

Catalogue of genera and species of the family

Chondracanthidae Milne Edwards, 1840

(Poecilostomatoida, Copepoda) with notes on morphology

Pia Østergaard

Department of Zoology, The Natural History Museum, Cromwell Road, London SW7 5BD,

UK

Abstract

The status of subfamilies and genera within Chondracanthidae Milne Edwards, 1840 has recently been revised. Forty four genera are currently recognised as valid for the Chondracanthidae and a comprehensive catalogue to the valid genera and species of the family is presented here. In addition, numerous supplementary observations are presented on existing taxa for which incomplete or inadequate data were previously available.

Introduction

The Chondracanthidae Milne Edwards, 1840 is a family of highly transformed parasitic copepods with a worldwide distribution. All species are parasitic on marine fishes. Both adults and larvae are typically found in the oral-branchial cavity of the fish host, attaching by means of powerful, hook-like antennae. A few species inhabit the nasal cavity or cloaca of their host (e.g. *Acanthochondria vancouverensis* Kabata, 1984; *Acanthochondrites annulatus* (Olsson, 1868); *Chondracanthus narium* Kabata, 1969; *C. triventricosus* Sekerak, 1970 and *Diocus lycenchelus* Hogans & Sulak, 1992), and rarely they have been found on exposed host surfaces. *Apodocondria medusae* Ho & Dojiri, 1988 and *Diocus semilunaris* Kabata & Gusev, 1966, for example, have been reported from the skin and fins of their hosts (Ho & Dojiri, 1988; Kabata & Gusev, 1966).

Two subfamilies, Chondracanthinae Milne Edwards, 1840 and Lernentominae Oakley, 1927, were traditionally recognised in the family Chondracanthidae (cf. Ho, 1970). Recent phylogenetic analysis showed that there was no justification in such a division and the two subfamilies were not recognised as valid (Østergaard *et al.*, in press). Østergaard *et al.* (in press) also disputed the validity of the Pharodidae Illg, 1948 since its sister group lay within the Chondracanthidae. Phylogenetic analysis supported the proposal to transfer Pharodidae into the family Chondracanthidae. Following Østergaard *et al.* (in press), the family Chondracanthidae now contains 44 genera comprising approximately 170 species.

The latest and most comprehensive review of Chondracanthidae was given by Ho in 1970. Here we provide a summary of additions and changes to the family since Ho's (1970) revision. The diagnosis of Chondracanthidae is amended to include the changes proposed by Østergaard *et al.* (in press). A summary of all genera and a species list is given. Species of several genera have been re-examined and details of previously overlooked characters are

noted. Full or partial (re-)descriptions are given when the original description lacked detail. All of this supplementary descriptive information was included in the phylogenetic analysis by Østergaard *et al.* (in press).

Material and methods

Examined material was cleared in lactic acid (98%) and dissected parts were mounted in lactophenol (20% w/v Phenol). The descriptive terminology follows Huys & Boxshall (1991) and Ho (1970).

The specimens studied were loaned from the following institutions: Africa Museum, Tervuren, Belgium (MT); Kangreung National University, Kangreung, South Korea; Museum of New Zealand, Te Papa Tongarewa, Wellington, New Zealand (NMNZ); National Museum of Natural History, Smithsonian Institution, Washington DC, USA (USNM); The Natural History Museum, London, UK (BMNH); Naturhistorisches Museum Wien, Austria (NHMW); Pacific Biological Station, Nanaimo, B.C. Canada; Royal Belgian Institute of Natural Sciences, Brussels, Belgium (IRSNB); South Australian Museum, Adelaide, Australia (SAM); University of Mie, Japan; and Zoological Museum, University of Copenhagen, Denmark (ZMUC).

Species of Chondracanthidae that have been relegated to synonymy with other species are listed in Appendix 1.

Family **Chondracanthidae** Milne Edwards, 1840.

Diagnosis. Body highly sexually dimorphic, with large transformed female typically carrying a small male, except in *Pharodes* Wilson, 1935 in which male attached direct to host. Transformed

female body divisible into head (cephalosome), neck (first, or first and second pedigerous somites), trunk (second or third to fifth pedigerous somites) and genitoabdomen (genital and abdominal somites). First pedigerous somite fused to cephalosome in some genera to form cephalothorax. Neck region, if present, may or may not be elongated. Neck formed by postantennary constriction of cephalosome in some genera. Head, neck and trunk often with processes. Dwarf male cyclopiform in some genera, retaining well defined segmentation and comprising cephalothorax (incorporating first pedigerous somite), free second to fifth pedigerous somites, genital somite and indistinctly 4-segmented abdomen. Segmental boundaries indistinct or lost in most genera. Genital apertures paired, located laterally or ventrolaterally on genitoabdomen in female, ventrally on genital somite in male. Caudal rami with up to 6 setae, often modified, with a terminal spiniform process and 3 setae.

Nauplius eye present. Antennule up to 6-segmented; typically cylindrical and fleshy, with indistinct segmentation in female; segmentation usually better defined in male. Antenna modified, forming main attachment organ: primitively 3-segmented; with coxa and basis fused to form coxobasis bearing 1 basal seta, and endopod of 2 segments. Proximal segment massive, typically produced into powerful, curved claw (uncinate type of antenna). Atrophied tip of antenna (formerly called the accessory antennule) slender, with up to 6 apical elements; tip lost in some genera. Proximal endopodal segment sometimes forming bifurcate, trifurcate or clavate structure embedded in host (non-uncinate type of antenna). Labrum rectangular, sometimes with median knob in male. Mandible with a squat segment drawn out into a distal, lanceolate process with teeth either on concave or convex margins, or on both margins; sexually dimorphic, with fewer and larger teeth in male. Paragnath lobate, ornamented with spinules. Maxillule a simple lobe bearing 2 or 3 setae. Maxilla well developed, usually the largest oral appendage; 2-segmented; syncoxa unarmed, basis forming a claw-like process, often toothed along convex margin, armed with up to 2 proximal elements; sexually dimorphic with fewer or no teeth on distal margin in male. Maxilliped 3-segmented in female, comprising syncoxa, basis and short distal subchela formed from endopod and terminal claw: syncoxa unarmed, basis usually ornamented with spinules, claw with teeth in some genera. Male maxilliped typically as in female. In male *Auchenochondria* Dojiri & Perkins, 1979 maxilliped 4-segmented with terminal claw separate from proximal endopodal segment.

Swimming legs 1 to 3 of female *Prochondracanthus* Yamaguti, 1939 and male *Juanettia* Wilson, 1921 biramous, with 2-segmented rami; leg 4 in male *Juanettia* with 2-segmented exopod, endopod lacking; leg 4 reduced to seta in female *Prochondracanthus*. Intercoxal sclerites present in legs 1 to 4. Inner seta on basis of leg 1 absent, inner coxal seta present in legs 1 to 4. Legs 1 to 4 typically specialized by fusion of segments, loss of armature elements and transformation of entire leg into lobate structure. Intercoxal sclerites usually lacking. Modified legs may be unilobate, bilobate or trilobate. Legs sometimes extremely reduced, or absent (in some males). Legs 1 to 4 absent in female *Apodochondria* Ho & Dojiri, 1988. Fifth leg highly reduced; represented by up to 2 setae on surface of somite, or absent. Leg 6 represented by genital opercula, armed with up to 2 setae in both sexes. Egg sacs paired, multiseriate.

Included genera

Acanthochondria Oakley, 1927.

Type-species. *A. cornuta* (Müller, 1776).

Other species. *A. bicornis* Shiino, 1955, *A. brevicorpa* Yü, 1935, *A. clavata* (Bassett-Smith, 1896), *A. constricta* Shiino, 1955, *A. cyclopsetta* Pearse, 1952, *A. diastema* Kabata, 1965, *A. dilatata* Shiino, 1955, *A. dojirii* Kabata, 1984, *A. elongata* (Bassett-Smith, 1898), *A. epachthes* (Wilson, 1908), *A. exilipes* Wilson, 1932, *A. fissicauda* Shiino, 1955, *A. fraseri* Ho, 1972, *A. galerita* (Rathbun, 1886), *A. glandiceps* Shiino, 1955, *A. hippoglossi* Kabata, 1987, *A. incisa* Shiino, 1955, *A. inimici* Yamaguti, 1939, *A. kajika* Ho & Kim, 1996, *A. laemonemae* Capart, 1959, *A. lepidionis* Barnard, 1955, *A. limandae* (Krøyer, 1863), *A. longifrons* Shiino, 1955, *A. macrocephala* Gusev, 1951, *A. margolisi* Kabata, 1984, *A. ophidii* (Krøyer, 1863), *A. oralis* Yamaguti, 1939, *A. phycidis* (Rathbun, 1886), *A. pingi* (Yü & Wu, 1932), *A. platycephali* Heegaard, 1940, *A. priacanthi* Shiino, 1964, *A. rectangularis* (Fraser, 1920), *A. shawi* Yü, 1935, *A. sicyasis* (Krøyer, 1863), *A. sixteni* (Wilson, 1922), *A. soleae* (Krøyer, 1837), *A. spirigera* Shiino, 1955, *A. tasmaniae* Heegaard, 1962, *A. tchangii* Yü, 1935, *A.*

triglae Herrera-Cubilla & Raibaut, 1990, *A. uranoscopi* Ho & Kim, 1995, *A. vancouverensis* Kabata, 1984, *A. yui* Shiino, 1964, *A. zebriae*, Ho, Kim & Kumar, 2000.

Species inquirendae. (See Ho & Kim, 1995a)

A. argatula (Markewitsch, 1940), *A. ateleopi* Capart, 1959, *A. barnardi* Capart, 1959, *A. bicornis* Shiino, 1955, *A. briani* (Yü & Wu, 1932), *A. compacta* Markewitsch, 1956, *A. cynoglottidis* (Thompson & Scott, 1903), *A. grandigenitalis* (Yü & Wu, 1932), *A. spinulosa* Capart, 1959, *A. wui* Yü, 1935

Material examined. Ovigerous female *Acanthochondria cornuta* with male attached, from gill filaments of *Hippoglossoides platessoides* (Fabricius) (Pleuronectidae) caught during Cruise 0800S (26.-29. May 2000) of *R/V Scotia* on station Bell Rock (56°27'N, 2°15'E) (BMNH 2002.179-180). Ovigerous female with male from *Pseudorhombus* sp. (Paralichthyidae) caught off Plymouth (BMNH 1951.11.24.2).

Diagnosis. See Ho (1970) and Kabata (1979a).

Supplementary Observations. Male *A. cornuta*: Distal claw (third segment) of maxilliped with a hooklet.

Remarks. A bilaterally denticulated mandible with two rows of teeth on the concave side was found in male *Acanthochondria exilipes* (cf. Ho, 1971a). This is only seen in *Apodocondria*, *Mecaderochondria* Ho & Dojiri, 1987 and some *Chondracanthus* Delaroche, 1811 species. Kabata (1979a) pointed out that this genus as currently constituted is quite heterogeneous. This is due in part to the scarcity of material on which many species were established, and to the phenomenon that some gross morphological features change with age. See Ho & Kim (1995a) for latest revision of the genus.

Acanthochondrites Oakley, 1930.

Type-species. *A. annulatus* (Olsson, 1868).

Other species. None.

Material examined. Ovigerous female with male from *Dipturus batis* (Linnaeus) (Rajidae) collected between Flannan and Kilda (58°N 8°W) (BMNH 1976.1225-1228).

Diagnosis. See Kabata (1979a).

Supplementary Observations. Male: Antennule short, cylindrical, non-segmented with a few setae. Antenna 2-segmented, first segment (basal segment) with 1 seta, second segment a curved claw with 1 seta and atrophied tip armed with 1 seta. Mandible with 11 teeth on concave and 19 on convex side. Maxillule with 2 setae. Maxilla with 5 teeth and 2 setae on apical segment. Maxilliped 3-segmented, patches of spinules on second segment and hooklet on distal claw. Leg 1 and 2 very reduced with outer basal seta and small exopod with 1-2 setae/spinules. Leg 2 smaller than leg 1.

Remarks. The atrophied tip on the male antenna observed by Kabata (1979a) is confirmed. The median lobe posteriorly on the female trunk reported by Ho (1970) was not found by either Kabata (1979a) or here.

Andreina Brian, 1939.

Type-species. *A. synapturae* Brian, 1939.

Other species. None.

Material examined. Ovigerous female with male from the gills of *Synaptura lusitanica* Capello (Soleidae) (MT I-1938.24058-24064).

Diagnosis. See Ho (1970).

Supplementary Observations. Female: See Brian (1939) for description of female body. Additional description of appendages: Antennule non-segmented with setal arrangement (from proximal to distal): 0-2-2-6. Antenna 2-segmented, terminal segment a claw with a small sclerotized knob. Mandible with one row of ca. 16 teeth on convex side of terminal

blade. Maxillule armed with two setae. Maxilla 2-segmented, terminal segment bearing 2 setae and a row of 14-16 teeth on terminal process. Maxilliped 3-segmented, first segment unarmed, second segment with 2 patches of spinules and terminal segment a small claw with hooklet. Leg 1 biramous, with outer basal seta, exopod with 7 setae and endopod with 4. Leg 2 as leg 1 but with 4 setae on exopod and 3 on endopod. Caudal ramus a pointed process bearing 3 setae.

Male: See Brian (1939) for description of male body. Additional description: Cephalosome fused with first pedigerous somite. Antennule indistinctly segmented with setal formula (from proximal to distal): 1-5. Antenna 2-segmented, terminal segment a claw with atrophied tip armed with 1 seta. Mandible with 7 teeth on convex side. Maxillule with 2 setae. Maxilla with 16-18 teeth and 1 seta on terminal portion. Maxilliped 3-segmented, distal claw naked. Leg 1 uniramous with outer basal seta and 2 setae on exopod. Leg 2 similar but with only 1 seta on exopod. Caudal ramus a spinulose process with 3 setae.

Remarks. The female antenna is similar to that of *Brachiochondrites* Markewitsch, 1940 and of *Ceratochondria* Yü, 1935, in having a small knob which is sclerotized along with the rest of the antenna and forms an integral part of the antenna. Mandibles with unilateral armature are also found in *Heterochondria atypica* Ho, 1972, *Pharodes* and *Praecidochondria* Kabata, 1968.

Apodochondria Ho & Dojiri, 1988.

Type-species. *A. medusae* Ho & Dojiri, 1988.

Other species. None.

Material examined. Oviparous female with male from pectoral fin of *Neosebastes pandus* (Richardson) (Neosebastidae) (SAM C4158-4159).

Diagnosis. See Ho & Dojiri (1988).

Supplementary Observations. None.

Remarks. The apical segment in female antenna (Ho & Dojiri, 1988) has been interpreted as an atrophied tip. The female mandible is unusual (Ho & Dojiri, 1988) in having one row of teeth on the convex side and two rows of teeth on the concave side. This is only seen in *Mecaderochondria* and some *Acanthochondria* and *Chondracanthus* species.

Auchenochondria Dojiri & Perkins, 1979.

Type-species. *A. lobosa* Dojiri & Perkins, 1979.

Other species. None.

Material examined. Ovigerous female with male from oral cavity of *Paralichthys californicus* (Ayres) (Paralichthyidae) caught in Agua Hedionda Lagoon, Carlsbad, California (USNM 171429).

Diagnosis. See Dojiri & Perkins (1979).

Supplementary Observations. None.

Remarks. All aspects of the original description are confirmed.

Bactrochondria Ho, Kim & Kumar, 2000.

Type-species. *B. papilla* Ho, Kim & Kumar, 2000.

Other species. *B. hoi* (Pillai, 1985), *B. longitrunca* (Yamaguti, 1939).

Material examined. Ovigerous female *Bactrochondria papilla* with male from gill filaments of *Cynoglossus dubius* Day (Cynoglossidae) collected by A. B. Kumar from Indian Ocean, off Kerala, India (BMNH 2001.7063-7065).

Diagnosis. See Ho *et al.* (2000).

Supplementary Observations. None.

Remarks. All aspects of the original description of *Bactrochondria papilla* are confirmed.

Berea Yamaguti, 1963.

Type-species. *B. ancoralis* (Bere, 1936).

Other species. *B. clava* Ho & Sey, 1997.

Material examined. One ovigerous female *Berea ancoralis* with male from *Ogocephalus* sp. (Ogocephalidae) collected in Lemon Bay, Florida (USNM 69845 & 79088).

Diagnosis. Amended from Ho (1970). Female: Body oblong, cylindrical. Head consisting of cephalosome only. Neck region (= first pedigerous somite) indistinct. Second, third, and fourth pedigerous somites fused into a large, cylindrical trunk. No body processes present. Antennule modified and fleshy. Antenna clavate, with small recurved hook. Oral appendages as in *Acanthochondria*. Two pairs of bilobate thoracic legs present.

Male: Cephalosome fused with first pedigerous somite, globose, and much larger than remaining parts of body. Metamerism of body indistinct. Antennule slender, cylindrical. Antenna with or without atrophied tip. Oral appendages essentially as in female. Distal claw on maxilliped with or without hooklet. Legs 1 and 2 modified.

Supplementary Observations. Female *B. ancoralis*: Leg 1 and 2 as described by Ho (1970) but with three vestigial setae on exopod of leg 1 and two vestigial setae on exopod of leg 2.

Male *B. ancoralis*: Antenna with atrophied tip armed with 1 seta. Maxillule with 2 setae. Terminal segment of maxilliped a naked claw. Leg 1 with outer basal seta, exopod armed with 2 setae and endopod with 1. Leg 2 similar to leg 1, but endopod naked.

Remarks. Ho (1970) described the ornamentation on leg 1 and 2 as spinules in female *B. ancoralis*. Reexamination of material of the type-species revealed that these elements are located above pores through the cuticle and therefore should be interpreted as setal vestiges. Ho & Sey (1997) did not find an atrophied tip in the male antenna of *Berea clava*.

Blias Krøyer, 1863.

Type-species. *B. prionoti* Krøyer, 1863.

Other species. None.

Material examined. Ovigerous female *Blias prionoti* with male from *Prionotus punctatus* (Bloch) (Triglidae) caught off Ubatuba, Brasil (BMNH 1979.672-680).

Diagnosis. See Ho (1970).

Supplementary Observations. None.

Remarks. All aspects of the redescription by Ho (1970) were confirmed. Male and female maxillae of *B. prionoti* are very different from those of other chondracanthids in having 2 pectinate lamellae on the terminal process.

Brachiochondria Shiino, 1957.

Type-species. *B. pinguis* Shiino, 1957.

Other species. *B. murtii* Rangnekar, 1975.

Species inquirenda. *B. higanfugu* Yamaguti & Yamasu, 1959 (see Ho, 1970).

Material examined. Ovigerous female *Brachiochondria pinguis* with male from *Takifugu poecilonotus* (Temminck & Schlegel) (Tetraodontidae) collected in Seto, Wakayama, Japan, 1954 (University of Mie, Japan, S-302).

Diagnosis. See Shiino (1957) and Ho (1970).

Supplementary Observations. Male: atrophied tip of antenna armed with one seta.

Remarks. The atrophied tip on the male antenna observed by Shiino (1957) was confirmed.

Brachiochondrites Markewitsch, 1940.

Type-species. *B. longicollis* Markewitsch, 1940.

Other species. None.

Material examined. Ovigerous female with male from *Lepidion* sp. (Moridae) (Pacific Biological Station, Nanaimo, B.C., Canada).

Diagnosis. See Kabata (1970).

Supplementary Observations. Female: Antennule unsegmented, fleshy. Antenna as in *Andreina*. Legs 1 and 2 with outer basal seta.

Remarks. The female antenna examined had the apex broken off, but it resembles that of *Andreina*.

Ceratochondria Yü, 1935.

Type-species. *C. brevicollis* (Krøyer, 1863).

Other species. None.

Material examined. Ovigerous female *Ceratochondria brevicollis* with male from *Pseudorhombus* sp. (Pleuronectidae) collected by Kollar, February 1837 in Moluccas, India (NHMW 19537).

Diagnosis. See Krøyer (1863) and Ho (1970).

Supplementary Observations. Female: Antenna as in *Andreina* and *Brachiochondrites*.

Maxillule armed with 2 setae. Maxilliped 3-segmented, terminal segment a naked claw.

Male: Antennule indistinctly segmented. Antenna 2-segmented, terminal segment an unarmed claw. Mandible falcate, 2 rows of teeth. Maxillule with 2 setae. Maxilla of usual form with terminal claw armed with teeth and 1-2 seta. Maxilliped 3-segmented, third segment unarmed; second with patches of spinules; and terminal segment with unarmed claw. Leg 1 uniramous, outer basal seta not observed, 1 seta on exopod. Other legs absent.

Remarks. None.

Chelonichondria Ho, 1994.

Type-species. *C. okamurai* Ho, 1994.

Other species. None.

Material examined. Ovigerous female with male from gill cover of *Coryphaenoides nasutus* Günther (Macrouridae) from Tosa Bay, Japan (USNM 266514).

Diagnosis. See Ho (1994).

Supplementary Observations. None.

Remarks. All aspects of original description are confirmed.

Chondracanthodes Wilson, 1932.

Type-species. *C. deflexus* Wilson, 1932.

Other species. *C. bulbosus* Kabata, 1965, *C. radiatus* (Müller, 1776), *C. tuberosifurcatus* Kabata & Gusev, 1966.

Material examined. Ovigerous female *Chondracanthodes deflexus* with male from unknown host caught in Porcupine Sea Bight area off SW Ireland (50°15'N 14°30'W) (BMNH 1994.3204-3209).

Diagnosis. See Ho (1970).

Supplementary Observations. None.

Remarks. All aspects of the redescription of *Chondracanthus deflexus* by Ho (1970) are confirmed.

Chondracanthus Delaroche, 1811.

Type-species. *C. zeii* Delaroche, 1811.

Other species. *C. angustatus* Heller, 1865, *C. australis* Ho, 1991, *C. barnardi* Ho, 1972, *C. brotulae* Capart, 1959, *C. colligens* Barnard, 1955, *C. cottunculi* Rathbun, 1886, *C. deltoideus* Fraser, 1920, *C. distortus* Wilson, 1922, *C. genypteri* Thomson, 1889, *C. gracilis* Fraser,

1920, *C. heterostichi* Ho, 1972, *C. horridus* Heller, 1865, *C. irregularis* Fraser, 1920, *C. janebennettae* Causey, 1953, *C. lepidionis* Kabata, 1970, *C. lepophidii* Ho, 1974, *C. lophii* Johnston, 1836, *C. lotellae* Thomson, 1889, *C. merluccii* (Holten, 1802), *C. multituberculatus* (Markewitsch, 1956), *C. narium* Kabata, 1969, *C. neali* Leigh-Sharpe, 1930, *C. nodosus* (Müller, 1776), *C. ornatus* Scott, 1900, *C. palpifer* (Wilson, 1912), *C. pinguis* Wilson, 1912, *C. polymixiae* Yamaguti, 1939, *C. psetti* Krøyer, 1863, *C. pusillus* Kabata, 1968, *C. quadratus* (Heegaard, 1945), *C. shiinoi* (Yamaguti, 1963), *C. solidus* (Gusev, 1951), *C. theragrae* Yamaguti, 1939, *C. triventricosus* Sekerak, 1970, *C. tuberculatus* Nordmann, 1832, *C. wilsoni* Ho, 1971, *C. yanezi* Atria, 1980.

Material examined. One ovigerous female *Chondracanthus zeii* with male from unknown host caught of Roscoff, France (BMNH 1975.327-330).

Diagnosis. See Kabata (1979a).

Supplementary Observations. None.

Remarks. This genus is quite heterogeneous. For example, the atrophied tip on the antenna is present in only some of the species. The mandible is typically falcate and bilaterally denticulated but in some species (e.g. *C. psetti* Krøyer, 1863 and *C. heterostichi* Ho, 1972) two rows of teeth have been observed on the concave side (Ho, 1971a and Ho, 1972). This is only seen in *Apodochondria*, *Mecaderochondria* and some *Acanthochondria* species. See Ho (1991) for revision of the genus.

Cryptochondria Izawa, 1971.

Type-species. *C. tricaudata* Izawa, 1971.

Other species. None.

Material examined. None.

Diagnosis. See Izawa (1971).

Supplementary Observations. None.

Remarks. None.

Diocus Krøyer, 1863.

Type-species. *D. gobinus* (Müller, 1776).

Other species. *D. frigidus* (Hansen, 1923), *D. lycenchelus* Hogans & Sulak, 1992,

D. sadoensis (Shiino, 1960), *D. semilunaris* (Kabata & Gusev, 1966).

Material examined. Ovigerous female *Diocus gobinus* with male from unknown host caught off Greenland by Levinsen (ZMUC).

Diagnosis. See Ho (1970). Female: Trunk with 1-2 pairs of lateral processes present; 2-3 pairs of rudimentary legs present.

Supplementary Observations. Female *D. gobinus*: Antennule is similar to that of the male described by Ho (1970). Male *D. gobinus*: Maxillule armed with two setae. Maxilla as in female but lacking teeth on terminal portion.

Remarks. All species of *Diocus* are found in the gill chambers of their hosts except for *D. lycenchelus*, which was found in the nasal cavity of *Lycenchelys verrillii* (Goode & Bean) (cf. Hogans & Sulak, 1992) and *D. semilunaris*, which was found on the skin and fins of *Lycodes diapterus* Gilbert (cf. Kabata & Gusev, 1966).

D. sadoensis and *D. semilunaris* were originally placed in the genus *Parapharodes* Shiino, 1960 (cf. Shiino, 1960; Kabata & Gusev, 1966) because of their similar appearance (small head and horseshoe-shaped trunk in the females) to *Pharodes*. In Ho's (1970) revision it was proposed that *Parapharodes* should be treated as a synonym of *Diocus*.

Heterochondria Yü, 1935.

Type-species. *H. longicephala* (Yü & Wu, 1932).

Other species. *H. atypica* Ho, 1972, *H. crassicornis* (Krøyer, 1837), *H. petila* Ho *et al.*, 2000, *H. pillaii* Ho, 1970, *H. similis* (Yü & Wu, 1932).

Species inquirenda. *H. longa* Tripathi, 1960 (see comments in Ho (1970)).

Material examined. Ovigerous female with male of *Heterochondria petila* from gills of *Pseudorhombus arsius* (Hamilton) (Paralichthyidae) collected from Indian Ocean (USNM 285486). Ovigerous female with male of *Heterochondria atypica* from *Oxyjulis californica* (Günther) (Labridae) (USNM 134671).

Diagnosis. Female as in Ho (1970). Male amended after Ho (1970): Indistinguishable from *Acanthochondria* except antennule slender, cylindrical with few apical setae, or reduced to a seta, or completely absent. Leg 1 can be reduced to 1-2 setae or missing. Leg 2 always absent.

Supplementary Observations. Leg 1 in female *H. petila* unilobate with outer basal seta and 2-3 setae distally on the lobe. Leg 2 similar to leg 1 but with 2 setae distally on lobe.

Remarks. The diagnosis has been amended to include character states exhibited by all the species recognised within the genus. The specific name *Heterochondria atypica* refers to the unusual feature of uniseriate denticulation on the female mandible (Ho, 1972). Mandibles with denticles on only one side are also seen in *Andreina*, *Pharodes* and *Praecidochondria*.

Hoia Avdeev & Kazatchenko, 1985.

Type-species. *H. hoi* Avdeev & Kazatchenko, 1985.

Other species. None.

Material examined. None.

Diagnosis. See Avdeev & Kazatchenko (1985).

Supplementary Observations. None.

Remarks. There is uncertainty concerning the state of maturity of the known female specimens.

Humphreysia Leigh-Sharpe, 1934.

Type-species. *H. floreata* Leigh-Sharpe, 1934.

Other species. *H. hoi* Do & Kasahara, 1982.

Material examined. None.

Diagnosis. See Do & Kasahara (1982).

Supplementary Observations. None.

Remarks. The only described female of *H. floreata* was non-ovigerous and no male was attached to it. This female may be immature. *Humphreysia hoi* is known from both sexes and is, therefore, used for the diagnosis of *Humphreysia* (see Do & Kasahara, 1982).

Immanthe Leigh-Sharpe, 1934.

Type-species. *I. campanulata* Leigh-Sharpe, 1934.

Other species. None.

Material examined. None.

Diagnosis. See Ho (1970).

Supplementary Observations. None.

Remarks. The only female described is non-ovigerous and is suspected to be immature. The existing description of the male is inadequate by modern standards.

Juanettia Wilson, 1921.

Type-species. *J. cornifera* Wilson, 1921.

Other species. *J. continentalis* Villalba & Fernandez, 1985.

Material examined. None.

Diagnosis. See Ho (1970).

Supplementary Observations. None.

Remarks. *Juanettia continentalis* has 4 pairs of legs in the female (Villalba & Fernandez, 1985) compared to *J. cornifera* which has only one pair (Ho, 1970). The description of *J. continentalis* could be based on an immature female, as there is no information given on the sexual status of the specimen. If the adult female of *J. continentalis* is confirmed as having legs 1-4 present, the diagnosis of this genus should be amended to include: “leg 2-4 sometimes present in female”.

Jusheyhoea Villalba & Fernandez, 1985.

Type-species. *J. macrura* Villalba & Fernandez, 1985

Other species. *J. moseri* Kabata, 1991, *J. ryukyuensis* Ho, 1994.

Material examined. None.

Diagnosis. See Kabata (1991).

Supplementary Observations. None.

Remarks. None.

Lagochondria Ho & Dojiri, 1988.

Type-species. *L. nana* Ho & Dojiri, 1988.

Other species. None.

Material examined. Oviparous females with males from *Callionymus* sp. (Callionymidae) collected in the Arafura Sea, Australia (SAM C4160-4161).

Diagnosis. See Ho & Dojiri (1988).

Supplementary Observations. None.

Remarks. All aspects of the original description are confirmed.

Lateracanthus Kabata & Gusev, 1966.

Type-species. *L. quadripedis* Kabata & Gusev, 1966.

Other species. *L. curtus* Kabata, 1993, *L. novus* Kabata, 1992, *L. quadripedis* f. *intermedius* Romero, 2001.

Species inquirenda. *L. macrurus* (Brady, 1883).

Material examined. Non-ovigerous females of *L. curtus* from *Macrourus* sp. (Macrouridae) collected June 1975 at Reykyavik ridge, N. W. Atlantic (BMNH 1993.2-5). Non-ovigerous females of *L. novus* from *Cetonurus* sp. (Macrouridae) collected November 1983 in Australian waters (34°56'S 151°15'E) (BMNH 1991.287).

Diagnosis. See Ho (1970).

Supplementary Observations. None.

Remarks. Ho (1970, 1975b) recognized *Chondracanthus macrurus* Brady, 1883 as an aberrant species of *Lateracanthus*. Kabata (1993) did not accept this interpretation and treated it as a *species inquirenda*.

The descriptions of *L. curtus* and *L. novus* are based on females without egg sacs and with no male attached (Kabata, 1992; 1993). This might indicate that they are not mature, possibly unmated and not yet at full body size. The characters which Kabata (1992, 1993) emphasised as specifically distinct for *L. curtus* and *L. novus* are age-dependent and may change on maturity. Romero (2001) established *L. quadripedis* f. *intermedius* mainly based on the same morphological characters that Kabata (1992, 1993) used for establishing *L. novus* and *L. curtus*. This form of Romero's is considered here as doubtful.

Lernentoma de Blainville, 1822.

Type-species. *L. asellina* (Linnaeus, 1758).

Other species. None.

Material examined. Ovigerous female with male from *Chelidonichthys gurnardus* (Linnaeus) (Triglidae) collected at Robin Hood's Bay off Whitby, Yorkshire, UK (BMNH 1975.667-677).

Diagnosis. See Kabata (1979a).

Supplementary Observations. None.

Remarks. All details presented in the redescription of Ho (1970) and Kabata (1979a) are confirmed. There is considerable confusion in the literature concerning both the generic and specific characters of *Lernentoma*. See Kabata (1979a) for a detailed account on the taxonomic history of this genus.

Markevitchielinus Titar, 1975.

Type-species. *M. anchoratus* Titar, 1975.

Other species. None.

Material examined. None. Types deposited in the parasitological collection at Zoological Institute of Russian Academy of Sciences, St. Petersburg were unavailable. *M. anchoratus* was found in the branchial cavity of *Hemitripterus villosus* (Pallas) (Hemitriptoridae) collected August 1949 in Anam Bay at the Shikotan, Kuril Islands.

Diagnosis. See supplementary observations.

Supplementary Observations. The description published in Russian by Kabata (1979b) is translated and adapted here as follows: "Female: Cephalothorax divided into two parts: 1) Anterior part transversely extended, wider than long, with rounded edges. Antennal part located anterodorsally. Mouth small, anteroventral. 2) Posterior part cylindrical, apparently contractile. Trunk about as wide as long, without processes, but with 3 pairs of rounded, lateral protrusions (Kabata, 1979b: fig. 3 a-c). Pair of cylindrical posterodorsal processes (Kabata, 1979b: fig. 3 d) with small protrusions near base (Kabata, 1979b: fig. 3 d'). Dorsal

surface with tubercle (Kabata, 1979b: fig. 3 e) near posterior end. Body surface smooth, no ornamentation. Genitoabdomen spherical, slightly wider than long with narrow base.

Dimensions of body (in mm): Width of anterior part of cephalothorax: 7.5-20.0; diameter of anterior part of cephalothorax: 1.5-5.0; length of posterior part of cephalothorax: 9.0-11.0; length of trunk: 6.0-10.0; and width of trunk: 6.0-7.0. Antennule (Kabata, 1979b: fig. 6) short and cylindrical, unsegmented, narrowing distally. Apical end armed with short setae (number not clear). Antenna (Kabata, 1979b: fig. 6) 2-segmented, first segment massive, terminal segment a strongly curved claw. Mandible (Kabata, 1979b: fig. 7) falcate, with teeth on both inner and outer margins of terminal blade. Teeth of approximately same size. Paragnath, maxillule and maxilla not found. Maxilliped (Kabata, 1979b: fig. 8) 3-segmented: first segment, strong, unarmed, separated from second by joint. Second segment shorter than first; third segment with curved hook armed with two small spines. Swimming legs absent. Egg sacs cylindrical, unevenly twisted.

Male: Unknown.”

Remarks. The remarks section from Kabata's (1979b) paper on *M. anchoratus* is translated and adapted as follows: “*Markevitchielinus anchoratus* is reminiscent of *Strabax* von Nordmann, 1864 but differs in following characteristics: large gap between antenna and mouth parts. The mouth is very small and difficult to find. The mouth parts are very reduced (e.g. no spinules on medial part of maxilliped) and is clearly smaller than those of the majority of chondracanthid species. The author could not find the maxillule and maxilla in any of the studied specimens. This species also differs from *Strabax* in the shape of the extended, transverse cephalothorax. When on the host the anterior part and almost all of the posterior part of the parasite's cephalothorax is embedded in host tissue. One can speculate that they grow and develop within host tissue and therefore are under the same restrictions characteristic for all crustaceans that live under similar conditions. Host tissue immunity can

reduce growth and hinder development of the anchorage apparatus, e.g. Kabata, 1979b: fig. 5 where half the cephalothorax is clearly smaller than the other half.”

Mecaderochondria Ho & Dojiri, 1987.

Type-species. *M. pilgrimi* Ho & Dojiri, 1987.

Other species. None.

Material examined. Ovigerous females with male from oral cavity of *Kathetostoma giganteum* Haast (Uranoscopidae) caught at Kaikoura, New Zealand (NMNZ Cr. 4639-4640).

Diagnosis. See Ho & Dojiri (1987).

Supplementary Observations. None.

Remarks. All aspects of the original description are confirmed. The mandible in both sexes is quite unusual in having one row of teeth on the convex side and two rows of teeth on concave side. This is shared with female *Apodocondria*, male *Acanthochondria exilipes* (cf. Ho, 1971a) and some *Chondracanthus* species (e.g. male *C. psetti* and both sexes of *C. heterostichi* (cf. Ho, 1977; Ho, 1972)).

Medesicaste Krøyer, 1863.

Type-species. *M. triglarum* Krøyer, 1863.

Other species. *M. penetrans* Heller, 1865.

Material examined. Ovigerous female with two males of *M. penetrans* from *Lepidotrigla cadmani* Regan (Triglidae) collected by A. Capart in the South Atlantic, Stn. 215, 1950 (IRSNB I.G. 16.808).

Diagnosis. See Krøyer (1863) and Ho (1970).

Supplementary Observations. Female: Head very small. Neck long (about three times length of trunk) with pair of lobes approximately at midlength. Neck probably comprising both first

and second pedigerous somites. Trunk small, with one pair of anterolateral processes and one pair of posterolateral processes. Antennule indistinctly 2-segmented with setae on apical segment. Antenna terminating in naked claw. Mandible with two rows of teeth (ca. 20 on convex and 14 on concave side) on terminal blade. Maxillule armed with 2 setae. Maxilla of usual type; apical claw with comb of setae and auxillary spine near base. Maxilliped three-segmented; first segment naked, second segment with patch of denticles and third segment claw bearing small hooklet. Leg 1 bilobed and similar to *Acanthochondria*. Outer basal seta not observed. Other legs missing. Caudal rami forming pointed process with 3 small setae. Male attachment lobes present in genital area.

Male: External body segmentation partly visible. Cephalosome fused with first pedigerous somite, fifth and sixth pedigerous somites also fused. Antennule of typical non-segmented shape with few apical setae. Antenna 2-segmented, first segment with 1 seta, terminal segment a claw with atrophied tip armed with 1 seta. Mandible with 16-20 teeth on convex and 12-20 on concave side of terminal blade. Maxillule armed with 2 setae and a lobe.

Maxilla 2-segmented, second segment with 2 setae and naked terminal process. Maxilliped 3-segmented of usual type, terminal claw with hooklet. Leg 1 and leg 2 similar, biramous, with outer basal seta, exopod armed with 2 setae and endopod naked. Caudal ramus directly attached to genital complex, forming pointed process bearing 3 setae.

Remarks. According to Ho (1970) the only apparent difference between the two species of *Medesicaste* is the location of the paired expansions on the neck. In *M. penetrans* they are located at about the middle of the neck but in *M. triglarum* they are found closer to the head (Ho, 1970). Ho only examined *M. penetrans* and did not confirm this statement by checking material of *M. triglarum*. In the original description of *M. triglarum* by Krøyer (1863) the expansions are described as sitting in a considerable distance from the head as seen in *M. penetrans*. Detailed comparison of both sexes is necessary to determine whether these two

species are valid or whether *M. penetrans* should be treated as junior synonym of *M. triglarum*.

The male antennule described by Krøyer (1863), was reported lacking by Ho (1970). Krøyer's observations are supported by our study. The male *M. penetrans* in Heller's (1865) original description is probably a copepodite as it has fairly clear body segmentation and 4 legs.

Neobrachiochondria Kabata, 1969.

Type-species. *N. quadrata* Kabata, 1969.

Other species. None.

Material examined. Two ovigerous females; one female with male from gills of *Hypoplectrodes nigrorubrum* (Cuvier) (Serranidae) collected at Port Willunga, South Australia (SAM C3373-3374).

Diagnosis. See Kabata (1969).

Supplementary Observations. None.

Remarks. All aspects of the original description are confirmed.

Pharodes Wilson, 1935.

Type-species. *P. tortugensis* Wilson, 1935.

Other species. *P. banyulensis* Delamere-Deboutteville, 1951, *P. biakensis* Illg, 1948, *P. clini* (Vaney & Conte, 1900), *P. ninnii* (Richiardi, 1882).

Material examined. Ovigerous females and males of *P. tortugensis* from the gills of *Scartella cristata* (Linnaeus) (Blenniidae) collected at Dry Tortugas, Florida (USNM 59767 and 69783).

Diagnosis. See Ho (1971b).

Supplementary Observations. Female *P. tortugensis*: Number of setae on atrophied tip of antenna could not be confirmed. Maxilliped 3-segmented, second segment unarmed, third segment terminating in blunt unarmed process.

Remarks. The dorsal protrusion in female *P. tortugensis* in Ho (1971b: p. 352) has been interpreted as a posteromedian process. Female leg 1 is interpreted here as having one outer basal seta and 1 exopodal seta. Legs 1-3 in male *P. tortugensis* has been interpreted as having an outer basal seta. Whether the small blunt processes on male legs 1-2 observed by Ho (1971b) are derived from exopodal setae have been questioned, but could not be confirmed in the material examined.

The mandible was one of the characters in *Pharodes* that was discussed by Østergaard *et al.* (in press). In *Pharodes* the mandible has a terminal blade with a few spinules on one edge. This unilaterally armed mandible was mentioned to occur in *Praecidochondria* as well. Furthermore, unilateral armature was also seen in female *Heterochondria atypica* and both sexes of *Andreina synapturae*.

Praecidochondria Kabata, 1968.

Type-species. *P. galathea* Kabata, 1968.

Other species. *P. setoensis* Izawa, 1975.

Material examined. None.

Diagnosis. See Izawa (1975).

Supplementary Observations. None.

Remarks. The female holotype of *P. galathea* is non-ovigerous and the male is unknown. Furthermore, Kabata (1968) did not dissect the female of *P. galathea* so there is no information on female mouthparts in the diagnosis. Therefore reference to Izawa's (1975) description of an ovigerous female *P. setoensis* with male is necessary to obtain a full

diagnosis. A unilaterally armed mandible is also seen in *Andreina*, *Heterochondria atypica* and *Pharodes*.

Prochondracanthopsis Shiino, 1960.

Type-species. *P. quadricornutus* Shiino, 1960.

Other species. None.

Material examined. None.

Diagnosis. See Shiino (1960) or Ho (1970).

Supplementary Observations. None.

Remarks. None.

Prochondracanthus Yamaguti, 1939.

Type-species. *P. haliichthydis* Yamaguti, 1939.

Other species. *P. platycephali* Ho, 1975.

Material examined. Ovigerous female of *P. platycephali* with male from unidentified Platycephalidae (NMNZ Cr3457).

Diagnosis. Female as in Ho (1970) and male as in Ho (1975a).

Supplementary Observations. Antennule in both sexes 4-segmented.

Remarks. The male of *P. haliichthydis* is unknown.

Protochondracanthus Kirtisinghe, 1950.

Type-species. *P. alatus* (Heller, 1868).

Other species. *P. trilobatus* (Pillai, 1964).

Material examined. Ovigerous female *P. alatus* with male from *Psettodes erumei* (Bloch & Schneider) (Psettodidae) collected in Indian Ocean, Kerala, India (BMNH 2001.7059-7062).

Diagnosis. See Ho (1970). Addition to female diagnosis: Head with or without processes.

Antennule modified, fleshy. Addition to male diagnosis: Leg 1 reduced or missing.

Supplementary Observations. Male *P. alatus*: Leg 1 with two apical setae and one proximal seta.

Remarks. The proximal seta on leg 1 of the male *P. alatus* is interpreted here as the outer basal seta. See Ho *et al.* (2000) for a complete redescription of both *P. alatus* and *P. trilobatus*.

Protochondria Ho, 1970.

Type-species. *P. longicauda* Ho, 1970.

Other species. *P. alaeopis* (Yamaguti, 1939), *P. neopercis* (Yamaguti, 1939).

Material examined. None.

Diagnosis. See Ho (1970).

Supplementary Observations. None.

Remarks. None.

Pseudacanthoanthopsis Yamaguti & Yamasu, 1959.

Type-species. *P. apogonis* Yamaguti & Yamasu, 1959.

Other species. *P. bicornutis* (Shiino, 1960), *P. rohdei* Ho & Dojiri, 1976.

Species inquirenda. *P. secunda* Yamaguti & Yamasu, 1960 (see Ho & Kim, 1995b).

Material examined. Ovigerous female with male of *Pseudacanthoanthopsis apogonis* from *Apogon semilineatus* Temminck & Schlegel (Apogonidae) collected in Tanabe Bay, Wakayama, Japan, 1975 (University of Mie, Japan, K-149). Ovigerous female with male of *Pseudacanthoanthopsis rohdei* from gills of *Pomacanthrus rhodonotus* Bleeker (Pomacentridae) collected at Great Barrier Reef, Queensland, Australia (USNM 168011).

Diagnosis. Amended after Ho (1970). Female: Body short and wide. Head with processes; consisting of cephalosome and first pedigerous somite. Neck short, comprising second pedigerous somite. Third and fourth pedigerous somites fused to form a short, wide trunk, bearing posterior processes. Genitoabdomen and caudal ramus of usual form. Egg sacs cylindrical. Antennule fleshy. Antenna terminating in curved claw with atrophied tip. Mouthparts of usual form, except maxilla which is armed with teeth or unarmed. Leg 1 and leg 2 biramous.

Male: Body with distinct segmentation. Cephalosome fused with first pedigerous somite. Caudal ramus bearing 4 elements, with long slender terminal seta. Antennule segmented. Antenna a curved claw with atrophied tip. Oral appendages essentially as in female. Maxilla armed with teeth. Legs 1 and 2 biramous and unmodified.

Supplementary Observations. Female *P. apogonis*: Leg 1 with outer basal seta, exopod armed with 4-5 setae and endopod with 0-1 seta. Male *P. apogonis*: Maxilliped 3-segmented.

Remarks. Apart from the characters noted under supplementary observations, all aspects of Izawa's (1975) redescription of *P. apogonis* are confirmed. All aspects of Ho & Dojiri's (1976) description of *P. rohdei* are confirmed.

Pseudoblias Heegaard, 1962.

Type-species. *P. lyrifera* Heegaard, 1962.

Other species. None.

Material examined. Ovigerous female with male from a *Pseudorhombus dupliciocellatus* Regan (Paralichthyidae) from Coff's Harbour, NSW, Australia (BMNH 1984.75).

Diagnosis. Female as in Ho (1970). Male: Body indistinctly segmented. Antennule non-segmented, with few apical setae. Antenna 2-segmented, first segment unarmed, terminal segment a naked claw. Mandible with two rows of teeth on terminal blade. Maxillule with 2

setae. Maxilla 2-segmented, second segment with auxillary spine and seta, plus 6 teeth on terminal blade. Maxilliped 3-segmented, first segment naked, second segment with patch of spines, third segment with naked claw. Leg 1 unilobed with one apical seta on exopod. Leg 2 unilobed, without setae. Caudal ramus a spinulose rod with 3 setae.

Supplementary Observations. Male: as listed for amended diagnosis.

Remarks. This is the first description of the adult male.

Pseudochondracanthus Wilson, 1908.

Type-species. *P. diceraus* Wilson, 1908.

Other species. *P. chilomycteri* (Thomson, 1889), *P. hexaceraus* Wilson, 1935, *P. murtii* Rangnekar & Rangnekar, 1954, *P. pseudorhombi* Yamaguti, 1939.

Material examined. Ovigerous female *Pseudochondracanthus diceraus* with male from *Sphoeroides spengleri* (Bloch) (Tetraodontidae) caught at Woods Hole, Massachusetts (USNM 60544).

Diagnosis. See Ho (1970).

Supplementary Observations. None.

Remarks. All aspects of the redescription of *Pseudochondracanthus diceraus* presented by Ho (1970) are confirmed.

Pseudodiocus Ho, 1972.

Type-species. *P. scorpaenus* Ho, 1972.

Other species. None.

Material examined. Ovigerous females from the gill cavity of *Scorpaena guttata* Girard (Scorpaenidae) from California (USNM 134665 and 134672).

Diagnosis. See Ho (1972).

Supplementary Observations. Female: Antennule slender and 4-segmented with setal formula (from proximal to distal): 0-0-3-4. Antennae not seen in any examined females.

Remarks. No males were available for examination and unfortunately the original description (Ho, 1972) does not give clear information on legs 1 and 2.

Pterochondria Ho, 1973.

Type-species. *P. alatalongicollis* (Heegaard, 1940).

Other species. None.

Material examined. Ovigerous female with male from the wall of branchial cavity of *Platycephalus bassensis* Cuvier (Platycephalidae) collected at Pt. Macquarie (BMNH 1984.72).

Diagnosis. See Ho (1973).

Supplementary Observations. Male: Maxilliped 3-segmented, first segment unarmed, second with patches of spinules and third with a naked claw. Caudal ramus a naked, spiniform process.

Remarks. All aspects of original description are confirmed.

Rhynchochondria Ho, 1967.

Type-species. *R. longa* Ho, 1967.

Other species. None.

Material examined. Ovigerous female with 7 males from *Peristedion* sp. (Goode & Bean) (Peristediidae) collected in Florida Straits (USNM113614).

Diagnosis. See Ho (1967).

Supplementary Observations. None.

Remarks. All aspects of original description are confirmed.

Rohdea Kabata, 1992.

Type-species. *R. cryptopoda* Kabata, 1992.

Other species. None.

Material examined. Ovigerous female with male from *Genypterus blacodes* (Forster)

(Ophidiidae) from Point Kembla (34°30'S, 150°54'E), New South Wales, Australia (BMNH 1991.282-286).

Diagnosis. See Kabata (1992).

Supplementary Observations. Male: Antennule 4-segmented with setae on terminal three segments. Antenna not seen. Mandible armed with two rows of teeth on terminal blade.

Maxillule armed with 2 setae. Maxilla as in female but with only 8 teeth on terminal process.

Maxilliped 3-segmented; first segment unarmed, second with patches of spinules and terminal claw with hooklet. Legs 1 and 2 uniramous, both with outer basal seta and 2 setae on exopod.

Caudal ramus a pointed process with 4 setae.

Remarks. The papilla that Kabata (1992) observed on the male antenna is re-interpreted as the atrophied tip, armed with 2 setae.

Scheherazade Leigh-Sharpe, 1934.

Type-species. *S. scheherazade* Leigh-Sharpe, 1934.

Other species. None.

Material examined. None.

Diagnosis. See Ho (1970).

Supplementary Observations. None.

Remarks. The only female ever observed from this genus is non-ovigerous and the male is unknown.

Strabax von Nordmann, 1864.

Type-species. *S. monstrosus* von Nordmann, 1864.

Other species. None.

Material examined. Ovigerous female with male from *Scorpaena scrofa* Linnaeus (Scorpaenidae) collected at Umhloti, Natal, South Africa (BMNH 1982.226).

Diagnosis. See Ho (1970).

Supplementary Observations. Male: Antenna 2-segmented, first segment (basal segment) with 1 seta, second segment terminating in claw, atrophied tip armed with 6 elements. Mandible armed with row of 10 teeth on convex side and 6-7 teeth on concave side of terminal blade. Maxilla with 1 seta and 2 teeth on terminal process. Maxilliped 3-segmented: basal segment unarmed, second segment with patch of short spinules, and third segment a curved naked claw. Legs 1 and 2 as described in Ho (1970).

Remarks. The long neck of the female, which is fully embedded into the host tissue, is interpreted as comprising first and second pedigerous somites. Female mouthparts have never been dissected, so there is no clear information on them.

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Appendix 1

Species of Chondracanthidae that have been relegated to synonymy.

Species	Synonym – Current valid name
<i>Acanthoanthopsis quadratus</i> Heegaard, 1945	<i>Chondracanthus quadratus</i> (Heegaard, 1945)
<i>Acanthochondria albigutta</i> Pearse, 1952	<i>Acanthochondria galerita</i> (Rathbun, 1886)
<i>Acanthochondria bulbosus</i> Heegaard, 1943	<i>Acanthochondria tchangi</i> (Yü, 1935)
<i>Acanthochondria chilensis</i> (Wilson, 1918)	<i>Acanthochondria phycidis</i> (Rathbun, 1886)
<i>Acanthochondria chilomycteri</i> (Thomson, 1889)	<i>Pseudochondracanthus chilomycteri</i> (Thomson, 1889)
<i>Acanthochondria crassicornis</i> (Krøyer, 1837)	<i>Heterochondria crassicornis</i> (Krøyer, 1837)
<i>Acanthochondria deltoidea</i> (Fraser, 1920)	<i>Chondracanthus deltoideus</i> Fraser, 1920
<i>Acanthochondria depressa</i> (Scott, 1905)	<i>Acanthochondria cornuta</i> (Müller, 1776)
<i>Acanthochondria flurae</i> (Krøyer, 1863)	<i>Acanthochondria cornuta</i> (Müller, 1776)
<i>Acanthochondria gemina</i> Heegaard, 1962	<i>Acanthochondria platycephali</i> Heegaard, 1940
<i>Acanthochondria genypteri</i> (Thomson, 1889)	<i>Chondracanthus genypteri</i> Thomson, 1889
<i>Acanthochondria gurnardi</i> Olsson, 1868	<i>Lernentoma asellina</i> (Linnaeus, 1758)
<i>Acanthochondria hazekuti</i> Yamaguti, 1939	<i>Acanthochondria brevicorpa</i> Yü, 1935
<i>Acanthochondria holocephalarum</i> Kabata, 1968	<i>Acanthochondria epachthes</i> (Wilson, 1908)
<i>Acanthochondria latili</i> Capart, 1959	<i>Acanthochondria exilipes</i> Wilson, 1932
<i>Acanthochondria ophidii</i> Yamaguti, 1963	<i>Acanthochondria ophidii</i> (Krøyer, 1863)

- Acanthochondria palpifera* Oakley, 1930
- Acanthochondria psetti* Oakley, 1930
- Acanthochondria purpurea* Oakley, 1930
- Acanthochondria sicyasis* Oakley, 1930
- Acanthochondria solida* Gusev, 1951
- Acanthochondria tenuis* Pearse, 1952
- Acanthochondrites inflatus* (Bainbridge, 1909)
- Acanthochondrites japonicus* Gusev, 1951
- Acanthochondrites laevirajae* Valle 1880
- Acanthochondrites pallidus* (van Beneden, 1870)
- Anops cornuta* Oken, 1815
- Anops gobina* Oken, 1815
- Anops radiatus* Oken, 1815
- Barnardia colligens* Yamaguti, 1963
- Berea nellcauseyae* (Causey, 1955)
- Berea tenuis* Pearse, 1952
- Blias molestus* Heller, 1865
- Ceratochondria hoi* Pillai, 1985
- Ceratochondria longitruncus* (Yamaguti, 1939)
- Chondracanthodes lotellae* Wilson, 1935
- Chondracanthodes lotellae* Yamaguti, 1963
- Chondracanthodes radiatus* Brian, 1912
- Chondracanthoides deflexus* Oakley, 1930
- Chondracanthus palpifer* (Wilson, 1912)
- Chondracanthus psetti* Krøyer, 1863
- Acanthochondria phycidis* (Rathbun, 1886)
- Acanthochondria sicyasis* (Krøyer, 1863)
- Chondracanthus solidus* (Gusev, 1951)
- Berea ancoralis* (Bere, 1936)
- Acanthochondrites annulatus* (Olsson, 1868)
- Acanthochondrites annulatus* (Olsson, 1868)
- Acanthochondrites annulatus* (Olsson, 1868)
- Acanthochondrites annulatus* (Olsson, 1868)
- Acanthochondria cornuta* (Müller, 1776)
- Diocus gobinus* (Müller, 1776)
- Chondracanthodes radiatus* (Müller, 1776)
- Chondracanthus colligens* Barnard, 1955
- Berea ancoralis* (Bere, 1936)
- Berea ancoralis* (Bere, 1936)
- Blias prionoti* (Krøyer, 1863)
- Bactrochondria hoi* (Pillai, 1985)
- Bactrochondria longitruncus* (Yamaguti, 1939)
- Chondracanthus irregularis* Fraser, 1920
- Chondracanthus lotellae* Thomson, 1889
- Chondracanthodes deflexus* Wilson, 1932
- Chondracanthodes deflexus* Wilson, 1932

<i>Chondracanthoides radiatus</i> (Müller, 1776)	<i>Chondracanthodes radiatus</i> (Müller, 1776)
<i>Chondracanthoides rickettsi</i> Wilson, 1935	<i>Chondracanthodes deflexus</i> Wilson, 1932
<i>Chondracanthopsis cottunculi</i> Oakley, 1930	<i>Chondracanthus cottunculi</i> Rathbun, 1955
<i>Chondracanthopsis dogieli</i> Markewitsch, 1956	<i>Chondracanthus irregularis</i> Fraser, 1920
<i>Chondracanthopsis multituberculatus</i> Markewitsch, 1956	<i>Chondracanthus multituberculatus</i> (Markewitsch, 1956)
<i>Chondracanthopsis nodosus</i> Oakley, 1930	<i>Chondracanthus nodosus</i> (Müller, 1776)
<i>Chondracanthus abdominalis</i> Heegaard, 1943	<i>Chondracanthus lophii</i> Johnston, 1836
<i>Chondracanthus alatus</i> Heller, 1865	<i>Protochondracanthus alatus</i> (Heller, 1868)
<i>Chondracanthus annulatus</i> Olsson, 1868	<i>Acanthochondrites annulatus</i> (Olsson, 1868)
<i>Chondracanthus bifurcatus</i> Capart, 1959	<i>Chondracanthus angustatus</i> Heller, 1865
<i>Chondracanthus bleckeri</i> Richiardi, 1881	nomen nudum
<i>Chondracanthus brevicollis</i> Krøyer, 1863	<i>Ceratochondria brevicollis</i> (Krøyer 1863)
<i>Chondracanthus briani</i> Yü & Wu, 1932	<i>Acanthochondria briani</i> (Yü & Wu, 1932)
<i>Chondracanthus chilensis</i> Wilson, 1918	<i>Acanthochondria phycidis</i> (Rathbun, 1886)
<i>Chondracanthus chilomycteri</i> Thomson, 1889	<i>Pseudochondracanthus chilomycteri</i> (Thomson, 1889)
<i>Chondracanthus clavatus</i> Bassett-Smith, 1896	<i>Acanthochondria clavata</i> (Bassett-Smith, 1896)
<i>Chondracanthus congiopodi</i> Barnard, 1955	<i>Chondracanthus tuberculatus</i> Nordmann, 1832
<i>Chondracanthus cornutus</i> Cuvier 1830	<i>Acanthochondria cornuta</i> (Müller, 1776)
<i>Chondracanthus crassicornis</i> Krøyer, 1837	<i>Heterochondria crassicornis</i> (Krøyer, 1837)
<i>Chondracanthus cynoglottidis</i> Thompson & Scott, 1903	<i>Acanthochondria cynoglottidis</i> (Thompson & Scott, 1903)

- Chondracanthus delarochiana* Cuvier, 1830
- Chondracanthus depressus* Scott, 1905
- Chondracanthus dogieli* Gusev, 1951
- Chondracanthus dufresnii* de Blainville, 1822
- Chondracanthus elongatus* Bassett-Smith, 1898
- Chondracanthus epachthes* Wilson, 1908
- Chondracanthus flurae* Krøyer, 1863
- Chondracanthus galeritus* Rathbun, 1886
- Chondracanthus gibbosus* Krøyer 1837
- Chondracanthus gibbosus* Shiino, 1955
- Chondracanthus gobinus* Krøyer, 1837
- Chondracanthus grandigenitalis* Yü & Wu, 1932
- Chondracanthus gurnardi* Olsson, 1868
- Chondracanthus inflatus* Bainbridge, 1909
- Chondracanthus laevirajae* Valle, 1880
- Chondracanthus larochii* Krøyer, 1837
- Chondracanthus limandae* Krøyer, 1863
- Chondracanthus longicephalus* Yü & Wu, 1932
- Chondracanthus lophii* Barnard, 1955
- Chondracanthus lophius* Risso, 1826
- Chondracanthus macrurus* Brady, 1883
- Chondracanthus merlangi* Krøyer, 1863
- Chondracanthus lophii* Johnston, 1836
- Acanthochondria cornuta* (Müller, 1776)
- Chondracanthus irregularis* Fraser, 1920
- Chondracanthus lophii* Johnston, 1836
- Acanthochondria elongata* (Bassett-Smith, 1898)
- Acanthochondria epachthes* (Wilson, 1908)
- Acanthochondria cornuta* (Müller, 1776)
- Acanthochondria galerita* (Rathbun, 1886)
- Chondracanthus lophii* Johnston, 1836
- Chondracanthus shiinoi* (Shiino, 1955)
- Diocus gobinus* (Müller, 1776)
- Acanthochondria grandigenitalis* (Yü and Wu, 1932)
- Lernentoma asellina* (Linnaeus, 1758)
- Acanthochondrites annulatus* (Olsson, 1868)
- Acanthochondrites annulatus* (Olsson, 1868)
- Chondracanthus zeii* Delaroche, 1811
- Acanthochondria limandae* (Krøyer, 1863)
- Heterochondria longicephala* (Yü & Wu, 1932)
- Chondracanthus barnardi* Ho, 1972
- Chondracanthus lophii* Johnston, 1836
- Lateracanthus macrurus* (Brady, 1883)
- Chondracanthus merlucii* (Holten, 1802)

- Chondracanthus ninnii* Richiardi, 1882 *Pharodes ninnii* (Richiardi, 1882)
- Chondracanthus ophidii* Krøyer, 1863 *Acanthochondria ophidii* (Krøyer, 1863)
- Chondracanthus pallidus* van Beneden, 1870 *Acanthochondrites annulatus* (Olsson, 1868)
- Chondracanthus palpifer* Brian, 1944 *Chondracanthus australis* Ho, 1991
- Chondracanthus phycidis* Rathbun, 1886 *Acanthochondria phycidis* (Rathbun, 1886)
- Chondracanthus pingi* Yü & Wu, 1932 *Acanthochondria pingi* (Yü & Wu, 1932)
- Chondracanthus radiatus* (Müller, 1776) *Chondracanthodes radiatus* (Müller, 1776)
- Chondracanthus rectangularis* Fraser, 1920 *Acanthochondria rectangularis* (Fraser, 1920)
- Chondracanthus rickettsi* Wilson, 1935 *Chondracanthodes deflexus* Wilson, 1932
- Chondracanthus sicyasis* Krøyer, 1863 *Acanthochondria sicyasis* (Krøyer, 1863)
- Chondracanthus similis* Yü & Wu, 1932 *Heterochondria similis* (Yü & Wu, 1932)
- Chondracanthus sixteni* Wilson, 1922 *Acanthochondria sixteni* (Wilson, 1922)
- Chondracanthus slastinicovi* Gusev, 1951 *Chondracanthus pinguis* Wilson, 1912
- Chondracanthus soleae* Krøyer, 1837 *Acanthochondria soleae* (Krøyer, 1837)
- Chondracanthus stramineus* Wilson, 1923 *Chondracanthus merlucii* (Holten, 1802)
- Chondracanthus triglae* Krøyer, 1837 *Lernentoma asellina* (Linnaeus, 1758)
- Chondracanthus trilobatus* Pillai, 1964 *Protochondracanthus trilobatus* (Pillai, 1964)
- Chondracanthus williamsoni* Scott, 1909 *Chondracanthus nodosus* (Müller, 1776)
- Chondracanthus xyphiae* Guerin, 1829 *Chondracanthus merlucii* (Holten, 1802)
- Diocus clini* Krøyer, 1863 *Pharodes clini* (Vaney & Conte, 1900)
- Disphaerocephalus horridus* Delamare-Deboutteville, 1952 *Chondracanthus horridus* Heller, 1865
- Disphaerocephalus ornatus* Oakley, 1930 *Chondracanthus ornatus* Scott, 1900

<i>Entomoda cornuta</i> (Müller, 1776)	<i>Acanthochondria cornuta</i> (Müller, 1776)
<i>Entomoda gobina</i> Larmarck, 1816	<i>Diocus gobinus</i> (Müller, 1776)
<i>Entomoda radiata</i> (Müller, 1776)	<i>Chondracanthodes radiatus</i> (Müller, 1776)
<i>Lernacantha delarochiana</i> de Blainville, 1822	<i>Chondracanthus lophii</i> Johnston, 1836
<i>Lernacantha delarochiana</i> de Blainville, 1822	<i>Chondracanthus zeii</i> Delaroche, 1811
<i>Lernaea asellina</i> Linnaeus 1758	<i>Lernentoma asellina</i> (Linnaeus, 1758)
<i>Lernaea cornuta</i> Müller, 1776	<i>Acanthochondria cornuta</i> (Müller, 1776)
<i>Lernaea gobina</i> Müller, 1776	<i>Diocus gobinus</i> (Müller, 1776)
<i>Lernaea merlucii</i> Holten, 1802	<i>Chondracanthus merlucii</i> (Holten, 1802)
<i>Lernaea nodosa</i> Müller, 1776	<i>Chondracanthus nodosus</i> (Müller, 1776)
<i>Lernaea radiata</i> Müller, 1776	<i>Chondracanthodes radiatus</i> (Müller, 1776)
<i>Lernaeomyzon triglae</i> de Blainville, 1822	<i>Lernentoma asellina</i> (Linnaeus, 1758)
<i>Lernentoma cornuta</i> de Blainville, 1822	<i>Acanthochondria cornuta</i> (Müller, 1776)
<i>Lernentoma dufresnii</i> de Blainville, 1822	<i>Chondracanthus lophii</i> Johnston, 1836
<i>Lernentoma gobina</i> de Blainville, 1822	<i>Diocus gobinus</i> (Müller, 1776)
<i>Lernentoma gurnardi</i> (Olsson, 1868)	<i>Lernentoma asellina</i> (Linnaeus, 1758)
<i>Lernentoma lophii</i> Baird, 1850	<i>Chondracanthus lophii</i> Johnston, 1836
<i>Lernentoma nodosa</i> de Blainville, 1822	<i>Chondracanthus nodosus</i> (Müller, 1776)
<i>Lernentoma radiata</i> (Müller, 1776)	<i>Chondracanthodes radiatus</i> (Müller, 1776)
<i>Lernentoma trigla</i> de Blainville, 1822	<i>Lernentoma asellina</i> (Linnaeus, 1758)
<i>Medesicaste asellinum</i> Scott & Scott, 1913	<i>Lernentoma asellina</i> (Linnaeus, 1758)
<i>Medesicaste triglarum</i> Valle, 1880	<i>Lernentoma asellina</i> (Linnaeus, 1758)
<i>Oralien asellinus</i> Bassett-Smith, 1899	<i>Lernentoma asellina</i> (Linnaeus, 1758)
<i>Oralien trigla</i> (de Blainville, 1822)	<i>Lernentoma asellina</i> (Linnaeus, 1758)
<i>Parapharodes sadoensis</i> Shiino, 1960	<i>Diocus sadoensis</i> (Shiino, 1960)

<i>Parapharodes semilunaris</i> Kabata & Gusev, 1966	<i>Diocus semilunaris</i> (Kabata & Gusev, 1966)
<i>Prochondracanthopsis bicornutus</i> Shiino, 1960	<i>Pseudacanthocanthopsis bicornutus</i> (Shiino, 1960)
<i>Prochondracanthus alaeopsis</i> Yamaguti, 1939	<i>Protochondria alaeopsis</i> (Yamaguti, 1939)
<i>Prochondracanthus neopercis</i> Yamaguti, 1939	<i>Protochondria neopercis</i> (Yamaguti, 1939)
<i>Protochondracanthoides angustatus</i> Heller, 1865	<i>Chondracanthus angustatus</i> Heller, 1865
<i>Pseudochondracanthoides hexaceraus</i> Wilson, 1935	<i>Pseudochondracanthus hexaceraus</i> Wilson, 1935
<i>Pseudochondracanthus elongatus</i> Pearse, 1952	<i>Pseudochondracanthus diceraus</i> Wilson, 1908
<i>Pseudochondracanthus longitruncus</i> Yamaguti, 1939	<i>Bactrochondria longitruncus</i> (Yamaguti, 1939)
<i>Pseudochondracanthus nellcauseyae</i> Causey, 1955	<i>Berea ancoralis</i> (Bere, 1936)
<i>Pseudochondracanthus</i> sp. Pillai, 1964	<i>Bactrochondria hoi</i> (Pillai, 1985)
<i>Rylovia argatula</i> Markewitsch, 1940	<i>Acanthochondria argatula</i> (Markewitsch, 1940)
<i>Trichthacerus molestus</i> Heller, 1868	<i>Blias prionoti</i> (Krøyer, 1863)
<i>Trichthacerus peristedii</i> Krøyer, 1863	<i>Blias prionoti</i> (Krøyer, 1863)
<i>Triphyllacanthus ancoralis</i> Bere, 1936	<i>Berea ancoralis</i> (Bere, 1936)
<i>Triphyllacanthus molestus</i> Oakley, 1930	<i>Blias prionoti</i> (Krøyer, 1863)
<i>Tucca</i> sp. Pearse, 1952	<i>Blias prionoti</i> (Krøyer, 1863)
<i>Tuccopsis pinguis</i> Pearse, 1952	<i>Blias prionoti</i> (Krøyer, 1863)
