

Acyrtus pauciradiatus, a new species of clingfish (Teleostei: Gobiesocidae) from Fernando de Noronha Archipelago, Pernambuco state, Northeastern Brazil

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Acyrtus pauciradiatus, new species, is described on the basis of three specimens collected at Fernando de Noronha Archipelago, state of Pernambuco, Brazil. It differs from its congeners by having a reduced number of rays in the pectoral, dorsal, and anal fins and is more isolated geographically, than any other species in the genus.

Acyrtus pauciradiatus, espécie nova, é descrita com base em três espécimes coletados no arquipélago de Fernando de Noronha, Pernambuco, Brasil. Ela difere dos seus congêneres por possuir número reduzido de raios das nadadeiras dorsal, peitoral e anal e apresenta o maior isolamento geográfico em relação as demais espécies do gênero.

Key words: Oceanic island, endemism, reef fish, systematics.

Introduction

Clingfishes (Gobiesocidae) are small, flattened and usually cryptic fishes that are most common on hard substrates in the shallow wave-washed areas immediately below the low tide mark (Thresher, 1984). All clingfishes are characterized mainly by the modified pelvic fins that form a disc, used to adhere to the substrate and by the presence of one small spine and four (rarely five) soft rays in the pelvic fin. Also, clingfishes have a spineless dorsal fin, head and body scaleless, genital papilla behind the anus, and no swim bladder (Nelson, 1994).

The family Gobiesocidae includes 43 genera and about 150 species (Hutchins, 2003) distributed in shallow waters along tropical and temperate seashores.

Briggs (1955) reviewed the western Atlantic clingfishes and recognized nine species distributed in five genera. His genera were diagnosed based on having a single or double pelvic disc, three or three and half gill arches, and gill membranes free or attached to isthmus. Twenty-five species of

clingfishes occur in the Western Atlantic (Williams & Tyler, 2003), excluding the new species described here and according to Menezes (2003) five species and three genera of clingfishes are found in Brazilian waters.

Fernando de Noronha Archipelago lies at 03°50'S - 32°25'W, about 340 km northeast off Brazil mainland coast. This archipelago's 20 islands are characterized by clear waters, low coral diversity and are influenced by the warm South Equatorial Current and Atlantic Equatorial Current (Eston *et al.*, 1986; Nunan, 1992; Rocha, 2003).

Recent collections taken from coastal waters of the Archipelago (Mendes, 2000) included three specimens of a clingfish that belongs to the gobiesocid genus *Acyrtus* Schultz, 1944, based on its having a broad central portion of the upper lip.

Relatively little is known about members of the genus *Acyrtus*, probably due to the cryptic habit of the species included, together with their small size and relatively low abundance. Herein, we describe a new species of *Acyrtus* from the Fernando de Noronha Archipelago, off northeastern Brazil.

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Material and Methods

The three specimens of clingfishes were captured using formalin (10%) and plastic bags during SCUBA dives in Ressureta Bay, at Rata Island, Fernando de Noronha archipelago in 1997 (see Maida & Ferreira, 1997 for map and area description). This bay is characterized by calm waters, with maximum depth of 12 meters. The substrate is composed of rocks and incrusting fauna and flora. Calcareous and Pheophyta algae, sponges, and ascidians are very common in the reefs concavities (Mendes, 2000).

The method used for making measurements and counts (morphometrics and meristics) and the description follow Briggs (1955). Measurements were made using a 0.1 mm precision caliper.

Type specimens of the new species were deposited in the ichthyological collections of the Museu de Zoologia da Universidade de São Paulo (MZUSP), Centro de Ciências Biológicas da Universidade Federal do Rio Grande do Norte (UFRN) and Museu Oceanográfico do Vale do Itajaí (MOVI).

Acyrtus pauciradiatus, new species

Fig. 1

Holotype. MZUSP 84516, 16.3 mm SL, Brazil, off State of Pernambuco, Fernando de Noronha Archipelago, Rata Island, in Ressureta Bay, at a depth of 12m; L. F. Mendes, 12 Dec 1997.

Paratypes. UFRN 0001, 13.2 mm SL; MOVI 37363, 12.6 mm SL, collected with holotype.

Diagnosis. *Acyrtus pauciradiatus* can be readily distinguished from all its congeners by the following combination of characters: pelvic disc small (2.9-3.7 times in SL vs. 2.8-3.2 in *Acyrtus rubiginosus*, and 2.3-2.6 in *Acyrtus artius*), shallow body depth (5.4-6.6 times in SL vs. 4.9-5.4 in *A. rubiginosus*, and 4.2-4.3 in *A. artius*), broad interorbital width (2.2-2.5 times in head length vs. 3.0-3.8 in *A. rubiginosus*, and 2.8-3.6 in *A. artius*), broad peduncle depth (0.5-0.7 times in its length vs. 1.3-2.3 in *A. rubiginosus*, and 1.2-1.4 in *A. artius*), short snout (6.6-11.0 times in head length vs. 3.3-4.3 in *Acyrtus rubiginosus*, and 3.7-4.0 in *A. artius*), short post-dorsal length (1.1-1.5 times in dorsal length vs. 0.8-1.0 in *A. rubiginosus*, and 1.0-1.2 in *A. artius*), dorsal-fin rays 7-8 (vs. 9-10 in *A. rubiginosus*, and 8 - 9 in *A. artius*), anal-fin rays 6 - 8 (vs. 7-9 in *A. rubiginosus*, and 7 in *A. artius*), caudal-fin rays 11-12 (vs. 7-9 in *A. rubiginosus*, and 8 - 9 in *A. artius*) and pectoral-fin rays 20-22 (vs. 25-26 in *A. rubiginosus*, and 24 - 25 in *A. artius*). Furthermore, the new species can be diagnosed by ten rows of papillae across width of disc region A; ten rows across width of disc in region B, and four or five rows across width of disc in region C.

Description: Meristic and proportional measurements of the holotype and two paratypes given in Table 1. Body moderately depressed, depth 5.4-6.6 in SL. Caudal peduncle short 0.5-0.7 in its length. Head depressed, head width 2.5-2.6 in SL. Snout steep with a rounded outline, 6.6-11.0 in head length, lower lip mostly covered with small papillae. Diameter of eye 0.6-0.8 in interorbital space and 3.0-4.2 in head length. Disc suction large, 2.9-3.7 in SL. Posterior nostril in front of anterior edge of eye, anterior nostril with an intermediate, branched dermal flap extending from its posterior margin. Dorsal to caudal distance great, 1.1-1.5 in dorsal fin length. Anus closer to anal origin than to rear margin of disc. Skin granular, covered with small glands. Maximum known size 16.3 mm SL.

Color in alcohol. Ground color uniform pale and colorless in the type series. Fins hyaline. Very diminutive chromatophores, associated with small gland (visible only with stereomicroscope) on dorsal and lateral surfaces of body.

Color in life. L. F. Mendes made observations of pigmentation in live specimens at the time of collection. Body uniformly pale reddish pink, without marks or bands. The color of the type specimens contrasts with the color of the patch of brown algae (*Sargassum* sp. and *Dictyota* sp. Division Phaeophyta), and the living colonies of coral *Montastrea cavernosa* (predominant coral in Noronha), surrounding the hole from which it was collected.

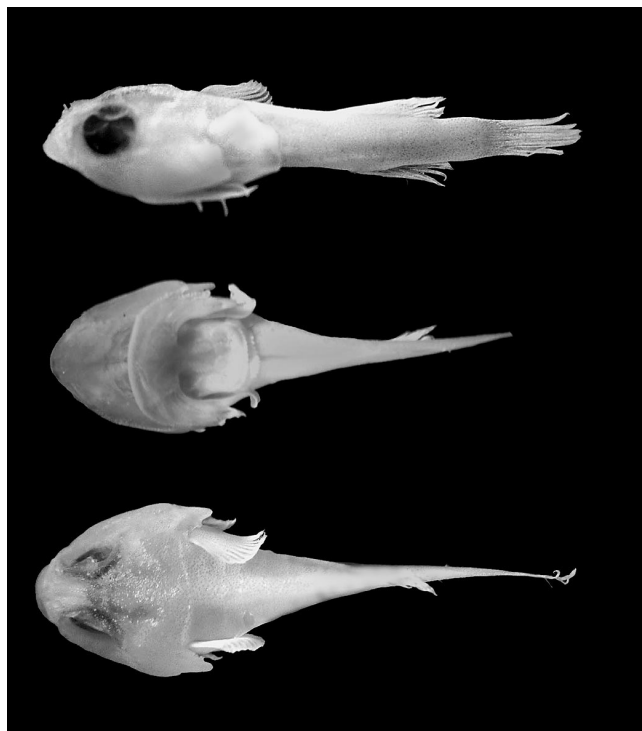


Fig. 1. *Acyrtus pauciradiatus*, new species. Holotype. MZUSP 84516, 16.3 mm SL, Brazil, off State of Pernambuco, Fernando de Noronha Archipelago, Rata Island, in Ressureta Bay.

Table 1. Morphometric and meristic characters for the holotype and paratypes of *Acyrtus pauciradiatus*.

Collection number	Holotype	Paratype	Paratype
	MZUSP	UFRN	MOVI
	84516	0001	37363
Standard length (mm)	16.3	13.2	12.6
Total length	20.1	17.4	15.7
Head length	6.6	5.6	5.5
Head width	6.3	5.3	4.8
Head depth	3	2.7	2.4
Interorbital width	2.8	2.5	2.2
Cornea diameter	2.2	1.5	1.3
Disc length	5.6	4.1	3.4
Disc width	5.9	4.5	4
Snout length	1	0.7	0.5
Pre-dorsal distance	11.4	9.4	8.5
Caudal peduncle depth	1.8	1.5	1.2
Caudal peduncle length	1.3	0.8	0.6
Anus to posterior margin of disc	2	1.7	1.5
Anus to anal fin origin	1.5	1.2	0.7
Pre-anal distance	11.3	10	9.1
Pectoral length	3	2.5	2.2
Dorsal length	3	2	2
Post-dorsal - caudal	2	1.7	1.5
Body depth	3	2	2

Distribution. Known only in shallow water at Fernando de Noronha Archipelago, off northeastern Brazil. Probably endemic to the Noronha hotspot, which includes the Fernando de Noronha Archipelago and Atol das Rocas (Rocha, 2003).

Habitat notes. The new species is found in shallow waters at the Fernando de Noronha Archipelago, occurring on hard-bottom habitats that consist of areas rich in calcareous and brown algae, corals and sponges. *Acyrtus pauciradiatus* was collected with the yellownose goby, *Elacatinus* sp.2 (*sensu* Moura *et al.*, 2003); manyscaled blenny, *Starksia multilepis* Williams & Mounts, 2003 and brownbar Goby, *Priolepis dawsoni* Greenfield, 1989, all endemic cryptic species from Brazilian reefs. *Acyrtus pauciradiatus* apparently is uncommon at the Noronha Archipelago and only three specimens have been collected.

Etymology. The new species is named *pauciradiatus* (Latin: having few rays) with reference to the dorsal, anal and pectoral fins rays, which have fewer rays than the other members of genus. The common name “Noronha’s Clingfish” is suggested.

Discussion

The distribution of the genus *Acyrtus* Schultz 1944 includes only the Western Atlantic (Briggs, 1955; Böhlke & Chaplin, 1993; Smith, 1997).

Acyrtus species have not been previously reported from any oceanic island off northeastern Brazil (Lubbock & Edwards, 1981; Nunan, 1992; Rosa & Moura, 1997; Moura, 1998; Feitoza *et al.*, 2003). Specimens of this species had not been collected previously, probably because of its cryptic habits.

The Fernando de Noronha Archipelago and Atol das Rocas were probably formed by the Noronha hotspot (Rocha, 2003). Although close (137 km apart), Castro & Pires (2001) affirm that the Fernando de Noronha Archipelago and Atol das Rocas consist of different coral reef structures and communities, but similar endemic reef fishes are commonly found in the Noronha – Atol insular complex (*e.g.* *Stegastes rocasensis* (Emery); *Storrsia olsoni* Dawson; *Starksia multilepis* Williams & Mounts; *Elacatinus* sp.2 (*sensu* Moura *et al.*, 2003); *Lythrypnus* sp.2; *Malacoctenus* sp.2; *Entomacrodus* spp. (*sensu* Moura, 2003); *Scartela* sp., *Ophioblennius* sp. (*sensu* Mendes, 2000); *Xyrichthys incandescens* Edwards & Lubbock) (C.L.S. Sampaio, pers. obs.).

Further investigation will probably show the occurrence of *Acyrtus pauciradiatus* at Atol das Rocas, due to their submerged, shallow (<200 m deep) shelves, which are only about 93 km apart from Noronha’s Archipelago. Furthermore, at about the midway point between the Fernando de Noronha Archipelago and Atol das Rocas lie two seamounts, with relatively flat summits found at depth of 57 and 38 m respectively, that provide potential intermediate “stepping stones” between their shallow waters faunas (Nunan, 1992; Rocha *et al.* 2000). *Acyrtus artius* has been recorded from deep waters, near 33 m (Johnson & Greenfield, 1983) suggesting that other members of the genus may reach these depths.

On the other hand, the differentiation of the endemic component of the reef fish faunas of Fernando de Noronha Archipelago and Atol das Rocas is suggested by Nunan (1992) and Rocha (2003) to have occurred rather recently. Brazilian endemic species have been reported to be taxonomically similar to their Caribbean sibling taxa, suggesting a relatively recent origin. The isolation of the two faunas may have occurred probably during the period of maximum terrigenous sediment deposition by the amazing Amazon River estuary and sea-level fluctuations (Floeter & Gasparini, 2001; Rocha, 2003).

Most clingfishes are small, territorial, benthic demersal-spawners or brooders, grow rapidly and probably reach sexual maturity in less than a year (Thresher, 1984). These characteristics have been associated by Floeter & Gasparini (2001) with most of the Brazilian endemic reef fishes. Williams & Tyler (2003) presented a discussion about the geographical distribution of the gobiesocid genus *Tomicodon*, and suggested that the restricted distribution of this genus can be related to the small body size of the included species. Apparently, *A. pauciradiatus* also has a restricted geographic distribution and appears to be long to one of the smallest oceanic Brazilian reef fish assemblages.

The small number of collected specimens of *A. pauciradiatus* together with the suspected restricted distribution of the new species leads to the proposition of a restricted endemic distribution.

Faced with the present limited knowledge about the geographic distribution of the small reef-dwelling fishes, the lack of ecological information and insufficient sampling, especially

for gobioid fishes, it is premature to propose a single meaningful hypothesis of speciation for *A. pauciradiatus*.

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