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A new species of *Ituglanis* from the Rio Xingu basin, Brazil, and the evolution of pelvic fin loss in trichomycterid catfishes (Teleostei: Siluriformes: Trichomycteridae)

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Abstract

A new species of the trichomycterid catfish genus *Ituglanis* is described from the Rio Curuá, Rio Xingu basin, Rio Amazonas drainage, Brazil. *Ituglanis apteryx*, new species, is promptly distinguished from congeners, except some specimens of *I. parahybae* (Eigenmann), by the absence of pelvic fins, girdle, and muscles. The new species differs from *I. parahybae* in the pattern of the cephalic laterosensory system; the absence of a posterior cranial fontanel; the presence of an epural; and the number of branchiostegal rays, ribs, and vertebrae. *Ituglanis apteryx* is one among the several trichomycterids lacking pelvic fins. Analysis reveals that pelvic fin loss independently evolved several times during the trichomycterid radiation.

Key words: Loricarioidea, catfish, taxonomy, systematics, phylogeny, musculature

Introduction

Trichomycteridae is a diversified family of catfishes (Siluriformes) with more than 260 valid species (Eschmeyer & Fong 2013). Trichomycterids inhabit the inland waters of almost the entire Neotropical region, occurring in a large array of habitats that include fast-flowing streams, lakes, large rivers, and subterranean watercourses (Berra 2007; de Pinna & Wosiacki 2003; Eigenmann 1918; Miles 1942; Rizzato *et al.* 2011). The most remarkable morphological feature of trichomycterids is their specialized opercular apparatus, in which the opercle and interopercle are drastically modified and equipped with noticeable patches of odontodes (= dermal teeth; Baskin 1973; de Pinna 1992a, 1998). By means of specialized muscles and ligaments, trichomycterids manoeuver the opercle and interopercle, using the patches of odontodes to anchor and move along hard substrate of riverbeds (Adriaens *et al.* 2010; Datovo & Bockmann 2010). This sophisticated apparatus helps some trichomycterids to ascend torrential watercourses and even climb up vertical walls in rapids and waterfalls (Eigenmann 1918; Mikolji 2013). The candirus, a group of semi-parasitic trichomycterids (Stegophilinae and Vandelliinae) that feed on mucus, scales, or blood of other fishes, use their modified opercular apparatus for hanging onto the body of their hosts (de Pinna 1998; Zuanon & Sazima 2004).

The Trichomycterinae is the most abundant subfamily of the Trichomycteridae, encompassing more than 70% of its alpha diversity (Eschmeyer & Fong 2013). Among the eight genera currently allocated in the Trichomycterinae, *Ituglanis* is the second most speciose with more than 20 species recognized to date (Eschmeyer 2013). Nearly half of the species of the genus were described in the last decade, and several other known new species of *Ituglanis* still await formal description. The present study describes a new species of *Ituglanis* from the Curuá River, a tributary of the Iriri River in the Xingu basin, Amazonas drainage, Brazil.

Material and methods

Measurements were point-to-point, taken with digital calipers and recorded to the nearest 0.1 mm following Datovo & Landim (2005). Number of post-Weberian vertebrae counts the compound caudal centrum (de Pinna &

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The most notable morphological feature of *Ituglanis apteryx* is the absence of pelvic fin, girdle and muscles (Fig. 1). Many other trichomycterids also lack pelvic fins: *Eremophilus mutisii* Humboldt, *I. parahybae, Silvinichthys bortayro* Fernández & de Pinna, *S. gualcamayo* Fernández, Sanabria & Quiroga, *S. huachi* Fernández, Sanabria, Quiroga & Vari, *S. leoncitensis* Fernández, Dominino, Brancolini & Baigún, *Trichomycterus catamarcensis* Fernández & Vari, *T. candidus* Miranda Ribeiro, *T. tropeiro* Ferrer & Malabarba, *"T." anhanga* Dutra, Wosiacki & de Pinna, *Miuroglanis platycephalus* Eigenmann & Eigenmann, and all glanapterygines except some specimens of *Glanapteryx* (pers. obs.; de Pinna 1989b; de Pinna & Wosiacki 2003; Dutra *et al.* 2012; Eigenmann 1918; Fernández & de Pinna 2005; Fernández & Vari 2000; Fernandez *et al.* 2014; Ferrer & Malabarba 2011; Myers 1927). In light of the currently accepted hypotheses of relationships among the Trichomycteridae, the loss of pelvic fins clearly evolved several times during the radiation of the family (Fig. 4; de Pinna 1989a, b; Fernandez *et al.* 2014). In the well-resolved regions of the trichomycterid cladogram, the pelvic fins are optimized as having been lost independently at the base of the Glanapteryginae, in *Miuroglanis* (Tridentinae), and in *"Trichomycterus" anhanga* (no designated subfamily). The number of events of pelvic fin loss within the Trichomycterinae remains undetermined in function of the current lack of phylogenetic resolution of the subfamily. Among species of *Ituglanis*, only some individuals of *I. parahybae* also lack pelvic structures (Costa & Bockmann 1993). While many morphological features discard a possible conspecificity between *I. apteryx* and *I. parahybae* (see Diagnosis), a closer relationship between the two species is unwarranted given the above discussed characters shared with other congeners. Therefore, it is impossible to determine at this time whether or not the pelvic fin loss in *I. apteryx* and *I. parahybae* evolved independently.

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