

A new species of the catfish genus *Trichomycterus* (Teleostei: Siluriformes: Trichomycteridae) from the Paranaíba basin, Central Brazil

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Abstract

Trichomycterus giarettai, new species, from a small river in Cumari municipality, Central Brazil is described. It is hypothesized to be closely related to species of *T. brasiliensis* complex by possessing the opercular odontodes disposed obliquely on the patch. *Trichomycterus giarettai* is diagnosed by the distribution of infraorbital pores, body width, caudal peduncle width, number of vertebrae, branchiostegal rays, dorsal and ventral procurrent rays, opercular and interopercular odontodes, length of the nasal barbels, and pelvic fin insertion.

Resumo

Trichomycterus giarettai, espécie nova, de um pequeno riacho no município de Cumari, Brasil Central, é descrito. Ele é hipotetizado como proximamente relacionado as espécies do complexo *T. brasiliensis* por possuir a distribuição diagonal dos odontódeos na placa opercular. *Trichomycterus giarettai* é diagnosticado pela distribuição dos poros infraorbitais, largura do corpo, largura do pedúnculo caudal, número de vértebras, raios branquiostegais, raios procorrentes ventrais e dorsais, odontódeos operculares e interoperculares, comprimento dos barbilhões nasais e inserção da nadadeira pélvica.

Key words

Catfishes, Goiás, Neotropical, Trichomycterinae, systematics, taxonomy.

Introduction

Trichomycterus Valenciennes, 1832 is one of the most diversified genera of catfishes among neotropical fishes, with almost 170 species (COSTA, 1992; BARBOSA & COSTA, 2003a, 2008; 2010a; 2011; 2012a; CASTELLANOS-MORALES, 2008; ESCHMEYER & FONG, 2016; FERNANDEZ & VARI, 2009; KATZ *et al.* 2013) geographically widespread between Costa Rica and Patagonia (WOSIACKI & PINNA, 2008). The species of the genus have the behaviour to hide in the substrate being usually found in isolated rivers headsprings with highly oxygenated waters (BARBOSA & COSTA, 2010a; BARBOSA, 2013). There is a remarkable concentration of *Trichomycterus* in Southeastern Brazil

with about 50 species described for the São Francisco, Paranaíba do Sul and Paraná river basins, as well as smaller adjacent coastal basins (EIGENMANN, 1918; COSTA 1992; BARBOSA & COSTA, 2010a; ESCHMEYER & FONG, 2016; KATZ, BARBOSA & COSTA, 2013). Among the *Trichomycterus* from southeastern Brazil highlights the *T. brasiliensis* species complex stands out, with the greatest species richness, 14 described species, all of them possessing the unique arrangement of opercular odontodes disposed obliquely. In the present study, *Trichomycterus giarettai*, the new species collected in the upper Paranaíba river, upper Paraná river basin, is described. It seems to

be closely related to the species of the *Trichomycterus brasiliensis* species complex, by displaying the unique arrangement of opercular odontodes, disposed obliquely.

Material and methods

Measurements and counts follow BARBOSA & COSTA (2003b). Measurements are presented as percentages of standard length (SL), except for subunits of head, which are presented as percentage of head length (HL). Counts of procurrent caudal-fin rays, vertebrae, branchiostegal rays, teeth and odontodes were made only in cleared and stained specimens (c&s) prepared according to TAYLOR & VAN DYKE (1985). Abbreviation for institution is: UFRJ, Universidade Federal do Rio de Janeiro, Rio de Janeiro. The method for species delimitation follows the methodology proposed by DAVIS & NIXON (1992) formally identified as population aggregation analysis (PAA), in which species delimitation is achieved through the presence of unique combination of non-overlapping character states. Comparative material is listed in BARBOSA & COSTA (2008) and BARBOSA & COSTA (2010a).

Trichomycterus giarettai new species

Fig. 1

Holotype. UFRJ 10109, 69.4 mm SL; Brazil: Estado de Goiás: Município de Cumari: small stream tributary of the rio Paranaíba, rio Paraná basin, approximately 18°22'52" S; 48°06'58" W, altitude approximately 590 m; A. Giaretta, 08 August 2013.

Paratypes. UFRJ 9676, 8, 27.0–71.2 mm SL; UFRJ 9739, 3 (c&s), 31.3–37.7 mm SL; same data as holotype.

Diagnosis. *Trichomycterus giarettai* is similar to all other species of the *T. brasiliensis* complex [*T. brasiliensis* LÜTKEN, 1784; *T. brunoii* BARBOSA & COSTA, 2010; *T. claudiae* BARBOSA & COSTA, 2010; *T. fuliginosus* BARBOSA & COSTA, 2010; *T. macrotrichopterus* BARBOSA & COSTA, 2010; *T. maracaya* BOCKMANN & SAZIMA, 2004; *T. mariamole* BARBOSA & COSTA, 2010; *T. mimonha* COSTA, 1992; *T. mirissumba* COSTA, 1992; *T. novalimensis* BARBOSA & COSTA, 2010; *T. rubiginosus* BARBOSA & COSTA, 2010; *T. pirabitira* BARBOSA & AZEVEDO-SANTOS; *T. potschi* BARBOSA & COSTA, 2010; and *T. vermiculatus* (EIGENMANN, 1918)] and distinguished from the remaining species of southeastern Brazil by having opercular odontodes obliquely arranged (vs. vertically). The new species is similar to *T. brasiliensis*, *T. mimonha*, *T. macrotrichopterus*, *T. rubiginosus*, and distinguished from the remaining species of the *T. brasiliensis* complex by having infraorbital canal with two pores (vs. four). It differs from *T. brasiliensis*, *T. mimonha*, *T. macrotrichopterus* and *T. rubiginosus* by having a narrower trunk (body width

5.7–7.7% SL, vs. 7.8–12.3%); from *T. claudiae*, *T. fuliginosus*, *T. maracaya*, *T. mariamole*, *T. mimonha*, *T. mirissumba*, *T. novalimensis*, *T. pirabitira*, *T. vermiculatus* by possessing 35–36 vertebrae (vs. 37–40); from *T. brasiliensis* and *T. fuliginosus* by having 7–8 branchiostegal rays (vs. 9); from *T. brunoii* by having 20–22 dorsal procurrent rays (vs. 17–19), 17–18 ventral procurrent rays (vs. 14–15), 8–10 opercular odontodes (vs. 13–23), 24–30 interopercular odontodes (vs. 31–50), and by the tip of nasal barbels reaching pectoral-fin base (vs. middle of opercular patch of odontodes); from *T. potschi* by having a narrower trunk (body width 5.7–7.7% SL, vs. 9.7–12.3%), and a narrower caudal peduncle (caudal peduncle width 2.8–3.6% SL, vs. 4.0–5.4%); and from *T. vermiculatus* by the position of pelvic fin insertion, in relation to the dorsal-fin origin (anterior to the dorsal-fin origin, vs. under dorsal-fin origin).

Description. Morphometric data for holotype and paratypes given in Table 1. Body moderately deep, subcylindrical on anterior portion, compressed on caudal peduncle. Dorsal profile slightly convex between snout and end of dorsal-fin base, straight on caudal peduncle. Ventral profile straight to slightly convex between lower jaw and end of anal-fin base, straight on caudal peduncle. Greatest body depth in vertical immediately in front of pelvic-fin origin. Skin papillae minute. Urogenital papilla conical, in vertical through anterior third of dorsal-fin base. Dorsal and anal fins approximately triangular. Dorsal-fin origin in vertical through centrum of 20th vertebra. Anal-fin origin in vertical just posterior to midlength of dorsal-fin base and through centrum of 23th vertebra. Pectoral fin about triangular, lateral and posterior edges slightly convex. First pectoral-fin ray terminating in short filament, about 15% of pectoral-fin length. Pelvic fin shorter than anal fin, covering urogenital opening, tip not reaching anal fin, in vertical just anterior to dorsal-fin origin; pelvic girdle short with mesial process absent or vestigial; pelvic-fin bases medially in close proximity; pelvic-fin insertion through vertical centrum of 17th or 19th vertebra. Caudal fin subtruncated, posterior margin slightly convex. Dorsal-fin rays 11; anal-fin rays 9–10; pectoral-fin rays 7; pelvic-fin rays 5; caudal-fin principal rays 13, dorsal procurrent rays 20–21, ventral procurrent rays 17–18. Total vertebrae 35–36; pleural ribs 13–15. Upper hypural plates separated, dorsal plate much wider than ventral plate, or ventral and dorsal plate with approximately the same width.

Head trapezoidal in dorsal view. Snout blunt. Mouth subventral. Maxilla shorter than premaxilla. Teeth conical, tip of nasal barbels reaching pectoral-fin base, maxillary barbels reaching middle of pectoral-fin base, and tip of rictal barbels reaching edge of opercular patch. Branchiostegal rays 7 or 8. Interopercular odontodes 24–30; opercular patch of odontodes narrow, with 8–10 odontodes; opercular odontodes about equal in width to interopercular odontodes; opercular odontodes arranged obliquely; odontodes conical. Medial margin of autopalatine slightly concave; posterior process of autopala-

Table 1. Morphometric data of *Trichomycterus giarettai* UFRJ 9676 and UFRJ 10109 (Holotype).

		Holotype						
Standart length (mm)	71.2	69.4	56.6	48.7	41.4	37.7	36.6	36.2
Percentage of standart length								
Body depth	13.6	13.8	16.3	15.0	14.3	14.6	14.2	16.0
Caudal peduncle depth	11.4	13.0	14.0	13.3	13.3	14.1	11.7	14.6
Body width	7.3	6.9	7.6	7.6	6.8	7.7	5.7	7.2
Caudal peduncle depth	2.9	3.0	3.5	3.3	3.1	3.2	3.6	2.8
Dorsal-fin base length	9.8	9.5	10.1	9.9	9.4	10.9	9.8	10.2
Anal-fin base length	9.8	8.6	8.3	8.2	8.7	10.1	8.5	9.7
Pelvic-fin length	7.6	9.8	9.2	9.2	8.7	9.3	8.5	9.1
Distance between pelvic-fin bases	0.4	0.4	0.9	0.6	0.7	0.5	0.8	0.3
Pectoral-fin length	10.4	10.5	11.0	11.3	12.6	13.3	9.8	14.1
Predorsal length	65.2	63.4	61.0	62.0	63.0	63.4	64.2	61.9
Prepelvic length	58.7	60.2	58.5	57.3	60.6	59.9	60.1	68.5
Head length	17.8	19.0	18.6	19.9	20.5	19.6	18.6	19.6
Percentage of head length								
Head depth	52.8	53.0	47.6	42.3	42.4	47.3	41.2	43.7
Head width	81.9	81.1	83.8	79.4	76.5	81.1	86.8	84.5
Interopercular width	29.9	8.3	30.5	27.8	29.4	32.4	30.9	33.8
Preorbital length	40.2	41.7	38.1	38.1	42.4	43.2	47.1	46.5
Eye diameter	9.4	8.3	10.5	11.3	10.6	10.8	11.8	14.1



Fig. 1. *Trichomycterus giarettai*, UFRJ 10109, preserved holotype, 69.4 mm SL; Brazil: Goiás: Município de Cumari. Photo by A.M.Katz.

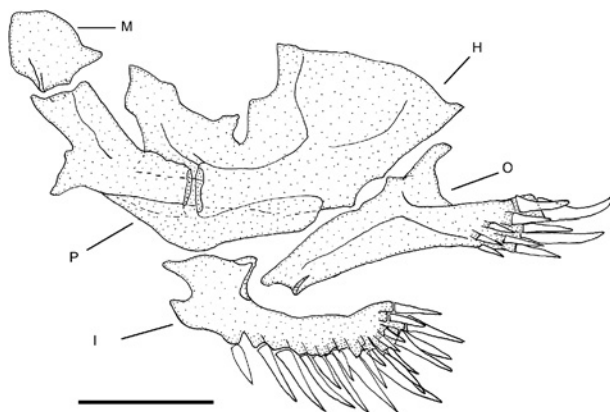


Fig. 2. Left jaw suspensorium and opercular series of *Trichomycterus giarettai*, UFRJ 9739, lateral view. H – hyomandibula; I – interopercle; M – metapterygoid; O – opercle; P – preopercle; Q – quadrate. Scale bar = 1 mm.

tine slightly shorter than autopalatine without posterior process. Lacrimal slightly longer than 1/3 of supraorbital length; supraorbital rod shaped. Metapterygoid moderate

in length, much deeper than wide, without distinct processes. Anterodorsal surface of hyomandibula with weak concavity.

Supraorbital canal with three pores; first pore in transverse line through anterior nostril, second in transverse line just posterior to posterior nostril, third in transverse line just posterior to orbit; third pore approximately equidistant to symmetrical pore and orbit. Infraorbital canal restricted to two pores; first and second pores absent; third and fourth present and posterior to orbit. Preopercular canal with one pore, in vertical through anterior margin of opercular patch of odontodes. Lateral line of body short, with three pores, posteriormost pore in vertical just posterior to pectoral-fin base.

Colouration in alcohol. Side of body and head pale yellowish brown, with dark brown dots coalesced to form reticulate pattern; venter yellowish; barbels brown. Fins hyaline with brown bases; pectoral-fin filament white. In juveniles, narrow dark brown stripe along lateral midline; dorsal dark brown with dark brown dots coalesced to form vermiculate or reticulate pattern; flank brown

with dark brown dots above, and light yellowish with small dark brown spots below midline.

Distribution. Known only from a small stream, tributary of the upper rio Paranaíba basin, Central Brazil.

Etymology. The name “giarettai” was given in honor to the herpetologist A. Giaretta, that first collected the new species in the field.

Discussion. The Paranaíba river basin, where the new species was found, is the second largest forming unit of the Paraná river basin, occupying 25.4% of its area, located in central Brazil. The tributaries of this wide basin drains part of Brazilian Shield and, despite being part of the upper Rio Paraná basin, seems to include a slightly different fauna (COSTA, 1996; COSTA, 2011; PAVANELLI & BRITSKI, 1999).

BARBOSA & COSTA (2010a) recognized the *T. brasiliensis* complex based on the presence of a unique arrangement of opercular odontodes, disposed obliquely. This group consists of fourteen species distributed through the upper São Francisco, Paraíba do Sul, and Paraná river basins, as well as, small coastal river basins in southeastern Brazil (BARBOSA & COSTA, 2012a,b; 2013). *Trichomycterus giarettai*, the first species of the genus described for Central Brazil, also possesses the unique arrangement of opercular odontodes, disposed obliquely, therefore being here hypothesized as belonging to the *T. brasiliensis* species complex. It differs from all other species of *T. brasiliensis* complex by the distribution of infraorbital pores, body width, caudal peduncle width, number of vertebrae, branchiostegal rays, dorsal and ventral procurrent rays, opercular and interopercular odontodes, length of the nasal barbels, and pelvic fin insertion.

Species of *T. brasiliensis* complex are very similar to each other, with all of them showing colour pattern possessing dark brown dots coalesced to form reticulate pattern. Because of this external similarity they were historically poorly identified and almost indistinguishable externally (BARBOSA & COSTA, 2010). Therefore, detailed morphology studies have shown that many of these seemingly similar species have many morphological informative features for taxonomy, allowing robust diagnosis of new species and being an important tool to recognize species (COSTA, 1992; BARBOSA & COSTA, 2003; BARBOSA & COSTA, 2010a, b; KATZ *et al.*, 2013). The number of species is probably much greater than the current biodiversity estimates (e.g. BICKFORD *et al.*, 2006).

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