

HISTORIA NATURAL

Tercera Serie | Volumen 9 (2) | 2019/29-40

DESCRIPTION OF *Careproctus fueguensis* SP. NOV. (TELEOSTEI, LIPARIDAE) FROM BEAGLE CHANNEL (TIERRA DEL FUEGO, ARGENTINA)

*Descripción de Careproctus fueguensis sp. nov. (Teleostei, Liparidae) del Canal de Beagle
(Tierra del Fuego, Argentina)*

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Resumen. Se describe una nueva especie de pez lipárido capturado en aguas costeras entre los 6 -18 m de profundidad, de las Islas Bridges, Canal Beagle. La nueva especie se distingue de sus congénicas por la siguiente combinación de caracteres: 3 radiales (2+0+1), los dos superiores escotados; dos fenestrae en la placa basal de la cintura escapular; placa hipural dividida casi hasta su base; aleta pectoral no escotada, con 26 radios; un pliegue cutáneo transversal detrás del disco ventral; D 29; A 25; C 12; 36 vértebras (9+27); poros cefálicos 2-6-7-3. Cuerpo de color uniformemente anaranjado. Se discuten las relaciones de la nueva especie con *C. pallidus* y *C. falklandicus*.

Palabras clave. Pisces, Taxonomía, babosas, especie nueva, Suramérica.

Abstract. A new coastal species of liparid fish captured in shallow waters of about 6-18 m depth surrounding the Bridges Islands, Beagle Channel, is described. The new species can be distinguished from its congeners by the following combination of characters: 3 (2+0+1) radials, the two upper being notched; 2 fenestrae in the basal lamina of the pectoral girdle; hypural plates divided nearly to its base; an unnotched pectoral fin with 26 rays; a transverse pocket-like skin fold behind the ventral disk; D 29; A 25; C 12; 36 (9+27) vertebrae; cephalic pores 2-6-7-3. Body uniformly orange. The relationships of the new species with *C. pallidus* and *C. falklandicus* are discussed.

Key words. Pisces, taxonomy, snailfishes, new species, South America.

INTRODUCTION

Knowledge of the diversity of the family Liparidae has substantially increased over the past 15-20 years, with more than 334 species of 29 genera being listed by Chernova *et al.* (2004). In the Southern Hemisphere, this family is composed of about five genera with over 150 species (Stein and Andriashev, 1990; Stein *et al.*, 2001; Andriashev, 2003; Stein, 2006). Particularly for Argentina, there are descriptions of deep-water liparids from the east coast of Patagonia (Andriashev, 1991a; 1991b). Liparid species are usually described from a few or single specimens, thus highlighting the importance of every new record (Chernova, 2006). For example, they are poorly represented in museum collections of South America, where their habitats in deeper waters of the continental slope and abyssal plain are infrequently sampled.

The genus *Careproctus*, a member of family Liparidae, comprises over 105 species worldwide, distributed in the shelf, bathyal, and abyssal waters of the oceans (Chernova, 2006). Matallanas and Pequeño (2000) described two new species of *Careproctus*: *C. patagonicus* and *C. magellanicus* from the Drake Passage. De Buen (1961) described *Careproctus crassus* based on a single ripe female of 90 mm TL from Melchor Island (Chile), having a transverse pocket-like skin fold behind the ventral disk, and distinguished it from the related *C. pallidus* (Vaillant, 1888) by the higher number of rays in the pectoral fin. The holotype of *C. crassus* that had been deposited at the Estación de Biología Marina, Montemar, near Valparaíso was destroyed or lost due to the tsunami that struck Valparaíso in 1968 and devastated the fish collection of Montemar (Stein *et al.*, 1991). The original and sole description of *C. crassus* is inadequate as the pectoral girdle and hypural complex were omitted but it could not be

completed because of the loss of the holotype. According to Stein *et al.* (1991), De Buen (1961) provided apparently reliable measurements of relative head length (25.5% SL), body depth (34.5% SL), snout length (35% HL), preanal-fin length (60% SL), anal-fin base length (165% HL) and disk width (55% HL), among others.

Stein *et al.* (1991) redescribed the syntypes of *C. pallidus* and examined a ripe female of 68 mm SL (CAS 60515: over a *Macrocystis* plant, Punta Toro, Navarino Island, 6-8 m depth), which was initially identified and catalogued as *Careproctus cf. crassus*, concluding that it represented *C. pallidus*. However, this specimen had only 26 and 27 pectoral-fin rays instead of the 37 as originally described for *C. pallidus*, thus indicating that it belonged to a different species.

Andriashev (1997) designated CAS 60515 as the neotype of *C. crassus* and argued that this species should be considered a junior synonym of *C. pallidus*, because the only difference between them, the number of rays in the pectoral fin, was found to be the result of a misprint in the original publication of *C. crassus*. Further, he redescribed *Careproctus pallidus* mainly from the CAS 60515 specimen (pectoral radials rounded, without notches, and hypural plates completely fused with no traces of a cleft), as well as from X-ray photographs of the syntypes. Until now, Vaillant's species is the only coastal species of *Careproctus* known from South America (Andriashev, 1997; Chernova *et al.*, 2004; Stein, 2005).

Careproctus is distinguished by the following characters: disk present, single nostril, pseudobranchs absent, and pectoral fin with fewer rays than anal fin (Burke, 1930; Kido, 1988). The diagnosis of the genus was emended by Orr and Maslenikov (2007) to include the variegated color pattern of the body.

In the Bridges Islands (54°52.3'S; 68°16.56'W) (Figure 1), Beagle Channel,

a specimen of *Careproctus* was captured by hand during low tide in shallow water at about 6 to 18 m depth. It was found on the rocky bottom, lying near other fish species and macrobenthic fauna typical of the Magellan region. This fish was initially identified as *Careproctus pallidus* by having, behind the ventral disk, a transverse pocket-like skin fold with a caudally-directed opening. The presence of a post-disk fold is specific to *C. pallidus* (De Buen, 1961; Stein *et al.*, 1991; Andriashev, 1997; Stein, 2005). However, a detailed examination of the

specimen, including X-rays and staining of the pectoral girdle, revealed that it is actually a new species described below.

MATERIAL AND METHODS

The holotype was captured in the Bridges Islands (54°52.3'S; 68°16.56'W), Beagle Channel, Tierra del Fuego, and deposited in the Ichthyological Collection of the Museo Argentino de Ciencias Naturales Bernardino Rivadavia (MACN-ICT 9514).

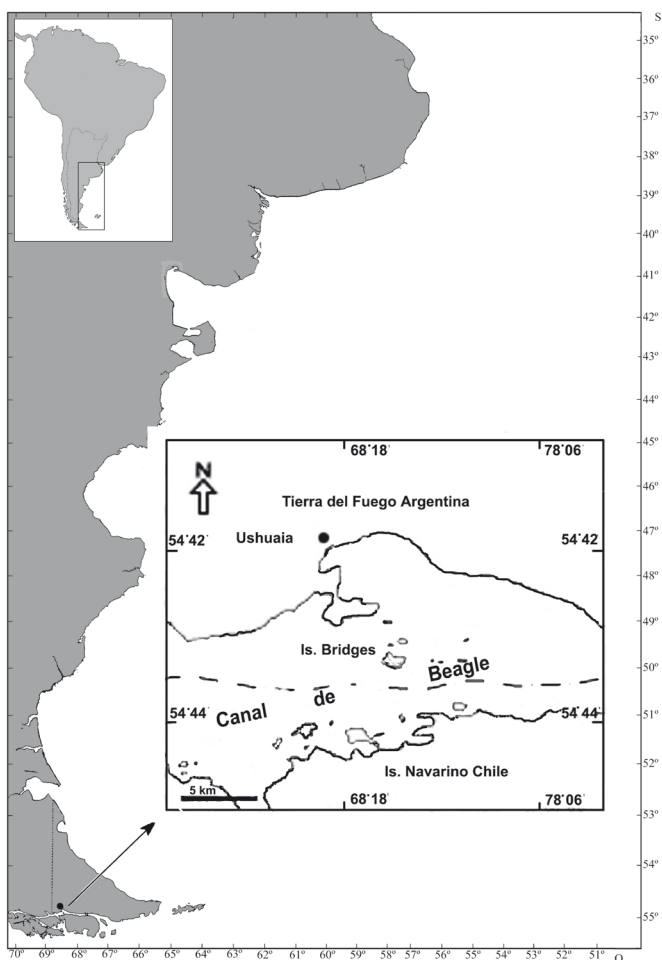


Figure 1 - Map location of *Careproctus fueguensis* new species holotype.

Counts, measurements and terminology follow Stein (1978), Kido (1988), Andriashev and Stein (1998), and Stein *et al.* (2001). Pore nomenclature follows Stein and Andriashev (1990), who developed a standard terminology for pore and canal to be used in liparid taxonomy consistent with that used in other families. The pair of terminal mandibular pores (one on each side of the mandibular symphysis), named the symphyseal pores (Andriashev and Stein, 1998) or chin pores (Stein *et al.*, 2001), are of taxonomic value at the species level because they frequently remain even though the remainder of the skin is missing or damaged (Andriashev and Stein, 1998). The specimen was X-rayed to record both shape and meristics of axial skeleton and vertical fins. Vertebral counts include the hypural complex. Measurements of predorsal-fin and preanal-fin lengths were made from radiographs. To study the endochondral pectoral girdle morphology, the right pectoral fin and girdle of the holotype were removed and stained following the method of Andriashev *et al.* (1977). Ratios are given as % SL, and % HL. Counts and morphometric ratios are given in Table 1. Abbreviations: TL, total length; SL, standard length; HL, head length; A, anal fin; D, dorsal fin; C, caudal fin; P, pectoral fin; R, radials (n: notched radial; r: rounded, unnotched; F, fenestrae; V, vertebrae. To minimize damage to the specimen and because abdominal dissection is unnecessary for species identification, the number of pyloric caeca as well as the color of stomach and peritoneum are not provided.

RESULTS

Careproctus fueguensis sp. nov.

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(Figures 2, 3A y 3B y 4; Tables 1-2).

Holotype. MACN-ICT 9514 (Museo Argentino de Ciencias Naturales Bernardino Rivadavia), 47 mm TL, Bridges Islands coastal waters, Beagle Channel, Argentina, 54°52.3'S; 68°16.56'W, captured by hand during low tide, 16 January 1990.

Diagnosis. Radials 3 (2+0+1), two upper notched. Two fenestrae in cartilaginous basal lamina. Hypural complex fused only at base, with well-developed cleft. Pectoral fin unnotched, with 26 rays. Transverse pocket-like skin fold with caudally-directed opening behind the ventral disk. D 29; A 25; C 12 (1+5/5+1); vertebrae 36 (9+27); pleural ribs 2; cephalic pores: 2-6-7-3. Body color uniformly bright orange.

Description of the holotype. Body short, without prickles. Preanal distance one-half SL, predorsal distance 1.2 times HL (Figure 3A). Ventral disk well-developed, nearly round, posterior margin rounded. Transverse pocket-like skin fold with caudally-directed opening and genital papilla protruding behind ventral disk (Figure 3B). Length of gill slit almost twice eye diameter, opens just above pectoral fin base. Dorsal end of gill slit remains open and a vertical cleft extending ventrally to uppermost 2-3 pectoral fin rays appears when opercular flap is closed.

Head depressed, length 1/3 SL, width 0.9 times HL, depth 2.2 times HL. Mouth subterminal, horizontal, cleft reaching posterior margin of nasal tube. Mandibular and premaxillary teeth distinctly tricuspid, middle cusp larger than lateral ones. Teeth arranged in 12-13 regular oblique rows of 8-9 teeth each near symphysis and 2-4 teeth posteriorly; innermost teeth larger. Eye small, about 1/7 HL, near dorsal profile of head. Interorbital region flat, width 2.2 times HL. Snout blunt; thick snout fold, smooth, not scalloped. Nostril single, with tube as long as wide, above upper mar-

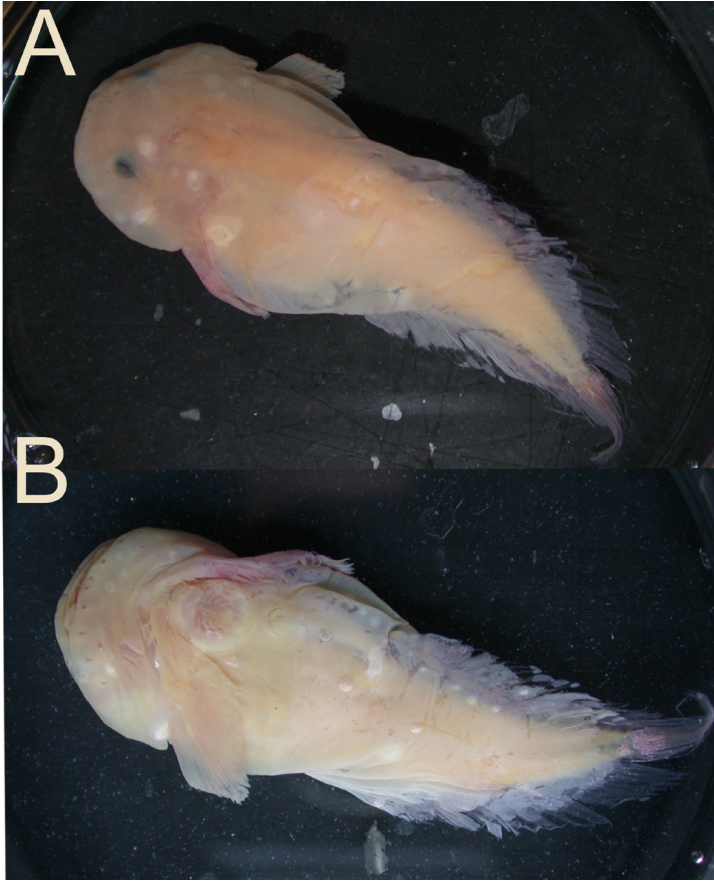


Figure 2 - *Careproctus fueguensis* new species. Holotype SL 37.5 mm, MACN-ICT 9514. **A:** dorsal view. **B:** ventral view.

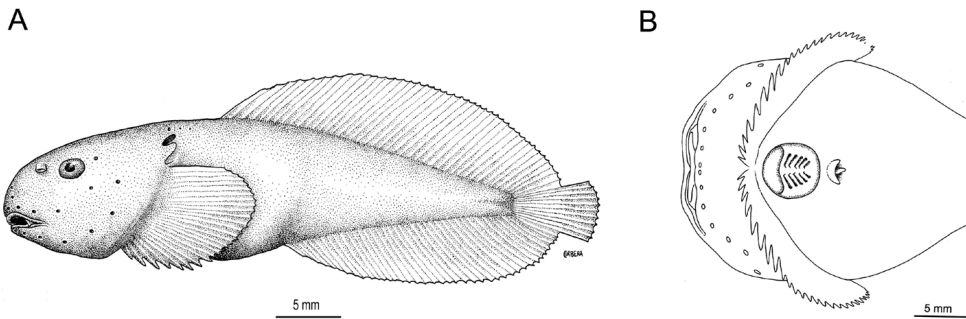


Figure 3 - *Careproctus fueguensis* new species. Holotype, MACN-ICT 9514, 47 mm TL, 37.2 mm SL. **A:** left lateral view showing general shape, pore pattern and gill slit. **B:** ventral view showing preoperculummandibular pores, ventral disk and transverse pocket-like skin fold with genital papilla.

gin of eye. Cephalic pores small, 2-6-7-3. Mandibular pores very small; interspace between chin pores (pm1-pm1) 2/3 that between pm1 and pm2, distance between pm1 and pm2 less than 3/4 that between pm2 and pm3. Infraorbital pores 6, including junction or first postorbital pore. Temporal pores 3, first one above posterior

end of gill slit, other two behind it (Figures 3A and 3B).

Pectoral fin with 26 rays unnotched, not reaching anal fin origin. Uppermost pectoral fin ray inserted about horizontal through center of eye. Upper 12 pectoral-fin rays closely spaced, remaining pectoral-fin rays become gradually more widely spaced, 10 ventralmost pectoral-fin rays with exerted tips. Three pectoral radials: 2+0+1 (Figure 4). Upper radial (Rn1) notched on its lower edge, Rn2 notched on upper and lower edges and Rn rounded, unnotched. Cartilaginous basal lamina of pectoral girdle with two interradiar fenestrae, upper fenestra between Rn1-Rn2, lower fenestra smaller and associated with ventral notch of Rn2. Vertebrae 36 (9+27); pleural ribs on abdominal vertebrae 8th and 9th. Epipleural ribs on abdominal vertebrae 2nd to 7th. Pterygiophore of 1st dorsal ray between neural spines of 6th and 7th vertebrae. Body color when fresh uniformly bright orange, orobranchial cavity pale.

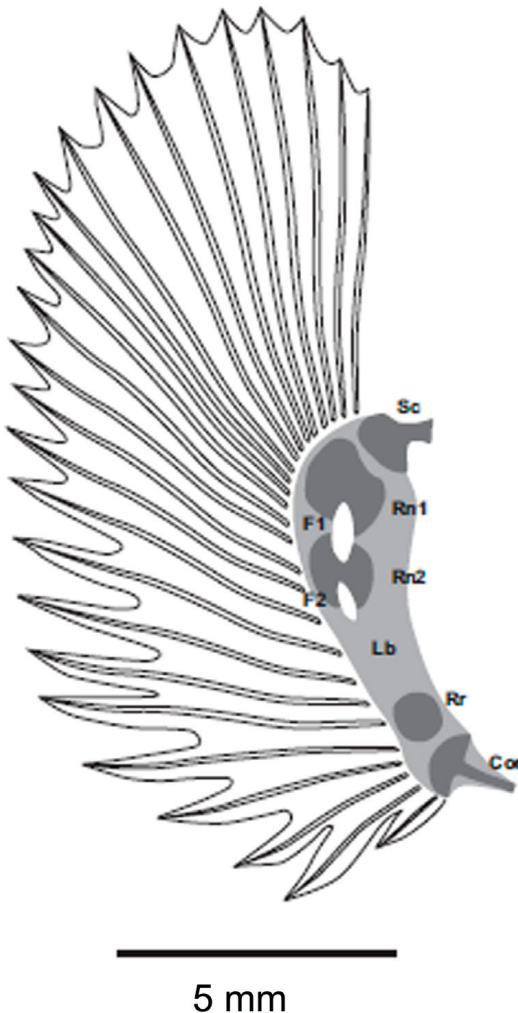


Figure 4 - Pectoral girdle of *Careproctus fueguensis* sp. nov. Cor: coracoid. F1-2: fenestrae. L.b.: basal cartilaginous lamina. R.n1-2: notched radials. R.r.: round radial. Sc: scapula. Bar: 5 mm.

Etymology. Named for its occurrence in coastal waters of Tierra del Fuego.

Comments. The identity of five recently hatched specimens assigned by Lloris and Rucabado (1991) to *C. pallidus* (Vaillant, 1888) is doubtful; these had been found in the peribranchial cavity of a male *Lithodes santolla* (Molina, 1872) from Ushuaia, Beagle Channel, between 20 and 30 m depth. The individuals measure between 6.3 and 6.7 mm TL –despite being at different ontogenetic stages- and share similar meristic characters with *C. pallidus* (redescription by Andriashev, 1997; Andriashev and Stein, 1998) and *C. fueguensis*. They resemble *C. falklandicus* in the vertebral number (38-40 vs. 38) but differ from it in the number of dorsal-fin rays, (34-36 vs. 30) anal-fin rays (27-30 vs. 25) and pectoral-fin rays (29-31 vs. 26).

Comparative material examined. *Careproctus guillemi* Matallanas, 1997. Holotype: (ZUAB: 001-1997); *Careproctus profundicola* Duhamel, 1992. Holotype (MNHN Paris, 1988-139); *Careproctus longipectoralis* Duhamel, 1992. Holotype (MNHN Paris, 1991-356); *Careproctus longipectoralis* Duhamel, 1992. ZUAB: 002-1997; *Careproctus patagonicus* Matallanas and Pequeño, 2000. Holotype: (MNHNC P. 7124); *Careproctus magellanicus* Matallanas and Pequeño, 2000. Holotype: (MNHNC P. 7125); *Careproctus pallidus*, specimens (5) IIPB No.556-560/1988; *Careproctus falklandicus*, MACN-ICT No. 2825. Is. Lennox 11-1-1941.

DISCUSSION

Careproctus fueguensis sp. nov., collected at 6-18 m depth from the Bridges Islands, Beagle Channel, is the second species for the genus described from shallow waters of the Magellan Strait in the Patagonian Region. The description of the new species was based on the characters used by Kröyer (1862) to define the genus emended by Orr and Maslenikov (2007), except for the number of suprabranchial pores.

Comparisons of meristic and morphometric characters of four specimens, including Holotype, Paratype and Neotype of the related *Careproctus pallidus* (Andriashev, 1997) and the additions and modifications done by Stein (2005), are discussed herein.

Careproctus fueguensis sp. nov. differs from *C. crassus* and *C. pallidus* by the following morphometric characters (first value for *C. fueguensis*: MACN-ICT 9514; second to fourth for *C. crassus* and fifth for *C. pallidus*: USNM 347660, MNHN 1884-841, MNHN 1884-842, CAS 60515: head length (31.7 vs. 25.5, 30, 23.8, 25.2, 24.2% SL); disk width (41.5 vs. 55% HL); disk

length (48.9 vs. 40, 38.2, 53, 45.9, 45.4 HL); snout length (28.8 vs. 35.5, 35.5, 35, 30.6, 40% HL); body depth (14.2 vs. 34.5, 29.4, 30.9, 32.4, 36.4% SL); preanal-fin length (50.9 vs. 60, 49.2, -, 46.8, 55.4% SL); anal-fin base (138.6 vs. 165% HL). *Careproctus fueguensis* also differs from *C. crassus* in having a smooth upper lip margin (vs. scalloped) and an almost rounded ventral disk (vs. with anterolateral notches and one central posterior notch).

Careproctus fueguensis resembles *C. pallidus* (Vaillant, 1888), in the presence of a pocket-like skin fold on the belly behind the ventral disk. The structural pattern of the endochondral pectoral girdle and hypural complex can also be used to separate these congeneric species. *Careproctus fueguensis* differs from *C. pallidus* because it has 2+0+1, notched pectoral radials (vs. 3+0+1, unnotched), a cartilaginous basal lamina with two fenestrae (vs. without fenestrae), hypural plates divided by a wide cleft into upper and lower portions nearly to its base (vs. completely fused with no traces of a cleft).

Additional characters distinguishing *C. fueguensis* sp. nov. from *C. pallidus* include the following combination of characters: chin pore pair spacing (notably converged vs. about equal to that of other pores); gill opening length (about twice eye length vs. slightly larger), and body color (uniformly bright orange in fresh specimens vs. "rosy gray or off white, washed with a light sepia on head and base of pectorals (Vaillant, 1888)).

Careproctus fueguensis differs from *C. falklandicus* from Burdwood Bank (53°45'S; 61°10'W), 137-150 m depth, Malvinas Islands, Southwestern Atlantic Ocean, in the following morphological characters: pocket-like skin fold on the belly behind the ventral disk (present vs. absent); number and shape of radials (2+0+1, notched vs. 1+1+1+1, round and arranged equidis-

tantly); pleural ribs (present vs. absent); pectoral fin (unnotched vs. slightly notched); skin (smooth, without prickles vs. with prickles). In addition, *Careproctus fueguensis* and *C. falklandicus* can be separated by the following meristic characters: dorsal-fin rays (29 vs. 34-36); anal-fin rays (25 vs. 27-30), and vertebrae (36 vs. 38-40).

The sub-Antarctic species *C. stigmatogenus* and *C. maculosus* from Burdwood Bank 54°45'6''S; 59°18'6''W, 273-297 m depth (Stein, 2006) differ from *C. fueguensis* sp. nov. in lacking the pocket-like skin fold on the belly behind the ventral disk and pleural ribs and in having 4 (1+1+1) rounded, unnotched radials.

In regard to meristic counts, *C. fueguensis* sp. nov. has 29 dorsal-fin rays, 25 anal-fin rays and 36 vertebrae (vs. 40, 36, 46 (8+38), respectively, in *C. maculosus* and 43, 35, 45 (9+36), respectively, in *C. stigmatogenus*). According to Andriashev (1997), a large number of rays in the pectoral fin (35-39) is a plesiomorphic condition for *Careproctus* Kröyer 1862. In this genus, the number of pectoral-fin rays is typically less than the number of anal-fin rays. *Careproctus fueguensis* sp. nov. shows a distinct condition, since the number of pectoral-fin rays decreased to 26, with this number being almost equal to that of anal-fin rays (25).

Andriashev and Prirodina (1990) divided the Antarctic and sub-Antarctic species of *Careproctus* into two groups according to the presence of ribs. Fish of the "rib-bearing group" have pleural ribs, 10-11 abdominal vertebrae, hypural plates divided nearly to its base, a total of 10-12 caudal rays; 4 pectoral radials of which 2 or 3 are notched, and 2-3 interradial fenestrae. The rib-bearing group is close to the plesiomorphic genus *Liparis*. Fish of the "ribless group" are devoid of pleural ribs; have 8-9 abdominal vertebrae; a total of 10 (rarely)-12 caudal rays; 4, 3, or 2 pectoral radials, all rounded, unnotched

and lacking interradial fenestrae. *Careproctus fueguensis* sp. nov. is unique as it has characters of both *Careproctus* groups. It shares with the rib-bearing group the presence of pleural ribs, hypural plates divided nearly to its base and a total of 12 caudal rays, while it shares with the ribless group 9 abdominal vertebrae and 3 (2+0+1) pectoral radials. Further, in contrast with the rib-bearing group, the new species has two notched upper radials and two fenestrae in the cartilaginous basal lamina of the pectoral girdle.

Finally, the validity of the genus *Enantioliparis* Vaillant, 1888 is recognized by Stein (2005) based on the presence of additional temporal pores, with the diagnostic characters being as follows: 3-4 temporal pores, t1, t2 (present or absent) and 2 suprabranchial pores; coronal and postcoronal pores absent; genital opening beneath a transverse fold of tissue, with a posteriorly-directed genital papilla emerging from beneath it; and rounded, unnotched pectoral radials. *Careproctus fueguensis* sp. nov. also shares these characters with *Enantioliparis*, except for 2 notched upper radials and 3 hypobranchial pores, this combination being unique to the new species.

As a result of the soft and pliable body of liparids, measurements of the head, pectoral fin and disk length are highly variable and thus useless as diagnostic characters (Able and McAllister, 1980). In contrast, the morphology of the endochondral pectoral girdle is of particular taxonomic value for this group (Andriashev, 1986; Andriashev *et al.*, 1977). The presence of notched radials, considered as a plesiomorphic state for genus *Careproctus*, is observed in most Northern Hemisphere species and in some southern species, such as *C. albescens*, *C. catherinae*, *C. herwigii*, *C. novaezealandiae*, *C. parini*, *C. smirnovi* (Andriashev, 1998), *Careproctus mage-*

Table 1 – Measurements of holotype specimen of *Careproctus fueguensis* sp. nov.

Measurements (mm)	
Total length (TL)	47
Standard length (SL)	37.2
Head length (HL)	11.8
Meristics	
Dorsal fin rays	30
Anal fin rays	25
Pectoral fin rays	26
Caudal fin rays	11 (5+6)
Vertebrae	36 (9+27)
Cephalic pores	2-6-7-3
Branchiostegal rays	6

llanicus (Matallanas and Pequeño, 2000) and *C. paxtoni* (Stein *et al.*, 2001). Among the southern species of *Careproctus*, *C. fueguensis* sp. nov. is unique in having notched radials with a radial formula (2+0+1) and a cartilaginous basal lamina with two interradial fenestrae.

ACKNOWLEDGMENTS

Thanks are due to Dr. Domingo Lloris (Instituto de Ciencias del Mar, CSIC, Barcelona, Spain) for the loan of five specimens of *Careproctus pallidus* (IIPB 55-6560/1978); to Carmen Benito (Servei de Radioisòtops, Facultat de Biologia, Universitat de Barcelona, Spain) for taking the radiographs, and to Jordi Corbera for the illustrations. We are particularly grateful to Dr. D. Stein who kindly reviewed the manuscript and Lic. S. Pietrokovsky for the correction of the English version of the manuscript.

Table 2 - Counts and morphometric ratios of standard length (SL) and head length (HL) of *Careproctus fueguensis* sp. nov.

Morphometrics	%SL	%HL
Head length	31.7	
Head width	33.4	104.2
Head depth	14.5	45.7
Snout length	9.1	28.8
Mouth width	15.6	49.1
Teeth bar length	6.2	19.6
Teeth bar width	1.4	4.5
Eye length	4.5	14.4
Interorbital width	14.2	44.9
Nostril tube length	2.2	6.9
Nostril tube width	2.1	6.6
Gill opening length	8.3	26.3
Snout to anus length	33.5	105.7
Chin to anus length	30.6	96.44
Chin to disk length	14.6	46.0
Disk length	14.7	48.9
Disk width	13.1	41.5
Disk to anus length	1.2	4.0
Pectoral fin length	20.4	64.4
Lowest Pectoral fin ray length	4.8	15.2
Predorsal fin length	40.3	127.1
Preanal fin length	50.9	160.5
Dorsal fin base length	62.9	198.3
Anal fin base length	43.9	138.6
Pectoral fin base height	20.1	63.5
Body depth	14.2	45.3

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Recibido: 20/07/2019 - Aceptado:15/08/2019 - Publicado: 11/11/2019