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BRIEF COMMUNICATION

First record of the genus *Jenynsia* from marine water on the coast of Punta del Este, Maldonado, Uruguay (Cyprinodontiformes: Anablepidae)

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The first report of the genus *Jenynsia* occurring in marine waters is presented here. The evolution of high salinity tolerance within Anablepidae is discussed and a hypothesis is proposed that this characteristic is a plesiomorphic trait in *Jenynsia* which was probably present in the common ancestor of the Anablepidae.

Key words: Atlantic Ocean; evolution; *Jenynsia multidentata*; salinity tolerance; seawater.

The genus *Jenynsia* Günther 1866 contains 14 valid species that inhabit a wide range of habitats spanning from mountain rivers in the Andes to flood plains and rivers, ranging from Rio de Janeiro in Brazil to Río Negro in Argentina (Aguilera *et al.*, 2013). *Jenynsia multidentata* (Jenyns 1842) has been reported from brackish waters in the estuarine region of Lagoa dos Patos, Brazil (Garcia *et al.*, 2001, 2004), and is known for its tolerance to high salinity (Ringuelet *et al.*, 1967). Moreover, Mai *et al.* (2005) showed that *J. multidentata* has a higher growth in high salinity environments. Fowler (1943) reported two individuals of *Fitzroyia lineata lineata* from 'Costas de Punta del Este, Maldonado, Uruguay' collected by Barattini in 1931. Those individuals probably belong to *J. multidentata*. Unfortunately, Fowler (1943) does not mention the exact location where these fish were collected: whether they were in marine water or in an adjacent creek or lagoon of fresh water. Therefore, no species of this genus have yet been reported coming from marine environments.

This is the first account of the occurrence of *J. multidentata* from a marine environment, near Punta del Este port, Maldonado, Uruguay (34° 58′ 20·37″ S; 54° 57′ 13·80″ W; Fig. 1). The diagnostic characteristics of *J. multidentata* that were described by

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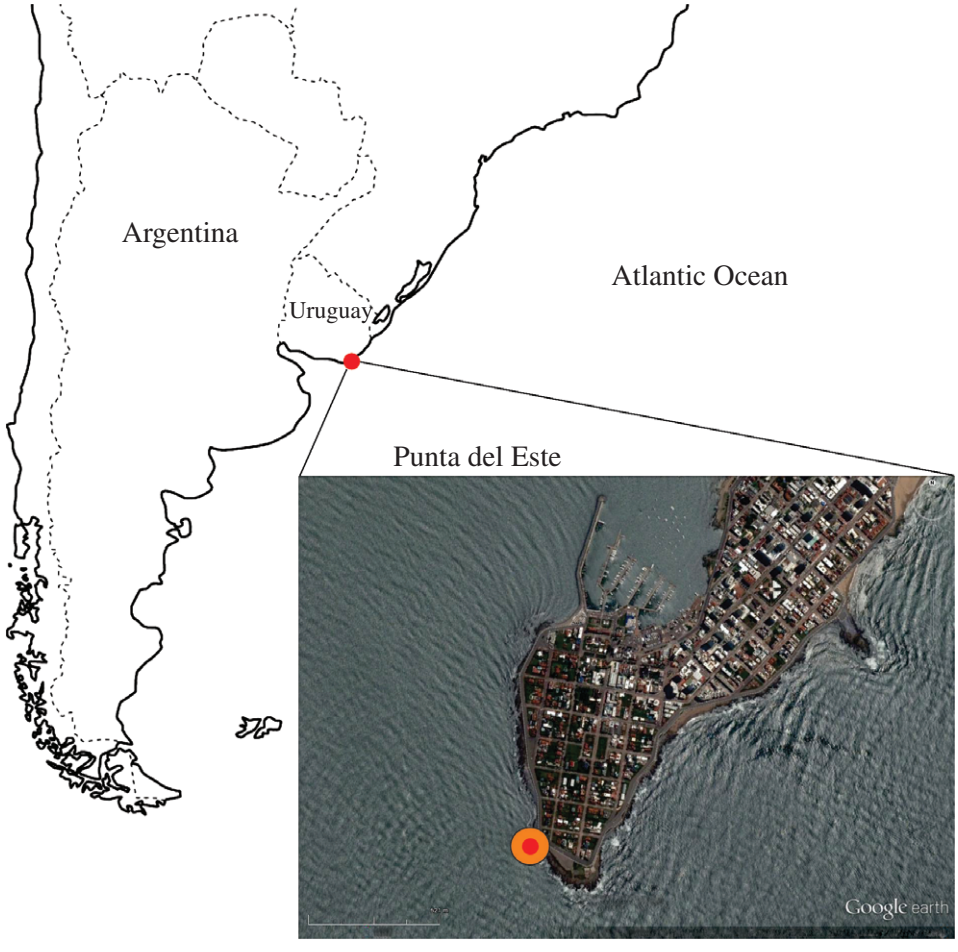

FIG. 1. Map showing the exact location of this new record (•) of *Jenynsia multidentata* from a marine environment near Punta del Este port, Maldonado, Uruguay (34° 58′ 20·37″ S; 54° 57′ 13·80″ W). Inset shows a satellite image from Google Earth of the respective area with a detail on the exact collecting point (●).

Ghedotti & Weitzman (1996) were observed in these individuals (Fig. 2): '(1) round or short, horizontal dash-shaped markings on sides that form approximately five to seven rows and also lines that extend for more than four scales in length on ventral caudal peduncle in adult females and large males and (2) presence of a distinct swelling between urogenital opening and anterior base of anal fin in females'.

In January 2015, a great number of individuals from this species inhabiting shallow pools of marine water were found (P. Calviño, pers. obs.). Interestingly, this species was only observed in a rocky area of about 200 m long, whereas it was not observed in the sandy environments nearby. A great number of individuals were observed in shallow pools between the rocks which were in permanent contact with seawater. No freshwater environments were observed in the area and the closest environments of this kind were 5 km away from this locality (Fig. 3). The individuals collected in summer, January 2015, are deposited in Museo Argentino de Ciencias Naturales 'Bernardino

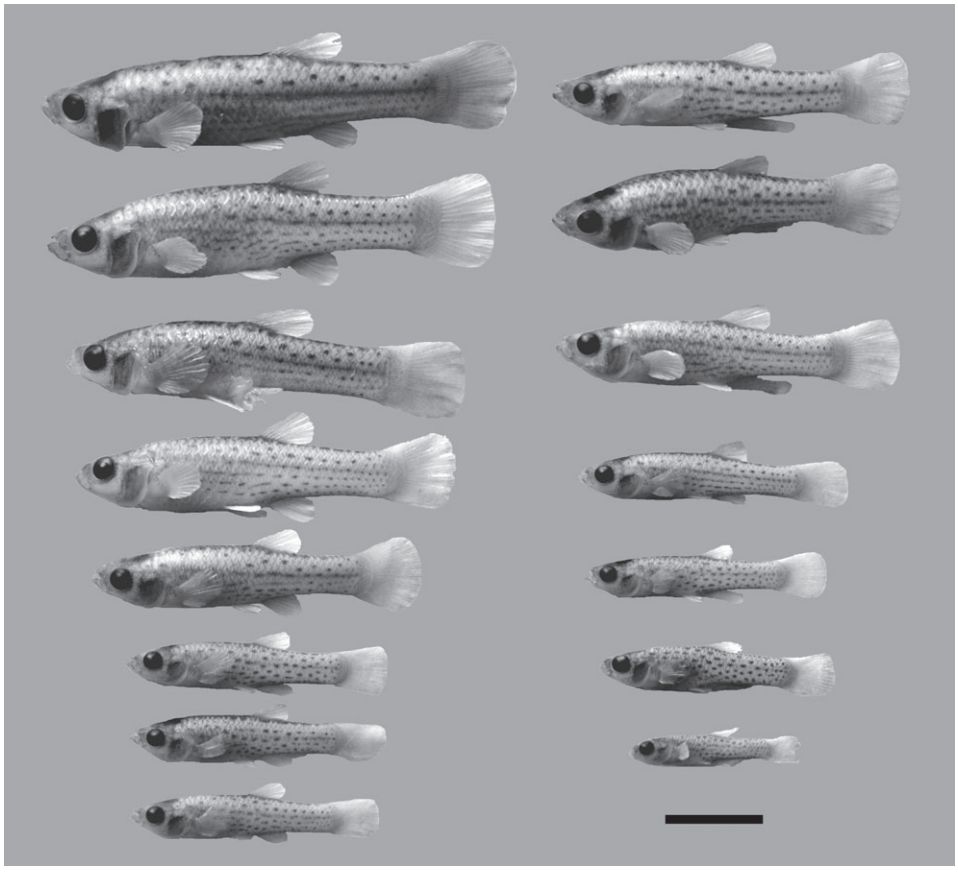

FIG. 2. Collected individuals of *Jenynsia multidentata*: 15 ex., 13·7–38·8 mm standard length, MACN-ict No. 10908. Bar = 10 mm.

Rivadavia' (MACN-ict No. 10908) and were collected together with individuals of the marine species of: *Diplodus argenteus* (Valenciennes 1830) (4 exemplars, 23·1–27·8 mm, standard length, L_S; MACN-ict No. 10910) and *Odontesthes argentinensis* (Valenciennes 1835) (1 ex., 48 mm L_S; MACN-ict No. 10909). The occurrence with marine species supports the assertion that this population is living in marine water. Nevertheless, brackish water influence in the area during autumn to winter does occur (Guerrero *et al.*, 1997), possibly facilitating the dispersion of this species. Notably, the size range of the individuals found (15 ex., 13·7–38·8 mm L_S) suggests that individuals from this population were breeding in this area. This hypothesis is also supported by the large size of the population observed consisting of several hundred individuals in that area that have been observed annually since 2005 (P. Calviño, pers. obs.). These observations support the hypothesis that this is a stable population. Interestingly, other members of the family Anablepidae such as the three species of *Anableps* (Miller, 1979) and *Oxyzygonectes dovii* (Günther 1866) (Murase *et al.*, 2014) are known to inhabit costal marine and estuarine habitats; therefore, tolerance to marine water may have evolved in the common ancestor of Anablepidae or before. Evolutionary transitions from seawater to fresh water rather than the opposite appear

FIG. 3. Habitat of *Jenynsia multidentata* from a marine environment near Punta del Este port, Maldonado, Uruguay.

to be more frequent in the evolution of Actinopterigyii (Betancur *et al.*, 2015). Putting this evidence together, and pending further evidence from phylogenetic analyses of this trait in the context of cyprinodontiform phylogeny, a marine or brackish origin for the Anablepidae may have occurred. Within the Suborder Cyprinodontoidei, brackish-marine salinity tolerance and habitat is common with all families having members with high salinity tolerance. Also, Ghedotti & Davis (2013) supported a higher salinity tolerance as ancestral for the Fundulidae. The resistance to high salinity may be a plesiomorphic trait in *Jenynsia* rather than an adaptative novelty to live in this kind of environment, but many members of this genus inhabit freshwater streams in the highlands of southern Brazil. The salinity tolerance of these species is not known (Ghedotti & Weitzman, 1996). Therefore, further studies of salinity tolerance in *Jenynsia* in a phylogenetic context are needed to address this hypothesis.

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