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Description of a new species of *Echiodon* (Teleostei: Carapidae) from the South Atlantic Ocean

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Abstract

A new species of pearlfish, *Echiodon atopus*, is described from a single adult male, 176 mm TL, collected off Inaccessible Island, Tristan da Cunha Group, South Atlantic Ocean. It is characterized by its high, equal D_{30} and A_{30} counts (46 rays each), 7 anal rays anterior to the dorsal-fin origin, 38 precaudal vertebrae, 18 pectoral-fin rays and ventral swim bladder tunic ridges. It was caught in a bottom trawl over a deep lava-reef structure, but may be pelagic.

Key words: *Echiodon*, pearlfish, Carapidae, Tristan da Cunha Group, South Atlantic Ocean

Introduction

The genus *Echiodon* Thompson, 1837, comprises a group of 12 known species of pearlfishes found in a depth range of 18–2000m (Markle and Olney 1990; Williams and Machida 1992; Markle 1999). *Echiodon* species are mainly deep-pelagic forms, although Markle (1999) suggested at least some may be facultative commensals (in benthic invertebrates like some other pearlfishes). Six of the 12 species of *Echiodon* are found in temperate waters of the Southern Ocean. During cruise ICEFISH-04 (May to July 2004) across the South Atlantic on RVIB NATHANIEL B. PALMER, a specimen of *Echiodon* was captured at the Tristan da Cunha Group. Originally thought by me to represent the circumglobal, austral *E. cryomargarites* Markle, Williams and Olney, 1983, it possesses several characters in combination that reveal it is unnamed. The purpose of this paper is to describe this new species.

Materials and methods

Measurements were made with dial calipers or ocular micrometer to the nearest 0.1 mm. Counts of features of the axial skeleton were made from a radiograph. The following

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abbreviations for meristic characters are from Markle *et al.* (1983) and Markle and Olney (1990): $A_{30,}$ anal-fin rays anterior to vertical through articulation between vertebrae 30 and 31; ARDO, anal-fin rays anterior to dorsal-fin origin; $D_{30,}$ dorsal-fin rays anterior to vertical through vertebrae 30–31; DRAO, dorsal-fin rays anterior to anal-fin origin; IO, infraorbital pores; LT, lateral-temporal pores; MAO, myomeres to anal-fin origin; MD, mandibular pores; MDO, myomeres to dorsal-fin origin; P_1, pectoral-fin rays; PCV, precaudal vertebrae; POP, preopercular pores; SO, supraorbital pores; ST, supratemporal pores; VAO, vertebrae to anal-fin origin; VDO, vertebrae to dorsal-fin origin; VPB, vertebra number under predorsal bone. Other abbreviations are: HL, head length; TL, total length; USNM, National Museum of Natural History, Washington, D.C., USA.

***Echiodon* atopus, new species**
(Figs.1–2)

Holotype: USNM 380406 (male, 176 mm TL), north of Inaccessible Island; RVIB NATHANIEL B. PALMER sta. 91/OT 60; 37° 16.1'S, 12° 42.2'W to 37° 16.6'S, 12° 43.1'W; 10 m otter trawl; 0– 139 m; 19:49– 20:06 hr; 9 July 2004.

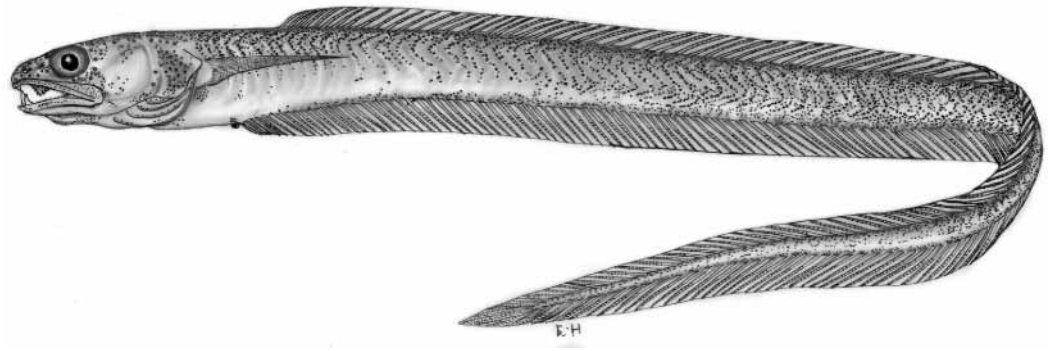

FIGURE 1. *Echiodon atopus* sp. n., holotype, 176 mm SL, USNM 380406, off Inaccessible Island, Tristan da Cunha Group.

Diagnosis. A species of *Echiodon* as defined by Markle and Olney (1990), with the following combination of characters: PCV 38; D_{30} 46; A_{30} 46; ARDO 7; P_1 18; posterior swim bladder tunic ridges ventral.

Description. Meristics: PCV 38; D_{30} 46; A_{30} 46; P_1 18; ARDO 7; DRAO 0; MAO 7; MDO 8; VAO 6; VDO 8; VPB 6; IO 8; SO 5; LT 3; MD 5; POP 2; ST 2; branchiostegal rays 7. Proportions as percent HL: body depth 48.8; bony interorbital width 13.7; eye diameter 20.3; head depth 48.8; head width 34.3; lower jaw length 52.0; upper-jaw length 46.4; prepectoral length 96.4; preanal length 118.1; predorsal length 129.3; pectoral-fin length 65.2; snout length 17.0; distance snout to anus 111.8.

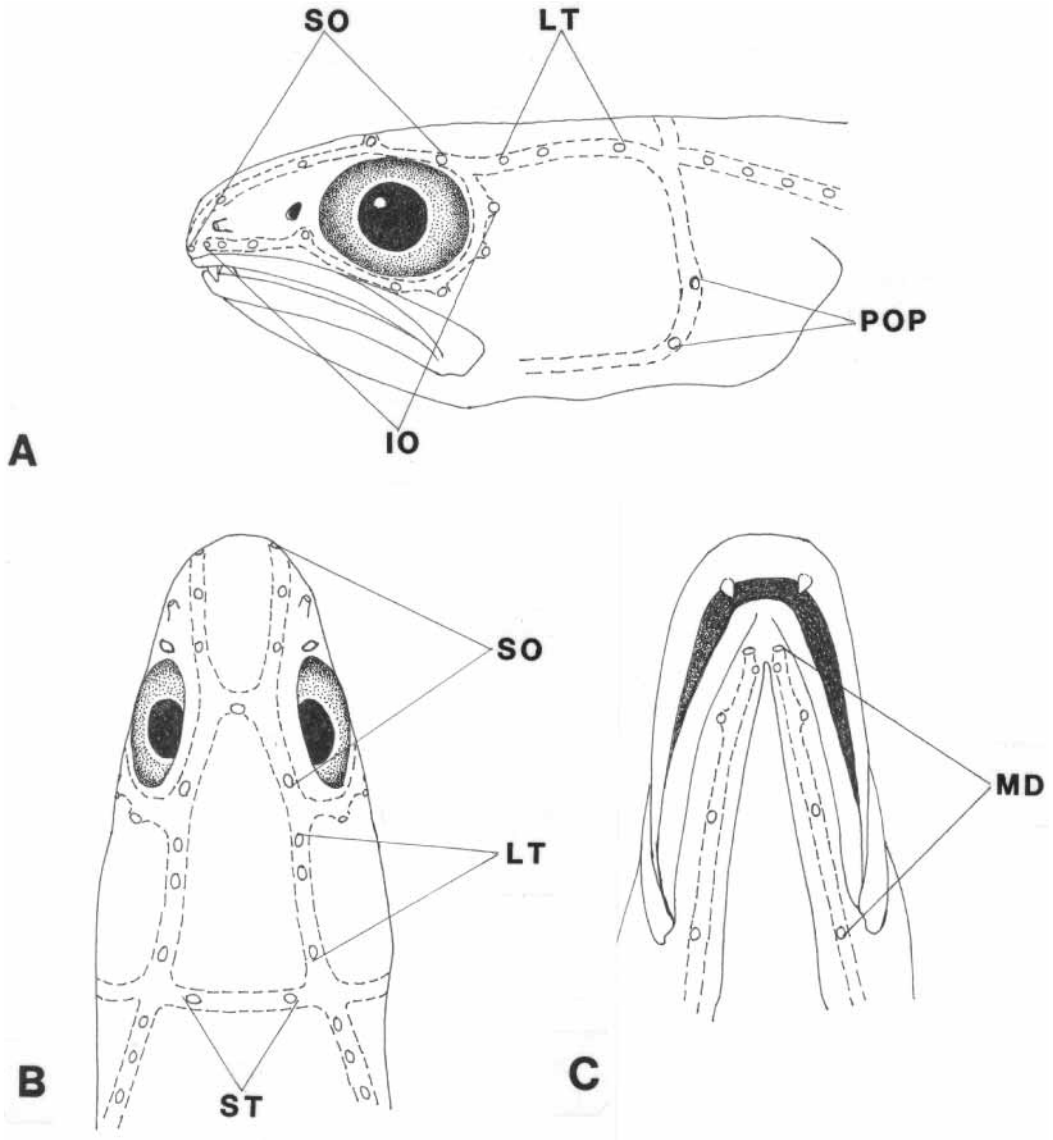

FIGURE 2. Head pore patterns of holotype of *Echiodon atopus* sp. n. A) left lateral view; B) dorsal view; C) ventral view.

Head elongate-ovoid; eye circular, entering dorsal profile of head when viewed laterally. Cephalic pores small, rounded, difficult to observe, pored lateral line mediolateral, extending posteriorly to anterior quarter of tail; pores becoming more widely spaced posteriad. No sensory papillae on head or along seismosensory canals. First gill arch with three elongate, tooth pads on upper limb, three slender, developed rakers and four rounded, toothed pads on lower limb. Posterior portion of maxilla unsheathed. Dorsal portion of gill opening extending forward about 3/4 eye diameter. Branchiostegal membrane free of isthmus, joined on vertical about 1 1/2 eye diameters posterior to rear margin of eye. Single

enlarged caniniform tooth near symphysis in premaxilla, dentary with two. Vomer with three smaller canines in a row surrounded by 25 tiny denticles. Palatine teeth in four irregular rows anteriorly blending into single, posterior row. Outer flap of upper lip at symphysis with single, furcate, ventrally-directed lobe fused to a broad, inner flange with a larger, conical lobe on either side. Dorsal-fin origin one eye diameter posterior to vertical through anal-fin origin. Posterior swim bladder constricted, with ventral tunic ridges as illustrated for *E. dentatus* (Cuvier) by Markle and Olney (1990, fig. 35).

Fresh coloration silvery blue, with fine, scattered melanophores. These are denser on dorsum than ventrally, except on tail, and form chevron patterns outlining myomeres on body posteriorly to middle of tail. Abdomen and eye dark blue. Peritoneum, stomach, lining of orobranchial chamber, including tongue and gill bars, black.

Etymology. From the Greek ατοποσ, (out of place) in reference to my original expectation that the specimen was *Echiodon cryomargarites* and its subsequent identification.

Comparisons. Markle and Olney's (1990) zoogeographic analysis of *Echiodon* revealed three distributional patterns that they hypothesized resulted from species radiation of an outer-shelf Indo-West Pacific ancestor. These are: 1) North Atlantic; 2) austral; and 3) a largely boreal temperate/subtropical group that includes the austral *E. cryomargarites*. *Echiodon atopus* is close to the austral *E. neotes* Markle and Olney 1990 and *E. rendahli* (Whitley) and seems to fit in that clade, although its larvae are unknown (Williams and Machida 1992). It differs from *E. neotes* in its significantly higher D_{30} count (38 in *E. neotes* vs 46 in *E. atopus*), more precaudal vertebrae (35 in *E. neotes* vs 38), ventral swim bladder tunic ridges (vs. lateral ridges in *E. neotes*) and lack of the larval vexillum, although the latter character is difficult to evaluate in the one known specimen of *E. neotes*. *Echiodon atopus* differs from *E. rendahli* in its A_{30} count (37–38 in *E. rendahli* vs 46 in *E. atopus*), greater number of anal-fin rays anterior to the dorsal-fin origin (0–4 in *E. rendahli* vs 7) and greater number of precaudal vertebrae (31–35 in *E. rendahli* vs 38). Finally, *E. atopus* differs from all other congeners in its equal D_{30} and A_{30} counts, although, owing to variability in fin-ray anatomy in ophidiiform fishes, this should not be expected to endure as a diagnostic character for the species when more specimens are found.

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Cruise of 2004 (H. W. Detrich, chief scientist, *RVIB Nathaniel B. Palmer*). For more information visit www.icefish.neu.edu.

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