1220 (cataloged).

Habitat: '...found inside the infra-branchial chamber of a bivalve, the mantle of which fuses in the mid-ventral line' (Lanchester).

Distribution: Known only from the type locality.

Pinnotheres spinidactylus Gordon, 1936

Pinnotheres spinidactylus GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 164, 167-172, fig. 1 a (♀ dorsal view), b (♂ dorsal view), c (gonopod), 2 (♀) a (maxilliped), b (chela), c (dactylus of legs 2-4) (♀ holotype: BM 1936: 6: 19: 2; 4 ♀♀ (3 ovig.), 1 ♂ paratypes: BM 1936: 6: 19: 3-7, type-locality: 'Siglap [Singapore]' (compared with *Pinnotheres gordonii*, *latus*, *parvulus*, *similis*, *sinensis*, and *tsingtaoensis*) (asymmetry). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1210 (cataloged, taxonomy). — GRIFFIN & CAMPBELL, 1969, Mem. Queensland Mus., 15 (3): 141, 156, 157, 150, 161, 162, fig. 7A-N (♀ first to fourth ambulatory legs, and details of these), O, R (♀ carapace), P (♀ chela), Q (♀ third maxilliped), 8A (♂ carapace), B (♂ abdomen), C (♂ chela), D (♂ third maxilliped), E-H (♂ first to fourth ambulatory legs). — STEPHENSON, WILLIAMS & LANCE, 1970, Ecol. Monogr., 40: 492 (listed, Moreton Bay).

Measurements: Male, 3.1 mm; female, 6 and 7.2 mm (Griffin & Campbell).

Habitat: In bivalves: *Modiolus philippinarum* (Hanley) (Gordon, 1936); *Modiolus* sp., 3.5 and 5 fms [6.5 and 9 m] (Griffin & Campbell).

Distribution: Siglap, Singapore; Moreton Bay, Queensland, Australia.

Pinnotheres subglobosus Baker, 1907

Pinnotheres subglobosa BAKER, 1907, Trans. Proc. Rept. Roy. Soc. S. Australia, 31: 179 (♀ syntypes: AM P 151; type-locality: South Australian coast).

Ostracotheres (?) ('*Pinnotheres*') *subglobosa* TESCH, 1918, Siboga-Exped. Monogr., 39c1 (84): 287 (listed).

Pinnotheres subglobosa RATHBUN, 1923, Biol. Res. Fish. Exper. 'Endeavour', 5 (3): 96-97, pl. 16 fig. 1 (♀ dorsal view), text-fig. 1 (♀ left maxilliped) (off Marsden Point, Kangaroo Island, South Australia, 'Endeavour' Sta. E. 4519). — HALE, 1927a, Trans. Roy. Soc. S. Australia, 51: 312 (Marsden Point, Kangaroo Island, South Australia). — HALE, 1927b, Crust. South Australia, 1: 173, 174, fig. 174 (Saint Vincent Gulf, South Australia). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1210, 1211, 1215, 1219 (cataloged, taxonomy).

Measurements: Female, length 7.6 mm, width 7.8 mm (Baker).

Habitat: In bivalves: *Chlamys bifrons* Lamarck, *Spondylus tenellus* Reeve, *Modiolaria australis* [*Musculus australis* (Gray)] (Hale, 1927b); 5-17 fms [9-31 m] (Hale, 1927a).

Distribution: South Australian Waters.

Pinnotheres taylori Rathbun, 1918

Pinnotheres taylori RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 64, 65, 66, 97, 98, pl. 21 figs. 5 (♂ ventral view), 6 (♂ dorsal view), 7 (♀ ventral view), 8 (♀ dorsal view), text-fig. 49 (♂ endognath of maxilliped) (♀ holotype: USNM 40397; type-locality: 'Ucluelet, British Columbia'). — CLEMENS, 1933, Check List Mar. Fauna & Flora Canad. Pacific Coast: 52 (Canadian Pacific Coast) (listed). — HART, 1935, Canad. Journ. Res., 12: 420-423 [larval stages], fig. 3 a-i (zoea 1), a (lateral view), b (abdomen), c (telson), d (antennule), e (antenna), f (maxilla 1), g (maxilla 2), h (maxilliped 1), i (maxilliped 2), j (zoea 2, lateral view), k (megalopa, dorsal view), l (megalopa, telson), m (megalopa pleopod 4), n-s (first young crab stage), n (dorsal view), o (antennule), p (antenna), q (maxilliped 1), r (maxilliped 2), s (maxilliped) (British Columbia). — AIKAWA, 1937, Rec. Oceanogr. Works Japan, 9 (1): 152 (larval characters). — GURNEY, 1938, Proc. Zool. Soc. London, (B) 108 (1): 79 (larval stages) (listed). — CHRISTENSEN & McDERMOTT, 1958, Biol. Bull. Woods Hole, 114 (2): 169, 170, 171 (mentioned). — GOODBODY, 1960, Nature, London, 185 (4714): 704 (mentioned). — COSTLOW & BOOKHOUT, 1966, Chesapeake Sci., 7 (2): 157, 162, 163 (larval). — PEARCE, 1966, Pacific Sci., 20 (1):

3, 31 (mentioned). — PEARCE, 1966, *Some Contemporary Stud. Mar. Sci.*: 565, 569 (biology). — SILAS & ALAGARSWAMI, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1174, 1175, 1177, 1211, 1219, 1226 (biology, cataloged). — LIE, 1968, *Fiskeri Direkt. Skr.*, 14: 314 (Puget Sound).

Pinnotheres taylori BALSS, 1956, in Bronn, *Klassen Ordnungen Tierreichs*, (ed. 2) 5 (1) (7): 1420 (mentioned).

Measurements: Male, length 4.3 mm, width 4.2 mm; female, length 4.4 mm, width 4.4 mm (Rathbun).

Habitat: In transparent tunicates (Rathbun).

Distribution: British Columbia, Puget Sound (Washington, U.S.A.).

Pinnotheres tenuipes Bürger, 1895

Pinnotheres tenuipes BÜRGER, 1895, *Zool. Jahrb. Syst.*, 8: 371, 372, pl. 9 fig. 11 (♀ dorsal view), pl. 10 fig. 11 (maxilliped) (♀ holotype: ZIMB 67/541, no longer extant; type- locality: 'Ubay [Philippine Islands.]'). — TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 250, 251, 253, 259 (listed). — SILAS & ALAGARSWAMI, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1211, 1216, 1222 (cataloged, taxonomy).

Pinnotheres tenuipes BALSS, 1956, in Bronn, *Klassen Ordnungen Tierreichs*, (ed. 2) 5 (1) (7): 1417 (mentioned).

Measurements: Female, length 6.0 mm, width 6.75 mm (Bürger).

Habitat: In the respiratory tree of a holothurian (Bürger).

Distribution: Known only from the type locality.

Pinnotheres tivelae Gordon, 1936

Pinnotheres tivelae GORDON, 1936, *Journ. Linn. Soc. London Zool.*, 40 (269): 167, 168, 174-176, fig. 4 (♀) a (dorsal view), b (maxilliped), c (chela), d-f (dactylus of legs 2-4), g-h (dactylus of right legs 3-4) (♀ holotype: BM 1936: 6: 19: 9; 2 ♀♀ paratypes: BM 1936: 6: 19: 10-11; type- locality: 'Muscat [Arabia]') (compared with *Pinnotheres alcocki*, *parvulus* and *similis*) (asymmetry). — SILAS & ALAGARSWAMI, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1211, 1219 (cataloged).

Measurements: Female, length 11.5 mm, width 13.6 mm (Gordon).

Habitat: In the bivalve, *Tivela ponderosa* (Philippi).

Distribution: Known only from the type locality.

Pinnotheres trapeziformis (Nauck, 1880)

Holothuriophilus trapeziformis NAUCK, 1880, *Zeitschr. Wiss. Zool.*, 34: 24, 66 (♀ ovig., holotype: ZIMB, 67/565a; type- locality and host not recorded). — DE MAN, 1887, *Zool. Jahrb. Syst.*, 2: 721, 722 (redescription of type). — ICZN, 1956: *Opin. Decl. Int. Comm. Zool. Nomencl.*, 1 (D): 36 (Direction 36; validation of specific name).

Pinnotheres trapeziformis BÜRGER, 1895, *Zool. Jahrb. Syst.*, 8: 380, 381, pl. 9 fig. 26 (♀ dorsal view), pl. 10 fig. 25 (♀ maxilliped) (Mazatlan, Mexico). — ADENSAMER, 1897, *Ann. K. K. Naturhist. Hofmus. Wien*, 12: 107 (Mazatlan, Mexico). — TESCH, 1918, *Siboga Exped. Monogr.*, 39c¹ (84): 285 (listed). — GARTH, 1948, *Bull. Amer. Mus. Nat. Hist.*, 92 (1): 55 (mentioned). — SILAS & ALAGARSWAMI, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1211, 1216, 1221 (cataloged, taxonomy).

Pinnotheres trapeziformis BALSS, 1956, in Bronn, *Klassen Ordnungen Tierreichs*, (ed. 2) 5 (1) (7): 1417 (mentioned).

Measurements: Female, length 10.5 mm, width 13.8 mm (De Man).

Habitat: The host of the type specimen is *Holothuria maxima* Semper. For the Mazatlan specimens of Bürger and Adensamer the host is *Holothuria inornata* [*Holothuria kefersteini* (Selenka)].

Distribution: Mazatlan, Mexico, and ? Indopacific.

Pinnotheres trichopus Tesch, 1918

Pinnotheres trichopus TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 250, 252, 256, 257, pl. 17 (♂) fig. 6 (dorsal view with abdomen extended), a (maxilliped), b

(right chela) (σ holotype: ZMA; type-locality: 'Great Kei Island [Molucca Islands]'). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1211, 1225 (cataloged, taxonomy).

Measurements: Male, length 6.4 mm, width 6.4 mm (Tesch).

Habitat: In the bivalve, *Meleagrina [Pinctada]* (Tesch).

Distribution: Known only from the type locality.

Pinnotheres tsingtaoensis Shen, 1932

Pinnotheres tsingtaoensis SHEN, 1932, Zool. Sinica, (A) 9 (1): 149–151, pl. 6 figs. 10 (σ dorsal view), 11 (σ dorsal view), text-fig. 92 a (σ dorsal view), b (σ dorsal view), text-fig. 93 a (maxilliped), b (chela), c (fingers of chela), text-fig. 94 a (σ abdomen), b (σ abdomen), c (gonopod) (σ holotype: FMI 8758; type-locality: 'Tsingtao, Shantung Peninsula'). — GORDON, 1936, Journ. Linn. Soc. London Zool., 40 (269): 171 (compared with *Pinnotheres spinidactylus*). — SHEN, 1937, Bull. Fan Mem. Inst. Biol. Zool., 7: 168, 178 (Kiaochow Bay, China). — SHEN, 1937, Contrib. Inst. Zool. Peiping, 3 (6): 308 (listed). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1210, 1224 (cataloged).

Measurements: Male, length 4.7 mm, width 5.2 mm; female (ovigerous), length 7.6 mm, width 8.4 mm (Shen, 1932).

Habitat: In bivalves: *Anatinia peichihliensis [Laternula pechiliensis]* (Grabau & King), *Trigonella quadrangularis [Macra quadrangularis]* (Deshayes) (Shen, 1932).

Distribution: Liaotung and Shantung Peninsulas, China.

Pinnotheres vicajii Chhappgar, 1957

Pinnotheres vicajii CHHAPGAR, 1957, Journ. Bombay Nat. Hist. Soc., 54 (3): 505, 506, pl. 12 figs. n (σ dorsal view), o (σ maxilliped), p (σ dorsal view), q (σ maxilliped) (compared with *Pinnotheres quadratus*) (σ lectotype: Indian Museum C3361/1; 1 σ syntype: Indian Museum C3362/1; type-locality: 'Bombay [India]'). — CHHAPGAR, 1957, Contrib. Taraporevala Mar. Biol. Sta., 1: 42–44, pl. 12 (facsimile of text and plate of preceding reference except for pagination). — CHHAPGAR, 1958, Records Indian Mus., 53 (1–2): 251, 253–258, fig. 2 c (σ dorsal view), d (σ maxilliped), e (σ dorsal view), f (σ maxilliped) (compared with *Pinnotheres quadratus*). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1212, 1216, 1217 (cataloged, taxonomy).

Measurements: Male, length 4.0 mm, width 4.0 mm; female, length 5.6 mm, width 6.4 mm.

Habitat: In the bivalve *Paphia malabarica* (Chemnitz) (Chhappgar, 1957).

Distribution: Known only from the type locality.

Pinnotheres villosissimus Doflein, 1904

Pinnotheres villosissimus DOFLEIN, 1904, Wiss. Ergeb. Deutsch. Tiefsee-Exped. Valdivia, 6: 125, 126, pl. 37 (σ) figs. 6 [5] (dorsal view), 7 [6] (ventral view), text-fig. 11 (maxilliped) (σ holotype: ZMB; type-locality: 'Emmahafen bei Padang [Sumatra, Indonesia]'). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 251, 255 (listed, key). — CHOPRA, 1931, Records Indian Mus., 33 (3): 312–315, pl. 7 fig. 2 (σ dorsal view), text-figs. 3 (σ cheliped), 4 (σ abdomen) (Andaman Islands). — JONES & MAHADEVAN, 1967, Journ. Mar. Biol. Assoc. India, 7 (2): 379 (host relationship). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1212, 1217, 1218 (cataloged, taxonomy).

Pinnotheres villosissimus BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1417 (mentioned).

Measurements: Male, length 6.0 mm, width 6.2 mm; female, length 8.3 mm, width 9.2 mm (Chopra).

Habitat: In the cloaca of the holothurian, *Muelleria lecanora [Actinopyga lecanora]* (Jaeger) (Doflein); common in the cloaca of holothurians, 'never more than one crab found in one Holothurian,' probably *Actinopyga mauritiana* (Quoy & Gaimard) (Chopra).

Distribution: Sumatra, Indonesia; Andaman Islands.

Pinnotheres villosulus Guérin-Méneville, 1831

Pinnotheres villosulus GUÉRIN-MÉNEVILLE, 1831, Iconogr. Règne Anim., Crust.: pl. 4 fig. 6 (σ dorsal view), a (frontal view), b (dactylus of leg), c (maxilliped),

d (fingers of chela) (♀ holotype: not extant; type-locality: Ile de Timor [Indonesia]). — LATREILLE, 1834, in Cuvier, *The Animal Kingdom*, 3: 174, 175, pl. 9 fig. 6 (♀ dorsal view), a (frontal view), b (dactylus of leg), c (maxilliped), d (fingers of chela). — GUÉRIN-MÉNEVILLE, 1838, *Voy. autour du Monde La Coquille*, Zool., 2 (2): 13, 14 (description). — GUÉRIN-MÉNEVILLE, 1838, *Icon. Règne Anim., Crust.*: 7 (explanation of the Guérin-Méneville, 1831, plate). — LUCAS, 1840, *Hist. nat. Crust.*: 66 (Timor, Indonesia). — MIERS, 1884, *Rept. Zoological Collections Alert*, (1): xv, 247, 248. — MIERS, 1886, *Rept. Sci. Res. Voy. H.M.S. Challenger*, 17 (49): 227, pl. 22 fig. 2 (♀) (dorsal view), a (frontal view), b (maxilliped), c (chela) (Torres Strait). — TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 251, 252, 255, 256 (listed, key) (Elat, Great Kei Island) (compared with *Pinnotheres trichopus*). — RATHBUN, 1924, *Arkiv Zool. K. Svenska Vetenskapsakad. Stockholm*, 16 (23): 13, 14, pl. 1 fig. 8 (♂ dorsal view), text-fig. 4 (♂ abdomen) (Cape Jaubert, Northwestern Australia). — McNEILL, 1927, *The Australian Encyclopaedia*, 1: 326 (mentioned) (northern coast of Australia). — GORDON, 1934, *Mém. Mus. Roy. Hist. Nat. Belgique, (hors sér.)* 3 (15): 20, 21, figs. 10a, b (maxillipeds), 11a, b (gonopod) (Enoe Island, Indonesia; ? New Guinea). — GORDON, 1936, *Journ. Linn. Soc. London Zool.*, 40 (269): 165 (mentioned).

Pinnotheres villosus H. MILNE EDWARDS, 1853, *Ann. Sci. Nat. Zool. Paris*, (3) 20: 184, pl. 11 fig. 8 (maxilliped) (Timor, Indonesia). — NAUCK, 1880, *Zeitschr. Wiss. Zool.*, 34: 23 (gastric mill). — BÜRGER, 1895, *Zool. Jahrb. Syst.*, 8: 366, pl. 10 fig. 5 (♀ maxilliped) (Zamboanga and Ubay, Philippine Islands).

Pinnotheres villasulus HORNELL & SOUTHWELL, 1909, *Rept. Govt. Baroda, Mar. Zool. of Okhamandal in Kattiawar*, 1: 101, 102 (listed).

Pinnotheres villosus HORNELL & SOUTHWELL, 1909, *Rept. Govt. Baroda, Mar. Zool. of Okhamandal in Kattiawar*, 1: 102 (listed).

Measurements: Female, length 21 mm, width 22.5 mm (Bürger).

Habitat: In *Meleagrina margaritifera* [*Pinctada margaritifera* (Linnaeus)] and *Pinna chemnitzii* [*Arina pectinata* (Linnaeus)] (Bürger); 29–80 feet [4.8–13.3 fms.; 8.8–24.4 meters] (Rathbun); 27 meters [14.76 fms.] (Tesch).

Distribution: Philippine Islands; Indonesia; New Guinea?; Torres Strait; northern and western coasts of Australia.

Pinnotheres winckworthi Gordon, 1936

Pinnotheres winckworthi GORDON, 1936, *Journ. Linn. Soc. London Zool.*, 40 (269): 167, 168, 177–179, fig. 7 (♀) a (dorsal view and enlarged view of anterior margin), b (maxilliped), c (chela), d–f (dactylus of legs 2–3) (♀ holotype: BM 1936: 6: 19: 12; 1 ovig. ♀ paratype: BM 1936: 6: 19: 13; type-locality: 'Penang [Malaysia]') (includes comparison with *Pinnotheres consors*, *lanensis* and *parvulus*) (asymmetry). — SILAS & ALAGARSWAMI, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1212, 1219 (cataloged).

Measurements: Female (ovigerous), length 8.6 mm, width 10.32 mm (Gordon).

Habitat: In the bivalve, *Paphia gallus* (Gmelin) (Gordon).

Distribution: Known only from the type locality.

Pinnotheres sp. A. Monod, 1956

Pinnotheres sp. A. MONOD, 1956, *Mém. Inst. Franç. d'Afrique Noire*, 45: 376, 377, fig. 502 (♂ dorsal view), 503 (♀ dorsal view), 504 (3rd maxilliped), 505 (♂ chela, outer view), 506 (♀ chela, outer view), 507 (leg 5) (1♂, 5♀, and 1 ovig.). — LONGHURST, 1958, *Colonial Fishery Publ.*, 11: 88 (ecologic data; listed) (West Africa). — SILAS & ALAGARSWAMI, 1967, *Mar. Biol. Assoc. India Symp. Ser.*, 2 (3): 1213 (cataloged).

Measurements: Male, length 2.0 mm, width 2.0 mm; female (ovigerous), length 5.5 mm, width 5.5 mm.

Habitat: In bivalve mollusks, *Ostrea gasar* [*Ostrea tulipa* Lamarck] and *Tellina nymphalis* Lamarck.

Distribution: Sankouta, near Toubacouta, Sénégal; Sierra Leone.

Pinnotheres sp. B. Monod, 1956

Pinnotheres sp. B. MONOD, 1956, *Mém. Inst. Franç. d'Afrique Noire*, 45: 378, 379, fig. 524 (♂ dorsal view and detached abdomen), 525 (♀ dorsal view), 510 (3rd

maxilliped), 511 (♀ right cheliped), 512 (♀ right pereopod 2), 513 (♀ right pereopod 3), 514 515 (♀ right pereopod 5), 516 (♀ left cheliped), 517 (♀ left pereopod 2), 518 (♀ left pereopod 3), 519 (♀ left pereopod 4), 520 (♀ left pereopod 5), 521 (pleopod 1), 522 (base of pleopod 1), 523 (base of pleopod 2) (3♂, 2♀).

Pinnotheres sp. B. SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1213 (cataloged).

Measurements: Male, length 15.0 mm, width 17.0 mm; female, length 16.0 mm, width 20.0 mm.

Habitat: In the bivalve mollusk *Panopea aldrovandi* Ménard, from about 5 meters.

Distribution: Port of Dakar, Senegal; Gorée.

Remarks: In Monod's 1956 paper figures 508 and 524 have been interchanged, as have figures 509 and 525: the explanation of figures 508 and 509 refer to figures 524 and 525 respectively, and vice versa.

Pinnotheres sp. C. Monod, 1956

Pinnotheres sp. C. MONOD, 1956, Mém. Inst. Franç. d'Afrique Noire, 45: 380-382, fig. 508 (♂ dorsal view), 509 (♀ dorsal view), 526 (♂ 3rd maxilliped), 527 (♀ right cheliped), 528 (♀ right pereopod 2), 529 (♀ right pereopod 3), 530 (♀ right pereopod 4), 531 (♀ right pereopod 5), 532 (♀ left cheliped), 533 (♀ left pereopod 2), 534 (♀ left pereopod 3), 535 (♀ left pereopod 4), 536 (♀ left pereopod 5), 537 (♂ pleopod 1), 538 (♂ pleopod 2) (2♂, 2♀, as well as 1♀ ovig., 1♀ juv.). — LONGHURST, 1958, Colonial Fishery Publ., 11: 88 (ecologic data; listed) (West Africa). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1214 (cataloged).

Measurements: Male, length 9.0 mm, width 11.0 mm; female, length 12.0 mm, width 14.0 mm.

Habitat: In the gastropod, *Conus papilionaceus* Bruguière and *Conus* sp.

Distribution: Conakry, Guinea; Sierra Leone.

Remarks: In Monod's 1956 paper figures 508 and 524 have been interchanged, as have figures 509 and 525: the explanation of figures 508 and 509 refer to figures 524 and 525 respectively, and vice versa.

Pinnotheres sp. D. Monod, 1956

Pinnotheres sp. D. MONOD, 1956, Mém. Inst. Franç. Afr. Noire, 45: 382, 383, fig. 539 (♀ dorsal view), 540 (♀ 3rd maxilliped).

Pinnotheres sp., ROSSIGNOL, 1962, Cahiers ORSTOM Océanographie, 2: 118 (listed).

Pinnotheres sp. D. SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1219 (catalogued).

Measurements: Female, length 10 mm, width 12 mm.

Distribution: Pointe Noire, Congo.

Pinnotheres sp. Semper, 1862

Pinnotheres [several] sp. SEMPER, 1862, Zeitschr. Wiss. Zool., 11: 105 (biology, occurrence) ("Zamboanga [and perhaps elsewhere, island of Mindanao, Philippines]"). — SEMPER, 1868, Reisen in Archipel der Philippinen, Wissenschaft. Resultate, 1 (2): 96, 97 (commensalism) ("Zamboanga [island of Mindanao, Philippines]").

Measurements, Habitat, and Distribution of specimens referred to in these two references cannot be linked with certainty to the Semper collected species identified by Bürger, 1895, Zool. Jahrb. (Syst.), 8: 361-390, pl. 9, 10, except, perhaps in case of *Pinnotheres holothuriae*, q.v.

Pinnotheres sp. Pesta, 1912

Pinnotheres sp. PESTA, 1912, Ann. K. K. Nat. Hist. Hofmuseum Wien, 26 (3/4): 343, 344, fig. 1, a, b (valves of opened pearl oyster revealing nodular growth about enclosed crab), 2a', b' (opened nodule with nacre encased crab in situ).

Measurements: Not recorded.

Habitat: The pearl oyster, *Meleagrina* [*Pinctada*].

Provenance: 'Banda Inseln', Molucca Islands.

Pinnotheres sp. Awati & Rai, 1931

Pinnotheres sp. AWATI & RAI, 1931, Indian Zool. Mem., 3: 12 (effects of this 'messmate' on the host mollusk). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1213 (cataloged).

Measurements: Not recorded.

Habitat: In the bivalve mollusk, the oyster, *Ostrea cuculata* Born.

Distribution: [Host mollusk] widely distributed along the rocky coasts of India.

Pinnotheres sp.? (aff. *edwardsi* De Man) Gordon, 1934

Pinnotheres sp. ? (aff. *edwardsi* DeMan) GORDON, 1934, Mém. Mus. Roy. Hist. Nat. Belgique, (hors sér.) 3 (15): 21, 22, fig. 11a (♂ first pleopod), c (distal part of 3rd maxilliped) (compared with *Pinnotheres edwardsi*, *kutensis*, *obesus* [of which *P. siamensis* is here listed as a synonym], and *P. villosulus*).

Measurements: Male, length 7.0 mm, width 7.0 mm.

Distribution: ? New Guinea.

Pinnotheres sp. Menon, 1937

Pinnotheres sp., MENON, 1937, Bull. Madras Govt. Mus., (n. ser.) (Nat. Hist.) 3 (5): 54—55, pl. 9 (larval stage II) figs. 266 (entire animal x 50), 267 (antennule x 30), 268 (antenna x 300), 269 (telson x 82) (larval stages II and IV) (compared with zoeae of *Pinnotheres veterum* [= *P. pinnotheres* (L.)]).

Measurements: [Cf. figure magnifications.]

Habitat: Plankton.

Provenance: Madras coast, India.

Pinnotheres sp., Balss, 1938

Pinnotheres sp., BALSS, 1938, Göteborgs Kungl. Vetensk. Vitterh. Samh. Handl., (5) (B) 5 (7): 75 (1 ♀). — MIYAKE, 1939, Records Oceanogr. Works Japan, 10 (2): 221, 241 (listed in text and table).

Measurements: Not recorded.

Habitat: Not noted.

Provenance: Gilbert Islands.

Pinnotheres sp. Steinbeck & Ricketts, 1941

Pinnotheres sp. (Glassell ms.), STEINBECK & RICKETTS, 1941, Sea of Cortez: 472 (Concepción Bay, Baja California).

Measurements: Not recorded.

Habitat: '94 pea-crabs taken at night by [electric] light overboard at anchorage.'

Provenance: Concepción Bay, Baja California.

Pinnotheres sp. Poisson, 1946

Pinnotheres sp. POISSON, 1946, Trav. Sect. Océanogr. Appl. Soc. Amis Parc Bot. Zool. Tananarive, 3: 25 (effects of this commensal on the host mollusk). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1213 (cataloged).

Measurements: Not recorded.

Habitat: In the oyster, bivalve mollusk, *Ostrea vitrefacta* Sowerby.

Provenance: Madagascar.

Pinnotheres sp. Barnard, 1950

'*Pinnotheres pisum* (?)' [not *pisum* (Linnaeus)] STEBBING, 1920, Ann. S. African Mus., 17 (4): 241 (Mossel Bay).

Pinnotheres ostrearius [not Rathbun, 1901] STEBBING, 1920, Ann. S. African Mus., 17 (4): 241 (part, specimen from Delagoa Bay).

Pinnotheres sp., BARNARD, 1950, Ann. S. African Mus., 38: 79, 80, fig. 16 g (♀ dactyl of fifth leg) (compared with a specimen believed to be *Pinnotheres pisum* (Linnaeus) from Europe), fig. 16 h (apex of abdomen ♂ in sternal groove, setae partly omitted to show apex of 1st pleopod), i (1st pleopod ♂) [Barnard, in a footnote to this figure, remarks, 'Last abdominal segment does not correspond with Atkins' figures of ♂ *pisum* (l.c., fig. 1, and pl. 1, fig. 2), and adds on p. 80, 'I have compared both Stebbing's specimens with European specimens of what I think is *pisum* (but see footnote to fig. 16), and the elongate dactyls of 4th and 5th legs at once distinguish the former.'] (Mossel Bay and Delagoa Bay). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1213 (cataloged, taxonomy).

Measurements: Female: length 8.0 mm, width 10 mm (Stebbing, 1920; Barnard, 1950).

Habitat: In bivalve mollusks: in *Modiola* [*Moliolus*] (Stebbing); in the pearl oyster, *Avicula*, believed to have been taken in 12 fms [22 m] (Barnard).

Distribution: Mossel Bay, South Africa; Delagoa Bay, Mozambique.

Pinnotheres sp. Jones, 1950

Pinnotheres sp. JONES, 1950, Journ. Bombay Nat. Hist. Soc., 49 (3): 525, 526, 528, pl. 1 fig. 1 (part: opened mussel with *Pinnotheres* in situ, dorsal view; provenance not stated). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1213.

Measurements: Not recorded.

Habitat: In the 'brown mussel (*Mytilus* sp.).'

Distribution: [Of host mollusk] Cape region of peninsular India, Trivandrum to Cape Cormorin, S.W. coast of India to Tinnevely coast, Gulf of Manar.

† *Pinnotheres* sp. Kaneko, 1958

Pinnotheres sp. Kaneko, 1958, Jubilee Publ. H. Fujimoto: 331 and in footnote translated: 'formerly spelled *Pinnothera*' ('only fossil crustacean [hitherto] reported from alluvial strata, Ūmēda-Sō, vicinity of Osaka City, Japan').

Measurements: Not recorded.

Habitat: Fossil, see above.

Distribution: Vicinity of Osaka, Japan.

Pinnotheres sp. Dell, 1960

Pinnotheres sp. DELL, 1960, New Zealand Dept. Science and Industry Res. Bull., 139 (1): 5, 6 (1 ♂). — SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1214 (cataloged).

Measurements: Not recorded.

Habitat: A bivalve mollusk, *Nemocardium pulchellum* Gray from 50 fms. [91.4 meters].

Provenance: Petre Bay, Chatham Island.

Pinnotheres sp. Guinot & Ribeiro, 1962

Pinnotheres sp. GUINOT & RIBEIRO, 1962, Mem. Junta Invest. Ultram., (2) 40: 64, figs. (♂) 30 (dorsal view), 31 a (pleopod 1), b (pleopod 1, tip), 32 (chela, outer view), 33 (3rd maxilliped) (Baía de Santa Marta, Angola).

Measurements: Male, length 7.0 mm, width 8.0 mm.

Habitat: Among mussels on rocks.

Provenance: Baía de Santa Marta, Angola.

Pinnotheres sp. Silas & Alagarwami, 1967

Pinnotheres sp. SILAS & ALAGARSWAMI, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1161-1174, 1214, pl. 1 fig. A (dorsal view, Stage I ♂), B (ventral view, Stage I ♂), C (dorsal view, Stage V ♀ ovig.), D (ventral view, Stage V ♀ ovig.), pl. 2 fig. A (dorsal view, Stage II ♂), B (ventral view, Stage II ♂), C (dorsal view, Stage II ♀), D (ventral view, Stage II ♀), pl. 3 figs. A-D (four views of gill erosion by *Pinnotheres* sp. in *Meretrix casta* (Chemnitz), the host mollusk), text-fig. 1

(1) (♀ ovig., dorsal view), (2) (♀ external maxilliped), (3) (♂ hard stage, dorsal view), (4) (♂ external maxilliped), (5) (gonopod), (6) (soft stage II ♂, tip of gonopod), text-fig. 2 (1) (appendages Stage I ♂), (2) (left appendages Stage II ♂), (3) (right appendages Stage II ♂), (4) appendages of ovig. ♀ Stage V) (biology, cataloged).

Measurements: Female, length (average) 6.06 mm, width (average) 6.6 mm.

Habitat: In a 'backwater clam,' the bivalve mollusk *Meretrix casta* (Chemnitz).

Provenance: Malpe, north of Mangalore, west coast of India.

***Pinnotheres* sp. Ward, 1967**

Pinnotheres sp. WARD, 1967, Proc. Royal Zool. Soc. New South Wales, 1965-1966: 62 (♂♀ from the same *Pinna*).

Measurements: Not recorded.

Habitat: From a bivalve mollusk, '*Pinna* or razor clam.'

Distribution: Lindeman Island, Queensland, Australia.

***Pinnotheres* sp. Gotto, 1969**

Pinnotheres sp. GOTTO, 1969, Marine Animals, Partnerships and other Associations: 60 (in *Ascidia mentula*) (Irish Sea).

***Pinnotheres* sp. Ganapati & Sastri, 1969**

Pinnotheres sp. GANAPATI & SASTRI, 1969, Curr. Sci., 38: 22 (in *Turbo intercostalis* (Menke), India).

Measurements: Female, length 6.2 mm, width 8.4 mm.

Habitat: Living in the mantle cavity of *Turbo intercostalis* (Menke).

Distribution: Waltair, Andhra Pradesh, eastcoast of India.

SAKAINA Serène, 1964

Sakaina SERÈNE, 1964, Vidensk. Meddel. Dansk Naturh. Foren. København, 126: 272. Type species, by original designation: *Sakaina japonica* Serène, 1964. Gender: feminine.

Distribution: Japan.

***Sakaina asiatica* (Sakai, 1933)**

Parapinnixa asiatica SAKAI, 1933, Sci. Rept. Tokyo Bunrika Daigaku, (1B) 1 (12): 143, 144, pl. 13 fig. 2 (♂ dorsal view), text-fig. 3 a (maxilliped), b (♀ abdomen), c (♂ abdomen) (♂ and ♀ types: ? depository; type-locality: 'Akane, near Simoda [Japan]'). — SAKAI, 1933, Botany and Zoology, Tokyo, 1 (2): 977 (47): 981, 982 (51, 52), fig. (dorsal view). — SAKAI, 1936, Crabs of Japan: 199, 200, pl. 57 fig. 1 (♂ dorsal view), text-fig. 103a (maxilliped), b (♀ abdomen), c (♂ abdomen). — SAKAI, 1939, Stud. Crabs of Japan: 597, pl. 70 fig. 1 (♂ dorsal view) (Akane, near Simoda, Japan). — SAKAI, 1956, Crabs: 51 (of species list), 17 (of popular account), fig. (dorsal view) (mentioned).

Sakaina asiatica SERÈNE, 1964, Vidensk. Medd. Dansk Naturh. Foren. København, 126: 272, 277 (discussed). — SAKAI, 1965, Crabs of Sagami Bay: 180 (color noted).

Measurements: Male, length 1.8 mm, width 2.8 mm (Sakai, 1933).

Habitat: 'Found entangled with a kind of algae, *Acanthopeltis japonica* Okamura growing on rocky bottoms, 10 meters deep (Sakai, 1939).'

Distribution: Known only from the type locality.

***Sakaina incisa* Sakai, 1969**

Sakaina incisa SAKAI, 1969, Proc. Biol. Soc. Washington, 82: 244, 277, fig. 19b (♂ abdomen), 20 (♂ dorsal view) (♂ holotype, USNM 125878; type-locality: Manazuru, Sagami Bay, Japan).

Measurements: Male holotype, length 2.5 mm, width 4 mm.

Habitat: Rocky shore.

Distribution: Known only from the type locality.

Sakaina japonica Serène, 1964

Sakaina japonica SERÈNE, 1964, Vidensk. Medd. Dansk Naturh. Foren. København, 126: 273-277, pl. 24 fig. B (♂ dorsal view), text-fig. 22 (♂) a (maxilliped), b (abdomen), c (gonopod) (♂ holotype: ? depository; type-locality: 'Japan, Misaki'). — SAKAI, 1965, Crabs of Sagami Bay: 180 (English pt.), 78 (Japanese pt.), pl. 88 fig. 3 (♂ dorsal view).

Measurements: Male, length 4.0 mm, width 5.3 mm.

Habitat: Tidal zone, under stones.

Distribution: Known only from the type locality.

Sakaina yokoyai (Glassell, 1933)

Parapinnixa affinis YOKOYA, 1928, Sci. Rept. Tōhoku Imp. Univ., (4) 3 (4) (2): 773-775, fig. 5 a (♀ dorsal view), b (frontal view), c (chela), d (abdomen) (♀ holotype; ? depository; type-locality: 'on a line between Benten Islands and Cape Kurosake, off Shukunobe [Japan]').

Parapinnixa yokoyai GLASSELL, 1933, Trans. San Diego Soc. Nat. Hist., 7 (27): 327, 328, fig. 2 (♀) a (dorsal view), b (frontal view), c (chela), d (abdomen) (replacement name for *P. affinis* Yokoya, 1933, a junior homonym of *P. affinis* Holmes, 1900; figures after Yokoya, whose female specimen is the holotype). — SAKAI, 1939, Stud. Crabs of Japan: 597, 598 (listed). — SAKAI, 1956, Crabs: 51 (of species list) (mentioned).

Sakaina yokoyai SERÈNE, 1964, Vidensk. Medd. Dansk. Naturh. Foren. København, 126: 272 (discussed). — SAKAI, 1965, Crabs of Sagami Bay: 180 (compared with *Sakaina japonica*).

Measurements: Female, length 6.3 mm, width 10.1 mm (Yokoya).

Habitat: 16 fms [29.3 m], mud (Yokoya).

Distribution: Known only from the type locality.

SCLEROPLAX Rathbun, 1893

Scleroplax RATHBUN, 1893, Proc. U. S. Nat. Mus., 16: 250. Type species, by monotypy: *Scleroplax granulata* Rathbun, 1893. Gender: feminine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, Smithsonian. Miscell. Coll., 73 (3): 13-18; see also Direction 37, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (2): 47-82) as name no. 370.

Hosts: Crustacea Decapoda (Callinassidae); Echiurida; ? Mollusca Bivalvia.

Distribution: East Pacific (Canada to Mexico).

Scleroplax granulata Rathbun, 1893

Scleroplax granulatus RATHBUN, 1893, Proc. U. S. Nat. Mus., 16: 251 (♀ holotype: USNM 17497; type-locality: 'Ensenada, Lower California [Mexico]'). — ICZN, 1956: Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (1): 21, 38 (Direction 36; specific name placed on Official List of Specific Names in Zoology as Name No. 919).

Scleroplax granulata RATHBUN, 1904, Harriman Alaska Exped. 10: 188, pl. 7 fig. 5 (♀ dorsal view). — WEYMOUTH, 1910, Leland Stanford Jr. Univ. Publ., (Univ. Ser.) 4: 59, fig. 8 (♀ dorsal view) (Puget Sound). — TAYLOR, 1912, Contrib. Canadian Biol., 1906-1910: 191, 212 (near Gabriola Islands, British Columbia). — WILLIAMSON, 1915, Nordisches Plankton, 6 (1): 563 (listed). — WAY, 1917, Publ. Puget Sound Mar. Sta., 1 (30-31): 362, 363, fig. 15 (♀ dorsal view) (Friday Harbor, Washington). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 171, 172, pl. 37 figs. 1 (♂ dorsal view), 2 (♂ ventral view), 3 (♀ dorsal view), text-fig. 109a (♂ abdomen), b (♀ endognath of maxilliped) (British Columbia to Lower California). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 246, 285 (listed). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 267, pl. 44 figs. 1 (♂ dorsal view), 2 (♂ ventral view), 3 (♀ dorsal view) (after Rathbun) (San Francisco Bay). — ICZN, 1925, Smithsonian. Miscell. Coll., 73 (3): 17 (Opinion 85; mentioned as type species of

Scleroplax). — JOHNSON & SNOOK, 1927, Seashore Anim. Pacific Coast: 394 (general account). — WELLS, 1928, Publ. Puget Sound Mar. Sta., 6: 306, figs., (♀), 42 (dorsal view), 43 (ventral view), 44 (left chela, outer view), (♂), 45 (dorsal view), 46 (ventral view), 47 (left chela, outer view) (Puget Sound). — FISHER & MacGINITIE, 1928, Ann. Mag. Nat. Hist., (10) 1: 210, 211, fig. 3e (in burrow of echiurid worm, *Urechis*) (biology, ecology). — HART, 1930, Canadian Field Naturalist, 44 (5): 108 (Gonzales Point, Vancouver Island, British Columbia). — SCHMITT, 1931, Smithsonian Sci. Ser., 10 (2): 211, fig. 40 (in burrow of echiurid worm, *Urechis*) (mentioned). — CLEMENS, 1933, Check List Mar. Fauna Flora Canadian Pacific Coast: 52 (Canadian Pacific Coast) (listed). — MacGINITIE, 1935, American Midland Naturalist, 16 (5): 717, 718 (Elkhorn Slough, Monterey Bay, Humboldt Bay to Ensenada, Lower California). — RICKETTS & CALVIN, 1939, Between Pacific Tides, (ed. 1): 221, 288, fig. 101 (in burrow of echiurid worm, *Urechis*) (biology, ecology). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [ed. 2, 1968]: 94, 176, 187, 191, 287, 292, 315, 428, fig. 58C (♂ in *Urechis* burrow), 158A (♂ dorsal view), B (♀ dorsal view) (biology, ecology, and Pliocene fossil). — RIOJA, 1950, Rev. Soc. Mexicana Hist. Nat., 11 (1-4): 145-147 (discusses commensalism in Crustacea, mentions *S. granulata*). — DALES, 1957, Mem. Geol. Soc. America, 67 (1): 396, 397, fig. 1 ('*The inkeeper Urechis caupo, in its burrow with its guests,*' includes dorsal view of *S. granulata*), 2 (diagram of commensal relationships with *Urechis*, *Upogebia* and *Callianassa*) (ecology). — CHRISTENSEN & McDERMOTT, 1958, Biol. Bull. Woods Hole, 114 (2): 171 (mentioned). — SCHMITT, 1965 (reprinted 1968, 1971), Crustaceans: 130, 131, fig. 52 (in burrow of echiurid worm, *Urechis*) (mentioned). — PATTON, 1967, Symp. Mar. Biol. Assoc. India, (2) 3: 1239 (behavior). — RICKETTS & CALVIN, 1968, Between Pacific Tides, (ed. 4, Hedgpeth revised): 320, 335-337, 345, 499, fig. 250 (in burrow of echiurid worm, *Urechis*) C (dorsal view) (biology, ecology).

Pinnixa (Scleroplax) granulata HOLMES, 1900, Occ. Pap. California Acad. Sci., 7: 94 (Bodega Bay, California).

Measurements: Male, length 5.0 mm, width 8.0 mm (Hart); female, length 7.75 mm, width 10.75 mm (Holmes).

Habitat: 'Found at low tide on Newhall's beach [San Juan Island, Washington]... in the mantle of *Mya arenaria* Linnaeus' [probably a temporary refuge, MacGinitie, 1935] (Way); 'Burrows of *Upogebia* on beach...' (Wells); commensal in the burrows of *Urechis caupo* Fischer & MacGinitie, *Upogebia pugettensis* (Dana), and *Callianassa californiensis* Dana (MacGinitie, 1935; MacGinitie & MacGinitie); 4-7 fms [7.3-12.8 m] (Rathbun).

Distribution: British Columbia to Lower California, Mexico.

XANTHASIA White, 1846

Xanthasia WHITE, 1846, Ann. Mag. nat. Hist., 18 (118): 176. Type species, by monotypy: *Xanthasia murigera* White, 1846. Gender: feminine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, Smithson. Miscell. Coll., 73 (3): 13-18; see also Direction 37, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (2): 47-82) as name no. 378.

Hosts: Mollusca Bivalvia.

Distribution: Indo-West Pacific region.

Key to species: Serène, 1967, Bull. Mus. Nat. Hist. Nat. Paris, (2) 38 (6): 824, 826.

Xanthasia murigera White, 1846

Xanthasia murigera WHITE, 1846, Ann. Mag. Nat. Hist., 18 (118): 176, 177, pl. 2 (♀) fig. 3 (dorsal view), a (ventral view) (2♀♀ syntypes: BM 43.6; type-locality: 'Philippine Islands'). — WHITE, 1847, List Crust. Brit. Mus.: 33 (Philippine Islands) (cites fig. 3, 1846, as fig. 2). — DANA, 1852, U. S. Expl. Exped., 13 (text): 384, (from the reefs of Vanua Lebu, of the Feejee Archipelago, near Mathuata). — H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool., Paris, (3) 20: 221 (187) (Philippine Islands). — DANA, 1855, U. S. Expl. Exped., 13 (atlas): pl. 24 (♀) fig. 6a (dorsal view), b (frontal view). — A. MILNE EDWARDS, 1873, Nouv. Archiv. Mus. Paris, 9 (2): 321 (New Caledonia). — HASWELL, 1882, Cat. Australian

Stalk- and Sessile-eyed Crust.: 113 (Cape Grenville, N. E. Australia). — MIERS, 1884, Rept. Zool. Coll. Voy. Alert: 518 (listed with geographic range), 546 (Mozambique, beach). — DE MAN, 1887, Journ. Linn. Soc. London Zool., 22 (136): 5, 106 (Owens Island, Mergui Archipelago). — BÜRGER, 1895, Zool. Jahrb. Syst., 8: 386, pl. 10 fig. 33 (maxilliped) (Bohol and Burias Islands, Philippine Islands). — ADENSAMER, 1897, Ann. K. K. Naturhist. Hofmus. Wien, 12: 109 (Fiji Islands). — NOBILI, 1899, Ann. Mus. Stor. Nat. Genova, (2) 40: 264 (35) (Batanta Island, N.W. New Guinea). — ALCOCK, 1900, Journ. Asiat. Soc. Bengal, 69 (2) (3): 341 (Andaman Islands, Mergui Archipelago). — NOBILI, 1903, Boll. Mus. Zool. Anat. Comp. R. Univ. Torino, 18 (447): 20 (Borneo, Indonesia; India [?]). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 246 (listed). — ICZN, 1925, Smithson. Miscell. Coll., 73 (3): 18 (Opinion 85; placement of genus, with *Xanthasia murigera* cited as the type, in the 'Official List of Generic Names in Zoology.'). — McNEILL, 1927, Australia Encyc., 1: 326 (Australia). — ESTAMPADOR, 1937, Philippine Journ. Sci., 62 (4): 547 (listed). — BLANCO & ABLAN, 1939, Philippine Journ. Sci., 70 (2): 217-219, pl. 1 fig. 1 (♀ dorsal view), 2 (♀ ventral view), 3 (♂ dorsal view), 4 (♂ ventral view) (Luzon, Philippine Islands). — BARNARD, 1950, Ann. S. African Mus., 38: 81 (Mozambique). — HOLTHUIS, 1953, Atoll Res. Bull., 24: 28 (Marshall Islands). — ICZN, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (1): 22 (Direction 36; specific name of this species placed as name no. 927 on the 'Official List of Specific Names in Zoology'). — GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution noted).

Measurements: Male, length 9.8 mm, width 11.0 mm (Bürger); female, length 11.5 mm, width 15.5 mm (Alcock); female (ovig.), length 11-14 mm, width 13-15 mm (Blanco & Ablan).

Habitat: in *Mytilus* (Dana); in *Tridacna crocea* Lamarck (De Man); in *Tridacna squamosa* Lamarck (Blanco & Ablan).

Distribution: Mozambique; India [?]; Andaman Islands; Mergui Archipelago; Indonesia; Philippine Islands; New Guinea; N.E. Australia; Marshall Islands; New Caledonia; Fiji Islands.

Xanthasia whitei De Man, 1887

Xanthasia species, DE MAN, 1887, Journ. Linn. Soc. London, Zool., 22 (136): 5, 106, 107, pl. 7 fig. 1 (♀ dorsal view) ('Elphinstone Island Bay [Mergui Archipelago]').

Xanthasia whitei DE MAN, 1887, Journ. Linn. Soc. London, Zool., 22 (136): 107 (2 syntypes: ? Indian Museum; Type-locality as above). — ALCOCK, 1900, Journ. Asiat. Soc. Bengal, 69 (2): 342 (Mergui Archipelago).

Xanthasia whitei TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 246 (listed). — CHUANG, 1961, On Malayan Shores: 189, pl. 94 fig. 5 (♀ dorsal view) (Malayan Peninsula, vicinity of Singapore). — SERÈNE, 1967, Bull. Mus. Nat. Hist. Nat. Paris, (2) 38 (6): 823, fig. 6 (♀ maxilliped), 7 (♂ first, second and third pleopod), pl. 1 fig. C (♀ dorsal view) (additional description; in *Tridacna*; Singapore).

Measurements: Female (ovig.), length 14.0 mm, distance between the raised lateral margins 12.5 mm (De Man).

Habitat: In *Tridacna gigas* (Linnaeus) (De Man); in *Tridacna* sp. (Serène); in *Pinna* (Chuang). Distribution: Mergui Archipelago and Malayan Peninsula.

Xenophthalminae Alcock, 1900

Xenophthalminae Alcock, 1900, Journ. Asiat. Soc. Bengal, 69 (2): 294.
This subfamily consists of a single genus.

XENOPHTHALMUS White, 1846

Xenophthalmus WHITE, 1846, Ann. Mag. nat. Hist., 18 (118): 177. Type species, by monotypy: *Xenophthalmus pinnotheroides* White, 1846. Gender: masculine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, Smithson. Miscell. Coll., 73 (3): 13-18; see also Direction 37, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (2): 47-82) as name no. 381.

Distribution: Indo-West Pacific (Iranian Gulf to Japan, Australia).

Xenophthalmus duplociliatus Sluiter, 1881

Xenophthalmus duplociliatus SLUITER, 1881, *Natuurk. Tijdschr. Nederlandsch-Indië*, 40: 163 (distinguished from *Xenophthalmus pinnotheroides*) (♀ holotype: ? depository; type-locality: 'Tandjong Priok [Java, Indonesia]'). — TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 271 (listed). — TAKEDA & MIYAKE, 1970, *Ohmu*, 3 (2): 12 (compared with *Xenophthalmus pinnotheroides*).

Distribution: Known only from the type locality.

Xenophthalmus latifrons Bürger, 1895

Xenophthalmus latifrons BÜRGER, 1895, *Zool. Jahrb. Syst.*, 8: 387, pl. 9 (♀ fig. 32a (dorsal view), b (frontal view), pl. 10 fig. 32 (♀ maxilliped) (♀, oviger., holotype: ? depository; provenance: 'Mariveles and Bohol [Philippine Islands]') (includes comparison with *Xenophthalmus pinnotheroides*). — TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 272 (remarks that reference 'to the present genus is certainly erroneous'). — ESTAMPADOR, 1937, *Philippine Journ. Sci.*, 62 (4): 548 (listed).

Measurements: Female (ovigerous), length 8.5 mm, width 10.75 mm (Bürger).
Distribution: Known only from Mariveles and Bohol, Philippine Islands.

Xenophthalmus obscurus Henderson, 1893

Xenophthalmus obscurus HENDERSON, 1893, *Trans. Linn. Soc. London, Zool.*, (2) 5: 394, pl. 36 figs. 18 (♀ dorsal view), 19 (frontal view) (♀ holotype: BM 88.34; type-locality: 'Gulf of Martaban [Burma]'). — ALCOCK, 1900, *Journ. Asiat. Soc. Bengal*, 69 (2): 333 (Ganjam coast of India; Andaman Islands). — RATHBUN, 1910, *K. Danske Videnskab. Selskab. Skrifter*, (7) 4 (4): 338, 339, pl. 2 fig. 13 (♂ dorsal view), text-fig. 23 (♂), a (carapace), b (antenna), c (chela), d (maxillipeds), e (abdomen) (Gulf of Siam). — TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 271, 272 (listed). — KELLOGG, 1928, *Lingnam Sci. Journ.*, 5 (4): 354 (Foochow, China). — RATHBUN, 1931, *Lingnam Sci. Journ.*, 8: 100 (Tsimei, Foochow, Santu, China). — SUVATTI, 1938, *Check-List aquatic Fauna Siam*: 74 (listed). — SHEN, 1940, *Bull. Fan Mem. Inst. Biol. Zool.*, 10 (2): 89 (listed). — SUVATTI, 1950, *Fauna Thailand*: 160 (listed). — TAKEDA & MIYAKE, 1970, *Ohmu*, 3 (2): 12, 13, 16, 17, figs. (♂) 1 b (fronto-orbital region), 2 d (gonopod, abdominal view), 2e (distal portion) (compared with *Xenophthalmus pinnotheroides* and *X. wolffi*; Gulf of Thailand).

Measurements: Female, length 6.0 mm, width 8.0 mm (Alcock); length 6.5 mm, width 7.0 mm (Henderson).

Habitat: 20 fms [36.6 m] (Alcock); soft clay bottom; mud bottom, dead shells, 3-15 fms [5.5-27.5 m] (Rathbun).

Distribution: East coast of India to Gulf of Siam; China.

Xenophthalmus pinnotheroides White, 1846

Xenophthalmus pinnotheroides WHITE, 1846, *Ann. Mag. Nat. Hist.*, 18 (118): 177, 178, pl. 2 fig. 2 (♀ dorsal view) (1♂ and 2♀♀ syntypes: BM 43.6; type-locality: 'Philippine Islands'). — ADAMS & WHITE, 1848, in *Adams, Zool. Voy. Samarang*, (text): 63. — ADAMS & WHITE, 1850, in *Adams, Zool. Voy. Samarang*, (atlas): pl. 12 fig. 3 (♀ dorsal view), a (abdomen). — H. MILNE EDWARDS, 1853, *Ann. Sci. Nat. Zool. Paris*, (3) 20: 221 (187) (Philippine Islands). — STIMPSON, 1858, *Proc. Acad. Nat. Sci. Philadelphia*, 1858: 107 (Hongkong). — SLUITER, 1881, *Natuurk. Tijdschr. Nederlandsch-Indië*, 40: 162, 163 ('Tandjong Priok [Java, Indonesia]'). — HENDERSON, 1893, *Trans. Linn. Soc. London, Zool.*, (2) 5: 394 ('Rameswarem [Gulf of Mannar, India]'). — NOBILI, 1903, *Boll. Mus. Zool. Anat. Comp. R. Univ. Torino*, 18 (452): 19. — STIMPSON, 1907, *Smithsonian Misc. Coll.*, 49: 141 (Hongkong). — RATHBUN, 1910, *K. Danske Videnskab. Selskab. Skrifter*, (7) 4 (4): 338, fig. 22 a (♂ carapace), b (♂ chela), c (♀ chela), d (maxillipeds), e

(♂ abdomen) (Gulf of Siam). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 271–274, 287 (Indonesia). — ICZN, 1925, Smithsonian Misc. Coll., 73 (3): 307, 312 (Opinion 85; cited as type species of *Xenophthalmus*). — GEE, 1925, Lingnaam Agr. Rev., 3 (2): 164 (Hongkong). — ESTAMPADOR, 1937, Philippine Journ. Sci., 63 (4): 548 (Mindoro, Philippine Islands). — SHEN, 1937a, Bull. Fan Mem. Inst. Biol. Zool., 7: 170, 178 (Kiachow Bay, China). — SHEN, 1973b, Contrib. Inst. Zool. Peiping, 3 (6): 301–304, 308, fig. 11 (♂) a (dorsal view), b (frontal view, orbits and antennae), c (maxilliped), d (maxilliped, inner view), e (chela), f (abdomen), g (gonopod) (North China) (includes comparison with *Xenophthalmus obscurus*). — SUVATTI, 1938, Check-List aquatic Fauna Siam: 74 (listed). — SHEN, 1948, Contrib. Inst. Zool. Peiping, 4 (3): 113, 114, fig. 4 (♂ right leg 4, denuded) (Loushan, China). — SUVATTI, 1950, Fauna of Thailand: 160 (listed). — ICZN, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (2): 22, 39 (Direction 36; specific name placed on Official List of specific Names in Zoology as Name No. 930). — SAKAI, 1955, Bull. Biogeogr. Soc. Japan, 16–19: 110 (Ariake Bay, Inland Sea of Japan). — SAKAI, 1956 Crabs: 52 (of species list) (mentioned). — MIYAKE, 1961, Rec. Oceanogr. Works. Japan, Special Number 5: 165, 175 (listed) (Sea of Ariaké [Ariakeno umi], Kyūshū Island, Japan). — SANKARANKUTTY, 1966, Mar. Biol. Assoc. India Symp. Ser., 2 (1): 347, 350 ('Devipatnam [Gulf of Mannar, India]'). — PEARCE, 1966, Pacific Sci., 20 (1): 28 (mentioned). — TAKEDA & MIYAKE, 1968, Journ. Fac. Agr. Kyūshū Univ., 14 (4): 542, 543, 575, 577, fig. 10 (♂) a, b, c (three views of gonopod) ('East China Sea'). — GRIFFIN & CAMPBELL, 1969, Mem. Queensland Mus., 15 (3): 153–156, fig. 5 (♂) A (dactyl and propodus right leg 1), B (last 3 segments right leg 2), C (maxilliped), D (chela), E (abdomen), fig. 6 (♂), E (first pleopod). — TAKEDA & MIYAKE, 1970, Ohmu, 3 (2): 11–18, figs. 1 a (♂ fronto-orbital region, denuded), 2 a, b, c (three views of gonopod) (compared with *Xenophthalmus duplociliatus*, *obscurus*, and *wolffi*) (East China Sea).

Xenophthalmus pinnotheroides ALCOCK, 1900, Journ. Asiat. Soc. Bengal, 69 (2): 332, 333 ('This species is included in the Indian fauna on the authority of Professor J. E. Henderson').

Measurements: Male, length 9.0 mm, width 13.0 mm (Stephenson); female, length 8.8 mm, width 11.0 mm (Shen, 1937).

Habitat: 'According to Sluiter it is not commensalistic in habits' (Tesch); sandy clay (Rathbun); sand-muddy and shelly bottom (Shen, 1937a); from about 5 meters [2.7 fms.] (Shen, 1937a, b); 6 to 10 fms. [11–18 meters] (Rathbun).

Distribution: Sea of Ariaké [Ariakeno umi], Kyushu Island, Japan. North China, Kiachow [Kiahsien, Shensi prov.], Kiaochow Bay; Hong Kong; Indonesia; Philippine Islands; Moreton Bay, Australia; Gulf of Siam; Gulf of Mannar, Gulf of Marataban, Burma.

Xenophthalmus wolffi Takeda & Miyake, 1970

Xenophthalmus pinnotheroides (not White, 1846) STEPHENSEN, 1945, Danish Sci. Invest. Iran, 4: 186, 187, 210, 211, fig. 54 (♂) a (right chela, outer view), b (three views of gonopod), c (legs 1–4) (Iranian Gulf).

Xenophthalmus wolffi TAKEDA & MIYAKE, 1970, Ohmu, 3 (2): 11–18, fig. 1 c–e, g, h (♂ holotype), f (♂ paratype), c (fronto-orbital region, denuded), d, e, (chela), f (left chela), g (distal three segments of right second ambulatory leg), h (distal five abdominal segments) fig. 2 f, g, h, i (several views of right first pleopod) (♂ type and ♀ allotype: UZM; type locality: Strait of Hormuz [entrance to Persian Gulf]) (compared with *Xenophthalmus obscurus* [obscurus], and *X. pinnotheroides*).

Measurements: Male, holotype, length 9.0 mm, width 13.0 mm; female allotype, length 8.5 mm width 12.0 mm.

Habitat: Free-living, on bottoms of sand, gravel, and shells, and sandy clay, in depths of from 9 to 22 meters.

Distribution: Strait of Hormuz, and Iranian [Persian] Gulf.

Pinnothereliinae Alcock, 1900

Pinnothereliinae Alcock, 1900, Journ. Asiat. Soc. Bengal, 69 (2): 294.

Pinnothereliinae Rathbun, 1918, Bull. U. S. Natl. Mus., 97: 127.

The genera and species of Pinnothereliinae are listed alphabetically below.

ALARCONIA Glassell, 1938

Alarcónia GLASSELL, 1938, Trans. San Diego Soc. Nat. Hist., 8 (33): 446. Type species, by monotypy: *Alarcónia seaholmi* Glassell, 1938. Gender: feminine. Distribution: East Pacific (Mexico).

Alarcónia seaholmi Glassell, 1938

Alarcónia seaholmi GLASSELL, 1938, Trans. San Diego Soc. Nat. Hist., 8 (33): 448-451, pl. 36 (♂) figs. 1 (right chela), 2 (abdomen and sternum), 3 (3rd maxilliped), 4 (left gonopod), 5 (dorsal view) (♂ holotype: SDSNH 1159; type-locality: '...Acapulco, State of Guerrero, Mexico.').

Measurements: Male, length 5.8 mm, width 9.0 mm.

Habitat: Sand and shell bottom, 6-10 fms [11-18 m]; dredged.

Distribution: Known only from the type locality.

PINNIXA White, 1846

Pinnixa WHITE, 1846, Ann. Mag. Nat. Hist., 18 (118): 33. Type species, by monotypy: *Pinnotheres cylindricum* Say, 1818. Gender: feminine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, Smithson. Miscell. Coll., 73 (3): 13-18; see also Direction 37, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (2): 47-82) as name no. 350.

Pinnixa Smith, 1869, Amer. Nat., 3 (5): 246. Erroneous spelling of *Pinnixa* White, 1846.

Tubicola LOCKINGTON, 1876, Proc. Calif. Acad. Sci., 7: 55. Type species, by monotypy: *Tubicola longipes* Lockington, 1876. Gender: masculine.

Palaeopinnixa VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 2. Type species, by original designation: *Pinnixa eocenica* Rathbun, 1926. Gender: feminine.

Hosts: Polychaeta; Enteropneusta; Echiurida; Sipunculida; Holothuroidea; Mollusca Bivalvia; Crustacea Decapoda (Callinassidae); Tunicata; ? Ceriantharia.

Distribution: West Atlantic (Massachusetts, U.S.A. to Argentina); East Pacific (Alaska, U.S.A. to Chile); Indo-West Pacific (Japan, East Africa).

Fossil: Tertiary (Eocene to Pleistocene) in California (U.S.A.), Spain, and U.S.S.R.

Pinnixa abbotti Glassell, 1935

Pinnixa abbotti GLASSELL, 1935, Trans. San Diego Soc. Nat. Hist., 8 (5): 13 (♀ holotype: SDSNH 208; ♂ and ♀ paratypes: USNM 71340, MCZ 9317; type-locality: 'San Felipe, Lower [Baja] California [Gulf of California]').

Measurements: Female, length 2.95 mm, width 6.5 mm.

Distribution: Known only from the type locality.

Pinnixa affinis Rathbun, 1898

Pinnixa affinis RATHBUN, 1898, Proc. U. S. Nat. Mus., 21: 606, 607, pl. 43 (♀) figs. 7 (dorsal view), 8 (right chela), 9 (maxilliped) (♀ holotype: USNM 21594; type-locality: 'Panama Bay... 8°27'60" N, 79°35'00" W'). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 168, fig. 105 (♀) a (dorsal view), b (endognath of maxilliped), fig. 106 (♀ right chela) (Panama Bay). — TESCH, 1918, Siboga-Exped. Monogr., 29c¹ (84): 267, 286 (listed). — GLASSELL, 1934, Journ. Washington Acad. Sci., 24 (7): 302 (Gulf of California) (listed).

Measurements: Female (ovigerous), length 3.4 mm, width 7.3 mm (Rathbun, 1898).

Distribution: Gulf of California; Panama.

Pinnixa aidae Righi, 1967

Pinnixa aidae RIGHI, 1967, Papéis Avulsos Zool. S. Paulo, 20 (10): 99, 107-110, 113, figs. 21 (♀ dorsal view), 22 (♀ third maxilliped), 23 (♂ gonopod [labeled ♀]),

24 (♂ abdomen [labeled ♀]), 25 (♀ right cheliped), 26 (♂ right cheliped) (♀ holotype: DZSP 2231; ♂ allotype: DZSP 2232; paratypes: DZSP 2233; type-locality: 'Enseada de Caraguatutuba, São Paulo, Brazil') (compared with *Pinnixa cristata*) (included in key to S. Amer. species of genus).

Measurements: Female (ovigerous), length of carapace 3.805 mm, width of carapace 8.498 mm; male, length of carapace 4.160 mm, width of carapace 10.650 mm.

Distribution: Known only from the type locality.

Pinnixa angeloi Righi, 1967

Pinnixa angeloi RIGHI, 1967, Papéis Avulsos Zool. S. Paulo, 20 (10): 99, 110–113, figs. 27 (♂ dorsal view), 28 (♂ right cheliped), 29 (♂ third maxilliped), 30 (♂ abdomen), 31 (♂ gonopod), 32 (♀ right cheliped) (♂ holotype: DZSP 2136; ♀ allotype: DZSP 2137; paratypes: DZSP 2138; type-locality: 'São Vicente, São Paulo, Brazil') (compared with *Pinnixa patagoniensis* and *cristata*) (included in key to S. Amer. species of genus). — RODRIGUES, 1971, Trabalhos Oceanogr. Univ. Fed. Pernambuco, Recife [for 1967/69 (1970)] 9/11: 262–264 (littoral Estado do São Paulo: Santo, São Vicente, Enseada de Caraguatutuba, Ilha dos Alcatrazes; Estado do Rio de Janeiro: off Praia do Furado in 12 meters, off Cabo Frio in 100 meters).

Measurements: Male [approximate, taken from figure], length 4 mm, width 12 mm (in text: 11.670 mm, inadvertently labelled length); female, length 3.98 mm, width 9.38 mm.

Distribution: Estado do São Paulo, littoral; Estado do Rio de Janeiro, 12 to 100 meters, Brazil.

Pinnixa arenicola Rathbun, 1922

Pinnixa arenicola RATHBUN, 1922, Proc. Biol. Soc. Washington, 35: 104 (♂ holotype: ZMA; type-locality: '...Spanish Harbor, Curaçao'). — RATHBUN, 1924, Bijdr. Dierk. Amsterdam, 23: 17, pl. 3 (♂) figs. 9 (dorsal view), 10 (ventral view), text-figs. (♂) 3 (left maxilliped), 4 (abdomen) (Spanish Port and Caracas Bay, Curaçao).

Measurements: Male, length, 3.0 mm, width 6.0 mm; female (ovigerous), length 3.2 mm, width 7.3 mm (Rathbun, 1924).

Distribution: Spanish Port and Caracas Bay, Curaçao.

Pinnixa bahamondei Garth, 1957

Pinnixa bahamondei GARTH, 1957, Lunds Univ. Arsskr., (n. ser.) (2) 53 (7): 75–78, 92, fig. 5 (♂) A (dorsal view), B (right chela), C (frontal view), D (right maxilliped), E (abdomen), F (gonopod) (♀ holotype, ovig.: ? depository; type-locality: 'Seno Reloncaví, S. of Punta San Pedro at Isla Maillén [Chile], 41°35'35"S, 72°58'20"W...') (includes comparison with *Pinnixa floridana* and *Pinnixa pembertoni*).

Measurements: Male, length 3.6 mm, width 8.2 mm; female (ovigerous), length 4.05 mm, width 10.2 mm.

Habitat: In the tubes of the polychaete, *Chaetopterus variopedatus* (Renier). Tidal belt to 45 meters.

Distribution: West side of Seno Reloncaví, Chile, between 41°30' and 41°43' S Lat.

Pinnixa balanoglossana Sakai, 1934

Pinnixa balanoglossana SAKAI, 1934, Sci. Rept. Tokyo Bunrika Daigaku, 2B (29): 40, 41, fig. 2a (♀ dorsal view), b (♀ abdomen), c (♂ abdomen), 4 (maxilliped) (♂, ♀ holotypes, ? depository; type-locality: 'Momotori in Ise-bay [Japan]'. — SAKAI, 1936, Crabs of Japan: 202, 203, fig. 106a (♀ dorsal view), b (maxilliped). — TU, 1938, Zool. Anz., 122 (7/8): 183 (mention of host relationship and adaptation). — SAKAI, 1939, Stud. Crabs of Japan: 599, 600, fig. 84a (♀ dorsal view), b (maxilliped) (? Tokyo Bay and Ise Bay, Japan). — SAKAI, 1949, Illustr. Encycl. Fauna Japan: 668, fig. 1926 (♀ dorsal view). — SAKAI, 1956, Crabs: 51 (of species list) (mention). — SAKAI, 1965, Crabs of Sagami Bay: 181, 182 (Eng. pt.), 79 (Jap. pt.), pl. 88 fig. 1 (♀ dorsal view) (coast of Akiya [Sagami Bay]).

Measurements: Female, length 5.5 mm, width 13.0 mm (Sakai, 1935).

Habitat: Commensal with the enteropneust, *Balanoglossus misakiensis* Kuwano (Sakai, 1934).

Distribution: Tokyo Bay, Sagami Bay, and Ise Bay, Japan (Sakai, 1965).

Pinnixa barnharti Rathbun, 1918

Pinnixa tumida [not Stimpson, 1858] STREETS, 1877, Bull. U. S. Nat. Mus., 7: 115 ('Bellañas Bay, Lower [Baja] California'). — TU, 1938, Zool. Anz., 122 (7/8): 184 (ecology).

Pinnixa faba [not Dana, 1851] RATHBUN, 1904, Harriman Alaska Exped., 10: 188 (part, vide Rathbun, 1918).

Pinnixa barnharti RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 130, 144, 149, 150, pl. 32 figs. 1 (♂ ventral view), 2 (♀ dorsal view), 3 (♀ ventral view), 4 (♂ abdomen), text-fig. 91 (♀ maxilliped) (♀ holotype: USNM 45589; 1♂, 1♀ paratypes: MCZ 5742; 'under pier at Venice, California) (San Diego and San Pedro, California). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 261, pl. 41 figs. 1 (♂ ventral view), 2 (♀ dorsal view), 3 (♀ ventral view), 4 (♂ abdomen) (after Rathbun, 1918). — RICKETTS & CALVIN, 1939, Between Pacific Tides, (ed. 1): 189, 190 (biology, ecology). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [ed. 2, 1968]: 249, 313 (biology, ecology). — L. H. HYMAN, 1955, The Invertebrates, 4: 243 (host relationship). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1417 (listed). — CASO, 1963, Anales Inst. Biol. Mexico, 34 (1, 2): 379 (mentioned). — HOPKINS & SCANLAND, 1964, Bull. S. Calif. Acad. Sci., 63 (4): 178-180, text-fig. (♀ dorsal view). — CASO, 1965, Anales Inst. Biol. Mexico, 36 (1, 2): 256 (Playa de las Gatas, Isla de Ixtapa, Zihuatanejo, Guerrero, Mexico). — LIE, 1968, Fiskeri Direkt. Skr., 14: 282, 302, 321, 348 (Puget Sound). — RICKETTS & CALVIN, 1968, Between Pacific Tides (ed. 4, Hedgpath revised): 294, 498 (biology, ecology).

Measurements: Male, length 10.2 mm, width 16.2 mm (Rathbun, 1918).

Habitat: In the cloaca of holothurians: *Liosoma arenata* [*Caudina arenicola* (Stimpson)] (Rathbun, 1904); *Molpadia arenicola* [*Caudina arenicola* (Stimpson)] (Rathbun, 1918); *Caudina arenicola* (Stimpson) (MacGinitie & MacGinitie); *Holothuria (Paraholothuria) riejai* Caso (Caso, 1963); *Molpadia [arenicola (Stimpson)]*... always has guests in its cloaca, the pea crab, *Pinnixa barnharti*, occurring so commonly as to be almost diagnostic' (Ricketts & Calvin, 1968).

Distribution: Puget Sound, Washington, U.S.A.; Venice, California; Zihuatanejo, Guerrero, Mexico.

Pinnixa brevipes H. Milne Edwards, 1853

Pinnixa brevipes H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 220 (186) (type probably not extant; type-locality: 'Madagascar'). — A. MILNE EDWARDS, 1873, Nouv. Archiv. Mus. Paris, 9 (2): 320 (compared with *Pinnixa faba* and *Tetrias fischeri*; New Caledonia). — HOFFMAN, 1869, Rech. Faune Madagascar, 5 (1): 30 (listed). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 268, 284, 285 (listed as *Pinnixa* with comment, '...this species does not seem to belong here...'). — SERÈNE, 1964, Vidensk. Medd. Dansk Naturh. Foren. Kobenhavn, 126: 277, 278 (discussed).

Pinnotheres brevipes HOFFMANN, 1869, Rech. Faune Madagascar, 5 (1): 41 (listed).

Pinnotheres (Ostracotheres) brevipes Hilgendorf, 1869, in Von der Decken, Reisen Ost-Afrika, 3: 110 (listed).

? *Pinnixa brevipes* GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 279 (listed, distribution of species noted).

Distribution: Known only from the type locality.

Pinnixa brevipollex Rathbun, 1898

Pinnixa brevipollex RATHBUN, 1898, Proc. U. S. Nat. Mus., 21: 605, 606, pl. 43 fig. 6 (♀ dorsal view) (♀ holotype, ♂ ♀ paratypes: USNM 21593; type-locality: 'Off Gulf of San Matias, Argentina'). — LAGERBERG, 1905, Wiss. Ergeb. Schwedischen Südpolar-Exped., 5 (7): 33 (after Rathbun, 1898). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 12, 130, 131, 169, 170, fig. 107 (♀ dorsal view), fig. 108a (♀ maxilliped), b (♂ abdomen). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 266 (listed). — RIGHI, 1967, Papéis Avulsos Zool. S. Paulo, 20 (10): 107, 113 (distinguishes *Pinnixa brevipollex* from *Pinnixa rapax*) (included in key to S. Amer. species of genus).

Measurements: Male, length 5.5 mm, width 11.0 mm; female, length 6.6 mm, width 12.5 mm (Rathbun, 1898).

Habitat: Off Cape Corrientes, Argentina, on hard, sandy bottom from 100 meters [54.68 fms.] (Lagerberg); off Gulf of San Matias, Patagonia, on dark and sand bottom with black specks, from 43 fms. [78.6 meters] (Rathbun).

Distribution: East coast of South America from 38° S to 46° S.

Pinnixa chacei Wass, 1955

Pinnixa sp. WASS, 1953, Key Decapod Crustacea Alligator Harbor Area: 11 (key).

Pinnixa chacei WASS, 1955, Quart. Journ. Fla. Acad. Sci., 18 (3): 160, 162, figs. 5 (♂ dorsal view), 6 (♂ right chela), 7 (♀ right chela), 8 (♂ abdomen), 9 (♂ left maxilliped) (♂ holotype, ♀ allotype: USNM 95694, paratypes: USNM 92431, 95695, 98905; type-locality: 'from Gulf Beach, Alligator Point, Franklin Co., Florida') (includes comparison with *P. patagoniensis* and *P. cristata*). — MENZEL, 1956, Contrib. Florida State Univ. Oceanogr. Inst., 61: 45 (listed).

Measurements: Male, length 3.3 mm, width 8.2 mm; female, length 2.7 mm, width 6.0 mm.

Habitat: 'Intertidal zone; commensal with the burrowing shrimp, *Callinassa islagrande* Schmitt, living in the upper part of the fragile sand-walled burrows.'

Distribution: Alligator Point, Florida, to Grande Isle, Louisiana, U.S.A.

Pinnixa chaetoptera Stimpson, 1860

Pinnixa cylindrica [not Say, 1818] STIMPSON, 1859, Ann. Lyc. Nat. Hist. New York, 7: 68 (South Carolina). — VERRILL, SMITH & HARGER, 1874, Rept. U. S. Fish Comm., 1: 546 (252) (part, fide Rathbun, 1918).

Pinnixa chaetoptera STIMPSON, 1860, Ann. Lyc. Nat. Hist. New York, 7: 235, 236 (107, 108) (types probably not extant; type-locality: Charleston Harbor, South Carolina). — COUES & YARROW, 1878, Proc. Acad. Nat. Sci. Phila., 1878: 324 (Fort Macon, North Carolina). — KINGSLEY, 1878, Proc. Acad. Nat. Sci. Phila., 1878: 324 (9) (Fort Macon, North Carolina). — KINGSLEY, 1880, Proc. Acad. Nat. Sci. Phila., 1879: 402 (Eastern Shore, Virginia; Beaufort, North Carolina; Florida Bay, Florida). — FAXON, 1879, Bull. Mus. Comp. Zool. Harvard Coll., 5 (11): 264, 265, pl. 5 figs. 8 (♂ left chela), 9 (♀ right chela) (Buzzards Bay, Massachusetts). — SMITH, 1880, Trans. Connecticut Acad. Arts Sci., 4: 250-252 (Long Island Sound, New York; Noank, Fisher's Island Sound, Connecticut; Vineyard Sound, Buzzard's Bay, and Cape Cod Bay, Massachusetts). — RATHBUN, 1881, Proc. U. S. Nat. Mus., 3: 119 (Wellfleet, Massachusetts). — VERRILL, 1882, Amer. Journ. Sci., (3) 24: 371 (Naushon Island, Massachusetts). — RATHBUN, 1900, Amer. Nat., 34: 589 (listed in key to species). — WILSON, 1900, Amer. Nat., 34 (401): 352 (Beaufort, North Carolina) (listed). — MOREIRA, 1901, Arch. Mus. Nac. Rio de Janeiro, 11: 38 (Rio Grande do Sul, Brazil). — ENDERS, 1905, Amer. Nat., 39 (457): 37-40 (Beaufort, North Carolina). — RATHBUN, 1905, Occas. Pap. Boston Soc. Nat. Hist., 7: 5 (Connecticut and Massachusetts). — CARY & SPAULDING, 1909, Publ. Gulf Biol. Sta. Louisiana: 11 (Chandeleur Islands, Louisiana). — FOWLER, 1912, Ann. Rept. New Jersey State Mus., 1911: 595 (Virginia province). — SUMNER, OSBURN & COLE, 1913, Bull. U. S. Bur. Fish., 31: 674 (Buzzards Bay, Massachusetts). — PEARSE, 1913, Biol. Bull. Woods Hole, 24 (2): 102-113 (Woods Hole, Massachusetts). — HAY & SHORE, 1918, Bull. U. S. Bur. Fish., 35: 445, 446, pl. 36 fig. 4 (♂ ♀ dorsal views) (Beaufort, North Carolina). — DOFLEIN, 1914, in Hesse & Doflein, Tierbau und Tierleben, 2: 274 (host; biology). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 130, 151-153, 158, pl. 33 figs. 3 (♀ dorsal view), 4 (♂ dorsal view), 5 (♀ ventral view), 6 (♂ ventral view), text-fig. 94a (♀ maxilliped), b (♂ abdomen) (Wellfleet, Woods Hole, Naushon Island, Vineyard Sound, Quissett, and Buzzards Bay, Massachusetts; Beaufort, North Carolina; Tangier Sound, South Carolina; Punta Rassa, Florida; Chandeleur Islands, Louisiana; Rio de Janeiro, Brazil). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 266 (listed). — ALLEE, 1922, Studies Mar. Ecol.: 69 (Falmouth and Gansett Island, Massachusetts). — O. W. HYMAN, 1924, Proc. U. S. Nat. Mus., 64 (7): 5, 6, pl. 4 (zoea 1) figs. 38 (frontal view), 39 (lateral view), 40 (antennule), 41 (antenna), 42

(mandible), 43 (maxillule), 44 (maxilla), 45 (maxilliped 1), 46 (maxilliped 2), 47 (abdomen and telson), pl. 6 figs. 68 (♂ left chela), 69 (♀ right chela) (larval stages) (Beaufort, North Carolina). — FISH, 1926, Bull. U. S. Bur. Fish., 41: 159, 160, figs. 59, 60 (surface collections of larvae). — LÉBOUR, 1928, Proc. Zool. Soc. London, 1928: 553 (larval stages compared with those of four other pinnotherids in three genera). — COWLES, 1930, Bull. U. S. Bur. Fish., 46: 355, 361 (Chesapeake Bay). — PRATT, 1935, Man. Common Invert. Anim.: 465 (briefly diagnosed). — AIKAWA, 1937, Rec. Oceanogr. Works Japan, 9 (1): 151, 152 (*Pinnix chaetpeterana*), (larval characters). — GURNEY, 1938, Proc. Zool. Soc. London, (B) 108 (1): 79 (larval stages) (listed). — RICHARDS, 1938, Anim. Seashore: 240, pl. 25 fig. 7 (dorsal view) (New Jersey). — GURNEY, 1942, Ray Soc., 129: 278, 279 (larval stages). — HARTMAN, 1945, Bull. Duke Univ. Mar. Sta., 2: 8, 35 (North Carolina). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [2nd ed., emended 1968]: 316 (biology, ecology). — JOHNSON, 1952, Trans. Kansas Acad. Sci., 55 (4): 459-464 (behavior). — WASS, 1953, Key Decapod Crustacea Alligator Harbor Area: 12 (key). — WASS, 1955, Quart. Journ. Florida Acad. Sci., 18 (3): 162 (Northern Gulf [of Mexico] Coast). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1452 (listed). — MENZEL, 1956, Contrib. Florida State Univ. Oceanog. Inst., 61: 45 (listed). — DAVENPORT, CAMOUGIS, & HICKOK, 1960, Anim. Behavior, 8 (3-4): 214-218 (behavior). — GRAY, 1961, Biol. Bull. Woods Hole, 120 (3): 353-359 (ecology) (Woods Hole, Massachusetts; Beaufort, North Carolina; Clearwater, Florida). — WASS, 1965, Special Sci. Rept. Virginia Inst. Mar. Sci., 24 (3d revision, mimeographed): 41 (listed) ('in [Chesapeake] bay'). — HOPKINS & SCANLAND, 1964, Bull. Southern California Acad. Sci., 63 (4): 175 (mentioned). — WILLIAMS, 1965, Fish. Bull. U. S. Fish Wildlife Serv., 65 (1): 210, 211, text-fig. 194A (♂ dorsal view), B (♂ chela, frontal view), C (♀ chela, frontal view) (to Rathbun, 1918 records, adds Villa Bella, [Ilha] São Sebastião, Brazil). — PEARCE, 1966, Pacific Sci., 20 (1): 20 (mentioned). — PEARCE, 1966, Some Contemporary Stud. Mar. Sci.: 565-589 (biology). — McDERMOTT, 1966, Amer. Zool., 6 (3): 331 (parasitized). — McDERMOTT, 1967, Amer. Zool., 7 (4): 772 (parasitized). — PATTON, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1233, 1235, 1236 (behavior). — RIGHI, 1967, Papéis Avulsos Zool. São Paulo, 20 (10): 99, 102, 113, figs. 1 (♂ gonopod), 2 (♂ abdomen), 3 (♀ right cheliped), 4 (♀ third maxilliped), 5 (adult ♂ right cheliped), 6 (juv. ♂ right cheliped) (Rio Grande do Sul, Brazil) (included in key to S. Amer. species of genus). — GOSNER, 1971, Guide Identif. mar. Invert. Cape Hatteras to Bay of Fundy: 551, fig. 21. 62C (major claw).

Pinnixia Chaetoptera SMITH, 1869, Amer. Nat. 3 (5): 246 (mentioned).

Pinnixia chaetoptera LÉBOUR, 1928, Proc. Zool. Soc. London, 1928: 553 (larval stages).

Measurements: Male, length 6.3 mm, width 14.0 mm; female, length 6.3 mm, width 14.0 mm (Rathbun, 1918).

Habitat: In the tubes of polychaetes: *Chaetopterus pergamentaceus* [*C. varioopedatus* (Renier)] (Stimpson, 1860); *Amphitrite ornata* (Leidy) (Smith, 1880); *Chaetopterus varioopedatus* (Renier) (MacGinitie & MacGinitie; Wass, 1955, 1965); 'This species is represented by two forms along the northern Gulf [of Mexico] Coast. The larger form lives in the tubes of the annelid, *Chaetopterus varioopedatus*, the smaller one in the burrow of *Callianassa jamaicensis louisianensis*. The latter form is probably the more common one, but it apparently has been overlooked previously (Chace, in litt.). The crab seems to prefer the upper narrow portion of the *Callianassa* burrow' (Wass, 1955). Shore to 8.5 fms [15.5 m] (Rathbun, 1918).

Distribution: Wellfleet, Massachusetts, to Rio Grande do Sul, Brazil.

Pinnixia chiloensis Garth, 1957

Pinnixia chiloensis GARTH, 1957, Lunds Univ. Arsskr., (n. ser.) (2) 53 (7): 82-85, 92, fig. 8 (♂) A (dorsal view), B (right chela), C (frontal view), D (right maxilliped), E (abdomen), F (gonopod) (♂ holotype and 3 ♀ paratypes, one ovigerous; ? depositary; type-locality: 'Lechagua, Bahía Ancud [Island of Chiloé, Chile]; also an ovigerous ♀ from 'Seno Reloncaví, Canal Tenglo, Isla Tenglo [Chile]') (includes comparison with *Pinnixia patagoniensis*).

Measurements: Male, length 6.1 mm, width 13.4 mm; female, length 7.3 mm, width 15.6 mm.

Habitat: In the tubes of the polychaete, *Arenicola assimilis* var. *affinis* [*Abarenicola affinis chilensis* Wells], hand sampled, from tidal belt, sand beach and small stones.

Distribution: Islands of Chiloé and Tenglo, Chile.

***Pinnixa cristata* Rathbun, 1900**

Pinnixa cristata RATHBUN, 1900, Amer. Nat., 34 (403): 589 (♀ holotype: USNM 42817; type-locality: 'Beaufort, North Carolina'). — FOWLER, 1912, Ann. Rept. New Jersey State Mus., 1911: 596 (listed). — HAY & SHORE, 1918, Bull. U. S. Bur. Fish., 35: 446, pl. 36 fig. 5 (♀ dorsal view) (Beaufort, North Carolina). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 129, 131, 134, 135, 136, pl. 29 (♀) figs. 8 (ventral view), 9 (dorsal view with detached left chela and legs 3 and 4), text-fig. 78 (♀ maxilliped) (Beaufort, North Carolina). — HUMM & WHARTON, 1942, Ecol. Monographs, 12 (2): 186 (Beaufort, North Carolina). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [ed. 2, emended, 1968]: 316 (biology, ecology). — BEHRE, 1950, Occas. Pap. Mar. Lab. Louisiana State Univ., 6: 26 (Grand Isle, Louisiana). — HEDGPETH, 1950, Publ. Inst. Mar. Sci. Univ. Texas 1 (2): 107, 116 (Long Lake, Texas). — WILLIAMS, 1965, Fish. Bull. U. S. Fish Wildlife Serv., 65 (1): 210, text-fig. 193 (♂ dorsal view) (to earlier records adds Edisto Island, South Carolina). — RHIGI, 1967, Papéis Avulsos Zool. S. Paulo, 20 (10): 113 (compared with *Pinnixa angeloi*).

Measurements: Female (ovigerous), length 4.0 mm, width 10.5 mm (Hay & Shore).

Distribution: Beaufort, North Carolina, to Grande Isle, Louisiana; Long Lake, Texas.

***Pinnixa cylindrica* (Say, 1818)**

Pinnotheres cylindricum SAY, 1818, Journ. Acad. Nat. Sci. Phila., 1 (16): 452–454 (♀ syntype, dry and in poor condition: BM cat. no. 1971.1; type-locality: 'Jekyll Island, Georgia'). — DEKAY, 1844, Zool. New York, 6: 13 (mentioned). — ICZN, 1925, Smithson. Miscell. Coll., 73 (3): 16 (Opinion 85; genus with *Pinnotheres cylindricum* cited as the type, placed in the 'Official List of Generic Names in Zoology'). — ICZN, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D): 19 (Direction 36; specific name placed on the 'Official List of Specific Names in Zoology,' as Name No. 901).

Pinnixa cylindrica WHITE, 1846, Ann. Mag. Nat. Hist., 18 (118): 177 (listed). — WHITE, 1847, List Crust. Brit. Mus.: 33 (listed). — H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 220 (186) (listed). — STIMPSON, 1859, Ann. Lyc. Nat. Hist. New York, 7: 68 (mentioned). — STIMPSON, 1860, Ann. Lyc. Nat. Hist. New York, 7: 235 (107) (Beaufort, North Carolina). — VERRILL, 1873, Rept. U. S. Fish Comm., 1: 367, 377, 520 [reprinted 1874 by Verrill and Smith: 73, 83, 226] pl. 1 fig. 1 (♂ dorsal view) (part, reference to Stimpson [73], fide Rathbun, 1918). — VERRILL, SMITH & HARGER, 1873, Rept. U. S. Fish Comm., 1: 546 [reprinted 1874: 252], pl. 1 fig. 1 ('Vineyard Sound and Long Island Sound to South Carolina'). — COUES & YARROW, 1878, Proc. Acad. Nat. Sci. Phila., 1878: 324 (Fort Macon, North Carolina). — KINGSLEY, 1878, Proc. Nat. Sci. Phila., 1878: 324 (9) (part, not reference to Smith nor Long Island Sound, fide Rathbun, 1918). — KINGSLEY, 1880, Proc. Acad. Nat. Sci. Phila., 1879: 402 (part, not references to Smith, fide Rathbun, 1918). — BUMPUS, 1898, Science N. York, (n. ser.) 8 (207): 853 (mentioned in account of breeding seasons of animals at Woods Hole, Massachusetts). — RATHBUN, 1900, Amer. Nat., 34 (403): 589 (listed in key to species). — DOFLEIN, 1914, in Hesse & Doflein, Tierbau und Tierleben, 2: 274 (host). — HAY & SHORE, 1918, Bull. U. S. Bur. Fish., 35: 446, 447, pl. 36 fig. 3 (♂ ♀ dorsal views) (Beaufort, North Carolina). — BOUVIER, 1917, Bull. Mus. Nat. Hist. Nat. Paris, 23 (5): 394 (compared with *Pinnixa rapax*). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 128, 129, 131, 138, 139, 151, 156, 159–161, pl. 35 (♂) figs. 5 (dorsal view), 8 (ventral view), text-fig. 89a (maxilliped), b (abdomen) (North Falmouth, Massachusetts; Chesapeake Bay, off Point Lookout, Maryland; Sarasota Bay, Florida). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 266 (listed). — A. MILNE EDWARDS & BOUVIER, 1923, Mem. Mus. Comp. Zool. Harvard Coll., 47 (4): 345 (compared with *Pinnixa rapax*). — COWLES, 1930, Bull. U. S. Bur. Fish., 46: 355, 361 (Chesapeake Bay). — HARTMAN, 1945, Bull. Duke Univ. Mar. Sta., 2: 8, 37 (North Carolina). — WASS, 1953, Key Decapod Crustacea Alligator Harbor Area: 12 (key). — MENZEL, 1956, Contrib. Florida State Univ. Oceanogr.

Inst., 61: 45 (listed). — HESS, 1961, Copeia, 2: 239, 240 (in stomach of dasyatid rays in Delaware Bay). — WELLS, 1961, Ecol. Monographs, 31 (3): 248, 251 (ecology) (Newport River, North Carolina). — McDERMOTT, 1962, Proc. Pennsylvania Acad. Sci., 36: 53–57 (biology). — WASS, 1965, Special Sci. Rept. Virginia Inst. Mar. Sci., 24 (3d revision, mimeographed): 41 (listed) (as noted in earlier 1963 also mimeographed edition: taken with *Arenicola* at Gloucester Point, Virginia). — WILLIAMS, 1965, Fish Bull. U. S. Fish Wildlife Serv., 65 (1): 213, 214, text-fig. 197 (♀ dorsal view) (North Falmouth, Massachusetts, to Alligator Harbor, Florida). — PEARCE, 1966, Some Contemporary Stud. Mar. Sci.: 565, 576, 582, 586 (biology). — GOSNER, 1971, Guide Identif. mar. Invert. Cape Hatteras to Bay of Fundy: 551, fig. 21. 62 F (third leg).

Pinnixa laevigata STIMPSON, 1859, Ann. Lyc. Nat. Hist. New York, 7: 68, 69 (♂ and ♀ types not extant; type-locality: 'near Fort Johnson, harbor of Charleston, S. C. [South Carolina]').

Pinnixa cylindrica SMITH, 1869, in Verrill, Amer. Nat., 3 (5): 246 (mentioned in account of the parasitic habits of Crustacea).

Measurements: Male, length 5.8 mm, width 11.8 mm; female, length 7.8 mm, width 15.3 mm (Rathbun, 1918).

Habitat: '...lives with the lobworm [lugworm] (*Arenicola cristata* Stimpson) in its hole in the sand, which is not lined by any tube. The young occur in the early spring on slimy shore at low-water mark' (Stimpson, 1859); 20 fms [36.6 m] (Rathbun, 1918).

Distribution: North Falmouth, Massachusetts; Chesapeake Bay to Alligator Harbor, Florida, inclusive of the Dry Tortugas.

Pinnixa darwini Garth, 1960

Pinnixa darwini GARTH, 1960, Pacific Sci., 14 (1): 39–42, fig. 1 (♂) a (dorsal view), b (right chela), c (frontal view), d (right maxilliped), e (abdomen), f (gonopod) (♂ holotype: AHF 3812; ♀ allotype: AHF 3812a; type-locality: 'Darwin Bay, Tower Island, Galapagos Islands'; also collected at Tagus Cove, Albemarle Island, Galapagos Islands).

Measurements: Male, length 3.1 mm, width 5.8 mm; female (ovigerous), length 3.8 mm, width 8.2 mm.

Habitat: In the tubes of the polychaete, *Chaetopterus variopedatus* (Renier), 17–70 fms [31–128 m].

Distribution: Galapagos Islands.

Pinnixa eburna Wells, 1928

Pinnixa eburna WELLS, 1928, Publ. Puget Sound Biol. Sta., 6: 298–301, figs. 30 (♀ dorsal view), 31 (♀ ventral view), 32 (♀ left chela, outer view), 33 (♂ dorsal view), 34 (♂ ventral view), 35 (♂ left chela, outer view) (♂ holotype: USNM 61786; ♀ paratype: USNM 61787; type-locality: 'False Bay, San Juan Island [Washington, U.S.A.]'). — RICKETTS & CALVIN, 1939, Between Pacific Tides, (ed. 1): 224 (biology, ecology). — WELLS, 1940, Univ. Washington Publ. Oceanogr., 2 (2): 19–50 (ecology). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [2nd emended ed., 1968], 209 (biology, ecology) (Puget Sound). — HART, 1962, Rept. Prov. Mus. Nat. Hist. Anthropol. British Columbia, 1961: W19 (Masset, Queen Charlotte Islands, to Victoria, British Columbia, Canada). — PEARCE, 1966, Pacific Sci., 20 (1): 30 (mentioned). — PATTON, 1967, Mar. Biol. Assoc. India Symp. Ser., (2) 3: 1237 (behavior). — RICKETTS & CALVIN, 1968, Between Pacific Tides, (ed. 4, Hedgpeth revised): 498 (listed).

Pinnixa eburna HEALY & WELLS, 1959, Proc. Zool. Soc. London, 133 (2): 325, 326, 331 (mentioned).

Measurements: Male, length 3.5 mm, width 6.5 mm; female, length 3.5 mm, width 8.0 mm (Wells, 1928).

Habitat: Commensal with polychaetes: *Arenicola pusilla* [*Abarenicola vagabunda* Healy & Wells] (Wells, 1940); *Arenicola claparedii* [*Abarenicola vagabunda* Healy & Wells] (MacGinitie & MacGinitie, 1949); 'The commensal crabs *Pinnixa eburna* and *P. schmitti* are commonly found with [*Abarenicola*] *vagabunda* and [*A.*] *pacifica* respectively, but it may be the substratum, rather than the worm, that determines the crab'; the substratum for *A. vagabunda* is 'deep sand near the mouth of the bay', at a single occasion *A. pacifica* was found on such a substratum and it had *P. eburna* as a commensal (Healy & Wells, 1959: 331); *Arenicola v. vagabunda* [*Abarenicola v. vagabunda* Healy & Wells], *Arenicola vagabunda oceanica* [*Abarenicola vagabunda oceanica* Healy & Wells] (Hart). On beach 'exposed by tides lower than 1.0 foot (Wells, 1928).

Distribution: False Bay, San Juan Island, Washington, U.S.A. to Masset, Queen Charlotte Islands, British Columbia.

† *Pinnixa eocenica* Rathbun, 1926

Pinnixa eocenica RATHBUN, 1926, Bull. U. S. Nat. Mus., 138: 34–35, pl. 1 figs. 3 (dorsal view), 4 (frontal view) (holotype: ? Department of Geology, University of Washington, Seattle; type-locality: 'Washington: West bank of Olegua Creek about one-eighth mile north of Vader Station, Lewis County; section 29, township 11 north, range 2 west; Eocene series...'). — VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 2, 3 (listed). — ZULLO & CHIVERS, 1969, The Veliger, 12 (1): 73 (mentioned).

Palaeopinnixa eocenica VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 2 (cited as type of new subgenus *Palaeopinnixa*).

Pinnixa (Palaeopinnixa) eocenica VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 3, fig. 1, la (carapace in dorsal view) (compared with *P. mytilicola*).

Distribution: Known only from the type locality.

Pinnixa faba (Dana, 1851)

Pinnothera faba DANA, 1851, Proc. Acad. Nat. Sci. Phila., 5: 253 (7) ([? ♀ holotype] not extant; type-locality: '...in freto 'Puget' Oregoniae'). — DANA, 1852, U. S. Explor. Exped., 13 (text): 381, 382 (description). — DANA, 1855, U. S. Explor. Exped., 13 (atlas): 9, pl. 24 (♀) figs. 4a (dorsal view), b (maxillipeds), c (chela) (Puget Sound).

Pinnotheres faba BATE, 1866, Naturalist in Vancouver Island, British Columbia, 2: 271 (Esquimalt Harbor, Vancouver Island, British Columbia). — LOCKINGTON, 1877, Proc. Calif. Acad. Sci., 7: 154 (10) (Oregon coast).

Pinnixa faba STIMPSON, 1857, Journ. Boston Soc. Nat. Hist., 6: 470 (30) (Willapa Bay, formerly known as Shoalwater Bay, Washington). — COOPER, 1860, Cat. Plants Coll. Washington Territory, 12 (2): 387 (Willapa Bay, Washington). — HASWELL*, 1882, Cat. Australian Stalk- and Sessile-eyed Crust.: 113 (Port Denison, Australia). — NEWCOMBE, 1893, Bull. Nat. Hist. Soc. British Columbia: 25 (Victoria, Nanaimo, Comox, and Clayoquot, Vancouver Island, British Columbia). — THOMSON*, 1893, Pap. Proc. Roy. Soc. Tasmania, 1892: 5 (Hobart, Tasmania). — ADENSAMER, 1897, Ann. K. K. Naturhist. Hofmus. Wien, 12: 108 (California). — HOLMES, 1900, Occ. Pap. Calif. Acad. Sci., 7: 93 (Queen Charlotte Island, British Columbia; San Pedro, California) (Rathbun, 1918, below, p. 144, believes that Holmes may have had *Pinnixa barnharti*). — THOMPSON, 1901, Cat. Crust. Pycnog. Mus. Univ. Coll. Dundee: 6 (north Pacific). — RATHBUN, 1904, Harriman Alaska Exped., 10: 188 (part, fide Rathbun, 1918). — GRANT & McCULLOCH*, 1906, Proc. Linn. Soc. New South Wales, 31: 6, 23 (Mast Head Island, Rat Island). — WEYMOUTH, 1910, Leland Stanford Jr. Univ. Publ. (Univ. Ser.) 4: 59 (part, fide Rathbun, 1918). — TAYLOR, 1912, Contrib. Canadian Biol., 1906–1910: 191, 212 (mentioned). — WILLIAMSON, 1915, Nordisches Plankton, 6 (1): 562 (listed). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 142–145, pl. 31 figs. 1 (♀ dorsal view), 2 (♂ dorsal view), 3 (♀ ventral view), 4 (♂ ventral view), text-figs. 87a (♀ leg 3), b (♂ leg 3), c (♂ right chela), d (♀ left chela), e (eye in orbit, frontal view), 88a (♀ maxilliped), b (♂ abdomen) (Cordova Bay, Prince of Wales Island, Alaska; Beaver Harbor, Departure Bay, Denman Island, Union Bay, Brandon Island, Kanaka Bay, Protection Island, Echo Bay, Snake Island, Taylor Bay, South of Mudge Island, and False Narrows, British Columbia; Simeahmoo, Puget Sound, Quarantine Dock, Port Orchard, and Rosedale, Washington; Yaquina, Oregon; 'Humboldt Bay South,' California). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 267, 285 (listed). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 259, pl. 40 figs. 1 (♀ dorsal view), 2 (♂ dorsal view), 3 (♀ ventral view), 4 (♂ ventral view), text-fig. 154a (♂ right chela), b (♀ left chela) (California) (after Rathbun). — JOHNSON & SNOOK, 1927, Seashore Anim. Pacific Coast: 393 (general account). — McNEILL*, 1927, Australian Encycl., 1: 326 (tropical Australia). — WELLS, 1928, Publ. Puget Sound Biol. Sta., 6: 290, 291, figs. (♀) 10 (dorsal view), 11 (ventral view), 12 (left chela, outer view), 13 (orbits), (♂) 14 (dorsal view), 15 (ventral view), 16 (left chela, outer view) (False

Bay, San Juan Island; Flat Point, Lopez Island; East Sound, Orcas Island; and Poulsbo, Washington). — HART, 1930, Canadian Field Nat., 44 (5): 107 (Parry Bay, Vancouver Island, British Columbia). — MacGINITIE, 1930, Ann. Mag. Nat. Hist., (10) 6: 68 (Elkhorn Slough, Monterey Bay, California). — CLEMENS, 1933, Check List Mar. Fauna Flora Canad. Pacific Coast: 52 (Canadian Pacific Coast) (listed). — MacGINITIE, 1935, Amer. Midland Naturalist, 16 (5): 657, 715 (Elkhorn Slough, Monterey Bay, Morro Bay, and Newport [Beach] Bay, California). — PRATT, 1935, Man. Common Invert. Anim.: 465 (briefly diagnosed). — RICKETTS & CALVIN, 1939, Between Pacific Tides, (ed. 1): 216 (biology, ecology). — WELLS, 1940, Univ. Wash. Publ. Oceanog., 2 (2): 19–50 (ecology) (Puget Sound). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [2nd ed., emended 1968]: 313, fig. 152 (♀ dorsal view) (biology, ecology). — RIOJA, 1950, Rev. Soc. Mexicana Hist. Nat., 11 (1–4): 145–147 (discusses commensalism in Crustacea, mentions *P. faba*). — GUILER*, 1952, Records Queen Victoria Mus., Tasmania, 3: 40 (Hobart, Tasmania) (listed). — ATKINS, 1954, Journ. Mar. Biol. Assoc. United Kingdom, (n. ser.) 33 (3): 633 (disposition of legs in megalopa when swimming). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1419 (listed). — NOBLE & NOBLE, 1961, Parasitology: 767, figs. — PEARCE, 1962, Biologist 45 (1–2): 11, 12, 14 (ecology). — PEARCE, 1966, Pacific Sci., 20 (1): 18, 30 (mentioned). — PEARCE, 1966, Some Contemporary Stud. Mar. Sci.: 565–589 (biology). — VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 3. — RICKETTS & CALVIN, 1968, Between Pacific Tides (ed. 4, Hedgpeth revised): 328, 498 (biology, ecology). — ZULLO & CHIVERS, 1969, The Veliger, 12 (1): 71 (fossil specimens of this crab found within paired valves of the bivalve *Tresus capax* in late Pleistocene deposits in Oregon, U.S.A.), pl. 5 fig. 2 (♀ optic region).

Pinnixa littoralis WEYMOUTH, 1910, Leland Stanford Univ. Publ., (Univ. Ser.) 4: 58, fig. 5 (♂ dorsal view and chela) (part, fide Rathbun, 1918).

Remarks: Of Haswell's record Rathbun (1918) says, 'Probably not *Pinnixa faba*.' This is probably true of the other Australasian records marked with an asterisk (*) in this synonymy and under 'Habitat' and 'Distribution' below.

Measurements: Male, length 8.5 mm, width 15.0 mm (Hart); female, length 15.2 mm, width 22.8 mm (Rathbun, 1918).

Habitat: In bivalves: *Lutaria* (Stimpson); *Schizothaerus nuttalli* [*Tresus nuttalli* (Conrad)] (Newcombe; MacGinitie, 1935); *Tresus Nuttalli* [*Tresus nuttalli* (Conrad)] (Taylor); *Saxidomus* probably *giganteus* Deshayes, *Tapes* (Rathbun, 1918); *Paphia* [*Tapes*] (Schmitt); *Cardium corbis* [*Clinocardium nuttalli* Conrad], *Lyonsia saxicola* [*Ertodesma saxicola* (Baird)], *Macoma indentata* Carpenter, *Macoma inquinata* [*Heteromacoma irus* (Hanley)], *Macoma nasuta* (Conrad), *Macoma secta* Conrad, *Mya arenaria* Linnaeus (Wells, 1928); *Schizothaerus capax* [*Tresus capax* (Gould)] (Pearce); in *Tresus capax* in late Pleistocene deposits (Zullo & Chivers). With nudibranch: 'from sea hare' *Aplysia* (Glassell, unpublished notes). In the atrial cavity of tunicates: *Sryela gibbsii* (Stimpson) (Wells, 1928). In cloaca of holothurians: *Liosoma arenaria* [*Caudina arenicola* (Stimpson)] (Holmes); *Liosoma arenata* [*Caudina arenicola* (Stimpson)] (Taylor); *Molpadia arenicola* [*Caudina arenicola* (Stimpson)] (Rathbun, 1918). Questionably in abalones: *Haliotis coco-radiata* [*Haliotis cocoradiata* (Reeve)] (Haswell)*; *Haliotis asinina* Linnaeus (Grant & McCulloch)*.

Distribution: Recent: Prince of Wales Island, Alaska, to Newport [Beach] Bay, California, U.S.A.; Port Denison, Australia (Haswell)*, and Hobart, Tasmania (Thomson)*.

Fossil: Late Pleistocene of Oregon, U.S.A.

Pinnixa faxoni Rathbun, 1918

Pinnixa faxoni RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 133, 134, pl. 29 figs. 4 (♂ ventral view), 5 (♂ dorsal view), 6 (♀ ventral view), 7 (♀ dorsal view), text-fig. 77 a (♂ abdomen), b (maxilliped) (♂ holotype: USNM 7639; type-locality: 'Trinidad'). — RIGHI, 1967, Papéis Avulsos Zool. S. Paulo, 20 (10): 113 (included in key to S. Amer. species of genus).

Measurements: Male, length 5.6 mm, width 11.0 mm; female, length 6.1 mm, width 13.3 mm.

Habitat: 'Shore.'

Distribution: Trinidad and Monos Island, off N.W. coast of Trinidad (Rathbun).

Pinnixa felipensis Glassell, 1935

Pinnixa felipensis GLASSELL, 1935, Trans. San Diego Soc. Nat. Hist., 8 (5): 14 (♀ holotype: SDSNH 210; 2♂ and 2♀ paratypes: MCZ 9319; type-locality: 'San Felipe, Lower [Baja] California [Gulf of California]...').

Measurements: Female, length 3.2 mm, width 8.3 mm.

Distribution: Known only from the type locality.

Pinnixa floridana Rathbun, 1918

Pinnixa cylindrica KINGSLEY, 1879, Proc. Acad. Nat. Sci. Phila., 1879; 402 (part, fide Rathbun, 1918).

Pinnixa floridana RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 138, 139, pl. 30 figs. 4 (♀ ventral view), 5 (♀ dorsal view), 6 (♂ dorsal views, detached legs of right side), 7 (♂ ventral view), text-fig. 82a (♂ abdomen), b (♀ maxilliped) (♀ holotype: USNM 6996; type-locality: 'Marco, Florida...'; also Sarasota Bay). — WASS, 1953, Key Decapod Crustacea Alligator Harbor Area: 12 (key). — WASS, 1955, Quart. Journ. Florida Acad. Sci., 18 (3): 162 (4 miles ESE of St. Marks Light and Alligator Point, Florida). — MENZEL, 1956, Contrib. Florida State Univ. Oceanogr. Inst., 61: 45 (listed). — VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 3 (listed). — WILLIAMS, McCLOSKEY & GRAY, 1968, Crustaceana, 15 (1): 57, 58, fig. 13 (♀ dorsal view, and a detached third leg) (SE of Point Lookout, North Carolina).

Measurements: Male, length 2.4 mm, width 4.4 mm; female (ovigerous), length 3.5 mm, width 8.0 mm (Rathbun).

Habitat: '...taken from a compound ascidian growing at the base of *Eugorgia virgulata* [*Leptogorgia virgulata* (Lamarck)], which was washed ashore on the outer beach of Alligator Point in August, 1952' (Wass). '... may have been living in the tubes of [the polychaete] *Diopatra cuprea* Claparède [= *D.c.* (Bosc)]' (Williams, McCloskey & Gray).

Distribution: Off the coast of North Carolina and west coast of Florida.

Pinnixa franciscana Rathbun, 1918

Pinnixa franciscana RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 12, 130, 131, 161, 162, pl. 35 figs. 1 (♂ ventral view), 2 (♂ dorsal view), 3 (♀ dorsal view), 4 (♀ ventral view), text-fig. 100 a (♂ abdomen), b (♀ maxilliped) (♀ holotype: USNM 48450; ♀ paratype: MCZ 12162; type-locality: 'Middle part of San Francisco Bay, California,...'). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 263, pl. 42 figs. 1 (♂ ventral view), 2 (♂ dorsal view), 3 (♀ dorsal view), 4 (♀ ventral view) (after Rathbun) (San Francisco Bay). — MacGINITIE, 1930, Ann. Mag. Nat. Hist., (10) 6: 68 (Elkhorn Slough, Monterey Bay). — MacGINITIE, 1935, American Midland Naturalist, 16 (5): 715, 716 (Elkhorn Slough, Monterey Bay, Morro Bay, and Newport Bay, California). — MacGINITIE, 1937, American Midland Naturalist, 18 (6): 1034, pl. 1 fig. 4 (♂♀ dorsal view) (ecology). — GLASSELL, 1937, Charleston Mus. Leaflet, 9: 5 (compared with *P. lunzi*). — RICKETTS & CALVIN, 1939, Between Pacific Tides, (ed. 1): 232, 306. — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [ed. 2, 1968]: 191, 287, 315, 316, fig. 159 a (♂ dorsal view), b (♀ dorsal view) (Elkhorn Slough, Monterey Bay, California) (biology, ecology). — DALES, 1957, Mem. Geol. Soc. America, 67 (1): 397, fig. 2 (diagram of commensal relationships with *Urechis*, *Upogebia*, and *Callianassa*) (ecology). — MARSHALL & ORR, 1960, in Waterman, Physiology of Crustacea, 1: 233, 243 (behavior). — RICKETTS & CALVIN, 1968, Between Pacific Tides, (ed. 4, Hedgpeth revised): 268, 336, 498 (biology, ecology).

Measurements: Female holotype: length 5.7 mm, width 11 mm (Rathbun); male (USNM 71621, from Elkhorn Slough), length 11.6 mm, width 22.7 mm. Size range of species runs 'from 2.8 mm in length by 5.4 mm in width to 11 mm in length by 22 mm in width' (MacGinitie, 1935).

Habitat: Commensal in the burrowing shrimps, *Callianassa californiensis* Dana and *Upogebia*, and the echinurid worm, *Urechis caupo* Fisher & MacGinitie, small specimens sometimes free (MacGinitie, 1935); 'juveniles are common in the tubes of terebellid polychaetes,' *Amphitrite robusta* Johnson; the polynoid, *Hololepidella tuta* [*Grubeopolynoe tuta* (Grube)]; and occasionally with *Urechis* (Ricketts & Calvin, 1939, 1968).

Distribution: San Francisco Bay to Newport Bay, California.

Pinnixa fusca Glassell, 1935

Pinnixa fusca GLASSELL, 1935, Trans. San Diego Soc. Nat. Hist., 8 (5): 13, 14 (♀ holotype: SDSNH 3880; ♀ paratype: USNM 71403; ♀ paratype: MCZ 9320; type-locality: 'San Felipe, Lower [Baja] California [Gulf of California]').

Measurements: Female, length 3.7 mm, width 11.5 mm.

Distribution: Known only from the type locality.

† *Pinnixa galliheri* Rathbun, 1932

Pinnixa galliheri RATHBUN, 1932, Journ. Washington Acad. Sci., 22 (14): 411-413, figs. 1 (dorsal view), 2 (dorsal view), 3 (ventral view), 4 (ventral view), 5 (dorsal view) (holotype: USNM 372851; type-locality: '...from top of hill with elevation of 610 feet about 1 mile W. of N. of Loma Alta and stratigraphically 700 feet approximately above the base of the type section of the Monterey formation [Miocene; Pacific Grove, California]'. — VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 2, 3 (listed, taxonomic position discussed). — ZULLO & CHIVERS, 1969, The Veliger, 12 (1): 73 (mentioned).

Distribution: Known only from the type locality.

Pinnixa haematosticta Sakai, 1934

Pinnixa haematosticta SAKAI, 1934, Sci. Rept. Tokyo Bunrika Daigaku, 2B (29): 42, 43, fig. 3 (♀) a (dorsal view), b (maxilliped) (♀ ? holotype: depository unknown, type-locality: 'S[h]imoda, off Kisami [Japan]' (compared with *Pinnixa transversalis*). — SAKAI, 1935, Crabs of Japan: 203, 204, pl. 57 fig. 4 (♀ dorsal view), text-fig. 107 (♀) a (dorsal view), b (maxilliped) (in Japanese) (compared with *Pinnixa penultipedalis*). — SAKAI, 1939, Stud. Crabs of Japan: 600, pl. 70 fig. 4 (♀ dorsal view), text-fig. 85 (♀ maxilliped) (Shimoda, Japan). — SAKAI, 1956, Crabs: 51 (of species list) (mentioned). — MIYAKE, 1961, Oceanogr. Works Japan, Special Number 5: 174 (listed) (Sea of Ariaké [Ariakeno umi], Kyūshū Island, Japan). — SAKAI, 1965, The Crabs of Sagami Bay: 181 (mentioned as from Shimoda, but not from Sagami Bay).

Measurements: Female, length 3.5 mm, width 7.0 mm (Sakai, 1935).

Habitat: Sandy bottom at 20 fms [36.6 m] among dead shells (Sakai, 1934).

Distribution: Shimoda, Island of Hondo, and Sea of Ariaké, Kyūshū Island, Japan.

† *Pinnixa heckeri* Birstein, 1956

Pinnixa heckeri BIRSTEIN, 1956, Bull. Soc. Nat. Moscow Geol., 31 (1): 69, pl. 1 figs. 14 (♂) a (dorsal view), b (ventral view), 15 (♀) a (dorsal view), b (ventral view) (♂ and ♀ types: ? depository; type-locality: right bank of the River Isfara, in the vicinity of Khanabad, Fergana, U.S.S.R.; Kyzyl-Ata, Fergana, U.S.S.R.; Sumsar Stage, Oligocene). — VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 2, 3 (listed).

Measurements: Male, length 9.0 mm, width 18.0 mm; female, length 10.5 mm, width 18.5 mm.

Distribution: Known only from the type locality.

Pinnixa hiatus Rathbun, 1918

Pinnixa hiatus RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 164, 165, pl. 36 (♀) figs. 1 (dorsal view), 2 (ventral view), 3 (left legs 3 and 4), 4 (right chela and legs 1-4), text-fig. 102 (♀ maxilliped) (♀ holotype: USNM 29949; type-locality: 'off Catalina Island, California'). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 265, pl. 43 (♀) figs. 1 (dorsal view), 2 (ventral view), 3 (left legs 3 and 4), 4 (right chela and legs 1-4) (after Rathbun).

Measurements: Female, length 3.6 mm, width 7.7 mm (Rathbun).

Distribution: Known only from the type locality.

Pinnixa huffmani Glassell, 1935

Pinnixa huffmani GLASSELL, 1935, Trans. San Diego Soc. Nat. Hist., 8 (14): 103 (♀ holotype: SDSNH 764; type-locality: '...Punta Peñasco (Rocky Point), Sonora, Mexico'). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1417 (listed).

Measurements: Female, length 6.1 mm, width 7.6 mm (Glassell).

Habitat: Commensal in the sea cucumber, *Thyone*.

Distribution: Known only from the type locality.

Pinnixa leptosynaptae Wass, 1968

Pinnixa leptosynaptae WASS, 1968, Tulane Stud. Zool., 14 (4): 137-139, figs. 1 (♂ dorsal view), 2 (♂ abdomen), 3 (♀ abdomen), 4 (left third maxilliped), 5 (right cheliped of male in ventral view), 6 (♂ right first pleopod) (♂ holotype: USNM 99389; ♀ allotype: USNM 99390; ♂ ♀ paratypes USNM 99391; type-locality: '...Bald Point at the entrance to Ochlockonee Bay, Franklin County, Florida').

Measurements: Male, length 2.3 mm, width 3.7 mm; female, length 2.1 mm, width 3.9 mm.

Habitat: On the body of the holothurian *Leptosynapta crassipatina* Clark.

Distribution: Known only from the type-locality.

Pinnixa littoralis Holmes, 1894

Pinnixa littoralis HOLMES, 1894, Proc. Calif. Acad. Sci., (2) 4: 571-573, pl. 20 (♂) figs. 14 (chela), 15 (orbits from above), 16 (leg) (♂ syntype: USNM 20859; type-locality: 'Bodega Bay, near Fort Bragg [California]'). — HOLMES, 1900, Occ. Pap. Calif. Acad. Sci., 7: 91 (Bodega Bay, California). — RATHBUN, 1904, Harriman Alaska Exped., 10: 188 (San Diego, California). — WEYMOUTH, 1910, Leland Stanford Univ. Publ., (Univ. Ser.) 4: 58 (part, Rathbun, 1918). — WAY, 1917, Publ. Puget Sound Mar. Sta., 1 (30, 31): 362, fig. 14 (dorsal view) (Brown Island and MacDonal's Beach, near Friday Harbor, Washington). — NININGER, 1918, Pomona Coll. Journ. Entomol. Zool., 10 (2): 41, 42, fig. 32 (dorsal view) (Balboa Bay, California). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 145-149, pl. 31 figs. 5 (♀ dorsal view), 6 (♂ dorsal view), 7 (♀ ventral view), 8 (♂ ventral view), text-fig. 89a (♀ left chela), b (front and eye in orbit), c (♀ leg 3), d (♂ left chela), e (♂ leg 3), text-fig. 90 a (♀ maxilliped), b (♂ abdomen) (Sitka and Cordova Bay, Prince of Wales Island, Alaska; Beaver Harbor, Victoria, Departure Bay, Ucluelet, Denman Island, Union Bay, Hammond Bay, Brandson Island, Kanaka Bay, Protection Island, Echo Bay, Snake Island, Taylor Bay, Mudge Island, and False Narrows, British Columbia; Friday Harbor and Quarantine Dock, and Port Orchard, Puget Sound, Washington; Humboldt Bay South, Bodega Bay, San Francisco Bay, off Catalina Island, and San Diego, California). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 267, 285 (listed). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 260, 261, pl. 40 figs. 5 (♀ dorsal view), 6 (♂ dorsal view), 7 (♀ ventral view), 8 (♂ ventral view) (San Francisco Bay, California) (after Rathbun). — JOHNSON & SNOOK, 1927, Seashore Anim. Pacific Coast: 393, 394, fig. 349 (♂ and ♀ dorsal views), fig. 356 (♀ dorsal and ventral views, ♂ dorsal view) (general account). — SMITH, 1928, Canadian Field Naturalist, 42 (7): 164 (Sidney, British Columbia). — WELLS, 1928, Publ. Puget Sound Biol. Sta., 6: 293, figs. 17 (♀ dorsal view), 18 (♀ ventral view), 19 (♀ left chela, outer view), 20 (♀ orbits), 21 (♂ dorsal view), 22 (♂ ventral view), 23 (♂ left chela, outer view), 48 (♀ right antennule), 49 (♀ right antenna), 50 (♀ right mandible), 51 (♀ right maxilla), 52 (♀ right maxilla 2), 53 (♀ right maxilliped 1), 54 (♀ right maxilliped 2), 55 (♀ right maxilliped), 56 (♀ right cheliped), 57 (♀ right leg 1), 58 (♀ right leg 2), 59 (♀ right leg 3), 60 (♀ right leg 4) (False Bay, San Juan Island; Flat Point, Lopez Island; East Sound, Orcas Island; and Poulsbo, Washington). — HART, 1930, Canadian Field Naturalist, 44 (5): 107 (Vancouver Island, British Columbia). — CLEMENS, 1933, Check List Mar. Fauna Flora Canad. Pacific Coast: 52 (Canadian Pacific coast) (listed). — PRATT, 1935, Man. Common Invert. Anim.: 465 (briefly diagnosed). — RICKETTS & CALVIN, 1939, Between Pacific Tides, (ed. 1): 186, 217 (biology, ecology). — WELLS, 1940, Univ. Wash. Publ. Oceanogr., 2 (2): 19-50 (ecology) (Puget Sound). — RIOJA, 1950, Rev. Soc. Mexicana Hist. Nat., 11 (1-4): 145-147 (discusses commensalism in Crustacea, mentions *P. littoralis*). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1419 (listed). — WOLFF, 1959, Proc. Internat. Congr. Zool., 15: 1061 (annelid commensal). — PEARCE, 1962, Biologist, 45 (1-2): 11, 12, 14 (ecology). — PEARCE, 1966, Pacific Sci., 20 (1): 18, 30 (mentioned). — PEARCE, 1966, Some Contemporary Stud. Mar. Sci.: 565-589 (biology). — RICKETTS & CALVIN, 1968, Between

Pacific Tides (ed. 4, Hedgpeth revised): 289, 328, 499 (biology, ecology). — HART, 1968, Nat. Hist. Papers, Nat. Mus. Canada, 38: 4 (Orca Inlet, Hawkins Island, Prince William Sound, Alaska). — ZULLO & CHIVERS, 1969, The Veliger, 12 (1): 71 (mentioned).

Pinnixa faba [not Dana, 1851] RATHBUN, 1904, Harriman Alaska Exped., 10: 188 (part, specimens from Sitka, Alaska).

Measurements: Male, length 8.0 mm, width 16.0 mm (Hart); female (ovigerous), length 16.3 mm, width 26.0 mm (Rathbun, 1918).

Habitat: In bivalves: *Mya arenaria* Linnaeus (Way); *Saxidomus*, probably *giganteus* (Deshayes), *Schizothaerus nuttalli* [*Tresus nuttalli* (Conrad)], *Tapes* (Rathbun, 1918); *Paphia* [*Tapes*] (Schmitt); *Cardium corbis* [*Clinocardium nuttalli* Conrad], *Lyonsia saxicola* [*Entodesma saxicola* Baird], *Macoma indentata* Carpenter, *Macoma inquinata* [*Heteromacoma irus* (Hanley)], *Macoma nasuta* (Conrad), *Macoma secta* Conrad, *Serripes groenlandicus* Bruguière (Wells, 1928); *Tresus capax* (Gould) (Pearce, 1966); *Saxidomus*, *Cardium* [*Clinocardium*], *Tresus nuttalli* Conrad, occasionally; frequently in basket cockle, *Clinocardium nuttalli* (Conrad) (Ricketts & Calvin, 1968); *Siliqua patula* (Dixon), intertidal (Hart). According to Holmes, picked up on the shore; shore to 50 fms [91.5 m] (Rathbun, 1918); clinging to the outside of the slime tube of an anemone, *Cerianthus* (Nininger).

Distribution: Sitka, Alaska, to San Diego, California.

Pinnixa longipes (Lockington, 1876)

Tubicola longipes LOCKINGTON, 1876, Proc. Calif. Acad. Sci., 7: 55–56 (1–2) (type not extant; type-locality: ‘Tomales Bay [California]').

Pinnixa longipes LOCKINGTON, 1877, Proc. Calif. Acad. Sci., 7: 156 (12) (Tomales Bay, California). — STREETS & KINGSLEY, 1878, Bull. Essex Inst., 9: 107 (mentioned). — HOLMES, 1894, Proc. Calif. Acad. Sci., (2) 4: 573–574, pl. 20 figs. 19 (dorsal view), 20 (maxilliped) (Tomales Bay, California). — HOLMES, 1900, Occ. Pap. Calif. Acad. Sci., 7: 92 (San Pedro, California). — RATHBUN, 1904, Harriman Alaska Exped., 10: 188 (mentioned). — WEYMOUTH, 1910, Leland Stanford Univ. Publ., (Univ. Ser.) 4: 58, fig. 6 (dorsal view) (part, fide Rathbun, 1918). — NININGER, 1918, Pomona Coll. Journ. Entomol. Zool., 10 (2): 41, fig. 31 (p. 42) (dorsal view) (Balboa Bay, California). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 12, 129, 131, 137, 138, 165, figs. 80 (dorsal view), 81 (maxilliped) (Tomales Bay, California). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 267, 285 (listed). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 257–258, fig. 152 (dorsal view) (California). — JOHNSON & SNOOK, 1927, Seashore Anim. Pacific Coast: 392, 393, fig. 348 (dorsal view) (general account). — BALSS, 1927, in Kükenenthal and Krumbach, Handb. Zool., 3 (1): 962, fig. 1056 (dorsal view). — MACGINITIE, 1935, American Midland Naturalist, 16 (5): 716 (Elkhorn Slough, Monterey Bay, Pacific Grove, Tomales Bay, Morro Bay, and Newport Bay, California). — PRATT, 1935, Man. Common Invert. Anim.: 465, fig. 637 (dorsal view) (briefly diagnosed, as in original, 1916, ed.: 399). — RICKETTS & CALVIN, 1939, Between Pacific Tides, (ed. 1): 199, 212 (mention of occurrence on east coast is apparently a slip in wording; if the authors had said that on the east coast the genus, not the species, occurs with *Chaetopterus*, subsequent authors [MacGinitie & MacGinitie, 1949, and, again, Ricketts & Calvin, 1968] would not have been misled) (biology, ecology). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1): 209, 314 (ed. 2, 1968, has on p. 476 fig. 285, ♂ dorsal view, after Holmes) (mention of occurrence on east coast is incorrect) (biology, ecology). — RIOJA, 1950, Rev. Soc. Mexicana Hist. Nat., 11 (1–4): 145–147 (discusses commensalism in Crustacea, mentions *P. longipes*). — DALES, 1957, Mem. Geol. Soc. America, 67 (1): 397, fig. 2 (diagram of commensal relationship with *Urechis* (ecology). — PATTON, 1967, Mar. Biol. Assoc. India Symp. Ser., 2 (3): 1234 (behavior). — RICKETTS & CALVIN, 1968, Between Pacific Tides, (ed. 4, Hedgpeth revised): 303, 322, 499 (mention of occurrence on east coast is incorrect) (biology, ecology).

Measurements: Female, length 3.2 mm, width 6.3 mm (Schmitt).

Habitat: ‘... on the tube of an annelid common on the sand flats left bare at low tide...’ (Lockington, 1876); commensal in the tubes of polychaetes *Pectinaria auricoma* [*P. californiensis* Hartman], *Pista elongata* Moore, *Clymenella rubrocincta* [*Axiathella rubrocincta* (Johnson)], also in burrows of *Urechis caupo* Fisher & MacGinitie (MacGinitie, 1935, and, in part, Ricketts & Calvin, 1968).

Distribution: Tomales Bay to Laguna Beach, California.

Pinnixa lunzi Glassell, 1937

Pinnixa lunzi GLASSELL, 1937, Charleston Mus. Leaflet, 9: 3-8, figs. 1 (♂ dorsal view), 2 (♂ right chela), 3 (♀ right chela), 4 (♂ abdomen), 5 (♀ abdomen), 6 (♀ left leg 3), 7 (maxilliped), 8 (gonopod) (♂ holotype, ♀ paratype: USNM 73138; type-locality: 'Isle of Palms [about 15 miles NE of Charleston], South Carolina') (compared with *Pinnixa franciscana*). — WILLIAMS, 1965, Fish. Bull. U. S. Fish Wildlife Serv., 65 (1): 214, 215, text-fig. 198 (♂ dorsal view), text-fig. 199 A (♂ right chela), B (♀ right chela), C (♀ left 3rd ambulatory leg), D (♀ abdomen), E (♂ abdomen). — BOESCH, 1971, Crustaceana, 20 (2): 219, 220 (off Virginia, Georgia; in burrow of echiuran *Thalassema hartmani*).

Measurements: Male, length 9.0 mm, width 21 mm; female, length 9.0 mm, width 21 mm (Glassell).

Habitat: Collected on beach, under drift material (Glassell), 10-26 m (Boesch). In burrow of echiuran *Thalassema hartmani* Fisher (Boesch).

Distribution: Virginia to Georgia, U.S.A.

Pinnixa minuta Rathbun, 1901

Pinnixa minuta RATHBUN, 1901, Bull. U. S. Fish Comm., 20 (2): 21, fig. 4 (♂) a (dorsal view), b (maxilliped), c (leg 3), d (last three abdominal segments) (♂ holotype: USNM 23768; type-locality: 'Mayaguez Harbor, Puerto Rico'). — DOFLEIN, 1904, Wiss. Ergeb. Deutschen Tiefsee Exped. Valdivia, 6: 307 (listed). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 150, 151, fig. 92 (♂) a (dorsal view), b (last three abdominal segments), c (right chela), d (third leg), e (endognath of maxilliped) (Mayaguez Harbor, Puerto Rico). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 266 (listed). — RATHBUN, 1933, Sci. Surv. Porto Rico Virgin Ids., 15 (1): 84, fig. 77 (♂) a (dorsal view), b (maxilliped), c (leg 3), d (abdomen and sternum) (Mayaguez Harbor, Puerto Rico). — VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 1, 3, 4.

Pinnixa (Palaeopinnixa) ? minuta VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 3 (affinities discussed).

Measurements: Male, length 1.3 mm, width 2.3 mm (Rathbun, 1901).

Habitat: Muddy sand.

Distribution: Known only from the type locality.

Pinnixa monodactyla (Say, 1818)

Pinnotheres monodactylum SAY, 1818, Journ. Acad. Nat. Sci. Phila., 1 (16): 454, 455 (type not extant; type-locality: 'Inhabits the American coast.'). — DEKAY, 1844, Zool. New York, 6: 13 (listed). — COUES & YARROW, 1878, Proc. Acad. Nat. Sci. Phila., 1878: 323 (mentioned). — MIERS, 1886, Rept. Sci. Results Voy. Challenger, 17 (49): 276 (listed).

Pinnixa monodactyla RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 136 ('Probably Atlantic coast of the Southern States. Not seen since the type was taken'). — BOUVIER, 1917, Bull. Mus. Nat. Hist. Nat. Paris, 23 (5): 393, 394 (compared with *Pinnixa rapax*). — TESCH, 1918, Siboga Exped. Monogr., 39c¹ (84): 266 (listed). — A. MILNE EDWARDS & BOUVIER, 1923, Mem. Mus. Comp. Zool. Harvard Coll., 47 (4): 345 (compared with *Pinnixa rapax*).

Measurements: Male, length 7.6 mm, width 12.7 mm (Say).

Distribution: Known only from the type locality (cf. Rathbun 1918).

† **Pinnixa montereyensis** Rathbun, 1932

Pinnixa montereyensis RATHBUN, 1932, Journ. Washington Acad. Sci., 22 (14): 413, fig. 11 (♂ ventral view) (♂ holotype: USNM 372852; type-locality: '...from top of Loma Alta (northerly peak) and stratigraphically about 1000-1300 feet above the base of type section [Monterey formation, Miocene, Pacific Grove, California].'). — VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 2, 3 (listed). — ZULLO & CHIVERS, 1969, The Veliger, 12 (1): 73 (mentioned).

Measurements: Male, length 8.0 mm, width 10.0 mm.

Distribution: Known only from the type locality.

† *Pinnixa mytilicola* Via Boada, 1966

Pinnixa (Palaeopinnixa) mytilicola VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 1, 3, 4, figs. 2, 2a (carapace in dorsal view) (Miocene, 'cerca del km 3 de la carretera de Sardanyola a St. Cugat del Vallés (Finca Xercavins),' slightly N.W. of Barcelona, Spain; holotype: MGSB 19.268).

Paleopinnixa mytilicola VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 2. Measurements: Maximum width of carapace 10 mm, maximum length 7 mm, fronto-orbital width 5 mm, frontal width 2 mm.

Habitat: Found among great numbers of fossil shells of *Mytilus michelini* Math., in 'un banco lumaquéllico, de color gris-azulado.'

Distribution: Known only from the type locality.

Pinnixa occidentalis Rathbun, 1893

Pinnixa occidentalis RATHBUN, 1893, Proc. U. S. Nat. Mus., 16: 248, 249 (part) (♂ lectotype: USNM 17474; ♂♂ and ♀♀ paralectotypes: USNM 17407-17473, 17475-17477, 17501, 17510-17514, MCZ 4262; type-locality: Albatross Sta. 3216, 54°20'30"N 163°27'00"W, south of Unimak Island, Alaska; Iliuliuk Harbor, Unalaska, to Gray's Harbor, Washington). — NEWCOMBE, 1893, Bull. Nat. Hist. Soc. British Columbia, 4: 26 (Queen Charlotte's Sound to the north of Vancouver Island, British Columbia). — HOLMES, 1900, Occ. Pap. Calif. Acad. Sci., 7: 89, 90 (Humboldt County, California). — RATHBUN, 1904, Harriman Alaska Exped., 10: 187, pl. 7 fig. 4 (♂ dorsal view), pl. 9 (♂) fig. 6 (dorsal view) a (chela) (part, not specimens from Cape Fox) (Juneau, Hot Springs, Sitka, and Wrangell, Alaska). — DOFLEIN, 1904, Wiss. Ergeb. Deutschen Tiefsee Exped. Valdivia, 6: 194, 307 (listed). — WEYMOUTH, 1910, Leland Stanford Univ. Publ., (Univ. Ser.) 4: 56, fig. 3 (♂ dorsal view and chela) (Monterey Bay, California). — TAYLOR, 1912, Contrib. Canadian Biol., 1906-1910: 191, 212 (Departure Bay, Port Harvey, British Columbia). — WILLIAMSON, 1915, Nordisches Plankton, 6 (1): 562 (listed). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 155-157, pl. 34 (♂) fig. 1 (dorsal view), text-figs. 96 (♂ left chela), 97 (♂) a (abdomen), b (maxilliped) (Alaska; British Columbia; Washington; Oregon; California; Monterey Bay, Lower California). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 266, 285 (listed). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 262, 263, pl. 42 figs. 5 (♂ dorsal view and left chela), 6 (♀ dorsal view), text-fig. 156 (♂) a (dorsal view), b (chela) (San Francisco Bay, California) (after Rathbun). — SAKAI, 1933, Botany and Zoology, Tokyo, 1 (2): 982 (52) (mentioned). — GLASSELL, 1934, Journ. Washington Acad. Sci., 24 (7): 302 (Gulf of California) (listed). — VAN WINKLE & SCHMITT, 1936, Journ. Washington Acad. Sci., 26 (8): 330 (S.E. of Cape Cheerful, Unalaska). — TU, 1938, Zool. Anz., 122 (7/8): 177, 183 (mention of host relationships and adaptations). — CLEMENS, 1933, Check List Mar. Fauna Flora Canad. Pacific Coast: 52 (Pacific coast of Canada) (listed). — HART, 1968, Nat. Hist. Papers Nat. Mus. Canada, 38: 4 (Orca Inlet, Cordova Bay, Alaska). — LIE, 1968, Fiskeri Direkt. Skr., 14: 321 (Puget Sound).

Pinnixa californiensis RATHBUN, 1893, Proc. U. S. Nat. Mus., 16: 249 (♂ holotype, 20 paratypes: USNM 17478; 1 ♂ and 1 ♀ paratypes: MCZ 4261; type-locality: 'Monterey Bay and off Point Ano Nuevo, California'). — RATHBUN, 1898, Proc. U. S. Nat. Mus., 21: 605 (Magdalena Bay, Lower California). — HOLMES, 1900, Occ. Pap. Calif. Acad. Sci., 7: 90 (Monterey Bay, California). — RATHBUN, 1904, Harriman Alaska Exped., 10: 187, pl. 7 fig. 3 (♀ dorsal view). — DOFLEIN, 1904, Wiss. Ergeb. Deutschen Tiefsee Exped. Valdivia, 6: 307 (listed). — WEYMOUTH, 1910, Leland Stanford Univ. Publ., (Univ. Ser.) 4: 56 (part, Rathbun, 1918). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 267, 285 (listed).

Measurements: Male, length 9.5 mm, width 19.5 mm; female, length 10.5 mm, width 20.5 mm (Rathbun, 1893).

Habitat: Commensal in burrows of the gephyrean worm, *Echiurus* (Rathbun, 1904). Intertidal, and dredged, from 28-30 fms. [18.28-54.9 meters] (Hart); 10-238 fms. [18.3-435.2 meters] (Rathbun, 1918).

Distribution: Iliuliuk Harbor, Unalaska, to Magdalena Bay, Baja California, Mexico.

Pinnixa paitensis Rathbun, 1935

Pinnixa paitensis RATHBUN, 1935, Proc. Biol. Soc. Washington, 48: 50 (♀ holotype (juv.): USNM 70830; type-locality: '...Paita, Peru').
Measurements: Female, length 3.0 mm, width 6.2 mm.
Distribution: Known only from the type locality.

Pinnixa patagoniensis Rathbun, 1918

Pinnixa patagoniensis RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 129, 131, 135, 136, pl. 30 (♂) figs. 1 (frontal view), 2 (dorsal view), 3 (ventral view), text-fig. 79 (♂) a (maxilliped), b (abdomen) (♂ holotype: MCZ 5741; ♂ paratype (juv.): USNM 49248; type-locality: 'San Matias Bay, Patagonia...'). — GARTH, 1957, Lunds Univ. Arsskr., (n. ser.) (2) 53 (7): 84, 85 (compared with *Pinnixa chiloensis*). — BOSCHI, 1964, Bol. Inst. Biol. Mar. Argentina, 6: 55, pl. 2 fig. 1 (♂ first pleopod), p (maxilliped), q (♂ second pleopod), pl. 16 fig. 1 (♀ dorsal view) (description). — BOSCHI, 1966, Mar. Biol. Assoc. India Symp. Ser., 2 (1): 453 (distribution). — RIGHI, 1967, Papéis Avulsos Zool. S. Paulo, 20 (10): 113 (compared with *Pinnixa angeloii*) (included in key to S. Amer. species of genus).

Measurements: Male, length 5.5 mm, width 12.8 mm.

Distribution: Buenos Aires Province, and northern Patagonia, Argentina.

Pinnixa pearsei Wass, 1955

Pinnixa pearsei WASS, 1955, Quart. Journ. Florida Acad. Sci., 18 (3): 164, 165, figs. (♂) 10 (dorsal view), 11 (right cheliped), 12 (right maxilliped), 13 (abdomen) (♂ holotype: USNM 74959; type-locality: '...Indian Pass, Apalachicola, Florida...'); ♂ paratype, USNM 94052, Alligator Harbor, Florida). — MENZEL, 1956, Contrib. Florida State Univ. Oceanogr. Inst., 61: 46 (listed).

Measurements: Male, length 3.5 mm, width 8.0 mm.

Habitat: From sand-mud beach among tubes of a polychaete worm, *Diopatra*.

Distribution: Indian Pass, Apalachicola, and Alligator Harbor, Franklin County, Florida (Wass).

Pinnixa pembertoni Glassell, 1935

Pinnixa pembertoni GLASSELL, 1935, Trans. San Diego Soc. Nat. Hist., 8 (14): 102, 103 (♂ holotype: SDSNH 3895; ♂ paratype: USNM 71406; ♀ paratype: USNM 71407; 2 ♂ 2 ♀ paratypes: MCZ 9318; type-locality: '...San Felipe [Gulf of California]; Baja California, Mexico...').

Measurements: Male, length 3.8 mm, width 7.6 mm.

Habitat: In the burrow of the 'lug worm,' *Arenicola*.

Distribution: Known only from the type locality.

Pinnixa penultipedalis Stimpson, 1858

Pinnixa penultipedalis STIMPSON, 1858, Proc. Acad. Nat. Sci. Phila., 1858: 108 (♀ holotype: probably not extant; type-locality: 'In portu' Hong Kong...'). — ORTMANN, 1894, Zool. Jahrb. Syst., 7: 695, 696, pl. 23 fig. 7 (♀ dorsal view), i (maxilliped) (Nagasaki, Japan). — STIMPSON, 1907, Smithsonian Misc. Coll., 49: 143 (Hongkong). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 267, 286 (listed). — BALSS, 1922, Arch. Naturgesch., 88A (11): 140 (listed). — GEE, 1925, Lingnaam Agr. Rev., 3 (2): 163 (Hongkong). — SAKAI, 1933, Botany and Zoology, Tokyo, 1 (2): 982 (52) (mentioned). — SAKAI, 1934, Sci. Rept. Tokyo Bunrika Daigaku, 1 (B): 316 (listed). — SAKAI, 1934, Sci. Rept. Tokyo Bunrika Daigaku, 2 (B): 41, fig. 2c (maxilliped). — SAKAI, 1935, Crabs of Japan: 204 (compared with *Pinnixa haematosticta*). — SHEN, 1937, Bull. Fan Mem. Inst. Biol. Zool., 7: 170, 177 (Kiaochow Bay, China). — SHEN, 1937, Contrib. Inst. Zool. Peiping, 3 (6): 298-301, 308, fig. 10 (♀) a (dorsal view), b (maxilliped), c (leg 3), d (cheliped), e (abdomen), f (dactylus leg 1), g (dactylus leg 2) (Tsangkou, China). — SAKAI, 1939, Stud. Crabs

of Japan: 600 (mentioned). — BARNARD, 1955, *Ann. S. African Mus.*, 43 (1): 19–21, fig. 6 (♂) a (dorsal view), b (left maxilliped, outer view), c (left maxilliped, inner view), d (exopod of right maxilliped, outer view), e (leg 1), f (leg 3), g (leg 4), h (gonopod, posterior view) (Inhambane, Mozambique). — SAKAI, 1956, *Crabs*: 51 (of species list) (mentioned). — MIYAKE, 1961, *Rec. Oceanogr. Works Japan*, 5: 175 (listed) (Sea of Ariaké [Ariakeno umi], Kyūshū Island, Japan. — SAKAI, 1965, *The Crabs of Sagami Bay*: 181 (Eng. pt.) (mentioned, as *P. peultipedalis*, from Nagasaki and Hongkong, but not from Sagami Bay).

Measurements: Female (ovigerous), length 2.3 mm, width 5.0 mm (Shen); another female, length 4 mm, width 7.5 mm (Miyake).

Habitat: Associated with sipunculids (Barnard). In tubes of polychaete worms: *Potamilla* (Shen); *Lomia* [*Loimia*] *medusa* (Savigny) (Miyake).

Distribution: Nagasaki and Sea of Ariaké, Kyūshū Island, Japan; north and south China; Inhambane, Mozambique.

Pinnixa petersi Bott, 1955

Pinnixa petersi BOTT, 1955, *Senckenbergiana Biol.*, 36 (1/2): 58, 59, pl. 7 (♂) fig. 10a (dorsal view), b (ventral view) (♂ holotype: SMF 2099; type-locality: 'El Salvador, Puerto El Triunfo').

Measurements: Male, length 9.0 mm, width 17 mm; female (ovigerous), length 8.0 mm, width 15.0 mm.

Distribution: Known only from the type locality.

Pinnixa plectrophoros Glassell, 1935

Pinnixa plectrophoros GLASSELL, 1935, *Trans. San Diego Soc. Nat. Hist.*, 8 (14): 102 (♂ holotype: SDSNH 3894; type-locality: 'Punta Peñasco (Rocky Point) [Gulf of California], Sonora, Mexico...').

Measurements: Male, length 2.0 mm, width 6.0 mm.

Habitat: In the tubes of a polychaete worm, *Clymenella*.

Distribution: Known only from the type locality.

Pinnixa rapax Bouvier, 1917

Pinnixa rapax BOUVIER, 1917, *Bull. Mus. Nat. Hist. Nat. Paris*, 23 (5): 392–394 (♂ holotype: MCZ 10997; type-locality: 'au S de l'embouchure de La Plata [Argentina]...') (compared with *Pinnixa cylindrica* and *monodactyla*). — A. MILNE EDWARDS & BOUVIER, 1923, *Mem. Mus. Comp. Zool. Harvard Coll.*, 47 (4): 344, 345, pl. 8 fig. 2 (♂ dorsal view), text-fig. 6 (♂ cheliped) (compared as above). — RIGHI, 1967, *Papéis Avulsos Zool. São Paulo*, 20 (10): 99, 105–107, 114, figs. 15 (♀ dorsal view), 16 (♂ gonopod), 17 (♀ third maxilliped), 18 (♀ right cheliped), 19 (♂ right cheliped), 20 (♂ abdomen) (Rio La Plata, Argentina; São Paulo, Brazil) (distinguishes *Pinnixa brevipollex* from *Pinnixa rapax*) (included in key to S. Amer. species of genus).

Measurements: Male, length 3.8 mm, width 7.0 mm.

Distribution: Argentina; Brazil.

Pinnixa rathbuni Sakai, 1934

Pinnixa occidentalis [not Rathbun, 1893] YOKOYA, 1928, *Sci. Rept. Tôhoku Imp. Univ.*, 3 (4) (2): 775, 776, fig. 6a (♂ dorsal view), b (chela), c (♀ right chela), d (♂ abdomen), e (♀ abdomen) (Futago Island, off Itanozaki, off Tsubakiyama, and off Cape Hanagurizaki, Japan). — YOKOYA, 1933, *Journ. Coll. Agr. Tokyo Imp. Univ.*, 12 (1): 208–210 (west of Kinkazan; southwest of Kinkazan; east of Siwoyazaki; and east of Owase, Mie-ken, Japan).

Pinnixa rathbuni SAKAI, 1934, *Sci. Rept. Tokyo Bunrika Daigaku*, 2 (B): 39, 40, fig. 1 (♂ dorsal view) (♂♀ syntypes; ? depository; type-locality: 'Mut[s]u Bay') (also Kinkazan, east of Siwoyazaki, Manazuru, Simoda, Monmotori in Ise-Bay, and Owase in Mie-prefecture, Japan). — SAKAI, 1935, *Crabs of Japan*: 201, 202, fig.

105 (♂ dorsal view). — SAKAI, 1939, Stud. Crabs of Japan: 599, fig. 83 (♀ dorsal view) (Mut[s]u Bay, Sagami Bay, and Ise Bay, Japan). — MIYADI, 1941, Mem. Imperial Mar. Obs., 7 (4): 512–517, fig. 4 (*Pinnixa* association; ecology) (Ise Bay, Japan). — SAKAI, 1949, Illustr. Fauna Japan: 667, fig. 1925 (♂ dorsal view). — VINOGRADOV, 1950, Journ. Pacif. Inst. Fisher. Indust. Oceanogr., 33: 240. — SAKAI, 1955, Bull. Biogeogr. Soc. Japan, 16–19: 109, fig. 6 (juvenile, dorsal view) (juveniles and adults). — SAKAI, 1956, Crabs: 51 (of species list) (mentioned). — MIYAKE, 1961, Rec. Oceanogr. Works Japan, Special Number 5: 174 (mouth of Rokkaku River, Nishinotsu, Okinohata, Yanagawa City, Saga Prefecture, Ariaké Sea [Ariakeno umi], Kyūshū Island, Japan). — SAKAI, 1965, Crabs of Sagami Bay: 182 (Eng. pt.), 79 (Jap. pt.), pl. 88 fig. 2 (♂ dorsal view) (Aomori Bay, off Kinkazan, Sagami Bay, Izu peninsula, Ise Bay, coast of Kanagawa Prefecture). — PEARCE, 1966, Pac. Sci., 20 (1): 28. — KOBJAKOVA, 1967, Explorations Fauna Seas USSR, 5 (13): 243 (Possjet Bay, S. Siberia). — TAKEDA & MIYAKE, 1968, Jour. Fac. Agr. Kyūshū Univ., 14 (4): 542, 543, 574 ('East China Sea').

Measurements: Male, length 6.1 mm, width 12.8 mm; female, length 6.6 mm, width 12.3 mm (Yokoya, 1928).

Habitat: 'Mouth of Rokkaku river, Saga Prefecture, collected by a larva-net; many crabs were collected on sandy and muddy flat exposed at low tide, Nishinotsu, Okinohata, Yanagawa City, cohabiting with *Volsella metcalfei* [*Modiolus metcalfei* Hanley] and *Loimia medusa* [(Savigny)]. This species is usually commensal in the tube of the latter. Some specimens are taken from stomachs of *Acanthogobius hasta* and *Mustelus manazo* (Miyake); commensal with *Chaetopterus variopeatus* (Renier) (Kobjakova); 37 to 132 meters (Takeda & Miyake).

Distribution: S. E. Siberia; Sachalin; S. Kuriles; Japan.

Remarks: Although Sakai (1934: 37, 39, 40) evidently meant to name this species for Dr. Mary J. Rathbun, he nowhere in the original publication said so unambiguously. Therefore, the spelling *rathbuni* for the specific name has to be maintained, and should not be changed to *rathbunae*.

Pinnixa retinens Rathbun, 1918

Pinnixa retinens RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 139–141, pl. 41 (♂) figs. 1 (dorsal view), 2 (ventral view), text-figs. 83 (♂ maxilliped), 84 (♂), a (abdomen), b (leg 3), 4 (left chela) (♂ holotype: USNM 50167; ♀ paratype: USNM 49641; type-locality: 'Chesapeake Bay; off Poplar Island, Maryland...') — WASS, 1953, Key Decapod Crustacea Alligator Harbor Area: 12 (key). — WASS, 1955, Quart. Journ. Florida Acad. Sci., 18 (3): 162 (Alligator Harbor, Florida; [Aransas area] Texas). — MENZEL, 1956, Contrib. Florida State Univ. Oceanogr. Inst., 61: 46 (listed). — WASS, 1965, Special Sci. Rept. Virginia Inst. Mar. Sci., 24 (3d revision, mimeographed): 41 (listed) (York River; common in Chesapeake Bay area). — WILLIAMS, 1965, Fish. Bull. U. S. Fish Wildlife Serv., 65 (1): 212, 213, text-fig. 196 A (♀ dorsal view), B (♂ abdomen), C (♂ 3rd ambulatory leg), D (♂ left chela). — GOSNER, 1971, Guide Identif. mar. Invert. Cape Hatteras to Bay of Fundy: 551, fig. 21. 62 B (major claw).

Measurements: Male, length 4.2 mm, width 7.0 mm (Rathbun); female (ovigerous), length 6 mm, width 12 mm (Williams).

Habitat: In the burrow of the mud shrimp, *Upogebia affinis* (Say) (Wass, 1955); from mud bottom (Wass, 1965).

Distribution: Chesapeake Bay; Alligator Harbor, Florida; Aransas area, Texas (Williams).

Pinnixa richardsoni Glassell, 1936

Pinnixa richardsoni GLASSELL, 1936, Trans. San Diego Soc. Nat. Hist., 8 (21): 301, 302, pl. 21, fig. 3 (♂ maxilliped) (♂ holotype: SDSNH 3923; type-locality: '...Balboa, Canal Zone, [Isthmus of] Panama...') (compared with *Pinnixa valerii*).

Measurements: Male, length 6.5 mm, width 12.8 mm.

Habitat: Dug out of heavy, thick mud in the upper tidal zone, from a small channel margined with mangrove trees.

Distribution: Known only from the type locality.

Pinnixa salvadorensis Bott, 1955

Pinnixa salvadorensis BOTT, 1955, Senckenbergiana Biol., 36 (1/2): 59, 60, pl. 7 (♂) fig. 11a (dorsal view), b (ventral view), text-fig. 3a (maxilliped), b (chela), c (gonopod) (holotype: SMF 2119; type-locality: 'El Salvador, Coral de Mulas').

Measurements: Male, length 3.0 mm, width 11.0 mm.

Distribution: Coral de Mulas and La Chepona, El Salvador.

***Pinnixa sayana* Stimpson, 1860**

Pinnixa sayana STIMPSON, 1860, Ann. Lyc. Nat. Hist. New York, 7: 236, 237 (108, 109) (type not extant; type-locality: '...off the mouth of Beaufort Harbor, N. C. [North Carolina]'). — COUES & YARROW, 1878, Proc. Acad. Nat. Sci. Phila., 1878: 323 (Fort Macon, North Carolina). — KINGSLEY, 1878, Proc. Acad. Nat. Sci. Philadelphia, 1878: 323 (8) (Fort Macon, North Carolina). — RATHBUN, 1905, Occ. Pap. Boston Soc. Nat. Hist., 7: 6 (Buzzards Bay and Vineyard Sound, Massachusetts; New Haven, Connecticut). — FOWLER, 1912, Ann. Rept. New Jersey State Mus., 1911: 596 (part, fide Rathbun, 1918). — SUMNER, OSBURN & COLE, 1913, Bull. U. S. Bur. Fish., 31: 674 (Vineyard Sound and Buzzards Bay, Massachusetts). — HAY & SHORE, 1918, Bull. U. S. Bur. Fish., 35: 446 (Beaufort, North Carolina). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 156–159, pl. 34 figs. 2 (♂ dorsal view), 3 (♀ ventral view), 4 (♀ dorsal view), text-fig. 98 (♂) a (maxilliped), b (abdomen) (Buzzards Bay, Vineyard Sound, and Woods Hole, Massachusetts; Narragansett Bay, Rhode Island; Long Island Sound, Branford Beacon, Connecticut; Chesapeake Bay, off Barren Island and off Cove Point Light, Maryland; Sarasota Bay, Florida). — TESCH, 1918, Siboga-Exp. Monogr., 39c (84): 266 (listed). — ALLEE, 1922, Studies Mar. Ecol., 2: 70 (Falmouth, Massachusetts). — O. W. HYMAN, 1924, Proc. U. S. Nat. Mus., 64 (2497): 6, 7, pl. 5 (last zoea) figs. 52 (maxilliped 1), 53 (maxilliped 2), 54 (frontal view), 55 (posterior view), 56 (maxilliped), 57 (maxilliped, cheliped, and walking legs), 58 (maxilla), pl. 6 (figs. 59–62, last zoeas) figs. 59 (maxillule), 60 (antennule and antenna), 62 (terminal segments of abdomen and telson), (figs. 63–67, 70–71, crab stage 1 [after Faxon]), 63 (dorsal view), 64 (ventral view), 65 (abdomen, ventral view), 66 (antennule), 67 (maxilliped 1), 70 (maxilliped 2), 71 (maxilliped) (larval stages). — FISH, 1926, Bull. U. S. Bur. Fish., 41: 159, 160, figs. 59, 60 (surface collections of larvae). — LEBOUR, 1928, Proc. Zool. Soc. London, 1928: 553 (mention of moult of last zoea directly into young crab, in discussion of pinnotherid larval stages of four other pinnotherids in three genera). — AIKAWA, 1929, Rec. Oceanogr. Works Japan, 2 (1): 23, 24, pl. 4 fig. 46 (telson, zoea) (larval stages). — COWLES, 1930, Bull. U. S. Bur. Fish., 46: 355, 361 (Chesapeake Bay). — PEARSE, 1936, Journ. Elisha Mitchell Sci. Soc., 52 (2): 197 (Bird Island Shoal, North Carolina). — AIKAWA, 1937, Rec. Oceanogr. Works Japan, 9 (1): 151, 152 (larval characters). — GURNEY, 1938, Proc. Zool. Soc. London, (B) 108 (1): 79 (larval stages) (listed). — BEHRE, 1950, Occ. Pap. Mar. Lab. Louisiana State Univ., 6: 26 (Grand Isle, Louisiana). — WASS, 1953, Key Decapod Crustacea Alligator Harbor Area: 12 (key). — WASS, 1965, Special Sci. Rept. Virginia Inst. Mar. Sci., 24 (3d revision, mimeographed): 41 (listed) (York River, Chesapeake Bay). — WILLIAMS, 1965, Fish. Bull. U. S. Fish Wildlife Serv., 65 (1): 212, text-fig. 195 (♂ dorsal view). — VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 3 (listed). — RIGHI, 1967, Papéis Avulsos Zool., São Paulo, 20 (10): 99, 102–105, 114, figs. 9 (♂ gonopod), 10 (♂ third maxilliped), 11 (♀ right cheliped), 12 (adult ♂ cheliped), 13 (juv. of ♂ cheliped), 14 (♂ abdomen) (São Paulo, Brazil) (included in key to S. American species of genus). — GOSNER, 1971, Guide Identif. mar. Invert. Cape Hatteras to Bay of Fundy: 551, fig. 21.62 G (third leg).

Pinnixa cylindrica [not Say, 1818] VERRILL, 1873, Rept. U. S. Fish Comm., 1: 367 [reprinted 1874 by Verrill & Smith: 73], pl. 1 fig. 1 (♂ dorsal view [actually ♀, fide Rathbun, 1918]) (not *Pinnotheres cylindrica* Say 1818, no reference to South Carolina, fide Rathbun, 1918). — VERRILL, SMITH, & HARGER, 1873, Rept. U. S. Fish Comm., 1: 546 (reprinted 1874 by Verrill & Smith, 1: 252], pl. 1 fig. 1 (for comment by Rathbun, 1918, regarding illustration and occurrence, cf. Verrill, 1873 above) (Vineyard Sound, Massachusetts; Long Island Sound). — KINGSLEY, 1878, Proc. Acad. Nat. Sci. Philadelphia, 1878: 324 (9) (part, fide Rathbun, 1918). — KINGSLEY, 1879, Proc. Acad. Nat. Sci. Philadelphia, 1879: 402 (part, fide Rathbun, 1918).

Pinnixa sp. [*sayana*, fide Rathbun, 1918] FAXON, 1879, Bull. Mus. Comp. Zool., 5 (11): 263, 264, pl. 4 (last zoea) figs. 5 (frontal view), 6 (posterior view), 7 (maxilliped 3, cheliped, and ambulatory legs and gills), 8 (maxilliped 3), 9 (maxilla 2), 10 (abdomen), 11 (maxilliped 2), 12 (maxilliped 1), 13 (maxilla 1), 14 (antennule

and antenna), 15 (metastoma), pl. 5 (first crab stage) figs. 1 (dorsal view), 2 (ventral view), 3 (abdomen), 4 (antennule), 5 (maxilliped 1), 6 (maxilliped 2), 7 (maxilliped 3) (larval stages) (Narragansett Bay, Rhode Island).

Pinnixa Sayana SMITH, 1880, Trans. Connecticut Acad. Arts Sci., 4: 252, 253 (Buzzards Bay and Vineyard Sound, Massachusetts; New Haven, Connecticut). — LEBOUR, 1928, Journ. Mar. Biol. Assoc. United Kingdom, (n. ser.) 15 (1): 116 (mentioned in discussion of larval stages).

Pinnixa (*Sayana* ?) FAXON, 1882, Mem. Mus. Comp. Zool., 9 (1): pl. 14 figs. 28, 29 (last zoea, dorsal and frontal views, and appendages), 30 (young, first crab stage, one direct moult removed from last zoea).

Measurements: Male, length 4.8 mm, width 9.7 mm (Rathbun, 1918); female, length 4.3 mm, width 8.7 mm (Smith, 1880).

Habitat: Shore to 26 fms [47.5 m], 'Either found free or dug out of mud' (Rathbun, 1918); '... occasionally found in the sand-walled tubes of *Arenicola cristata*' (Hay & Shore). (The latter remark undoubtedly applies to *Pinnixa cylindrica*, which species Hay & Shore synonymized with the species before us [see Rathbun, 1918: 159]).

Distribution: Vineyard Sound, Massachusetts, to Sarasota Bay, Florida, and Grand Isle, Louisiana; Brazil.

Pinnixa schmitti Rathbun, 1918

Pinnixa occidentalis [not Rathbun, 1893] RATHBUN, 1904, Harriman Alaska Exped., 10: 187 (part, fide Rathbun, 1918).

Pinnixa schmitti RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 162-164, pl. 35 figs. 6 (♀ dorsal view), 7 (♂ dorsal view), 9 (♀ ventral view), text-fig. 101 (♂) a (maxilliped), b (abdomen), c (left chela) (Port Levasheff, Unalaska; Cape Fox, Alaska; Puget Sound, Washington; San Francisco Bay, California) (♀ holotype: USNM 48441; type-locality: 'Lower San Francisco Bay, California'). — SCHMITT, 1921, Univ. California Publ. Zool., 23: 264-265, pl. 42 figs. 7 (♂ dorsal view), 8 (♀ dorsal view), 9 (♀ ventral view), text-fig. 157 (♂ chela) (after Rathbun) (San Francisco Bay, California). — WELLS, 1928, Publ. Puget Sound Mar. Sta., 6: 296-298, figs. 24 (♀ dorsal view), 25 (♀ ventral view), 26 (♀ left chela, outer view), 27 (♂ dorsal view), 28 (♂ ventral view), 29 (♂ left chela, outer view) ([Puget Sound, Washington]: Beach near Friday Harbor, Minnesota Reef, and False Bay, San Juan Island; and on Blakeley Island). — HART, 1930, Canadian Field Nat., 44 (5): 107, 108 (Brentwood Bay and Parry Bay, Vancouver Island, British Columbia). — MacGINITIE, 1930, Ann. Mag. Nat. Hist., (10) 6: 68 (Elkhorn Slough, Monterey Bay, California). — CLEMENS, 1933, Check List Mar. Fauna Flora Canad. Pacific Coast: 52 (Canadian Pacific Coast) (listed). — MacGINITIE, 1935, Amer. Midland Naturalist, 16 (5): 716 (Elkhorn Slough, Monterey Bay, Morro Bay, and Humboldt Bay, California). — RICKETTS & CALVIN, 1939, Between Pacific Tides (ed. 1): 221, 222 (biology, ecology). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [ed. 2, emended 1968]: 191, 287, 315 (biology, ecology) (Morro Bay, California). — DALES, 1957, Mem. Geol. Soc. America, 67 (1): 397, fig. 2 (diagram of commensal relationship with *Callianassa*) (ecology). — HEALY & WELLS, 1959, Proc. Zool. Soc. London, 133 (2): 326, 331 (commensalism). — PEARCE, 1966, Pacific Sci., 20 (1): 30 (mentioned). — RICKETTS & CALVIN, 1968, Between Pacific Tides (ed. 4, Hedgpeth revised): 268, 336, 338, 499 (biology, ecology). — HART, 1968, Nat. Hist. Papers Nat. Mus. Canada, 38: 4 (N.W. side Hogan Island, Imperial Passage, off west coast of Chicagof Island). — LIE, 1968, Fiskeri Direkt. Skr., 14: 276, 285, 291, 299, 307, 314, 329, 338, 348, 357, 422-431, figs. 34 (growth curve), 35 (weight/size curve) (Puget Sound, occurrence, seasonal abundance).

Pinnixa schmidtii VIA BOADA, 1966, Acta Geologica Hispanica, 1 (4): 3 (listed).

Measurements: Male, length 5.0 mm, width 9.2 mm; female, length 5.0 mm, width 8.6 mm (Rathbun, 1918).

Habitat: In bivalves: *Macoma secta* Conrad (MacGinitie). In tubes of polychaetes: *Pista elongata* Moore (MacGinitie); *Amphitrite* (*Amphitrite*) (Hart). In shrimp burrows: *Upogebia pugettensis* (Dana) (Wells); *Upogebia pugettensis* (Dana), *Callianassa californiensis* Dana (MacGinitie). Commonest commensal in tubes of echiurid worms: *Echiurus echiurus pallasi* [*Echiurus echiurus alaskensis* Fisher], and *Urechis*; the young are commensal with terebellid worms (Ricketts & Calvin, 1939, 1968). The commensal crabs *Pinnixa eburnea* and *P. schmittii* are commonly found with [*Abarenicola*] *vagabunda* and [*A.*] *pacifica* respectively, but it may be the substratum, rather than the worm, that

determines the crab' (Healy & Wells, 1959; 331); the substratum for *Abarenicola pacifica* is said to be the 'gravelly or muddy material' round the margin of the bay. Common intertidally (Hart); sand and mud, soft mud, mud with shells and clinkers 7-80 fms [13-146 m] (Rathbun, 1918).

Distribution: Port Levasheff, Unalaska, to Morro Bay, California; common in California bays.

Pinnixa tomentosa Lockington, 1877

Pinnixa ? nitida LOCKINGTON, 1877, Proc. California Acad. Sci., 7: 155, 156 (11, 12) (part, female) (♀ holotype not extant; type-locality: 'Angeles Bay, Gulf of California').

Pinnixa tomentosa LOCKINGTON, 1877, Proc. California Acad. Sci., 7: 156 (12) (♀ holotype not extant; type-locality: '... Angeles Bay, Gulf of California...'). — HOLMES, 1894, Proc. Calif. Acad. Sci., (2) 4: 459, pl. 20 (♀) figs. 10 (maxilliped), 11 (chela), 12 (leg 1), 13 (leg 3) (Angeles Bay, Gulf of California). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 129, 141, 142, pl. 30 fig. 8 (♀ dorsal view), text-figs. 85 (♀ maxilliped), 86 (♀) a (chela), b (leg 3), c (leg 1) (San Clemente Island, California). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 258, fig. 153 (♀) a (leg 3) b (leg 1), c (chela) (after Rathbun). — MacGINITIE, 1930, Ann. Mag. Nat. Hist., (10) 6: 68 (Elkhorn Slough, Monterey Bay, California). — GLASSELL, 1934, Journ. Washington Acad. Sci., 24 (7): 302 (Gulf of California) (listed). — MacGINITIE, 1935, Amer. Midland Naturalist, 16 (5): 716 (Elkhorn Slough, Monterey Bay and Corona del Mar, California). — HEWATT, 1946, Ecol. Monogr., 16 (3): 202 (Santa Cruz Island, California) (listed).

Measurements: Female, length 7.5 mm, width 14.0 mm (Lockington).

Habitat: In the tubes of the polychaetes, *Chaetopterus variopedatus* (Renier) and *Pista elongata* Moore; 10-66 fms [18-121 m] (MacGinitie); 15-20 fms [27.5-36.6 m] (Hewatt).

Distribution: Monterey Bay, California, to Angeles Bay, Gulf of California.

Pinnixa transversalis (H. Milne Edwards & Lucas, 1844)

Pinnotheres transversalis H. MILNE EDWARDS & LUCAS, 1844, in d'Orbigny, Voy. Amér. Mérid., (text) 6 (1): 23, 24. — H. MILNE EDWARDS & LUCAS, 1847, in d'Orbigny, Voy. Amér. Mérid., (atlas) 6 (1): pl. 10 fig. 3 (dorsal view), a (frontal view), b (maxilliped 3), c (maxilliped 2), d (maxilliped 1), e (sternum and abdomen) (syntype: PANS 3044; type-locality: '... côtes du Chili...', type labeled 'Patagonia'). — NICOLET, 1849, in Gay, Hist. Fisic. Polit. Chile, 3: 156, 157 (Valparaiso, Chile).

Pinnixa transversalis WHITE, 1847, List Crust. Brit. Mus.: 33 (listed). — H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 220 (186), pl. 11 fig. [in explanation of plates] 5 (maxilliped) [in text erroneously cited as fig. 11 under genus heading] (part, Garth, 1957) (Chile). — MIERS, 1881, Proc. Zool. Soc. London, 1881: 70, 71 (part, fide Rathbun, 1918) (Coquimbo, Chile). — CANO*, 1889, Boll. Soc. Nat. Napoli, 3 (3) (1): 93, 98, 248 (Puerto Bueno, Chile). — ORTMANN*, 1897, Zool. Jahrb. Syst., 10: 329 (Patagonia). — LENZ*, 1902, Zool. Jahrb. Suppl., 5: 764 (Punta Arenas and Puerto Montt, Chile). — PORTER*, 1909, Rev. Chilena Hist. Nat., 13 (3): 246, 247 (Ancud, Calbuco, and Punta Arenas, Chile). — PORTER*, 1909, Act. Soc. Sci. Chile, 19: 35 (Ancud, Calbuco, and Punta Arenas, Chile). — PORTER, 1936, Comunicaciones Mus. Concepcion, 1 (9): 152 (listed). — RATHBUN, 1910, Proc. U. S. Nat. Mus., 38: 546, 588, 616, pl. 46 fig. 1 (dorsal view) (northeast side of San Lorenzo Island, Peru) (not all synonymy, Garth, 1957). — PORTER*, 1911, Bol. Mus. Nac. Santiago, 3 (2): 443 (Ancud, Calbuco, and Punta Arenas, Chile). — PORTER*, 1917, Bol. Mus. Nac. Santiago, 10: 96 (Tenglo Island, Chile). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 12, 129, 131-133, 134, pl. 20 figs. 1 (♀ dorsal view), 2 (♂ ventral view), 3 (♂ dorsal view), text-figs. 74 (♀ maxilliped), 75 a (♂ abdomen), b (cheliped), 76 (♂ abdomen and sternum) (Panama; near northeast side of San Lorenzo Island, Peru). — TESCH, 1918, Siboga Exped. Monogr., 39c¹ (84): 267, 286 (listed). — FINNEGAN, 1931, Journ. Linn. Soc. London Zool., 37 (255): 611, 648, 649 (Coiba Island, Panama). — GLASSELL, 1934, Journ. Washington Acad. Sci., 24 (7): 302 (Gulf of

*Garth, 1957, says that this and the succeeding seven similarly starred records are probably not *Pinnixa transversalis* (H. Milne Edwards & Lucas).

California) (listed). — PORTER*, 1937, Rev. Chilena Hist. Nat., 40: 338 (Talcahuano, Chile). — STEINBECK & RICKETTS, 1941, Sea of Cortez: 472 (Angeles Bay, Gulf of California). — GARTH, 1946, Allan Hancock Pacific Exped., 5: 497, 498, pl. 84 (♀) figs. 6 (dorsal view), 8 (ventral view) (Darwin Bay, Tower Island, Galapagos Islands). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim. (ed. 1) [ed. 2, emended, 1968]: 316 (biology, ecology) (Gulf of California). — GARTH, 1957, Lunds Univ. Arsskr., (n. ser.) (2) 53 (7): 71-75, 92, figs. 3 (♂ abdomen), 4 (♂) A (dorsal view), B (right chela), C (frontal view), D (left maxilliped), E (abdomen), F (gonopod), G (tip of gonopod) (Iquique, Puerto Lagunas, and Taltal, Chile). — GARTH, 1960, Pacific Sci., 14 (1): 41, 42, fig. 2 (♂) a (right maxilliped), b (abdomen), c (gonopod) (compared with *Pinnixa darwini*). — HAIG, 1968, Crustaceana, 15 (1): 27 (Isla San Lorenzo, Peru). — DEL SOLAR, BLANCAS & MAYTA, 1970, Cat. Crust. Peru: 29 (listed) (Isla San Lorenzo; Isla Galápagos near Pucusana; Pucusana).

Pinnixa panamensis FAXON, 1893, Bull. Mus. Comp. Zool. Harvard Coll., 24 (7): 158 (2 ♂, and 3 ♀ syntypes: MCZ 4495; type-locality: 'Panama'). — FAXON, 1895, Mem. Mus. Comp. Zool. Harvard Coll., 18: 30, 31, pl. 5 (♂) fig. 1 (dorsal view) a (chela), b (abdomen) (Panama). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 267, 286 (listed).

Measurements: Male, length 7.4 mm, width 15.2 mm (Garth, 1957); female, length 11.0 mm, width 21.0 mm (H. Milne Edwards & Lucas).

Habitat: Commensal with sandy-tubed worm on sand flat (Steinbeck & Ricketts); in the tube of the polychaete, *Chaetopterus variopedatus* (Renier) (Garth, 1957); 'Embedded in sand at low water mark, among fine seagrass and dead coral' (Finnegan); 2.5 to 70 fms [4.5-128 m] (Garth, 1946).

Distribution: Gulf of California to Coquimbo, Chile; Calapagos Islands; questionably to Valparaiso, Chile, and beyond.

Pinnixa tubicola Holmes, 1894

Pinnixa tubicola HOLMES, 1894, Proc. Calif. Acad. Sci., (2) 4: 569-571, pl. 20 figs. 17 (chela), 18 (leg) (types not extant; type-localities: '...Trinidad, Cape Mendocino, and Bodega Bay [California]'). — HOLMES, 1900, Occ. Pap. Calif. Acad. Sci., 7: 91 (Puget Sound; Trinidad, Cape Mendocino, Bodega Bay, San Pedro, and San Diego, California). — RATHBUN, 1904, Harriman Alaska Exped., 10: 187 (off Point Conception, California). — WEYMOUTH, 1910, Leland Stanford Univ. Publ., (Univ. Ser.) 4: 57, fig. 4 (♂ dorsal view) (Monterey Bay, California) (part, fide Rathbun, 1918). — TAYLOR, 1912, Contrib. Canadian Biol., 1906-1910: 191, 212 (mentioned). — WILLIAMSON, 1915, Nordisches Plankton, 6 (1): 562 (listed). — WAY, 1917, Publ. Puget Sound Mar. Sta., 1 (30, 31): 361, 362, pl. 81 fig. 13 (dorsal view) (Newhall's beach and Brown Island, Washington). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 129, 165, 166, pl. 36 figs. 5 (♀ dorsal view), 6 (♀ right leg 3), 7 (♀ ventral view), 8 (♂ dorsal view), text-fig. 103a (♀ maxilliped), b (♂ abdomen), c (♂ left chela) (Puget Sound; Trinidad, Mendocino, Pacific Grove, and off Point Conception, California). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 267, 285 (listed). — SCHMITT, 1912, Univ. Calif. Publ. Zool., 23: 265, 266, pl. 43 figs. 5 (♀ dorsal view), 6 (♀ right leg 3), 7 (♀ ventral view), 8 (♂ dorsal view) (after Rathbun, 1918). — JOHNSON & SNOOK, 1927, Seashore Anim. Pacific Coast: 394 (Brown Island, Washington). — WELLS, 1928, Publ. Puget Sound Mar. Biol. Sta., 6: 301-304, figs. 36 (♀ dorsal view), 37 (♀ ventral view), 38 (♀ left chela, outer view), 39 (♂ dorsal view), 40 (♂ ventral view), 41 (♂ left chela, outer view) (Brown Island and False Bay, Washington). — HART, 1930, Canadian Field Nat., 44 (5): 107 (Parry Bay, Horswell Point, and Shelter Point, Vancouver Island, British Columbia). — MacKAY, 1932, Canadian Field Nat., 46: 153 (Prince Rupert and Metlakatla, British Columbia). — CLEMENS, 1933, Check List Mar. Fauna Flora Canad. Pacific Coast: 52 (Canadian Pacific Coast) (listed). — MacGINITIE, 1935, Amer. Midland Naturalist, 16 (5): 717 (Elkhorn Slough, Monterey Bay, California). — RICKETTS & CALVIN, 1939, Between Pacific Tides, (ed. 1): 49, 172 (biology, ecology). — WELLS, 1940, Univ. Wash. Publ. Oceanogr., 2 (2): 19-50 (ecology) (Puget Sound). — RIOJA, 1950, Rev. Soc. Mexicana Hist. Nat., 11 (1-4): 145-147 (discusses commensalism in Crustacea, mentions *P. tubicola*). — HART, 1962, Rept. Prov. Mus. Nat. Hist. Anthr., British Columbia, 1961: W 19

(Clayoquot, Vancouver Island to Masset, Queen Charlotte Islands, British Columbia). — PEARCE, 1966, *Some Contemporary Stud. Mar. Sci.*: 576 (biology). — VIA BOADA, 1966, *Acta Geologica Hispanica*, 1 (4): 3. — RICKETTS & CALVIN, 1968, *Between Pacific Tides* (ed. 4, Hedgpeth revised): 70, 268, 499, fig. 198 (dorsal view of an unidentified pinnotherid, not *P. tubicola*) (biology, ecology) (Alaska to California).

Pinnixa longipes [not Lockington, 1876] WEYMOUTH, 1910, *Leland Stanford Univ. Publ.*, (Univ. Ser.) 4: 58 (part, fide Rathbun, 1918).

Measurements: Male, length 4.5 mm, width 9.0 mm; female, length 5.0 mm, width 13.0 mm (Hart).

Habitat: In the leathery tubes of annelids (Holmes, 1894); in calcareous [serpulid] worm tube, and in tubes of *Amphitrite* (Rathbun, 1918); in the shell- and gravel-encrusted tubes of the terebellid worms, *Eupolyomma* (Hart, 1962); lives in tubes of terebellid worms, and with polynoids, *Halosydna* [most likely *H. brevisetosa* Kinberg and *H. californica* Moore] (Ricketts & Calvin, 1968); to a depth of 31 fms [57 m] (Rathbun, 1918).

Distribution: Alaska (fide Ricketts & Calvin, 1968); Prince Rupert, British Columbia, to San Diego, California.

Pinnixa tumida Stimpson, 1858

Pinnixa tumida STIMPSON, 1858, *Proc. Acad. Nat. Sci. Phila.*, 1858: 108 (♀ holotype: probably not extant; type-locality: 'In portu 'Hakodadi' [Hakodate, Japan]...'). — STIMPSON, 1907, *Smithsonian Misc. Coll.*, 49: 143 (Hakodadi Bay, Japan). — TESCH, 1918, *Siboga-Exped. Monogr.*, 39c¹ (84): 267, 286 (listed). — BALSS, 1922, *Arch. Naturgesch.*, 88A (11): 140 (listed). — YOKOYA, 1928, *Sci. Rept. Tôhoku Imp. Univ.*, 4 (3) (2): 776-778, figs 7 a (dorsal view), b (frontal view), c (chela), d (♂ abdomen), e (♀ abdomen) (Moura, Japan). — SHEN, 1932, *Zool. Sinica*, (A) 9 (1): 127-130, pl. 5 fig. 3 (♂ dorsal view), text-figs. 75 (♀ dorsal view), 76 (frontal view), 77 a (♂ abdomen), b (gonopod), c (tip of gonopod), d (♀ abdomen) (Peichihli Bay and Chefoo, China). — SAKAI, 1933, *Botany and Zoology, Tokyo*, 1 (2): 982 (52) (mentioned). — SAKAI, 1934, *Sci. Rept. Tokyo Bunrika Daigaku*, 2 B (29): 39 (mentioned). — SAKAI, 1935, *Crabs of Japan*: 201, pl. 57 fig. 5 (♀ dorsal view). — SHEN, 1937, *Bull. Fan Mem. Inst. Biol. (Zool.)* 7: 169, 177 (Peitaiho, Chefoo, and Tsingtao, China). — SHEN, 1937, *Contrib. Inst. Zool. Peiping*, 3 (6): 308 (listed). — TŪ, 1938, *Zool. Anz.*, 122 (7/8): 184 (mentioned in account of host relationships and adaptations). — SAKAI, 1939, *Stud. Crabs of Japan*, 598, 599, pl. 70 fig. 5 (♀ dorsal view) (Moura and Asamusi, Japan). — SHEN, 1948, *Contrib. Inst. Zool. Peiping*, 4 (2): 112, 113 (Loushan and Chefoo, China). — SAKAI, 1949, *Illustr. Encycl. Fauna Japan*: 667, fig. 1924 (♀ dorsal view). — SAKAI, 1956, *Crabs*: 51 (of species list) (mentioned). — SAKAI, 1965, *The crabs of Sagami Bay*: 181 (mentioned as from Mutsu Bay and Hakodate Bay, but not from Sagami Bay). — JONES & MAHADEVAN, 1967, *Journ. Mar. Biol. Assoc. India*, 7 (2): 379 (host relationship).

Pinnixa timida [timida] TAO, 1930, *Proc. Fourth Pacific Sci. Congress*, 1929 (3): 8 (parasitism) (Mutsu Bay, Aomori Prefecture, Japan). — L. H. HYMAN, 1955, *The Invertebrates*, 4: 243 (host relationship).

Measurements: Male, length 5.0 mm, width 8.5 mm (Sakai, 1935); female, length 5.6 mm, width 9.7 mm (Shen, 1948).

Habitat: In cloaca of holothurians: *Caudina chilensis* [*Paracaudina chilensis* (Müller)] on sandy beaches (Yokoya; Tao; L. H. Hyman); *Paracaudina chilensis ransonettii* von Marenzeller (Sakai, 1956).

Distribution: Moura and Asamusi, Aomori Prefecture, and Hakodate, Hokkaido Prefecture, Japan; North China.

Pinnixa valdiviensis Rathbun, 1907

Pinnotheres transversalis [not H. Milne Edwards & Lucas, 1844] CUNNINGHAM, 1871, *Trans. Linn. Soc. London Zool.*, 27: 492 (Punta Arenas, Chile).

Pinnixa transversalis [not H. Milne Edwards & Lucas, 1844] MIERS, 1881, *Proc. Zool. Soc. London*, 1881: 70 (part, Rathbun, 1918). — DOFLEIN & BALSS, 1912, *Mitt. Naturh. Mus. Hamburg.*, 29: 39 (Punta Arenas, Chile).

Pinnixa valdiviensis RATHBUN, 1907, *Rev. Chilena Hist. Nat.*, 11: 45-47, pl. 3 figs. 2 (dorsal view), 3 (ventral view), text-fig. 1 (maxilliped). (♂ ♀ syntypes: Valparaiso Museum; ♂ syntype: USNM 32260; type-locality: 'Corral, Province

Valdivia [Chile...]). — PORTER, 1909, Rev. Chilena Hist. Nat., 13 (3): 247 (Corral, Chile). — PORTER, 1909, Act. Soc. Sci. Chili, 19: 35 (listed). — RATHBUN, 1910, Proc. U. S. Nat. Mus., 38: 588 (Corral, Chile). — PORTER, 1911, Bol. Mus. Nac. Santiago, 3 (2): 444 (Corral, Chile). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 154, 155, pl. 33 (♂) figs. 1 (dorsal view), 2 (ventral view), pl. 34 (♂) figs. 5 (ventral view), 6 (dorsal view), text-fig. 95 (♂) a (abdomen), b (left chela), c (maxilliped) (Corral and Eden Harbor, Smith Channel, Straits of Magellan, Chile). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 267, 286 (listed). — GARTH, 1957, Lunds Univ. Arsskr., (n. ser.) (2) 53 (7): 78–82, fig. 6 (♂) A (dorsal view), B (right chela), C (frontal view), D (right maxilliped), e (abdomen), f (gonopod), g (tip of gonopod), text-fig. 7 (♂) a (dorsal view), b (right chela), c (frontal view), d (right maxilliped), e (abdomen), f (gonopod) (Punta Arenas, Valparaiso, Corral, Eden Harbor, Archipiélago de los Chonos, Bahía Herradura de Guayacán, and Bahía de Concepción, Chile; Chinchas Islands, Peru). — GARTH, HAIG & YALDWYN, 1967, Trans. Roy. Soc. New Zealand, 8 (16): 183 (Puerto Eden, Isla Wellington, Chile). — DEL SOLAR, BLANCAS, & MAYTA, 1970, Cat. Crust. Peru: 30 (listed) ('Islas de Chincha').

Measurements: Male syntype, length 3.7 mm, width 6.8 (Rathbun, 1918); male, length 13.8 mm, width 30.1 mm; female, length 9.5 mm, width 21 mm (Garth, 1957).

Habitat: In tubes of the polychaete *Chaetopterus variopedatus* (Renier) in 5–7 meters; at Puerto Eden in 90% of the tubes of *Chaetopterus* from a sand, or sandy mud bottom; 0–32 meters (Garth, 1957; Garth et al., 1967).

Distribution: Chinchas Islands, Peru, to Punta Arenas, Strait of Magellan, Chile.

Pinnixa valerii Rathbun, 1931

Pinnixa valerii RATHBUN, 1931, Journ. Washington Acad. Sci., 21: 262, 263, figs. 1 (♀ dorsal and ventral views), 2 (♀ left maxilliped) (♂ holotype, ♀ paratype: USNM 63854; type-locality: 'Isla San Lucas, west coast of Costa Rica;...').

Measurements: Male, length 5.3 mm, width 9.8 mm.

Distribution: Known only from the type locality.

Pinnixa vanderhorsti Rathbun, 1922

Pinnixa vanderhorsti RATHBUN, 1922, Proc. Biol. Soc. Washington, 35: 104 ('... Spanish Harbor, Curaçao'). — RATHBUN, 1924, Bijdr. Dierk. Amsterdam, 23: 17, pl. 3 (♂) figs. 7 (dorsal view), 8 (ventral view), text-figs. 1 (♂ left maxilliped), 2 (♂ abdomen) (♂ holotype: ZMA; type-locality: 'Spanish Harbor, Curaçao').

Measurements: Male, length 3.4 mm, width 6.0 mm (Rathbun, 1922).

Distribution: Known only from the type locality.

Pinnixa weymouthi Rathbun, 1918

Pinnixa californiensis [not Rathbun, 1893] WEYMOUTH, 1910, Leland Stanford Jr. Univ. Publ., (Univ. Ser.) 4: 56 (part, Rathbun, 1918).

Pinnixa faba [not Dana, 1851] WEYMOUTH, 1910, Leland Stanford Jr. Univ. Publ., (Univ. Ser.) 4: 59, fig. 7 (♀ dorsal view with detached chela) (Monterey Bay, California).

Pinnixa weymouthi RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 155, 157, pl. 36 (♀) figs. 9 (dorsal view with detached chela and two legs of right side), 10 (ventral view), text-fig. 104 (♂) a (maxilliped), b (left chela), c (abdomen) (♂ holotype: USNM 50998; type-locality: 'Monterey Bay, California'). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 266, 267, pl. 43 (♀) figs. 9 (dorsal view with detached chela and two legs of right side), 10 (ventral view) (after Rathbun).

Measurements: Male, length 3.3 mm, width 5.3 mm (Rathbun).

Habitat: Beach to 5 fms [9 m] (Rathbun).

Distribution: Monterey Bay, California, U.S.A.

Pinnixa sp. Harrington & Griffin, 1898

Pinnotheres sp. HARRINGTON & GRIFFIN, 1898, Trans. New York Acad. Sci., 16: 157 (vicinity of Port Townsend, Washington). [Note: On basis of hosts

involved (see Habitat), *Schizothaerus* [*Tresus*] and *Cardium* [*Clinocardium*], these authors'. '*Pinnotheres*' specimens were either, or all, *Pinnixa littoralis* or *Pinnixa faba*].

Measurements: None recorded.

Habitat: In bivalves living in sand flats near low water line: *Schizothaerus nuttalli* [*Tresus nuttalli* Conrad] and *Cardium corbis* [*Clinocardium nuttalli* (Conrad)].

Distribution: Puget Sound; however, the ranges of the species probably involved, *Pinnixa faba* and *Pinnixa littoralis*, are, respectively, Prince of Wales Island, Alaska, to Newport Bay, California, and Sitka, Alaska, to San Diego, California.

Pinnixa sp. Reger, 1967

Pinnixa sp. REGER, 1967, Journ. Ultrastruct. Res., 20: 72-82, figs. 1-12 (ultrastructure of striated muscle fibre of first antenna and claw). — REGER, 1970, Journ. Morphology, 132 (1): 89-93, pls. 1-3 (histologic sections discussed in text).

Measurements: Not recorded.

Habitat: California coast littoral.

Distribution: ? Venice, California.

Pinnixa sp. Moore et al., 1968

Pinnixa sp. MOORE, DAVIES, FRASER, GORE & LOPEZ, 1968, Bull. mar. Sci. Univ. Miami, 18 (2): 268, 271 (biomass studies in Biscayne Bay, Florida).

Measurements: Not given.

Distribution: Biscayne Bay, Florida, U.S.A.

† *Pinnixa* sp., Zullo & Chivers, 1969

Pinnixa sp., ZULLO & CHIVERS, 1969, The Veliger, 12 (1): 71, pl. 5 fig. 1 (♀ thoracic musculature), 3 (♂ thorax, 12 mm. wide).

Measurements: Female, carapace width 9.2 mm; male, carapace width 12 mm.

Habitat: Pleistocene of Oregon, in deposits with the bivalve *Tresus capax* (Gould).

Distribution: 'in the SE 1/4 of the NE 1/4 of Sec. 2, T. 32S., R. 16 W., Cape Blanco quadrangle, Curry County, Oregon, U.S.A. Elevation 61 m.

PINNOTHERELIA H. Milne Edwards & Lucas, 1844

Pinnotherelia H. MILNE EDWARDS & LUCAS, 1844, in D'Orbigny, Voy. Amérique Mérid., 6 (1): 24. Type species, by monotypy: *Pinnotherelia laevigata* H. MILNE EDWARDS & LUCAS, 1844. Gender: feminine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, Smithson. Miscell. Coll., 73 (3): 13-18; see also Direction 37, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (2): 47-82) as name no. 351.

Distribution: East Pacific (Peru, Chile); ? Central Pacific (Marquesas).

Pinnotherelia laevigata H. Milne Edwards & Lucas, 1844

Pinnotherelia laevigata H. MILNE EDWARDS & LUCAS, 1844, in d'Orbigny, Voy. Amér. Mérid., 6 (1) (text): 25. — H. MILNE EDWARDS & LUCAS, 1847, in d'Orbigny, Voy. Amér. Mérid., 6 (1) (atlas): pl. 11 (♂) fig. 1 (dorsal view) a (frontal view), b (maxilliped), c (maxilliped 2), d (maxilliped 1), e (dactylus) (♂ holotype: PANS 3064; type-locality: 'côtes du Chili,' holotype labelled 'Patagonia'). — NICOLET, 1849, in Gay, Hist. Fisic. Polit. Chile, 3: 158 (Chile). — H. MILNE EDWARDS, 1853, Ann. Sci. Nat. Zool. Paris, (3) 20: 221 (187) (Chile). — CANO, 1889, Boll. Soc. Nat. Napoli, (1) 3 (3) (1): 93, 98, 247 (Porto Arenas, Chile). — PORTER, 1909, Rev. Chilena Hist. Nat., 13 (3): 246 (Bay of Arauco, Chile). — PORTER, 1909, Act. Soc. Sci. Chili, 19: 34, 35 (Bay of Arauco, Chile). — RATHBUN, 1910, Proc. U. S. Nat. Mus., 38: 546, 588, pl. 51 fig. 3 (dorsal view) (Callao, Peru). — PORTER, 1911, Bol. Mus. Nac. Santiago, 3 (2): 442, 443 (Bay of Arauco, Chile). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 181, 182, pl. 39 (♂) figs. 1

(frontal view), 2 (dorsal view), 3 (ventral view), pl. 40 (♀) figs. 1 (dorsal view), 2 (ventral view) (Marquesas Islands; San Lorenzo Island and Callao, Peru). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 286 (listed). — PORTER, 1936, Comunicaciones Mus. Concepcion, 1 (9): 153 (listed). — PORTER, 1937, Rev. Chilena Hist. Nat., 40: 338 (Talcahuano Bay, Chile). — ICZN, 1925, Smithsonian Miscell. Coll., 73 (3): 16 (Opinion 85, placement of genus with *Pinnotherelia laevigata* cited as type, in the 'Official List of Generic Names in Zoology.'). — ICZN, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D): 22 (Direction 36, specific name placed on the 'Official List of Specific Names in Zoology' as name No. 902). — GARTH, 1957, Lunds Univ. Arsskr., (n. ser.) (2) 53 (7): 89–91 (Callao, Peru; West coast of South America). — DEL SOLAR, BLANCAS & MAYTA, 1970, Cat. Crust. Perú: 30 (listed) (Pacasmayo, Ancon, Callao, Isla San Lorenzo, Islas de Chinchas, Lagunilla near Pisco, Peru).

Cyclograpsus (?) *gnatherion* KINAHAN, 1857, Journ. Roy. Dublin Soc., 1 (5): 343, 344 (syntypes: depository unknown; type-localities: Chinchas Islands and Callao, Peru).

Measurements: Male, length 10.7 mm, width 12.7 mm (Rathbun, 1918).

Habitat: At Callao, 'en diques naturales de piedra [rocky ledges]' (Del Solar et al.).

Distribution: Pacasmayo, Peru, to Punta Arenas, Chile; ? Marquesas Islands in the south central Pacific.

PSEUDOPINNIXA Ortmann, 1894

Pseudopinnixa ORTMANN, 1894, Zool. Jahrb. Syst., 7: 694. Type species, by original designation and monotypy: *Pseudopinnixa carinata* ORTMANN, 1894. Gender: feminine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, Smithsonian Miscell. Coll., 73 (3): 13–18; see also Direction 37, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (2): 47–82) as name no. 360.

Distribution: Japan.

Pseudopinnixa carinata Ortmann, 1894

Pseudopinnixa carinata ORTMANN, 1894, Zool. Jahrb., Syst., 7: 694, 695, pl. 23 fig. 6 (♀ dorsal view), g (maxilliped 1), h (maxilliped 2), i (maxilliped 3), k (chela), z (♂ abdomen) (syntypes: MZUS; type-locality: 'Tokio-bai, Japan'). — BOUVIER, 1906, Bull. Mus. Hist. Nat. Paris, 12 (7): 483 (mentioned). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 287 (listed). — ICZN, 1925, Smithsonian Miscell. Coll., 73 (3): 17 (Opinion 85; *Pseudopinnixa carinata* cited as the type of *Pseudopinnixa*). — ICZN, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (1): 20 (Direction 36; addition of specific name of this species to the Official List of Specific Names in Zoology as name No. 909). — SAKAI, 1955, Bull. Biogeogr. Soc. Japan, 16–19: 110 (Tokyo and Osaka Bay). — SAKAI, 1956, Crabs: 51 (of species list) (mentioned) (Osaka Bay).

Pseudopinnixa carinata SAKAI, 1933, Botany and Zoology Tokyo, 1 (2): 982 (52) (mentioned).

Measurements: Of figured male, length 13 mm, width 15 mm.

Distribution: Tokyo Bay and Osaka Bay, Japan.

TETRIAS Rathbun, 1898

Tetrias RATHBUN, 1898, Proc. U. S. Nat. Mus., 21: 607. Type species, by monotypy: *Tetrias scabripes* Rathbun, 1898. Gender: masculine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, Smithsonian Miscell. Coll., 73 (3): 13–18; see also Direction 37, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (2): 47–82) as name no. 374.

Hosts: Polychaeta; Mollusca Bivalvia.

Distribution: East Pacific (Mexico); Indo-West Pacific (Andaman Islands to Japan and New Caledonia).

Tetrias fischeri (A. Milne Edwards, 1867)

Pinnotheres Fischerii A. MILNE EDWARDS, 1867, Ann. Soc. Ent. France, 7: 287, 288 (3 syntypes: MNHNP, dry specimens; type-locality: 'Port de France (Nouvelle-Calédonie)' (compared with *Pinnixa faba*). — VAN BENEDEEN, 1875, Commens. Parasit.: 29 (mentioned).

Pinnixa Fischeri A. MILNE EDWARDS, 1873, Nouv. Archiv. Mus. Paris, 9 (2): 319, 320, pl. 18 fig. 3 (♀ dorsal view), a (chela) (New Caledonia) (compared with *Pinnixa faba* and *Pinnixa brevipes*). — DE MAN 1888, Arch. Naturgesch., 53 (1): 385, 386, pl. 17 fig. 2 a (♂ abdomen), b (maxilliped) (Amboina, Indonesia).

Pseudopinnixa Fischeri ADENSAMER, 1897, Ann. K. K. Naturhist. Hofmus. Wien, 12: 108 (Amboina, Indonesia).

Tetrias Fischeri ALCOCK, 1900, Journ. Asiat. Soc. Bengal, 69 (2): 336, 337 (Andaman Islands).

Tetrias fischeri TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 268–271, pl. 18 fig. 1 (♀ dorsal view), a (maxilliped), b (right leg 4) (Amboina, Indonesia). — BALSS, 1938, Göteborgs Kungl. Vetensk. Vitterh. Samh. Handl., (5) (B) 5 (7): 75 (Gilbert Islands). — SERÈNE, 1964, Vidensk. Medd. Dansk Naturh. Foren. København, 126: 277–279, pl. 24 fig. C (♂ dorsal view). — SAKAI, 1965, Crabs of Sagami Bay: 181 (English pt.), 87 (Japanese pt.), pl. 87 figs. 5 (♀ dorsal view), 6 (♂ dorsal view).

Measurements: Male, length 5.7 mm, width 8.0 mm (Tesch); female, length 5.8 mm, width 9.6 mm (Balss).

Habitat: In the bivalve, *Fistulana clava* [*Eufistulana mumia* (Spengler)] (A. Milne Edwards, 1873); in the tubes of an annelid (De Man); in '36–51 meters, 1♂, on reef' (Tesch).

Distribution: Andaman Islands; Indonesia; New Caledonia; Fiji Islands; Japan.

Tetrias scabripes Rathbun, 1898

Tetrias scabripes RATHBUN, 1898, Proc. U. S. Nat. Mus., 21: 608, pl. 43 figs. 12 (♀ dorsal view), 13 (maxillipeds), 14 (right chela) (♀ holotype: USNM 21595; type-locality: 'southern part of Gulf of California, ["Albatross"] Sta. 2826 [24°12'00" N 109°55'00" W]). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 179, 180, pl. 39 fig. 4 (♀ ventral view), fig. 5 (dorsal view), text-fig. 114 a (♀ right chela), 114b (maxillipeds), 114c (dorsal view) (Gulf of California). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 268, 269, 270, 286 (listed). — ICZN, 1925, Smithsonian Miscell. Coll., 73 (3): 17 (Opinion 85; listed as type species of *Tetrias*). — GLASSELL, 1934, Journ. Washington Acad. Sci., 24 (7): 302 (Gulf of California) (listed). — ICZN, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (1): 21 (Direction 36; specific name placed on the Official List of Specific Names in Zoology as name No. 923).

Measurements: Female (ovigerous holotype), length 6.0 mm, width 10.0 mm (Rathbun).

Habitat: 9.5 fms [17.5 m].

Distribution: Known only from the type locality.

Asthenognathinae Stimpson, 1856

Asthenognathinae STIMPSON, 1858, Proc. Acad. Nat. Sci. Philadelphia, 1858: 107.

The genera and species of Asthenognathinae are listed alphabetically below.

APHANODACTYLUS Tesch, 1918

Aphanodactylus TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 283. Type species, by monotypy: *Aphanodactylus sibogae* Tesch, 1918. Gender: masculine.

Host: Polychaeta.

Distribution: Indo-West Pacific.

Aphanodactylus edmondsoni Rathbun, 1932

Aphanodactylus edmondsoni RATHBUN, 1932, Journ. Washington Acad. Sci., 22 (7): 181, 182 (♀ holotype: BPBM S3576, ♂ paratype: BPBM S3577; type-

locality: 'Oahu' [Hawaii] (includes comparison with *Aphanodactylus sibogae*). — EDMONDSON, 1946, Bernice P. Bishop Mus. Special Publ., 22: 303, fig. 182 (♂ dorsal view). — EDMONDSON, 1962, Occ. Pap. Bernice P. Bishop Mus., 23 (1): 7, fig. 3 (♂ dorsal view). — ELDREDGE, 1967, Catal. Invert. Type Specimens Bernice P. Bishop Mus.: [14] (listed).

Measurements: Female, length 9.6 mm, width 16.2 mm (Rathbun).

Habitat: '...lives in the shelly tube of a large terebellid worm' (Edmondson, 1946). (This terebellid, *Loimia medusa* (Savigny), is quite common in Hawaiian waters and may attain a length of 14 inches or more [fide C. C. Cutress, personal communication.]).

Distribution: Known only from the type locality.

Aphanodactylus sibogae Tesch, 1918

Aphanodactylus sibogae TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 283–285, pl. 18 fig. 2 (♀ dorsal view) a (♂ dorsal view with abdomen extended), b (maxillipeds), c (♂ right chela), d (♂ left leg 3) (1 ♂ and 1 ♀ syntypes: ZMA; type-locality: 'Sapeh Bay, north coast of Sumbawa [Indonesia]'). — RATHBUN, 1932, Journ. Washington Acad. Sci., 22 (7): 181, 182 (compared with *Aphanodactylus edmondsoni*). — SERÈNE, 1964, Vidensk. Medd. Dansk Naturh. Foren. København, 126: 278 (discussed).

Measurements: Male, length 5.3 mm, width 7.8 mm; female, length 6.0 mm, width 11.25 mm (Tesch).

Habitat: Sand, coral, and mud. 'The species was found, ♂ and ♀ together, in the tube of a terebellid [worm] (*Loimia*)' (Tesch). Depth, up to 36 meters (Tesch).

Distribution: Known only from the type locality.

ASTHENOGNATHUS Stimpson, 1858

Asthenognathus STIMPSON, 1858, Proc. Acad. Nat. Sci. Philadelphia, 1858: 107. Type species, by monotypy: *Asthenognathus inaequipes* Stimpson, 1858. Gender: masculine. Placed on the Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, Smithsonian. Miscell. Coll., 73 (3): 13–18; see also Direction 37, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (2): 47–82) as name no. 287. (Bocquet, 1963, while synonymizing *Asthenognathus* Stimpson and *Tritodynamia* Ortmann, stated that *Asthenognathus* Bocourt, a snake genus, was described in 1854 and therefore had priority over *Asthenognathus* Stimpson, 1858; however, Bocourt's description was published in 1884 and *Asthenognathus* Bocourt was placed on the Official Index of Rejected and Invalid Generic Names in Zoology as Name no. 469. *Asthenognathus* Stimpson, 1858, thus would have had priority over *Tritodynamia* Ortmann had the two genera been congeneric as Bocquet stated).

Hosts: Polychaeta; ? Echinoidea.

Distribution: East Atlantic (France to Angola); Indo-West Pacific (Thailand, Japan).

Asthenognathus atlanticus Monod, 1933

Asthenognathus atlanticus MONOD, 1933, Bull. Soc. Sci. Nat. Maroc, 12 (4–6): 147–153, figs. 6 (♀ dorsal view), 7 (♀ frontal view), 8 a, b (♀ maxillipeds), c (♂ right chela), d (♀ left chela), e (♂ dorsal view), f (♂ abdomen), 9 a (♀ abdomen), b (gonopod), c–f (♀ legs 1–4) (compared with *Asthenognathus hexagonum*) (♂ ♀ syntypes: MNHNP; type-locality: 'Côte atlantique Maroc, entre Redhala et Rabat et en face de Skrirat...'). — PÉREZ, 1942, Bull. Soc. Zool. France, 67: 152 (Roscoff, France). — MONOD, 1956, Mém. Inst. Franç. Afr. Noire, 45: 383–386, figs. 541 (♀ dorsal view), 541 bis a (♂ frontal view), b (♂ dorsal view), c (♂ abdomen), 542 (♀ dorsal view), 543 (♀ third maxilliped), 544 (♂ third maxilliped), 545 (gonopod) (compared with *Asthenognathus hexagonum*, *inaequipes*, and *japonica*) (Ardent Bank, Casando and Lévrier Bays, Mauritania; Gold Coast, off Senegal). — GAULD, 1960, Journ. West African Sci. Assoc., 6 (1): 71 (Accra, Ghana). — GUINOT & RIBEIRO, 1962, Mem. Junta Invest. Ultram., (2) 40: 65 (Angola). — ROSSIGNOL, 1962, Trav. Centre Oceanog. Pointe-Noire, 2 (5): 119 (Pointe Noire, Congo). — SALVAT, 1962, Cahiers Biol. Mar., 3: 236 (Arcachon, S.W. France). — VIA

BOADA, 1966, Acta Geologica Hispanica, 1 (4): 1, 3 (listed). — ZARIQUEY ALVAREZ, 1968, Invest. Pesquera Barcelona, 32: 410 (definition, distribution), fig. 137 (♀, after Monod) a (dorsal view), b (third pereopod), c (fifth pereopod) (Spain, N.W. coast, Ria de Arosa).

Tritodynamia atlantica BOCQUET, 1963, Cahiers Biol. Mar., 4: 65-78, figs. 1 (♀ dorsal view), 2 (♂ ventral view), 3 (♀ ventral view), 4 I (♀ chela, external view), II (♀ chela, internal view), III (♀ chela, external view), IV (♀ chela, internal view), 5 (branchial area), 6 I (♂ pleopod I), II (♀ pleopod II) (compared with *Tritodynamia* [*Asthenognathus*] *hexagonum* and *T. inaequipes* [*Tritodynamia japonica*]). — GLEMAREC, 1963, Penn ar Bed, 4 (33): 61 (west- and southcoast of Brittany, France). — BOCQUET, 1965, Cahiers Biol. Mar., 6: 407-418, figs. 1 (Zoea I) A (lateral view), B (front view), C (abdomen), D (caudal furca), 2 (abdomen) A (Zoea II), B (Zoea III), C (Zoea IV), D (Zoea V), 3 (abdomen in lateral view) A (Zoea IV), B (Zoea V), 4 (antenna) A (Zoea I), B (Zoea III), C (Zoea IV), D (Zoea V), 5 (megalopa in dorsal view), 6 (megalopa) A (posterior part of abdomen), B (maxilliped), C (chela), 7 (outlines of carapace of megalopa and first to fourth crab stages) (development and systematic position: placed in the family Goneplacidae, subfamily Rhizopinae). — BOURDON, 1965, Decap. Stomatop. Inventaire Faune marine Roscoff: 31 (region of Roscoff, France; commensal of Polychaete *Amphitrite edwardsii* (Quatrefages)).

Measurements: Male, length 6.5 mm, width 8.5 mm; female, length 4.4 mm, width 6.5 mm (Monod, 1933; 1956).

Habitat: On echinoid *Brisopsis lyrifera* (Forbes), black mud, 70 meters (Monod, 1933); sublittoral, from 8 to 14 meters, and from stomach of the fish *Trigla lyra* Linnaeus taken in 200 meters or more (Monod, 1956); commensal in tubes of the terrellid worm *Amphitrite edwardsii* (Quatrefages), at times in company with the polynoid *Gauryana cirrosa* (Pallas) (Bocquet, 1963; Bourdon, 1965).

Distribution: East Atlantic from the Department of Manche, France, to Angola.

Asthenognathus hexagonum Rathbun, 1909

Asthenognathus hexagonum RATHBUN, 1909, Proc. Biol. Soc. Washington, 22: 111 (♀ holotype, ovig.; ? UZM; type-locality: 'north of Koh Kong' [Thailand]). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 5 (4): 339, 340, pl. 2 fig. 14 (♀ dorsal view), text-fig. 24 (♀) a (anterior border), b (chela), c (buccal cavity) (Gulf of Siam). — TESCH, 1918, Siboga Exped. Monogr., 39c¹ (84): 276 (in key distinguished from *Asthenognathus inaequipes*, 277) (listed). — MONOD, 1933, Bull. Soc. Sci. Nat. Maroc, 12 (4-6): 152 (listed). — SUVATTI, 1938, Check-List aquatic Fauna Siam: 56 (listed). — SUVATTI, 1950, Fauna of Thailand: 160 (listed). — TAKEDA & MIYAKE, 1968, Jour. Fac. Agr. Kyushu Univ., 14 (4): 575 (compared with *Asthenognathus inaequipes*).

Tritodynamia hexagonum BOCQUET, 1963, Cahiers Biol. Mar., 4: 72-78, fig. 10 (♀) I (dorsal view), II (chela, external view), III (walking leg 3) (compared with *Tritodynamia* [*Asthenognathus*] *atlanticus* and *inaequipes* [*Tritodynamia japonica*]).

Measurements: Female (ovigerous), length, 5.6 mm, width 7.8 mm (Rathbun, 1910).

Habitat: Mud; 8 fms [14.6 m] (Rathbun).

Distribution: Known only from the type locality.

Asthenognathus inaequipes Stimpson, 1858

Asthenognathus inaequipes STIMPSON, 1858, Proc. Acad. Nat. Sci. Phila., 1858: 107 (♀ holotype: probably not extant; type-locality: 'Nippon' lat. bor. 38°). — DE MAN, 1907, Trans. Linn. Soc. London Zool., (2) 9: 396, pl. 31 (♀) figs. 4 (inferior view of cervical region), 5 (left chela), 6 (right leg 2) (Inland Sea of Japan). — STIMPSON, 1907, Smithsonian Misc. Coll., 49: 140, pl. 14 fig. 1 (♀ dorsal view). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 276, 277, 287 (in key distinguished from *Asthenognathus hexagonum*). — BALSS, 1922, Arch. Naturgesch., 88A (11): 141 (part). — ICZN, 1925, Smithsonian. Miscell. Coll., 73 (3): 14 (Opinion 85). — YOKOYA, 1928, Sci. Rept. Tōhoku Imp. Univ., (4) 3 (4) (2): 778 (Cape Futagozaki and Mourakozima Island; between Anomori and Oshima Island; off Itanozaki; between Cape Futagozaki and Oshima Island; off Urata; Abruakawa; Jūsanmori)

(part). — MONOD, 1933, Bull. Soc. Sci. Nat. Maroc., 12 (4-6): 151, 152 (part). — SAKAI, 1933, Botany and Zoology Tokyo, 1 (2): 983, 984 (53, 54), fig. 8 a (dorsal view), b (third maxilliped). — SAKAI, 1934, Sci. Rept. Tokyo Bunrika Daigaku, 1 (B): 317 (brief discussion). — SAKAI, 1935, Crabs of Japan: 206, 207, fig. 110 (♂) a (dorsal view), b (maxilliped). — SHEN, 1937, Bull. Fan Mem. Inst. Biol., (Zool.) 7: 176 (part). — SAKAI, 1939, Stud. Crabs of Japan: 601, 602, fig. 86 (♀) a (dorsal view), b (maxilliped [this fig. is a much reduced facsimile of Sakai's 1935 fig., but labeled ♀ instead of ♂]) (Mutsu Bay; near Sendai; Onagawa Bay, Osaka Bay). — SAKAI, 1949, Illustr. Encycl. Fauna Japan: 668, fig. 1927 (dorsal view) (popular). — ICZN, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D): 12 (Direction 36; specific name placed on 'Official List of Specific Names in Zoology' as name no. 843). — KANEKO, 1958, Jubilee Publ. H. Fujimoto: 334, 335, 338, 339, pl. 15 (♂) fig. 2 (dorsal view), 3 (dorsal view of a second specimen) (fossils from the Holocene deposits at Osaka City, Japan; 14 specimens, of which only 3 showed carapacial characters). — SAKAI, 1956, Crabs: 51 (of species list) (Mutsumi Bay; Onagawa Bay, off Sendai Bay; Osaka Bay). — MIYAKE, 1961, Rec. Oceanogr. Works Japan, Special Number 5: 175 (listed) (Sea of Ariake [Ariakeno umi], Kyūshū Island, Japan). — SAKAI, 1965, Crabs of Sagami Bay: 182 (English pt.), 80 (Japanese pt.), pl. 88 fig. 4 (♀ dorsal view). — TAKEDA & MIYAKE, 1968, Journ. Fac. Agr. Kyushu Univ., 14 (4): 542-575 (compared with *Asthenognathus hexagonum* (East China Sea)).

Measurements: Female holotype, length 7.4 mm, width 9.5 mm (Stimpson). For the lone male specimen reported by Sakai 1935 are given: length 7 mm, width 10 mm. However, in the Emperor of Japan's collection (Sakai, 1965) there was also a male, presumably the specimen figured (pl. 88 fig. 4) which the legend accompanying the illustration describes as a female measuring: length 8 mm, width 11.2 mm.

Habitat: sandy-mud bottom, 30 fms [55 m] (Stimpson, 1858, 1907); muddy bottoms, 10-65 meters (Sakai, 1939, 1965); 'Abundant on muddy bottom, innermost part of Sea of Ariake. Some specimens taken from stomach of *Platycephalus indicus* (Linnaeus)' (Miyake).

Distribution: East coast of Honshu, Tokyo Bay to Inland Sea of Japan, Mutsu Bay, Sendai Bay, Osaka Bay; Sea of Ariake [Ariakeno umi], Kyūshū Island, Japan. Also fossil in the third stratum of the Holocene deposits at Osaka City, rarely in the fourth (fide Kaneko).

CHASMOCARCINOPS Alcock, 1900

Chasmocarcinops ALCOCK, 1900, Journ. Asiat. Soc. Bengal, 69: 334. Type species, by monotypy: *Chasmocarcinops gelasimoides* Alcock, 1900. Gender: masculine.

Hosts: Mollusca Bivalvia.

Distribution: Indo-West Pacific (India to Thailand and Indonesia).

Chasmocarcinops gelasimoides Alcock, 1900

Chasmocarcinops gelasimoides ALCOCK, 1900, Journ. Asiatic Soc. Bengal, 69 (2) (3): 334, 335 (1 ♂, 1 ♀ syntypes: Indian Museum 3688/10, 3688/11; type-locality: '...from off Madras'). — ALCOCK & McARDLE, 1902, Illustr. Zool. Investigator, Crustacea, (10): pl. 62 fig. 2 (♀) (dorsal view), a (inferior view of cervical region), fig. 3 (♂) (dorsal view), a (chela). — RATHBUN, 1910, K. Danske Videnskabs Selskab. Skrifter, (7) 5 (4): 340, pl. 1 fig. 10 (♂ in bivalve *Amussium pleuronectes* (Linnaeus), pl. 2 fig. 12 (♂, 13.1 mm wide, dorsal view) (between Koh Kadat and Koh Kut, South of Koh Bidang, West of Koh Kut, East of Koh Mak, South of Koh Samit, West of Koh Chang, and South of Koh Tulu, Gulf of Siam). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 280, 281 (Bay of Batavia, Kwan-dang Bay and Saleyer Island, Celebes Islands). — SUVATTI, 1938, Check-List aquatic Fauna Siam: 58 (listed). — SUVATTI, 1950, Fauna of Thailand: 161 (listed).

Measurements: Male, length 11 mm, width 12 mm (Alcock); female (ovigerous), length 10 mm, width 11 mm (Tesch).

Habitat: From sandy clay, sandy mud, clay, mud, and shelly bottom, 6-30 fms [11-55 m]; one ♂ specimen from a bivalve, *Amussium pleuronectes* (Linnaeus) (Rathbun).

Distribution: Madras, India; Gulf of Siam; Indonesia.

HAPALONOTUS Rathbun, 1897

Malacosoma DE MAN, 1879, Notes Leyden Mus., 19: 67. Type species, by monotypy: *Malacosoma reticulatum* De Man, 1879. Gender: neuter. Invalidated by *Malacosoma* Huebner, 1820 (Lepidoptera) and *Malacosoma* Feldermann, 1837 (Coleoptera).

Hapalonotus RATHBUN, 1897, Proc. Biol. Soc. Washington, 11: 164. Replacement name for *Malacosoma* De Man, 1879. Gender: masculine.

Distribution: Indonesia.

Hapalonotus reticulatus (De Man, 1879)

Malacosoma reticulatum DE MAN, 1879, Notes Leyden Mus., 19: 67, 68 (♀ holotype: RMNH no. D 319; type-locality: 'Amboina' [Indonesia]).

Hapalonotus reticulatus TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 278, 279, pl. 18 (♀) fig. 3 (dorsal view), a (ventral view of front), b (abdomen) (Amboina, Indonesia).

Measurements: Female, length 20.5 mm, width 24.0 mm (De Man).

Distribution: Known only from the type locality.

MORTENSENELLA Rathbun, 1909

Mortensenella RATHBUN, 1909, Proc. Biol. Soc. Washington, 22: 111. Type species, by monotypy: *Mortensenella forceps* Rathbun, 1909. Gender: feminine.

Distribution: Thailand.

Mortensenella forceps Rathbun, 1909

Mortensenella forceps RATHBUN, 1909, Proc. Biol. Soc. Washington, 22: 111. (♂ syntype: USNM 39731; ♀ syntype: UZM; type-locality: 'Koh Chang [Thailand]). — RATHBUN, 1910, K. Danske Videnskab. Selskab. Skrifter, (7) 5 (4): 337, pl. 1 fig. 18 (♂ dorsal view), text-fig. 21 (♂) a (abdomen), b (gonopods), c (chela), d (maxilliped) (Koh Chang, Thailand). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 277 (listed). — MONOD, 1933, Bull. Soc. Sci. Nat. Maroc, 12 (4-6): 153 (Koh Chang, Thailand). — SUVATTI, 1938, Check-List aquatic Fauna Siam: 65 (listed). — SUVATTI, 1950, Fauna of Thailand: 160 (listed).

Measurements: Male, length 4.2 mm, width 6.8 mm (Rathbun, 1909).

Distribution: Known only from the type locality.

OPISTHOPUS Rathbun, 1893

Opisthopus RATHBUN, 1893, Proc. U. S. Nat. Mus., 16: 251. Type species, by monotypy: *Opisthopus transversus* Rathbun, 1893. Gender: masculine. Placed on Official List of Generic Names in Zoology in Opinion 85 of the International Commission on Zoological Nomenclature (1925, Smithsonian. Miscell. Coll., 73 (3): 13-18; see also Direction 37; 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D) (2): 47-82) as name no. 338.

Hosts: Mollusca Bivalvia and Gastropoda; Polychaeta; Holothuroidea.

Distribution: East Pacific (California, U.S.A.).

Opisthopus transversus Rathbun, 1893

Opisthopus transversus RATHBUN, 1893, Proc. U. S. Nat. Mus., 16: 252 (♀ lectotype: USNM 3446; type-locality: 'Monterey, California'). — HOLMES, 1900, Occ. Pap. California Acad. Sci., 7: 97 (San Diego, California). — RATHBUN, 1900, Amer. Nat., 34 (403): 590 (listed). — RATHBUN, 1904, Harriman Alaska Exped., 10: 188, pl. 9 fig. 2 (♀ dorsal view), text-fig. 95 (♀ endognath of maxilliped) (Monterey to San Diego, California). — WEYMOUTH, 1910, Leland Stanford Jr. Univ. Publ., (Univ. Ser.) 4: 61, fig. 9 (♀ dorsal view with detached chela) (Monterey Bay, Cali-

foria). — NININGER, 1918, Pomona Coll. Journ. Entomol. Zool., 10 (2): 36, fig. 8 (dorsal view) (Laguna Beach, California). — RATHBUN, 1918, Bull. U. S. Nat. Mus., 97: 172–174, pl. 37 (♂) figs. 4 (ventral view), 5 (dorsal view), text-fig. 110 (♀) a (dorsal view), b (endognath of maxilliped) (Monterey Bay, Pacific Grove, Anaheim Landing, off Catalina I., SE of Point del Rey, Laguna Beach, Point Loma, and San Diego, California). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 280, 286 (Coast of California). — SCHMITT, 1921, Univ. Calif. Publ. Zool., 23: 268, pl. 44 (♂) figs. 4 (ventral view), 5 (dorsal view), text-fig. 158 (♀ dorsal view) (Monterey to San Diego, California) (after Rathbun). — ICZN, 1925, Smithson. Miscell. Coll., 73 (3): 16 (Opinion 85; placement of genus with *Opisthopus transversus* cited as the type, on the 'Official List of Generic Names in Zoology'). — JOHNSON & SNOOK, 1927, Seashore Anim. Pacific Coast: 394, 395, fig. 350 (♀ dorsal view) (general account). — MacGINITIE, 1935, Amer. Midland Naturalist, 16 (5): 718 (Elkhorn Slough, Monterey Bay, California). — RICKETTS & CALVIN, 1939, Between Pacific Tides, (ed. 1): 63, 64, 190, 217, 287, pl. 13 fig. 3, inset (dorsal view) (biology, ecology). — MacGINITIE & MacGINITIE, 1949, Nat. Hist. Mar. Anim., (ed. 1) [ed. 2, 1968]: 249, 313, 387 (referred to merely as 'pea-crab') (biology, ecology). — L. H. HYMAN, 1955, The Invertebrates, 4: 243 (host relationship). — ICZN, 1956, Opin. Decl. Int. Comm. Zool. Nomencl., 1 (D): 17 (Direction 36; specific name placed on the 'Official List of Specific Names in Zoology' as name no. 890). — BALSS, 1956, in Bronn, Klassen Ordnungen Tierreichs, (ed. 2) 5 (1) (7): 1417 (listed). — HOPKINS & SCANLAND, 1953, Bull. S. California Acad. Sci., 63 (4): 175–180, text-fig. (♀ dorsal view) (discussion of hosts). — PEARCE, 1966, Some Contemporary Stud. Mar. Sci.: 585, 587 (biology). — JONES & MAHADEVAN, 1967, Journ. Mar. Biol. Assoc. India, 7 (2): 379 (host relationship). — BEONDÉ, 1968, Veliger, 10 (4): 375–377 (lists 16 hosts, one of which, the nudibranch *Aplysia vaccaria* Winkler, was only recently discovered and is here discussed in detail). — RICKETTS & CALVIN, 1968, Between Pacific Tides (ed. 4, Hedgpath revised): 92, 93, 294, 328, 498, fig. 60, inset (dorsal view). — CROSNIER, 1969, Bull. Mus. Nat. Hist. Nat. Paris, (2) 41 (2): 535, fig. 11 (♂ carapace, dorsal view), 12 (♂ buccal cavity), 13 (♂ maxilliped), 14 (♂ abdomen), 15 (♂ first pleopod), 16 (♀ carapace, dorsal view).

Measurements: Male, length 9.8 mm, width 11.8 mm (Rathbun, 1918); female, length 14.0 mm, width 18.0 mm (Rathbun, 1893).

Habitat: In mollusks: in gills of *Cryptochiton stelleri* (Middendorff) (Schmitt); from gastropods: *Lucapina crenulata* [*Megathura crenulata* (Sowerby)] (Rathbun, 1893); *Astraea undosa* (Wood) (Schmitt); *Megathura crenulata* (Sowerby), *Polinices lewisii* (Gould), *Navanax inermis* (Cooper), *Bulla gouldiana* Pilsbry (MacGinitie & MacGinitie); *Aplysia vaccaria* Winkler (Beondé); in bivalves: *Mytilus edulis* Linnaeus, *Pholas* sp. (Rathbun, 1904); *Schizothaerus nuttalli* [*Tresus nuttalli* (Conrad)] (Schmitt); *Sanguinolaria nuttalli* Conrad, *Zirfaea* sp., *Platyodon* sp., *Modiolus* sp., (MacGinitie & MacGinitie); *Zirphaea pilsbryi* [*Zirfaea pilsbryi* (Lowe)], *Trachycardium robustum* [*Dinocardium robustum* (Lightfoot)], *Hinnites multirugosus* (Gale) (Hopkins & Scanland); *Megapitaria squalida* (Sowerby) (Beondé). Commensal in polychaete tubes: *Chaetopterus variopedatus* (Renier) (Hopkins & Scanland). In holothurians: *Stichopus californicus* [*Parastichopus californicus* (Stimpson)] (Weymouth; also L.H. Hyman); *Stichopus parvimensis* [*Parastichopus parvimensis* (Clark)], *Molpadia arenicola* [*Caudina arenicola* (Stimpson)] (Hopkins & Scanland). To a depth of 50 fms [91 m] (Rathbun, 1918).

Distribution: Monterey to San Diego, California.

TRITODYNAMIA Ortmann, 1894

Tritodynamia ORTMANN, 1894, Zool. Jahrb. Syst., 7: 692. Type species, by monotypy: *Tritodynamia japonica* Ortmann, 1894. Gender: feminine.

Tritodynamea BALSS, 1922, Arch. Naturgesch., 88 (A) (11): 140. Type species, by original designation and monotypy: *Tritodynamia horvathi* Nobili, 1905. Gender: feminine.

Hosts: Polychaeta; ? Bivalvia.

Distribution: China, Korea, Japan.

Remarks: Balss (1922) incorrectly synonymized *Tritodynamia japonica* Ortmann, 1894, the type species of the genus *Tritodynamia*, and *Asthenognathus inaequipes* Stimpson, 1858, the type species of the genus *Asthenognathus*. *Tritodynamia horvathi* was considered by him to be generically distinct and was made the type of a new genus which he named *Tritodynamea*. Various authors subsequently followed Balss in uniting *Tritodynamia japonica* and *Asthenognathus inaequipes*. Shen, 1937, stated that *Tritodynamia horvathi* Nobili, 1905, replaced *T. japonica* Ortmann, 1894, as the type species of the genus *Tritodynamia*; this would have been incorrect even had Balss' synonymizing been accurate. Sakai, 1934, restored *Tritodynamia japonica* and *Asthenognathus inaequipes* to the positions their authors intended, and mentioned Balss' agreement with this action. So *Tritodynamea* Balss falls as a junior (subjective) synonym of *Tritodynamia* Ortmann.

Tritodynamia horvathi Nobili, 1905

Tritodynamia Horváthi NOBILI, 1905, Ann. Mus. Nat. Hungar., 3: 407–411, pl. 10 fig. 1a–e (♀, 1 dorsal view), a (maxilliped), b (maxilliped 2), c (chela, outer view), d (chela, inner view), e (leg 3), 1f (♂ abdomen), 1g (♀ abdomen), 1h (mandible), 2b (legs 3; upper figure *Tritodynamia japonica*, lower *Tritodynamia horvathi*, fide Balss, 1922) (♀ holotype: ? depository; type-locality: 'Kobe [Japan]') (compared with *Tritodynamia japonica*).

Tritodynamia horváthi TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 277, 287 (listed).

Tritodynamea horvathi BALSS, 1922, Arch. Naturgesch., 88A (11): 141 (Yokohama, Japan).

Tritodynamia fani SHEN, 1932, Zool. Sinica, (A) 9 (1): 125–127, pl. 5 fig. 6 (♂ dorsal view), text-figs. 73 (♂ dorsal view), 74 (♂ frontal view) (♂ holotype: FMI 12441; type-locality: Shatsukou, Shantung Peninsula [China]).

Tritodynamea Horváthi MONOD, 1933, Bull. Soc. Sci. Nat. Maroc., 12 (4–6): 153 (repeats Nobili's records).

Tritodynamia horváthi SAKAI, 1933, Botany and Zoology, Tokyo, 1 (2): 983 (53) (mentioned).

Tritodynamia horvathi SAKAI, 1934, Sci. Rept. Tokyo Bunrika Daigaku, 1 (B): 317, 318, fig. 25 a (♂ dorsal view), b (tip of gonopod) (Misaki and Nagasaki, Japan). — SAKAI, 1936, Crabs of Japan: 205, fig. 108 (♂) a (dorsal view), b (tip of gonopod). — SHEN, 1935, Chinese Journ. Zool., 1: 24 (Kobe, Japan). — SHEN, 1937, Bull. Fan Mem. Inst. Biol., (Zool.) 7: 169, 176, 177 (southern coast of the Shantung Peninsula, China). — SHEN, 1937, Contrib. Inst. Zool. Peiping, 3 (6): 307 (listed). — TU, 1938, Zool. Anz., 122 (7/8): 180 (compared with *Tritodynamia intermedia*). — SAKAI, 1939, Stud. Crabs of Japan: 604, 605, fig. 88 (♀ dorsal view) (near Yokohama, Misaki, and Nagasaki, Japan; Tarinkai Bay, Korea). — SAKAI, 1949, Illustrated Encycl. Fauna Japan: 669, fig. 1929 (♂ dorsal view). — SAKAI, 1956, Crabs: 52 (of species list) (mentioned). — MIYAKE, 1961, Rec. Oceanogr. Works Japan, Special Number 5: 175 (listed) (Sea of Ariaké [Ariakeno umi], Kyūshū Island, Japan). — BOCQUET, 1963, Cahiers Biol. Mar., 4: 72 (compared with *Tritodynamia atlantica* [*Astenognathus atlanticus*]). — PEARCE, 1966, Pacific Sci., 20 (1): 28 (mentioned).

Measurements: Male, length 8.5 mm, width 12.5 mm (Sakai); female, length 9.0 mm, width 13.5 mm (Shen).

Habitat: 'Taken up by fishing nets on sandy bottom' (Shen); 'In the province of Ariake Bay, Kyūshū, this crab is called 'Miroku-gani' in Japanese, which means an inhabitant in the mantle cavity of a kind of bivalve shell, miroku-gai... It is very notable that this crab migrates in a large swarm of many thousands of individuals including both sexes, from the middle of autumn to the beginning of winter (according to T. Kamita, however, the migration occurs in June and July in Tinkai Bay, Korea). The swarm migrates very slowly from place to place below the calm surface of the inland sea, but the individual animal continues to swim by the quick movements of the last ambulatory legs...' (Sakai, 1939); Miyake corroborates the Sakai, 1939, remarks naming the bivalve *Anadara* (*Scapharea*) *subrenata* (Lischke); he adds that 'some specimens were taken in the tubes of a kind of polychaete, *Loimia medusa*... [(Savigny)]... The crabs are used for manure in the districts of Ariaké.'

Distribution: Japan; Korea; Shantung Peninsula, China.

Tritodynamia intermedia Shen, 1935

Tritodynamia horvathi [not Nobili, 1905; fide Shen, 1935: 23] SHEN, 1932, Zool. Sinica, (A) 9 (1): 123–125, pl. 5 fig. 5 (♂ dorsal view), text-figs. 71 (♂ dorsal view), 72 (♂), a (frontal view), b (abdomen), c (tip of gonopod) ('Chefoo,' Shantung Peninsula, China...).

Tritodynamia intermedia SHEN, 1935, Chinese Journ. Zool., 1: 23, 24, fig. 4 (♂ chela) (♂ holotype: FMI 12442; type-locality: Chefoo, China). — SHEN, 1937, Bull. Fan Mem. Inst. Biol., (Zool.) 7: 168, 176, 177 (Chefoo, China). — SHEN, 1937, Contrib. Inst. Zool. Peiping, 3 (6): 307 (listed). — TU, 1938, Zool. Anz., 122 (7/8): 178–181, 184 (biology; host relationship; compared with *Tritodynamia fani* [*T. horvathi*], *T. horvathi*, and *T. rathbuni*) (Shantung Peninsula, China). — SAKAI, 1939, Stud. Crabs of Japan: 605, 606 (Tokyo Bay and Nagasaki, Japan). — SAKAI, 1956, Crabs: 52 (of species list) (mentioned). — MIYAKE, 1961, Rec. Oceanogr. Works Japan, Special Number 5: 175 (listed) (Sea of Ariaké [Ariakeno umi], Kyūshū Island, Japan).

Measurements: Male, length 6.5 mm, width 10.0 mm (Shen); female (ovigerous), length 11.7 mm, width 20.5 mm (Shen).

Habitat: In the tubes of the polychaete, *Chaetopterus* probably *Chaetopterus variopedatus* (Renier). In 27 tubes 13 crabs were taken (Tu).

Distribution: Japan; Shantung Peninsula, China.

Tritodynamia japonica Ortmann, 1894

Tritodynamia japonica ORTMANN, 1894, Zool. Jahrb. Syst., 7: 693, pl. 23 fig. 5 (♀ dorsal view) a (frontal margin), i (ischium and merus), k (chela) (♀ holotype: MZUS; type-locality: 'Japan, Tokiobai'). — NOBILI, 1905, Ann. Mus. Nat. Hungar., 3: 407–412, pl. 10 fig. 2 (♀ carapace, dorsal view) a (manus), b (third legs), c (♀ abdomen) (compared with *T. horvathi*). — DE MAN, 1907, Trans. Linn. Soc. London, Zool., (2) 9: 395 (mentioned). — PARISI, 1918, Atti Soc. Ital. Sci. Nat., 57: 92. — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 277, 287 (mentioned). — BALSS, 1922, Arch. Naturgesch. 88A (11): 140 (mentioned). — SAKAI, 1933, Botany and Zoology, Tokyo, 1 (2): 982 (52), fig. 7 (dorsal view). — SAKAI, 1934, Sci. Rept. Tokyo Bunrika Daigaku, 1 (b): 317 (mentioned). — SAKAI, 1936, Crabs of Japan: 204, pl. 57 fig. 2 (♀ dorsal view). — SAKAI, 1956, Crabs: 52 (of list of species; mentioned). — MIYAKE, 1961, Rec. Oceanogr. Works Japan, Special Number 5: 175 (listed) (Sea of Ariaké [Ariakeno umi], Kyūshū Island, Japan).

Asthenognathus japonica RATHBUN, 1910, K. Danske Videnskab. Selskab Skrifter, (7) 5 (4): 340 (mentioned).

Asthenognathus inaequipes YOKOYA, 1928, Sci. Rept. Tōhoku Imp. Univ., (4) 3 (4): 778 (part of synonymy). — MONOD, 1933, Bull. Soc. Sci. Nat. Maroc., 12 (4–6): 151, 152 (part of synonymy).

Tritodynamia japonicus SHEN, 1937, Bull. Fan Mem. Inst. Biol., (Zool.) 7: 176 (mentioned).

Tritodynamia inaequipes BOCQUET, 1963, Cahiers Biol. Mar., 4: 65–78, fig. 9 I (♀ dorsal view), II (chela, view of inner face), III (chela, view of outer face), IV (third walking leg) (part) (compared with *Tritodynamia* [*Asthenognathus*] *atlanticus*, and *T. hexagonum*).

Measurements: Female, length 8.5 mm, width 16.5 mm, distance between orbits 8.0 mm.

Habitat: with the lugworm *Arenicola cristata* Stimpson (Sakai, 1934).

Distribution: Japan.

Tritodynamia rathbunae Shen, 1932

Tritodynamia rathbuni SHEN, 1932, Zool. Sinica, (A) 9 (1): 118–122, pl. 5 fig. 4 (♀ dorsal view), text-figs. 68 (♀ dorsal view), 69a (♀ frontal view), b (♀ chela), c (♂ chela), 70a (♂ abdomen), b (tip of gonopod), c (♀ abdomen) (♂ holotype: FMI 4913; type-locality: 'Chefoo [China]'). — SAKAI, 1934, Sci. Rept. Tokyo Bunrika Daigaku, 1 (B): 317, 318 (listed). — SAKAI, 1936, Crabs of Japan: 206, pl. 57 fig. 3 (♀ dorsal view), text-fig 109 (maxilliped). — SHEN, 1935, Chinese Journ. Zool., 1: 22, 23 (republication of measurements of type). — SHEN, 1937, Bull. Fan Mem. Inst. Biol., (Zool.) 7: 168, 176, 177 (Liaotung and Shantung Peninsulas, China). — SHEN, 1937, Contrib. Inst. Zool. Peiping, 3 (6): 307 (listed). — TU, 1938, Zool. Anz., 122 (7/8): 180 (compared with *Tritodynamia intermedia*). — SAKAI, 1939, Stud. Crabs of Japan: 603, 604, pl. 70 fig. 3 (♀ dorsal view), text-fig. 87 (♀ maxilliped) (Japan, Korea). — SAKAI, 1949, Illustr. Encycl. Fauna Japan: 668, fig. 1928 (♀ dorsal view). — SAKAI, 1956, Crabs: 51 (of species list) (mentioned). — MIYAKE, 1961, Rec. Oceanogr. Works Japan, Special Number 5: 175 (listed) (Sea of Ariaké [Ariakeno umi], Japan). — SAKAI, 1965, Crabs of Sagami Bay: 183 (Eng. pt.), 80 (Jap. pt.), pl. 88 fig. 5 (♂ dorsal view). — KOBJAKOVA, 1967, Explorations Fauna Seas USSR, 5 (13): 244 (Possjet Bay and Peter the Great Bay, S.E. Siberia).

Measurements: Male, length 8.4 mm, width 15.2 mm (Shen); female, length 11.0 mm, width 20.3 mm (Sakai).

Habitat: In the tubes of *Chaetopterus variopedatus* (Renier), *Mesochaetopterus japonicus* Fujiwara, and *Balanoglossus misakiensis* Kuwano (Sakai); *Crenomytilus grayanus* [*Mytilus* (*Crenomytilus*) *grayanus* Dunker], *Modiolus difficilis* (Kuroda & Habe) (Kobjakova).

Distribution: S. E. Siberia; Japan; east coast of Korea; Chantung and Liaotung Peninsula, China.

Remarks: Since Shen (1932: 122) definitely stated that he was 'naming this new and interesting species after Dr. Mary J. Rathbun,' its specific name should be spelled *rathbunae* rather than *rathbuni*.

VOELTZKOWIA Lenz, 1905

Voeltzkowia LENZ, 1905, Abhandl. Senckenberg. Naturforsch. Ges., 27 (4): 364. Type species, by original designation and monotypy: *Voeltzkowia zanzibarensis* Lenz, 1905. Gender: feminine.
Distribution: East Africa.

Voeltzkowia zanzibarensis Lenz, 1905

Voeltzkowia zanzibarensis LENZ, 1905, Abhandl. Senckenberg. Naturforsch. Ges., 27: 365, pl. 47 fig. 9 (ovig. ♀ dorsal view), a (♀ abdomen), b (orbital view), c (maxilliped) (♀ ovig. holotype: ? depository; type-locality: 'Zanzibar, Kokotoni'). — TESCH, 1918, Siboga-Exped. Monogr., 39c¹ (84): 282 (listed). — GUINOT, 1966, Mém. Inst. Fondamental Afrique Noire, 77: 280 (listed, distribution noted).
Measurements: Female (ovigerous), length 5.0 mm, width 8.0 mm (Lenz).
Distribution: Known only from the type locality.

Anomalifrontinae Rathbun, 1931

Anomalifrontinae RATHBUN, 1931, Lingnan Sci. Journ., 8: 84.
This subfamily consists of a single genus.

ANOMALIFRONS Rathbun, 1931

Anomalifrons RATHBUN, 1931, Lingnan Sci. Journ., 8: 85. Type species, by monotypy: *Anomalifrons lightana* Rathbun, 1931. Gender: feminine.
Distribution: China.

Anomalifrons lightana Rathbun, 1931

Anomalifrons lightana RATHBUN, 1931, Lingnan Sci. Journ., 8: 85-87, 104, 121, pl. 13 (♂) figs. 37 (dorsal view), 38 (ventral view), 39 (ventral view) (♂ holotype: USNM 61878; type-locality: 'Guantao, near Foochow, Fukien, China'). — SHEN, 1940, Bull. Fan Mem. Inst. Biol., (Zool.) 10 (2): 89 (listed). — SERÈNE, 1964, Crustaceana, 7 (3): 184 (systematic position).
Measurements: Male, length 9.8 mm, width 14.8 mm (Rathbun).
Distribution: Known only from the type locality.

Species incertae

The following species are of uncertain identity. Although the genera *Dissodactylozoa* and *Pinnozoa* nomenclaturally are synonymous with *Dissodactylus* and *Pinnotheres* respectively, the generic identity of the new species assigned to them by Aikawa (1933, 1942), all of which are based on larvae, cannot now be ascertained, and therefore all are listed here. The identity of *Leucosia pacifica* Poëppig, also listed here, likewise is uncertain.

Dissodactylozoa pelagica Aikawa, 1933

Dissodactylozoa pelagica AIKAWA, 1933, Rec. Oceanogr. Works Japan, 5 (2): 132, 219-221, fig. 44 (zoëa, stage 3), 1 (lateral view), 2 (telson), 3 (2nd antenna), 4 (endopodite of 2nd maxilliped).

Measurements: Stage 3, zoëa, length 0.84 mm, width 0.65 mm.
Habitat: Plankton.
Distribution: Otawa Bay, Sagami Bay area, Japan.

Dissodactylozoea pinna Aikawa, 1933

Dissodactylozoea pinna AIKAWA, 1933, Rec. Oceanogr. Works Japan, 5 (2): 132, 211–214, fig. 39 (zoea), 1 (lateral view, stage 2), 2 (lateral view, stage 3), 3 (2nd antenna, stage 4), 4 (abdomen, stage 3), 5 (2nd maxilla, stage 5), 6 (endopod, 2nd maxilla, stage 4), 7 (1st maxilla, stage 5), 8 (1st and 2nd antennae, stage 5), 9 (1st antenna, stage 2), 10 (2nd antenna, stage 2).

Measurements: Zoecal carapace, stage 2, length 0.71 mm, width 0.28 mm; stage 3, length 0.79 mm, width 0.56 mm; stage 4, width 0.91 mm; stage 5, length 1.77 mm.

Habitat: Plankton.

Distribution: Tinkai Bay, Korea (= Tyosen); off Haneda, Tokyo Bay, Japan.

Dissodactylozoea singularis Aikawa, 1933

Dissodactylozoea singularis AIKAWA, 1933, Rec. Oceanogr. Works Japan, 5 (2): 132, 217, 218, fig. 42 (zoea, stage 3), 1 (lateral view), 2 (2nd antenna), 3 (telson).

Measurements: Stage 3 zoea, carapace length 1.22 mm, width 0.88 mm.

Habitat: Plankton.

Distribution: Korea Strait, Korea (= Tyosen).

Dissodactylozoea speciosa Aikawa, 1933

Dissodactylozoea speciosa AIKAWA, 1933, Rec. Oceanogr. Works Japan, 5 (2): 132, 214, 215, fig. 40 (zoea stage 4), 1 (lateral view), 2 (2nd antenna), 3 (abdomen).

Measurements: Stage 4 zoea, carapace length 0.76 mm, width 0.58 mm.

Habitat: Plankton.

Distribution: Korea Strait, Korea (= Tyosen).

Dissodactylozoea tokyoensis Aikawa, 1933

Dissodactylozoea tokyoensis AIKAWA, 1933, Rec. Oceanogr. Works Japan, 5 (2): 132, 218, 219, fig. 43 (zoea stage 3), 1 (lateral view), 2 (antennae), 3 (telson) (larval stage).

Measurements: Stage 3 zoea, carapace length 1.03 mm, width 0.89 mm.

Habitat: Plankton.

Distribution: Off Haneda, Tokyo Bay, Japan.

Dissodactylozoea unicornis Aikawa, 1933

Dissodactylozoea unicornis AIKAWA, 1933, Rec. Oceanogr. Works Japan, 5 (2): 132, 215–217, fig. 41 (zoea stage 2), 1 (lateral view), 2 (2nd antenna), 3 (1st antenna), 4 (1st maxilla), 5 (2nd maxilla).

Habitat: Plankton.

Distribution: Korea Strait, Korea (= Tyosen).

Dissodactylozoea sp. (1) Aikawa, 1942

Dissodactylozoea (1) AIKAWA, 1942, Palao Trop. Biol. Sta. Studies, 2 (3) (6): 587, 601–602, 608, fig. 13 (zoea), 1 (lateral view), 2 (antenna 2), 3 (endopod of maxilla 1), 4 (endopod of maxilla 2), 5 (endopod of maxilliped 2), 6 (telson) (larval stages) (compared with *Pinnozoea* (2)).

Measurements (mm): Rostrum 0.55, length of carapace 1.65, abdomen 1.96, telson 0.53.

Habitat: Plankton.

Distribution: Iwayama Bay, Palao.

Dissodactylozoea sp. (2) Aikawa, 1942

Dissodactylozoea (2) AIKAWA, 1942, Palao Trop. Biol. Sta. Studies, 2 (3) (6): 587, 602–604, 608, fig. 14 (zoea, second stage), 1 (lateral view), 2 (antennae 1 & 2), 3 (endopod of maxilla 1), 4 (endopod of maxilla 2), 5 (endopod of maxilliped 2), 6 (telson) (larval stages) (compared with *Pinnozoea*, but 'it is not certain if *Dissodactylozoea* (2) belongs in the Family Pinnotheridae').

Measurements (mm): Dorsum 0.56, rostrum 0.48, perpendicular distance between their tips 1.79, lateral spine 0.13, length of carapace 0.83, abdomen 1.34, telson 0.46.

Habitat: Plankton.

Distribution: Iwayama Bay, Palau Island.

'*Leucosia pacifica*' Poëppig, 1836

Leucosia pacifica POEPPIG, 1836, Arch. Naturgesch., 2 (1): 140 (description), pl. 4 fig. 3 (♀ dorsal view), 3¹² (frontal view), 3³ (third maxillipeds), 3⁴ (antenna), 3⁵ (abdomen) (holotype female, in ? Zoological Museum of the University of Leipzig, Germany ('Mus. univ. Lips. '); type-locality 'Habitat inter Fuci gigantei acervos sinus Talcahuano' [= Bay of Talcahuano, Chile]). — RATHBUN, 1910, Proc. U. S. Nat. Mus., 38: 613 (listed; doubtfully identified as *Cyclograpsus cinereus* Dana). — RATHBUN, 1937, Bull. U. S. Nat. Mus., 166: 183, footnote ('*Leucosia pacifica*... is a pinnotherid'). — GARTH, 1957, Lunds Univ. Arsskr., (n. ser.) (2) 53 (7): 91 (incertae sedis: 'This species... is a pinnotherid rather than a leucosid').

Measurements: 'Thorax octa ad novem lineas latus' [carapace width 8 to 9 lines, = about 16 mm].
Distribution: Only known from the type locality.

Pinnozoea ostrea Aikawa, 1933

Pinnozoea ostrea AIKAWA, 1933, Records Oceanogr. Works Japan, 5 (2): 247 description of 'indeterminable zoea' of Pinnotherid found in *Ostrea spinosa* Quoy & Gaimard, fig. 57 (1, lateral view; 2 abdomen). — MIYAKE, 1935, Bulteno Sci. Fak. Terk. Kjusu Univ., 6 (3): 192 (listed).

Habitat: in the oyster, *Ostrea spinosa* [= *Crassostrea echinata* (Quoy)] (Aikawa, 1933).
Distribution: Misaki, Japan.

Pinnozoea sp. (1) Aikawa, 1942

Pinnozoea (1) AIKAWA, 1942, Palao Trop. Biol. Sta. Studies, 2 (3) (6): 586, 599–600, 608, fig. 11 (zoea, third stage), 1 (lateral view), 2 (enp. maxilla 1), 3 (enp. maxilla 2), 4 (enp. maxilliped 2), 5 (telson) (larval stage).

Measurements (mm): Rostrum 1.38, lateral spine 0.93, length of carapace 0.59, orbital distance 0.53, abdomen 1.12, telson 0.24.

Habitat: Plankton.

Distribution: Iwayama Bay, Palau Island.

Pinnozoea sp. (2) Aikawa, 1942

Pinnozoea (2) AIKAWA, 1942, Palao Trop. Biol. Sta. Studies, 2 (3) (6): 587, 600–601, 608, fig. 12 (zoea), 1 (lateral view), 2 (rostrum), 3 (enp. maxilla 1), 4 (enp. maxilla 2), 5 (enp. maxilliped 2), 6 (abdomen), 7 (telson) (larval stage).

Measurements (mm): Rostrum 0.02, length of carapace 0.66, abdomen 0.70, telson 0.19.

Habitat: Plankton.

Distribution: Iwayama Bay, Palau Island.

Species incorrectly assigned to the Pinnotheridae

A number of genera, that at present are placed in the family Goneplacidae, have been assigned by earlier authors to the Pinnotheridae (see, e.g., ORTMANN, 1894, Zool. Jahrb. Syst., 7: 690, 691). Such genera are not further considered here. The following list only enumerates those species that are incorrectly assigned to genera that are accepted here as belonging to the Pinnotheridae.

Pinnotheres auritus (FABRICIUS, 1775) Bosc, 1801-1802, Hist. nat. Crust., (ed. 1) 1: 245. — DESMAREST, 1830, Bosc. Hist. nat. Crust., (ed. 2) 1: 296. *Cancer auritus* Fabricius, 1775, from Iceland is a species incerta, but certainly not a Pinnotherid.

Pinnotheres ferrugineus (HERBST, 1790) Bosc, 1801-1802, Hist. nat. Crust., (ed. 1) 1: 244. — DESMAREST, 1830, Bosc, Hist. nat. Crust., (ed. 2) 1: 295. *Cancer ferrugineus* Herbst, 1790, locality unknown, resembles a species of *Pilumnus* and is certainly not a Pinnotherid (see also LATREILLE, 1802-1803, Hist. nat. Crust. Ins., 6: 84).

Pinnotheres glaberrimus (HERBST, 1790) Bosc, 1801-1802, Hist. nat. Crust., (ed. 1) 1: 244. — *Pinnotheres glaberrimus* DESMAREST, 1830, Bosc, Hist. nat. Crust., (ed. 2) 1: 295. *Cancer glaberrimus* Herbst, 1790, at present is placed in the genus *Tetralia* (fam. Xanthidae). The specimens observed by Bosc 'dans la haute mer sur des fucus,' evidently are *Planes minutus* (L.) (fam. Grapsidae).

Pinnotheres minutus (FABRICIUS) Bosc, 1801-1802, Hist. nat. Crust., (ed. 1) 1: 244. — DESMAREST, 1830, Bosc, Hist. nat. Crust., (ed. 2) 1: 295. *Cancer minutus* Linnaeus, 1758, at present is placed in the genus *Planes* (fam. Grapsidae).

Pinnotheres plicatus (FABRICIUS, 1798) Bosc, 1801-1802, Hist. nat. Crust., (ed. 1) 1: 244. — DESMAREST, 1830, Bosc, Hist. nat. Crust., (ed. 2) 1: 296. *Cancer plicatus* Fabricius, 1798, from China, is a species incerta, probably not a Pinnotherid; LATREILLE (1802-1803, Hist. nat. Crust. Ins., 6: 84) thought that it might be a Grapsid.

Pinnotheres pusillus (FABRICIUS, 1798) Bosc, 1801-1802, Hist. nat. Crust., (ed. 1) 1: 244. — DESMAREST, 1830, Bosc, Hist. nat. Crust., (ed. 2) 1: 295. *Cancer pusillus* Fabricius, 1798, at present is synonymized with *Planes minutus* (Linnaeus, 1758) (fam. Grapsidae).

Pinnotheres semicylindrus (FABRICIUS, 1798) Bosc, 1801-1802, Hist. nat. Crust., (ed. 1) 1: 245. — *Pinnotheres semicylindricus* DESMAREST, 1830, Bosc, Hist. nat. Crust., (ed. 2) 1: 296. *Cancer semicylindricus* Fabricius, 1798, from the Indian Ocean, is a species incerta, but certainly not a Pinnotherid.

Pinnotheres sexpes (FABRICIUS, 1798) Bosc, 1801-1802, Hist. nat. Crust., (ed. 1) 1: 244. — DESMAREST, 1830, Bosc. Hist. nat. Crust., (ed. 2) 1: 296. *Cancer sexpes* Fabricius, 1798, at present is placed in the genus *Hexapus* (fam. Goneplacidae).

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