

# BRILL

Two New Species of Clavella (Copepoda, Siphonostomatoida, Lernaeopodidae) and a New Species of Lophoura (Copepoda, Siphonostomatoida, Sphyriidae): Parasites on the Deep-Water Fish, Nezumia

pulchella from the Northern Chilean Coast Author(s): Raul Castro and M. T. Gonzalez

Source: Crustaceana, Vol. 82, No. 4 (Apr., 2009), pp. 411-423

Published by: Brill

Stable URL: http://www.jstor.org/stable/27743296

Accessed: 24-02-2016 02:34 UTC

#### **REFERENCES**

Linked references are available on JSTOR for this article: http://www.jstor.org/stable/27743296?seq=1&cid=pdf-reference#references\_tab\_contents

You may need to log in to JSTOR to access the linked references.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <a href="http://www.jstor.org/page/info/about/policies/terms.jsp">http://www.jstor.org/page/info/about/policies/terms.jsp</a>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Brill is collaborating with JSTOR to digitize, preserve and extend access to Crustaceana.

http://www.jstor.org

# TWO NEW SPECIES OF *CLAVELLA* (COPEPODA, SIPHONOSTOMATOIDA, LERNAEOPODIDAE) AND A NEW SPECIES OF *LOPHOURA* (COPEPODA, SIPHONOSTOMATOIDA, SPHYRIIDAE): PARASITES ON THE DEEP-WATER FISH, *NEZUMIA PULCHELLA* FROM THE NORTHERN CHILEAN COAST

BY

RAUL CASTRO R.1,3) and M. T. GONZALEZ<sup>2,4</sup>)

 Universidad de Antofagasta, Depto. Acuicultura, Casilla 170, Antofagasta, Chile
Universidad de Antofagasta, Instituto de Investigaciones Oceanológicas, Casilla 170, Antofagasta, Chile

#### **ABSTRACT**

Three new species of parasitic copepods were isolated from the macrourid fish, *Nezumia pulchella* (Pequeño, 1971), caught along the northern Chilean coast, and are described and illustrated herein. *Clavella singularis* n. sp. is characterized by the shape and armature of the second antenna, and, by a combination of characteristics, can be distinguished from all other congeneric species bearing a genital process. *Clavella fortis* n. sp. is characterized by a strong cephalosome and by a combination of characteristics that also differentiates it from its congeners with a genital process. The new species, *Lophoura unilobulata* is characterized by the presence of a simple holdfast, with one lobe on each side of the neck. With this report, the number of reported *Clavella* species parasitizing fish from the Chilean coast increases to nine. In addition, the *L. unilobulata* reported herein represents the third record of a *Lophoura* species parasitizing a species of the genus *Nezumia* and represents the first record of the genus in the southeastern Pacific ocean; it is also the third record of a species of the family Sphyriidae occurring along the Chilean coast.

### RESUMEN

Tres nuevas especies de copépodos parásitos sobre un macrourido, *Nezumia pulchella* desde la costa norte de Chile son descritas e ilustradas. *Clavella singularis* n. sp. se caracteriza por la forma y armadura de la segunda antena y puede ser distinguida de todas sus congéneres, con proceso genital, por una combinación de caracteres. *Clavella fortis* n. sp. se caracteriza por su fuerte cefalosoma, es también diferenciada de sus congéneres con proceso genital, por una combinación de características. La nueva especie *Lophoura unilobulata* se caracteriza por la presencia de una estructura de anclaje simple, con sólo un lóbulo sobre cada lado de su cuello. Con este reporte el número de especies de

© Koninklijke Brill NV, Leiden, 2009 Also available online: www.brill.nl/cr Crustaceana 82 (4): 411-423 DOI:10.1163/156854008X400586

<sup>&</sup>lt;sup>3</sup>) e-mail: rcastro@uantof.cl

<sup>4)</sup> e-mail: mtgonzalez@uantof.cl

Clavella en la costa de Chile se incrementa a nueve. L. unilobulata es el tercer registro de una especie de Lophoura parasitando a especies de Nezumia. Adicionalmente, este descubrimiento representa el primer registro del género en el Pacífico Sur Este, y es la tercera especie de Sphyriidae habitando la costa de Chile.

#### INTRODUCTION

The members of the genus *Clavella* (Oken, 1815) are ectoparasites on teleost fishes ranging from those living in the neritic zone (the primary hosts) to the deep-sea species of the family Macrouridae (Pisces, Teleostei). *Clavella* species can live on the fin base, fin rays, opercular inner surface, gills, or branchial arches. This genus contains a total of 34 species, of which only nine have been reported from deep-sea fishes. *Clavella* spp. parasitizing deep-sea fishes are known from the studies of Nunes-Ruivo (1962), Kabata (1963, 1979, 1992), Kazatchenko & Avdeev (1977), Ho (1993), and Castro (1994). *Clavella convergentis* isolated from *Nezumia convergens* (Garman, 1899) residing in northern Chile was reported and described by Castro (1994). Thus, the present study represents the third report of a species of *Clavella* parasitizing *Nezumia* spp.

The family Sphyriidae includes nine genera: Driocephalus Raibaut, 1999 (also known as Thamnocephalus Diebakate, Raibaut & Kabata, 1997), Opimia C. B. Wilson, 1908, Paenocanthus Kabata, 1965, Tripaphyllus Richiardi, 1878, Paeon C. B. Wilson, 1919, Norkus Dojiri & Deets, 1988, Periplexis C. B. Wilson, 1919, Sphyrion Cuvier, 1830, and Lophoura Kölliker, 1853 (see also Diebakate et al., 1997; Benz et al., 2006). Species of Lophoura are mesoparasites (a parasitic copepod that lives partly embedded in its host) on deep-sea fishes. These species live on the flank musculature of the fish, with the cephalosome buried in the host body penetrating to near the internal organs or, in some cases, close to the vertebral column. This genus belongs to the Sphyrion clade in the cladogram of sphyriids (Dojiri & Deets, 1988). Sphyriids comprise 18 nominal species including the oldest Lophoura species, those described by Ho (1989), and one most recently described by Boxshall (2000). All of them are parasites on deepsea fishes belonging to the orders Gadiformes (Macrouridae: Coryphaenoides, Coelorhynchus, Nezumia, and Ventrifossa) and Anguilliformes (Synaptobranchids: Synaptobranchus, Histobranchus). Species of Lophoura exhibit a relatively high degree of host specificity, each species having been reported parasitizing only one or two host species (Boxshall, 1988).

The body of *Lophoura* species comprises a cephalosome with small distal lobes (head region), a long and cylindrical neck, and a trunk region of variable shape. The joint between the cephalosome and neck is indicated by the presence of a holdfast of variable shape. In some species the holdfast is a simple lobe,

in others the lobe is ramified. The only species without a holdfast is *Lophoura simplex*, a parasite of *Histobranchus bathybius* (cf. Boxshall, 2000). The trunk bears ramified posterior processes and a small genital process. The abdomen can be minute or more developed. The species has extremely reduced appendages, such as the antenna. Antennule, maxillula, and maxilla (as a simple lobe), and thoracic appendages are absent (Ho & Kim, 1989). The taxonomy of the genus has been based primarily on the presence of a holdfast near the cephalosome and neck joint; holdfast shape, neck size, trunk shape, shape of the posterior processes, and the presence and development of a genital process are used in the generic systematics as well.

Sphyriidae that have been recorded from fishes along the Chilean coast are Sphyrion laevigatum (Quoy & Gaimard, 1824) [= Sphyrion kingi (Atria, 1977)] and Paeon triakis Castro, 2001. The present report is the first record of a Lophoura species from the Chilean coast and the third record of a Lophoura species parasitizing a species of the genus Nezumia. In this report, we describe and illustrate two Clavella and one Lophoura species found parasitizing Nezumia pulchella (Pequeño, 1971) from northern Chile.

#### MATERIAL AND METHODS

The parasites were collected from 165 specimens of *Nezumia pulchella* caught between 25°37′S and 29°13′S at a depth of 300-400 m as a by-catch in a squat lobster fishery. The copepods were collected with tweezers and fixed in 70% alcohol. Appendages were dissected for drawings and measurements. Drawings were made using a camera lucida, and measurements were conducted using a reticulated eye piece.

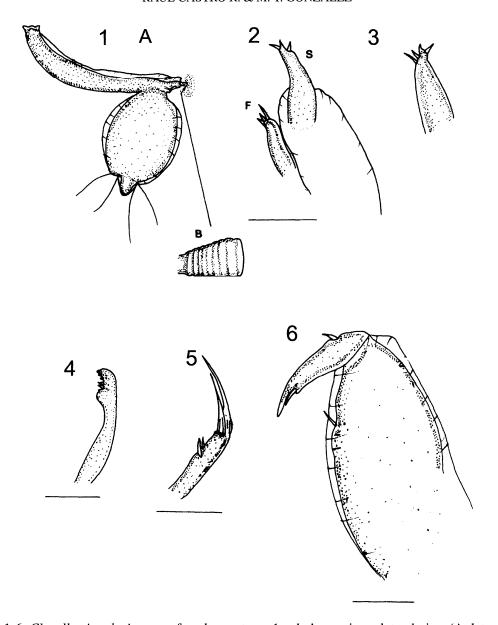
#### **RESULTS**

# Clavella singularis n. sp.

(figs. 1-12)

Material examined. — Six females (holotype, MNHNCL CP  $N^o$  15099 and 5 paratypes, MNHNCL CP  $N^o$  15100), collected from the teleost fish host *Nezumia pulchella* (Pequeño, 1971) caught between Taltal (25°37′S 70°45′W) and Coquimbo (29°13′S 71°35′W), Chile. Specimens were living on the branchial arches of their host with a prevalence of 15%; a single male was collected from the female genital area.

Description of female (fig. 1). — Cephalosome subcylindrical, a little longer than trunk, with the same width all along its length. Trunk sub-oval, with a short genital process. Second maxilla short, including fine, short duct of the maxillary glands.



Figs. 1-6. *Clavella singularis* n. sp., female paratype. 1, whole specimen lateral view (A, lateral; B, maxilla and bulla); 2, antennule and second antenna (F, antennule; S, second antenna); 3, antennule detail; 4, mandible; 5, first maxilla; 6, maxilliped. Scale bars: 2, 4, 5,  $6 = 25 \mu m$ .

Measurements (based on 10 specimens; ranges in parentheses): cephalosome 1,799  $\mu$ m (1,670-1,932  $\mu$ m) long, 223  $\mu$ m (180-256  $\mu$ m) wide; trunk 1,040  $\mu$ m (769.9-1,256  $\mu$ m) long, and 830.6  $\mu$ m (609-974  $\mu$ m) wide; second maxilla 448  $\mu$ m (385-615  $\mu$ m) long, 160.9  $\mu$ m (128-231  $\mu$ m) wide; genital process 114.5  $\mu$ m (102-122  $\mu$ m) long, 132.1  $\mu$ m (102-183  $\mu$ m) wide; egg sac 2,256  $\mu$ m (1,795-2,744  $\mu$ m) long, 245.8  $\mu$ m (205-321  $\mu$ m) in diameter.

Female antennule (fig. 2) short, armed with only three elements. Second antenna (figs. 2, 3) apparently uniramous, endopod a long axis. Terminal segment armed

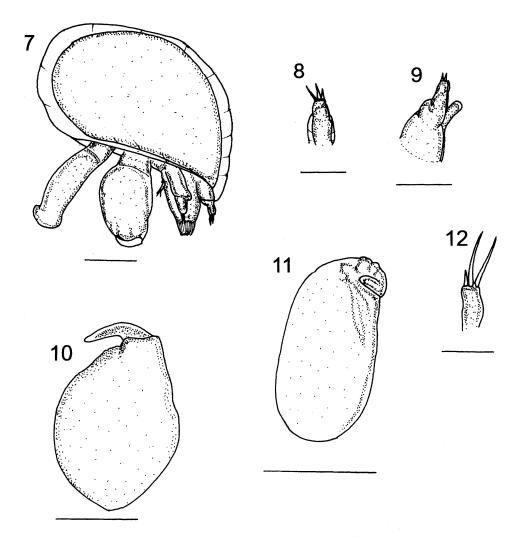
with centro-distal lobular process bearing one seta on one side and two on the other.

Female mandible (fig. 4) with dental formula P1P1S1 B3. Maxillule (fig. 5) slender, with short exopod armed with two unequal setae and endopod with two setae of different size. No accessory dorsal setae or spinulose area on dorsal surface. Maxilla (fig. 1) very short, with fused branches. Bulla (fig. 1B) short, with manubrium passing imperceptibly into anchor and bearing nine well-defined flanges. Maxilliped (fig. 6) strong, with robust corpus and a myxal area armed with only one seta; subchela with a simple seta on proximal section, with accessory seta near distal end and margin apparently without spinules.

Description of male (fig. 7). — Male was typical of *Clavella*. Total length 280  $\mu$ m (one specimen). Cephalosome and trunk fused, acute anteriorly, wider and more rounded in the posterior end than anteriorly. No genital process present. First antenna (fig. 8) apparently with three segments; distal two segments similar in size to basal segment. Distal armature of only three setae, one of which short and two long. Second antenna (fig. 9) had an endopod with two segments and a distal segment armed with only two setae. Exopod short, rounded at the distal end, and apparently unarmed. Maxillule (fig. 12) with two distal setae and one short seta on basis. Maxilla and the maxilliped oriented ventrally and separated from each other. Second maxilla (fig. 10) subchelate, with strong corpus and strongly curved subchela. Maxilliped (fig. 11) with rectangular basal segment and a blunt claw with small lobes on its surface.

Etymology. — The name *singularis* refers to the simple armature of the second antenna. It is an adjective agreeing in gender with the (feminine) generic name.

Remarks. — This species belongs to the group of *Clavella* of which the representatives bear a genital process. *C. singularis* n. sp. differs from the other species of this group in that the antennule is armed with only three elements, the second antenna is uniramous and armed with three elements, and the mandible has a dental formula P1P1S1 B3. In this group, the species *C. parva* (C. B. Wilson, 1922), *C. embiotocae* (Dojiri, 1981), and *C. adunca* (Strøm, 1762) have a biramous second antenna. The remaining species that have a uniramous second antenna are *C. collaris* (Ho, 1993), *C. squamigera* (C. B. Wilson, 1915) (both have scales on the second maxilla), *C. tumidula* (Kabata, 1992), *C. alata* (Brian, 1909), *C. canaliculata* (C. B. Wilson, 1915), and *C. perfida* (C. B. Wilson, 1911); the latter four are distinct from the new species with respect to the type of second maxilla. The other species of this group include *C. sokodara* (Ho, 1993), which differs by the shape of the second maxilla, the shape of the bulla, and by small differences in all the other appendages, and *C. longicauda* (Ho, 1993), which differs by the



Figs. 7-12. Clavella singularis n. sp., male paratype. 7, whole specimen left lateral view; 8, antennule; 9, second antenna; 10, first maxilla; 11, second maxilla; 12, maxilliped. Scale bars: 7,  $11, 12 = 50 \mu m$ ; 8, 9,  $10 = 25 \mu m$ .

elongated bulla (the bulla is short in the species described herein), the armature of the first and second antenna, and the dental formula of the mandible.

C. okamurai (Ho, 1993) differs from the present species by the shape of the trunk, which has two lobes in C. okamurai and is suboval in the new species, and also by differences in the armature of the first and second antennae.

The widely distributed *C. adunca* differs from *C. singularis* n. sp. by the armature of the first and second antennae in addition to the biramous condition of the second antenna. The second antenna is uniramous in the present species. The mandible shows differences among both species. We therefore propose the new taxon *Clavella singularis* n. sp. in order to accommodate specimens of *Clavella* parasitizing *Nezumia pulchella*, and primarily characterized by the type and armature of the second antenna.

# Clavella fortis n. sp.

(figs. 13-21)

Material examined. — Five females (holotype, MNHN CP N<sup>o</sup> 15101 and one paratype, MNHN CP N<sup>o</sup> 15102) were collected from the branchial arches of the teleost host fish *Nezumia pulchella* (Pequeño, 1971) caught between Taltal (25°37′S 70°45′W) and Coquimbo (29°13′S 71°35′W), Chile, with a prevalence of 3%. No males were collected.

Description of female (figs. 13A, 14, 15). — Cephalosome longer than trunk, wide at distal end. Second maxilla shorter than trunk and left and right appendages fused along their length. Bulla (fig. 13B) oblong and of medium size. Aliform protrusion developed at base of second maxilla. Trunk wider than long, with rounded margin and presenting conspicuous lobes, especially in ventral view. Genital process present.

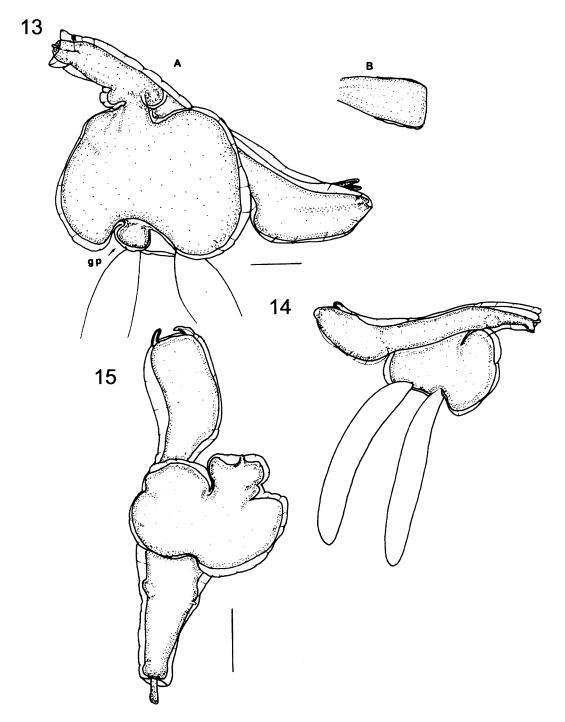
Measurements (based on 10 specimens; ranges in parentheses): cephalosome 2,001  $\mu$ m (1,487-2,359  $\mu$ m) long, 557  $\mu$ m (462-718  $\mu$ m) wide. Second maxilla 818  $\mu$ m (564-923  $\mu$ m) long, 372  $\mu$ m (282-538  $\mu$ m) wide. Bulla 280  $\mu$ m (274-282  $\mu$ m) long, 131  $\mu$ m (128-142  $\mu$ m) wide. Trunk 1,148  $\mu$ m (718-1,538  $\mu$ m) long, 2,001  $\mu$ m (1,870-2,590  $\mu$ m) wide. Genital process 330  $\mu$ m (230-512  $\mu$ m) long, 246  $\mu$ m (205-512  $\mu$ m) wide. Egg sac 2,431  $\mu$ m (1,538-2,794  $\mu$ m) long, 307  $\mu$ m (282-333  $\mu$ m) in diameter.

Antennule (fig. 16) three-segmented, with distal two segments similar in size to basal segment. Distal armature of six elements (1, 2, 3, 4, 5, 6). No flagellum detected.

Second antenna (figs. 17, 18) uniramous, globose, distally armed with small lobes containing spinules, and three spines at its base. Mandible (fig. 19) with dental formula P3B3 and no secondary dentition. Maxillule (fig. 20) exopod armed with short papillae containing two unequal short setae; endopod with two typical, long setae (spinules on dorsal part of endopod not detected). Maxilla (fig. 13) bearing bulla with short manubrium passing imperceptibly to anchor, and lacking flanges on surface. Maxilliped (fig. 21) strong, with myxal area containing a seta and a patch of spinules. Subchela armed with accessory seta and spinules at its base.

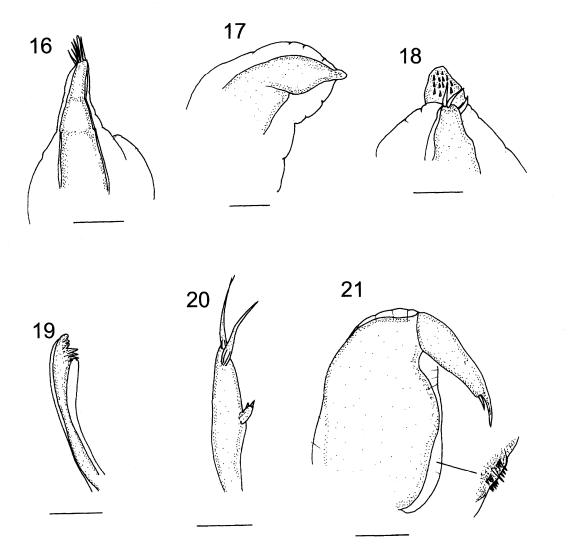
Etymology. — The name *fortis* refers to the robust appearance of the cephalosome. It is an adjective agreeing in gender with the feminine generic name.

Remarks. — This species belongs to the genus *Clavella* and to the group bearing a genital process, similarly as *C. singularis* n. sp. This new species can be distinguished from the other species of this group (*C. adunca*, *C. parva*, *C. sokodara*, *C. longicauda*, *C. okamurai*, *C. collaris*, *C. tumidula*, and *C. embiotocae*) by the aspect of the trunk, which forms lobes, and by the large cephalosome, neither of which have been observed in any other *Clavella* species.



Figs. 13-15. Clavella fortis n. sp., female paratypes. 13A, whole specimen ventral view (gp, genital process); 13B, anchor of bulla; 14, whole specimen dorsolateral view; 15, other whole specimen, ventral view. Scale bars:  $13 = 250 \ \mu m$ ,  $15 = 500 \ \mu m$ .

The uniramous second antenna is a condition shared with some other *Clavella* species bearing genital processes; the second antenna is biramous in *C. embiotocae* and *C. parva. C. fortis* n. sp. resembles *C. perfida* and *C. adunca* with respect to



Figs. 16-21. *Clavella fortis* n. sp., female appendages. 16, antennule; 17, second antenna; 18, second antenna distal armature; 19, mandible; 20, first maxilla; 21, maxilliped and detail of myxal area. Scale bars: 16, 19,  $20 = 25 \mu m$ ;  $17, 21 = 50 \mu m$ ;  $18 = 20 \mu m$ .

the presence of a distal lobule containing spinules and three elements. However, in the new species the distal lobule is minute and has three setae at the base. The mandible has a dental formula P3B3; the lack of secondary dentition is different from the majority of *Clavella* species, but is similar to that of the other species described herein.

C. fortis n. sp. can be differentiated from C. sokodara by the shape of the bulla and trunk, the first maxilla, and by the mandibular dentition. C. longicauda can clearly be distinguished from C. fortis by the shape of the trunk, the mandibular dentition, and the type of second antenna. C. okamurai differs from the new species by the trunk aspect, which is drawn out laterally and does not project. In addition, other differences were observed in the armature of the mandible and second antenna.

C. collaris differs from C. fortis by the shape of the trunk and by the second maxilla, which is completely fused and forms a distal, enlarged collar, unlike the normally developed second maxilla of C. fortis. Moreover, differences are also found in the second antenna and the mandible. Finally, this new species differs from C. singularis by the shape of the trunk, of the bulla, the armature of the first antenna, and the type and armature of the second antenna. We therefore propose the new taxon Clavella fortis n. sp. to accommodate these Clavella specimens.

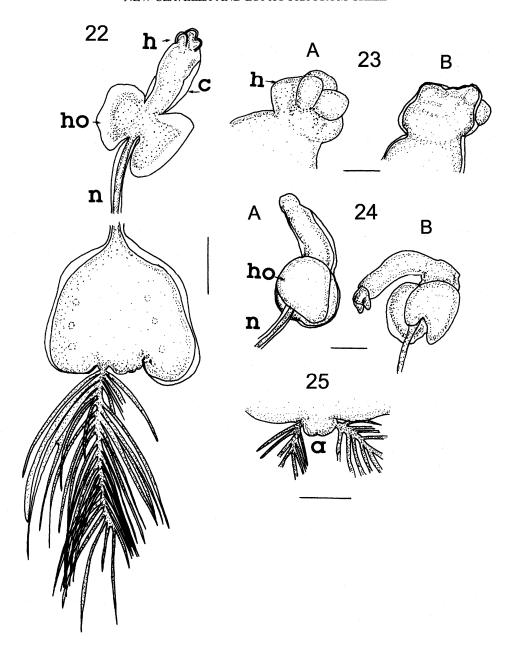
The discovery of *Clavella singularis* n. sp. and *Clavella fortis* n. sp. increases the number of identified *Clavella* species parasitizing fishes from the Chilean coast to nine: *C. applicata* Castro & Baeza, 1985, *C. caudata* Castro & Baeza, 1985, *C. simplex* Castro & Baeza, 1985, *C. parva* C. B. Wilson, 1922, and *C. chiloensis* Castro, 1994 are all parasites of inshore fishes, and *C. adunca* (Strøm, 1762) *C. convergentis* Castro, 1994, and the two new species presented in this study (*C. singularis* and *C. fortis*) are parasites on *Nezumia pulchella*, a deep-sea fish. The identification of *C. singularis* and *C. fortis* also increases the number of reported *Clavella* species parasitizing rattail fishes of the genus *Nezumia* from the Chilean coast to three. The first species was described by Castro (1994) as *C. convergentis* parasitizing *N. convergens*. These three species have distinct overall morphologies, particularly with respect to the trunk, the second maxilla, and the other appendages. In addition, both *Clavella* species described herein have a genital process, whereas *C. convergentis* does not.

# Lophoura unilobulata n. sp.

(figs. 22-25)

Material examined. — Two females (holotype, MNHNCL CP N° 15103) collected from teleost host fish *Nezumia pulchella* (Pequeño, 1971) caught between Taltal (25°37′S 70°45′W) and Coquimbo (29°13′S 71°35′W), Chile. Specimens were attached with their cephalosome buried in the lateral musculature of the host, close to the pectoral or dorsal fins, with a prevalence of 3%. No males were collected.

Description of female (fig. 22). — Cephalothorax short: shorter and wider than neck. Head (figs. 23, 24) also short. Holdfast (figs. 22, 24A–B) located between cephalosome and neck and comprising two large, plain lobes (one on each side, each as long as cephalothorax). Holdfast margin subcircular in lateral view (fig. 24). In one specimen, the posterior margin of the holdfast was split (fig. 24B). Neck slender, with similar diameter along its length. Trunk pear-shaped with a distinct abdomen (fig. 25). Stalk of posterior processes cylindrical (fig. 22), narrow, and arising laterally from abdomen (fig. 25). Each stalk bearing approx. 36 processes: processes long (some longer than trunk) and simple, but some are bifid as well.



Figs. 22-25. Lophoura unilobulata n. sp., female paratype. 22, whole specimen (neck detail is cut to reduce display size) (c, cephalothorax; h, head; ho, holdfast; n, neck); 23, head ventral view (A, ventral; h, head) and lateral view (B, lateral); 24, cephalosome and holdfast, lateral view of typical (left) and other (right) specimen (A, left; B, right; ho, holdfast; n, neck); 25, abdomen and position of processes (a, abdomen). Scale bars:  $22 = 5,000 \ \mu m$ ;  $23 = 500 \ \mu m$ ;  $24 = 1,500 \ \mu m$ ;  $25 = 2,300 \ \mu m$ .

Measurements (based on two specimens; ranges in parentheses): head 999.5  $\mu$ m (717-1,282  $\mu$ m) long, 1,102  $\mu$ m (1,025-1,179  $\mu$ m) wide. Cephalosome 6,307  $\mu$ m (3,461-9,153  $\mu$ m) long, 1,282  $\mu$ m (1,282-1,282  $\mu$ m) wide. Neck 13,485.5  $\mu$ m (11,536-15,435  $\mu$ m) long, 3,718.5  $\mu$ m (3,590-3,847  $\mu$ m) wide. Holdfast 2,538  $\mu$ m (2,512-2,564  $\mu$ m) long, 2,485.5  $\mu$ m (2,484-2,487  $\mu$ m) wide. Trunk 7,500  $\mu$ m

 $(7,000-8,000 \ \mu\text{m}) \ \text{long}, \ 8,000 \ \mu\text{m} \ \text{(no variation in width observed)} \ \text{wide}. \ \text{Stalk}$  processes 22,000  $\mu\text{m} \ (19,000-25,000 \ \mu\text{m}) \ \text{long}.$ 

No appendages observed.

Etymology. — The name *unilobulata* refers to the holdfast having one lobule on each side. It is an adjective agreeing in gender with the feminine generic name.

Remarks. — Lophoura Kölliker, 1853 includes a total of 18 nominal species. The specimens we observed parasitizing Nezumia pulchella have simple lobes on the cephalosome and neck that are common in only three other species: Lophoura bouvieri (Quidor, 1912), L. gracilis (C. B. Wilson, 1919), and L. edwardsii (Kölliker, 1853). L. unilobulata n. sp. can be differentiated from those species by the shape of the trunk, the development of the abdomen, and by the presence of a well defined and simple lobe at each side of the neck, distinctly separated from the cephalosome: there are three median-size lobes in L. bouvieri and five small lobes in L. gracilis and L. edwardsii (cf. Brian, 1912). The specimens of L. unilobulata we collected displayed some variation in the holdfast lobes; one had lobes in which the posterior margin was separated into two lobes. The present species can be distinguished from the other species of the genus by the position of the length of the stalk bearing the processes, and by the length of the processes. L. simplex can be distinguished from L. unilobulata by the lack of a holdfast. In addition, L. unilobulata n. sp. can be discriminated from L. caparti (Nunes-Ruivo, 1962) by the presence of a simple dilatation and by the shape of the trunk. The presence of a holdfast with simple lobes separates the present species from all species bearing a ramified holdfast. Consequently, we propose the new taxon Lophoura unilobulata n. sp. to accommodate these *Lophoura* specimens parasitizing *N. pulchella*.

Only two *Lophoura* species have been reported as parasites on *Nezumia* species: *L. tetraloba* (Ho & Kim, 1989) was discovered on *N. condylura* Jordan & Gilbert, 1904, and *L. bouvieri* (Quidor, 1912) was discovered on *N. bairdii* (Goode & Bean, 1877). The present report, in which *L. unilobulata* was found parasatizing *N. pulchella*, is the first record of the genus *Lophoura* along the coast of Chile. Three species have been reported for the northern Pacific Ocean: *L. cardusa* (Leigh-Sharpe, 1934), *L. kamoharai* (Yamaguti, 1939), and *L. cornuta* (Ho, 1989). Three species belonging to three genera of Sphyriidae have now been identified parasitizing fishes from the Chilean coast: *Sphyrion laevigatum* (Quoy & Gaimard, 1824), *Paeon triakis* (Castro, 2001), and *L. unilobulata* (presented herein).

#### **ACKNOWLEDGMENTS**

The authors thank Ximena Salinas for collecting the parasite samples and Carrie Auld for editing an earlier draft. The fish were collected with support given by the Fishery Investigation Projects: FIP N° 2006-04 and FIP N° 2006-11. This study was partially supported by FONDECYT, Postdoctoral N° 3060054 granted to MTGY.

#### REFERENCES

- BENZ, G. W., K. NAGASAWA, A. YAMAGUCHI, B. C. MCMEANS & A. MCELWAIN, 2006. New host and ocean records for *Driocephalus cerebrinoxius* (Sphyriidae, Siphonostomatoida) and a reconsideration of phylogeny within Sphyriidae. Acta Ichthyol. et Pisc., **36** (1): 1-9.
- BOXSHALL, G. A., 1988. Host specificity in copepod parasites of deep-sea and mid-water fishes. Syst. Parasitol., 47: 173-181.
- —, 2000. Parasitic copepods (Copepoda: Siphonostomatoida) from deep-sea and mid-water fishes. Syst. Parasitol., **47**: 173-181.
- CASTRO, R., 1994. Two new species and a new record of *Clavella* (Oken, 1815) (Copepoda Lernaeopodidae) parasitic on fishes from the Chilean coast. Est. Oceanol., **13**: 23-33.
- DIEBAKATE, C., A. RAIBAUT & Z. KABATA, 1997. *Thamnocephalus cerebrinoxius* n. g., n. sp. (Copepoda: Sphyriidae), a parasite in the nasal capsules of *Leptocharias smithii* (Müller & Henle, 1839) (Pisces; Leptocharidae) off the coast of Senegal. Syst. Parasitol., **38**: 231-235.
- DOJIRI, M. & G. DEETS, 1988. *Norkus cladocephalus* new genus, new species (Siphonostomatoida; Sphyriidae) a copepod parasitic on an elasmobranch from southern California waters, with a phylogenetic analysis of the Sphyridae. Journ. Crust. Biol., **8** (4): 679-687.
- Ho, J.-S., 1993. New species of *Clavella* (Copepoda: Lernaeopodidae) parasitic on Japanese rattails (Pisces, Macrouridae). Publs Seto mar. biol. Lab., **36** (3): 107-118.
- Ho, J.-S. & I. H. Kim, 1989. *Lophoura* (Copepoda Sphyriidae) parasitic on the rattails (Pisces Macrouridae) in the Pacific, with notes on *Sphyrion lumpi* from the Sea of Japan. Publs Seto. mar. biol. Lab., **34** (1/3): 37-54.
- KABATA, Z., 1963. A new species of *Clavella* (Copepoda: Lernaeopodidae) from the South Atlantic. Crustaceana, **5**: 257-262.
- —, 1979. One poorly known and two new species of the parasitic Copepoda from the collection of the Zoological Institute in Leningrad. Parazit., **13** (2): 43-49.
- —, 1992. Copepoda parasitic on Australian fishes XIV. An assemblage of bathypelagic species. Journ. nat. Hist., London, **26**: 9-45.
- KAZATCHENKO, V. N. & G. N. AVDEEV, 1977. Parasitic copepods (Crustacea) collected during 57<sup>th</sup> cruise of Vityaz in the western tropical Pacific and seas of the Indo-Malayan Archipelago. Trudy Inst. Okeanol., **107**: 30-48.
- NUNES RUIVO, L., 1962. Deux espèces nouvelles de Lernaeopodidae (Copepoda) parasites de poissons de profondeur. Crustaceana, 6 (3): 175-178.

First received 5 February 2008. Final version accepted 2 August 2008.