

CHIRONEMID FISHES FROM JUAN FERNANDEZ ARCHIPELAGO AND DESVENTURADAS ISLANDS, CHILE. (PERCIFORMES: CHIRONEMIDAE).

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ABSTRACT. Chironemid fishes from Juan Fernández Archipelago and Desventuradas Islands, Chile. (Perciformes: Chironemidae).

Chironemus delfini (Porter 1914) is resurrected and redescribed from eleven specimens collected at Juan Fernández Islands, Chile. *Cheilodactylus bicornis* Steindachner 1898, also from Juan Fernández Archipelago and Desventuradas Islands is validated to *Chironemus* and is redescribed. *Chironemus delfini* is distinguished from *Chironemus bicornis* by the absence of supraorbital tubercles, a flat interorbital space, and fewer than 17 dorsal fin rays. *Chironemus delfini* appears to be endemic around the Juan Fernandez Archipelago.

Key words: *Chironemus*, coastal fishes, systematics, distribution.

RESUMEN. Peces chironémidos del Archipiélago de Juan Fernández e Islas Desventuradas, Chile (Perciformes: Chironemidae).

Se revalida y describe *Chironemus delfini* (Porter 1914) sobre la base de once ejemplares recolectados en el Archipiélago de Juan Fernández, Chile. *Cheilodactylus bicornis* Steindachner 1898, también del mismo Archipiélago e Islas Desventuradas se describe y se revalida a *Chironemus*. *Chironemus delfini* se distingue de *Chironemus bicornis* por la ausencia de las crestas óseas supraorbitales, espacio interorbital plano, y menos de 17 radios en la aleta dorsal. *Chironemus delfini* sería endémica del Archipiélago de Juan Fernández.

Palabras claves: *Chironemus*, peces costeros, sistemática, distribución.

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INTRODUCTION

The Chironemidae is a marine family comprised of two genera, *Chironemus* and *Threpterus* (Nelson 1984). Records exist from coastal Australia, Tasmania and New Zealand (Gill 1862, Norman 1966, Last et al. 1983, Nelson 1984) and Juan Fernández Islands (Steindachner 1905). They are characterized by the presence of 14 or 16 spines and 16-21 soft rays in the dorsal fin; vomer with teeth and palatines toothless. They are included in the Superfamily Cirrhitidae, and are related to Cirrhitidae, Aplodactylidae, Cheilodactylidae y Latridae (Nelson 1984). *Chironemus* has teeth on vomer, operculum with two flat spines, villiform teeth in both jaws, without ca-

nines; 6 or 7 simple lower pectoral rays; dorsal with 14-16 spines. *Chironemus* differs from *Threpterus* in its smaller mouth, premaxilla only reaching the middle of the orbit versus premaxilla extending behind the middle of the orbit, and in its un-notched dorsal membrane versus deeply notched dorsal membrane between the second and third spines (Last et al. 1983).

This paper resurrects *Chironemus delfini* and redescribes a second species of genus from Juan Fernández Island, *Chironemus bicornis* Steindachner 1898, which was initially ascribed to *Cheilodactylus*.

METHODS

Measurements and counts follow Hubbs & Lagler (1958), except pectoral fin ray counts which are given as the number of upper branched pectoral fin rays (Arabic numbers) plus the number of

thickened unbranched lower pectoral fin rays (Roman numbers). The counts of dorsal and anal fins are based mostly on radiographs. Institutional abbreviations follow Leviton et al. (1985).

RESULTS

Key to the species of Chironemidae of Juan Fernández Archipelago and Desventuradas Islands

1a) Supraorbital tubercles present (in adults); interorbital space concave; base of spinous and soft

portions of dorsal fin about the same lengthC. *bicornis* (Juan Fernandez Archipelago and Desventuradas Islands)

1b) Supraorbital tubercles absent; interorbital space flat; base of

spinous portion of dorsal fin about 1.5 times longer than base of the soft portion of dorsal fin.....

..... *C. delfini*
(Juan Fernandez Archipelago)

Chironemus delfini (Porter 1914)

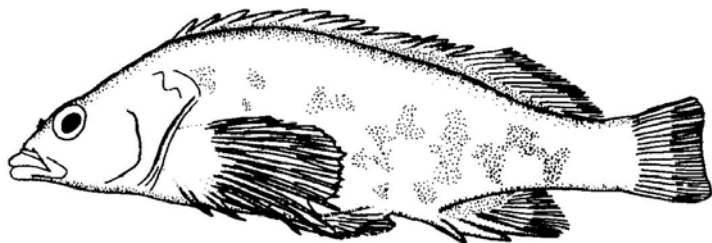


Fig. 1. *Chironemus delfini* (Porter 1914) SI0 65-655 245 mm SL.

Chilodactylus delfini: Porter 1914:
204-205 (original description)

Diagnosis: A species of *Chironemus* with the length of base of the spinous portion of the dorsal fin more than 1.5 times the length of the soft dorsal fin, supraorbital tubercles absent, interorbital space flat, premaxillary extending to mid orbit. Dorsal fin membranes with more than 4 prominent dermal cirri behind each spine.

Counts: Dorsal fin XV, 15-16, anal fin III, 7-8, pectoral fin 8+VII, pelvic fin 1-5. Lateral line scales 59-62,

vertebrae 12+20 (11-12+19-21).

Morphometry of the adult specimens ($n = 9$) 174-245 mm SL. Morphometric data expressed as % SL: Head length 34.4 - 40.3, snout 10.0 - 13.7, post orbital length 18.0 - 22.0, interorbital width 5.4 - 6.8, orbit diameter 5.4 - 6.6, premaxilla length 10.9 - 15.4, predorsal length 29.6 - 38.2, preanal length 66.3 - 75.4, prepectoral length 31.2 - 38.4, prepelvic length 44.3 - 53.5, base of dorsal fin 58.9 - 66.3, base of spinous portion of dorsal fin 38.9 - 44.3, base of soft portion of dorsal fin 20.2 - 24.8, pectoral fin

base 8.8 - 10.8, pelvic fin base 3.6 - 5.1, body depth 24.4 - 38.9, caudal peduncle depth 10.5 - 11.5.

Morphometry of juvenile specimens (n=2) 51 - 53 mm SL. Head length 33.7-35.7, snout 8.8 - 9.4, post orbit length 16.9, interorbit length 5.9 - 6.6, orbit diameter 9.0 - 9.2, premaxilla length 9.6 - 10.0, predorsal length 30.2 - 32.1, preanal length 70.6 - 71.6, prepectoral length 32.9 - 36.0, prepelvic length 51.3 - 51.5, dorsal fin base length 58.6 - 59.6, spinous dorsal fin base length 34.9 - 37.5, soft dorsal fin base length 22.5 - 22.8, pectoral fin base 9.6 - 9.8, pelvic fin base 2.7 - 3.0, body depth 30.2 - 30.4, caudal peduncle depth 9.6 - 10.8.

Body elongate, head triangular in lateral view, interorbital space flat. Premaxilla extending to mid orbit, upper jaw slightly longer than lower jaw, lips very thick. Conical teeth in rows in both jaws, becoming a triangular patch near symphyses, vomer with teeth. Nostrils large, the anterior with fimbriated lobes. Snout, suboperculum, and border of preoperculum scaleless. Opercle broad, with two separated flat spines in its upper portion. Cycloid scales on body, lateral line almost straight. Single dorsal fin originating anterior to pectoral fin, spinous dorsal base length more than 1.5 the soft dorsal base length, membrane behind each dorsal spine with more than 4 prominent dermal cirri. Dorsal fin with a row of scales along its base. Anal fin short, with a row of scales along its base, the second spine larger and stronger. Pectoral fin with scaled base, area

under pectoral fin scaleless. Upper pectoral rays branched, lower rays greatly thickened, the second one the longest. Pelvic fin base scaleless. Caudal fin rounded to truncate.

Color in formalin and alcohol: In adults the body is dark brown and in others pale yellow, with a diffuse pattern of obscure vertical bands. Preopercle and opercle ventrally with a white reticulate pattern. Fins with dark brown vertical banding. In juveniles body pale brown with oval reticulate pattern including paired and unpaired fins; ventral area of head and abdomen before anal fin pale brown without reticulate pattern; lips dark brown.

Similar species: *Chironemus delfini* is similar to *Chironemus marmoratus* Günther 1860 and *Chironemus georgianus* Cuvier 1829, both from the Australian-New Zealand region, mainly because of the lack of supraorbital tubercles. *Chironemus marmoratus* has approximately equal length spinous and soft-rayed sections of the dorsal fin, and the dorsal membranes lack dermal cirri behind each spine (Table 1). *Chironemus georgianus* has fewer scales in the lateral line (Table 1), and the length of the premaxilla does not reach the anterior border of the orbit (versus premaxilla reaches to mid orbit).

Distribution: *Chironemus delfini* is known only from the Juan Fernández Archipelago, Chile, between 0-20 m.

Size: *Chironemus delfini* reaches 460 mm in TL.

Remarks: The eye and the premaxilla of this species show ontogenetic change. The eye size is proportionally greater and the length of the premaxilla proportionally shorter in juveniles than the adults.

Comments: Porter (1914), described *Chironemus delfini* from Juan Fernández Island. Eventhough it was a short description, he mentioned the lack of supraorbital tubercles, the interorbital

width flat and the difference in the length of the spinous and soft portions of the dorsal fin. These characters differentiated *Chironemus delfini* from *Chironemus bicornis*. De Buen (1959), included *Chironemus delfini* as a synonym of *Chironemus bicornis*, and this criteria has been used since then by other authors e.g., Bahamonde & Pequeño (1975), Sepúlveda (1988) and Pequeño (1989).

Chironemus bicornis (Steindachner 1898)

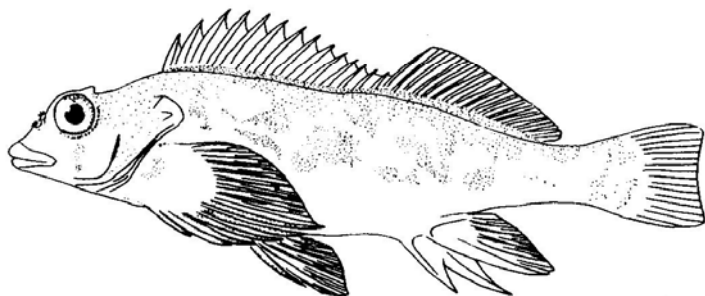


Fig. 2. *Chironemus bicornis* (Steindachner 1898) (after Steindachner, 1898)

Diagnosis: A *Chironemus* with one supraocular tubercle, interorbital space concave, length of base of spinous dorsal fin less than 1.5 times length of soft rayed dorsal fin.

Counts: D XIV, 17-19, A III, 6-8, P 9-VI, pelvic fin 1-5. Lateral line

scales 60-65. Vertebrae 31-32 (12+19-20).

Morphometry of adult specimens ($n = 21$) 113-190 mm SL: Morphometric data expressed as percent of SL, are as follows: Head length 29.0 - 32.9, snout 8.7 - 11.8, postorbital length 13.6 -

15.4, interorbital width 6.4 - 8.4, orbit diameter 7.0 - 8.8, premaxilla length 7.6 - 9.6, predorsal length 27.5 - 31.7, preanal length 66.0 - 77.0, prepectoral length 28.0 - 32.1, prepelvic length 40.7 - 48.3, base of dorsal fin 58.5 - 69.2, anal fin base 9.9 - 12.3, pectoral fin base 9.3 - 11.3, pelvic fin base 3.9 - 4.7, base of spinous portion of dorsal fin 32.8 - 36.2, base of soft portion of dorsal fin 26.7 - 33.8, maximum body depth 21.6 - 25.8, caudal peduncle depth 8.4 - 9.2.

Morphometry of juvenile specimens (n = 18) 25.3 - 53.5 mm SL: morphometric data expressed as a percent of SL, are as follows: Head length 31.2 - 34.7, snout 7.4 - 11.2, postorbital length 14.1 - 16.5, interorbital width 6.0 - 8.3, orbit diameter 8.5 - 10.0, premaxilla length 7.1 - 8.9, predorsal length 30.7 - 33.3, preanal length 69.1 - 73.3, prepectoral length 29.0 - 32.7, prepelvic length 41.5 - 48.6, base of dorsal fin 54.5 - 62.1, anal fin base 11.9 - 16.2, pectoral fin base 10.1 - 11.8, pelvic fin base 2.8 - 4.4, base of spinous portion of dorsal fin 24.0 - 32.1, base of soft portion of dorsal fin 24.2 - 31.0, maximum body depth 22.6 - 27.4, caudal peduncle depth 9.0 - 11.2.

Comments: Steindachner (1898) described *Chellodactylus bicornis* from Juan Fernández Island. In 1905 he declared that *Chellodactylus bicornis* was a *lapsus calami*, and said the name should be *Chironemus bicornis*. Perhaps this error occurred because the Chellodactylidae and Chironemidae are very similar morphologically and have overlapping ranges in numbers of fin elements.

They are distinguished by the presence of vomerine teeth and two flat spines in the opercle in Chironemidae and absence of both characters in Chellodactylidae (Smith 1980, Nelson 1984). These two characters are present in *Chironemus bicornis*.

Steindachner's (1898) original description of *C. bicornis* did not mention the presence of one to three cirri in the dorsal membrane behind each spine of the dorsal fin. These cirri are hard to find in preserved specimens, because the membrane is very fragile. Only a few well preserved specimens had cirri present.

All juvenile specimens of *C. bicornis* (less than 43.0 mm SL) lack the supraorbital tubercle. Based on the material examined, supraorbital tubercles should develop between 43.0 and 53.5 mm SL.

Color in formalin or alcohol: Adults specimens dark brown with six darkest spots along the dorsal base and the upper 1/3 of the body, the last one on the caudal peduncle. Ventral area from the mouth to the origin of the anal fin pale. Juveniles specimens follows the same pattern of the adults but without heavy pigmentation on pectoral and caudal fins. A black spot between the two spines on the opercle is typically present in the juveniles of *C. bicornis*.

De Buen (1959), indicated that *Chironemus bicornis* attains more than 600 mm total length, and they are found resting above rocks covered by calcareous algae.

Table 1. Comparison of selected morphometric and meristic characters ranges of the *Chironemus* species. (Values of morphometry expressed as a percent of standard length).

	<i>Chironemus bicornis</i>	<i>Chironemus delfini</i>	<i>Chironemus georgianus</i>	<i>Chironemus marmoratus</i>	<i>Chironemus microlepis</i>
Morphometry					
Standard length (mm)	25.3-190	62.0-460	45.0-149	75.0-201	275.0
Head length	29.0-34.7	33.7-40.3	33.5-38.5	31.5-35.3	32.7
Interorbital width	6.0-8.4	5.4-6.8	6.7-8.0	5.8-7.5	7.4
Premaxilla length	7.1-9.6	9.6-15.4	8.2-9.3	8.6-9.9	10.7
dorsal fin base length	54.5-69.2	58.6-66.3	57.1-64.4	60.5-65.9	64.0
Anal fin base length	9.9-16.2	11.8-14.7	10.8-14.8	10.9-12.6	10.1
Spinous portion of dorsal fin	24.0-36.2	34.9-43.0	32.3-40.9	29.8-36.8	36.0
Soft portion of dorsal fin	24.2-33.8	20.2-24.8	33.5-38.5	27.2-32.2	28.1
Counts					
Dorsal fin	XIV, 17-19	XV, 15-16	XV-XVI, 15-16	XIV, 19-20	XV, 17
Anal fin	III, 6-8	III, 7-8	III, 6-7	III, 6-7	III, 7
Pectoral fin	9, VI	8, VII	7-9, VII	9-VI	8-VI
Scales on lateral line	60-65	59-62	50-52	56-60	> 60
Cirri on dorsal fin	yes	yes	yes	no	yes
Number of specimens	35	11	14	5	1

Similar species: *Chironemus bicornis* is similar to *Chironemus microlepis* Waite 1916, from Australia and New Zealand in the presence of a supraocular tubercle, but in *C. microlepis* they are less developed. *Chironemus bicornis* differs from *C. microlepis* in the lower count of scales above and below the lateral line.

Distribution: *Chironemus bicornis* is known from the Juan Fernández Archipelago, Chile, between 0-20 m depth, and

Desventuradas Islands (Sepúlveda 1988).

Material examined

Chironemus delfini: MNHNC P. 6654, 385 mm Standard Length (SL), male, February 1973, Juan Fernández Island. MNHNC P. 6655, 175 mm SL, February 1970, El Palillo Bay, Juan Fernández Island. MNHNC P. 6656, 359 mm SL, 5-12 m depth, 6 March 1970, Juan Fernández Island. USNM 88769, 315 mm SL, 15 December

1926, Juan Fernández Island. MCZ 46157, two specimens, 51-53 mm SL, 12 January 1966, 0-20 m depth, West Bay, Més a Tierra, Juan Fernández Island. SIO 65-655, three specimens, 174-245 mm SL, 33° 41' S, 78° 58' W, West of Bahía Carvajal, Juan Fernández Island, 15 December 1965. 110A-0999, (Instituto de Investigaciones Oceanológicas, Universidad de Antofagasta, Antofagasta, Chile), 236 mm SL, 5-12 m depth, 6-March-1970, Juan Fernández Island.

Other specimen: One specimen, 260 mm SL, female with eggs, no collecting data, at MNHNC uncataloged.

Chironemus bicornis: MNHNC P. 6207, 190 mm SL, Juan Fernández Island, 33° 42' S, 79° 00' W, 27 January 1953. MNHNC P. 6202, 4 specimens, 113-159 mm SL, Santa Clara, Juan Fernández Island, 15 December 1965. USNM 88768, 164 mm SL, 17 December 1926, Juan Fernández Island. USNM 176542, 149 mm SL, 17 March 1945, 33° 38' S, 78° 50' W, Cumberland Bay, Juan Fernández Island. USNM 227305, 3 specimens, 39.0-177 mm SL, 18 Febrero 1966, 30 m depth, 33° 38' S, 78° 59' W, Juan Fernández Island, Més a Tierra. MCZ 46175, 43 mm SL, 27 Ja-

nuary 1966, 0-20 m depth, West Bay, Més a Tierra, Juan Fernández Island. SIO 65-636, 17 specimens, 28.0-148 mm SL, off Chile, Isla Juan Fernández, MY65-1V-43, SIO 65-657, 10 specimens, 27.3-172 mm SL. CAS 5569, 1 specimen, 53.5 mm SL, San Félix Island. 18 February 1935.

Comparative material: *Chironemus georgianus* Cuvier 1829. WAM P. 27127-014, 8 specimens, 45-105 mm SL, Sorrento, Victoria, Australia, 38° 20' S, 144° 45' E, 1981. AMS I. 20162-001, 6 specimens, 62-149 mm SL, Kangaroo Island, Stokes Bay South Australia, 35° 38' S, 137° 12' E.

Chironemus marmoratus Günther 1860. WAM P. 27074-009, one specimen, 152 mm SL. Byron Bay, New South Wales, 28° 38' S, 153° 37' E, 1980. WAM P. 29128-001, two specimens, 75-91 mm SL, Seal Rocks, New South Wales, Australia, 32° 26' S, 152° 58' E. 1970. SIO 78-236, two specimens, 85-201 mm SL. Australia.

Chironemus microlepis Walte 1916, AMS I. 14067, 275 mm SL, Lord Howe Island, N.S.W., January, 1917.

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