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Description of two new species of the catfish genus *Trichomycterus* from southeastern Brazil (Siluriformes: Trichomycteridae)

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Abstract

Two new species of *Trichomycterus* from isolated small river basins of southeastern Brazil are described: *T. pantherinus*, new species, from the Rio Santa Maria da Vitória basin, and *T. caudofasciatus*, new species, from the Rio Itabapoana basin. Both new species are diagnosed by a combination of morphological features, also occurring in *T. alternatus* and *T. longibarbatus*, including number of pectoral-fin rays, odontodes and branchiostegal rays, long filamentous first pectoral-fin ray and wide opercular patch of odontodes. *Trichomycterus pantherinus* differs from other congeners by possessing a light orangish yellow flank with dark brown to black rounded spots. *Trichomycterus caudofasciatus* is distinguished from other species of the genus by having four gray bars on the caudal fin.

Key words: *Trichomycterus*, new species, trichomycteridae, Siluriformes, catfish, taxonomy, southeastern Brazil

Resumo

Duas novas espécies de *Trichomycterus* de pequenas bacias de rios isolados do sudeste do Brasil são descritas: *T. pantherinus*, espécie nova, da bacia do rio Santa Maria da Vitória, e *T. caudofasciatus*, espécie nova, da bacia do rio Itabapoana. Ambas espécies novas são diagnosticadas por uma combinação de características morfológicas, também ocorrendo em *T. alternatus* e *T. longibarbatus*, incluindo número de raios d nadadeira peitoral, odontóides e raios branquiostegais, primeiro raio de nadadeira peitoral filamentoso longo e base de inserção de odontóides operculares larga. *Trichomycterus pantherinus* difere de outros congêneres por possuir flanco amarelo alaranjado com manchas arredondadas castanho escuras a negras. *Trichomycterus caudofasciatus* se distingüe das outras espécies do gênero por ter quatro barras cinzentas na nadadeira caudal.

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Introduction

Trichomycterus Valenciennes is a specious assemblage of catfishes inhabiting mountain rivers of South America and southern Central America, each species usually endemic to a single river basin (Eigenmann, 1918). About 60 nominal species are endemic to the river basins draining the Andes and hills of the Guianan Shield, and about 30 species are endemic to river basins draining the Brazilian Shield. However, it is not known if the whole genus *Trichomycterus* is a monophyletic lineage, or even if species of each region form a clade.

Trichomycterus is still poorly known in the Brazilian Shield river basins, with many undescribed species. Most described species of this region are endemic to the Rio Paraíba do Sul basin (Costa, 1982), but many areas are still insufficiently sampled. For example, only one species, *Trichomycterus longibarbatus* Costa, is known to occur in the vast area occupied by numerous isolated river basins between the Rio Paraíba do Sul and Rio Doce basins, southeastern Brazil. However, recent collections in this area revealed several new species of *Trichomycterus*, of which two species exhibiting very distinctive color patterns are herein described.

Material and Methods

Measurements and counts follow Costa (1992). Measurements are presented as percentages of standard length (SL), except for subunits of head, which are presented as percentage of head length. Osteological observations were made only in cleared and stained specimens (c&s) prepared according to Taylor & Van Dyke (1985). The material is deposited in UFRJ, Universidade Federal do Rio de Janeiro, Rio de Janeiro, and MCP, Museu de Ciências e Tecnologia, PUC-RS, Porto Alegre.

Trichomycterus pantherinus new species
(Fig.1)

Holotype. UFRJ 6001, 55.3 mm SL; Brazil: Estado do Espírito Santo: Município de Santa Leopoldina, below waterfall near Fazenda Sete Quedas, Rio da Prata, Rio Santa Maria da Vitória basin, 20°03'15.9"S 40°32'20.5"W, altitude 377 m; W. J. E. M. Costa, B. B. Costa and C. P. Bove, 2 January 2003.

Paratypes. MCP 35029, 6 ex., 37.0–45.9 mm SL; UFRJ 5659, 22 ex., 32.9–69.9 mm SL; UFRJ 5660, 6 ex. (c&s), 40.6–48.5 mm SL; all collected with holotype.

Diagnosis: Similar to *T. alternatus* (Eigenmann), *T. longibarbatus* and *T. caudofasciatus*, and distinguished from other congeners by the combination of the following features: 7–8 pectoral-fin rays, long filamentous first pectoral-fin ray (about 50–70 % pectoral-fin

length), 10–20 opercular odontodes, 30–52 interopercular odontodes, opercular patch of odontodes wide, and 6–7 branchiostegal rays. It differs from *T. alternatus, T. longibarbatus* and *T. caudofasciatus* by the absence of anteriormost section of infraorbital canal (vs. presence) and having 7 pectoral-fin rays (vs. 8 rays). It differs from all other species of the genus from the Brazilian Shield river basins by a unique color pattern, consisting of a light orangish yellow flank with dark brown to black rounded spots irregularly distributed.

FIGURE 1. *Trichomycterus pantherinus*, UFRJ 6001, live holotype, 55.3 mm SL; Brazil: Espírito Santo: Santa Leopoldina (Photo by W.J.E.M. Costa).

TABLE 1. Morphometric data of *Trichomycterus pantherinus*. H: holotype.

	H	Paratypes (UFRJ 5659)									
Standard length (mm)	55.3	60.8	69.9	62.2	50.6	64.3	62.7	58.0	57.4	58.4	53.2	50.2
Percents of standard length												
Body depth	14.0	15.9	16.0	15.2	14.6	15.4	15.8	14.4	14.0	14.0	14.4	14.0
Caudal peduncle depth	10.2	11.2	11.3	10.8	11.3	12.1	10.7	11.2	11.3	11.0	10.5	10.7
Body width	9.1	9.6	10.6	10.7	10.4	10.8	9.9	10.3	9.0	9.0	9.8	8.9
Caudal peduncle width	2.2	2.3	2.1	2.5	2.4	3.0	2.6	2.0	1.7	1.8	1.9	2.0
Dorsal-fin base length	10.0	12.1	11.4	12.1	10.3	11.4	10.5	9.8	10.8	12.5	10.9	10.9
Anal-fin base length	9.3	8.9	8.7	9.8	8.6	9.1	9.1	8.2	9.7	10.2	10.5	9.8
Pelvic-fin length	9.4	10.5	9.0	9.3	9.8	9.4	9.0	9.4	9.2	9.3	9.7	9.1
Distance between pelvic-fin bases	1.9	1.9	2.2	1.8	2.1	1.7	1.9	1.9	1.6	1.9	1.6	1.2
Pectoral-fin length	13.8	10.4	12.2	11.5	12.9	12.6	12.1	11.7	12.8	12.8	12.7	14.1
Predorsal length	64.3	61.1	63.9	60.5	61.1	62.8	60.3	60.3	60.3	60.6	60.0	60.0
Prepelvic length	57.8	58.0	57.2	56.8	55.7	56.0	55.2	53.5	53.1	55.1	53.3	54.5
Head length	19.4	19.6	19.2	19.6	20.6	19.6	19.0	19.0	19.3	18.7	20.5	20.5
Percents of head length												
Head depth	50.3	50.8	50.6	50.9	50.0	52.3	52.4	50.5	50.0	51.7	50.4	49.8
Head width	88.5	93.1	94.3	87.9	88.9	96.7	97.6	91.6	89.0	92.6	88.1	88.0
Interorbital width	28.9	26.4	32.0	28.4	32.2	28.0	29.0	29.4	29.2	32.4	30.6	31.4
Preorbital length	46.1	41.6	42.5	43.7	43.8	46.0	46.0	43.0	44.3	44.3	41.4	42.0
Eye diameter	7.5	8.4	7.8	7.0	8.9	7.0	8.4	7.8	7.4	8.3	8.4	8.7

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 to slightly convex 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 spherical, at vertical just anterior to dorsal-fin base.

Dorsal and anal fins approximately triangular. Dorsal-fin origin at vertical through centrum of 18th or 19th vertebrae. Anal-fin origin at vertical through base of 8th or 9th dorsal-fin ray and through centrum of 22nd or 23rd vertebra. Pectoral fin about triangular, lateral and posterior edges slightly convex. First pectoral-fin ray terminating in long filament, about 50 % of pectoral-fin length. Pelvic fin shorter than anal fin, covering urogenital pore, tip not reaching anal-fin, in vertical through base of 2nd unbranched dorsal-fin ray; pelvic-fin bases separated by interspace; pelvic-fin origin in vertical through centrum of 15th or 16th vertebra. Caudal fin subtruncate. Dorsal-fin rays 11–12; anal-fin rays 9–10; pectoral-fin rays 7; pelvic-fin rays 5; caudal-fin principal rays 13, dorsal procurrent rays 18–19, ventral procurrent rays 14–15. Total vertebrae 36–37; pleural ribs 11–13. Upper hypural plates separated, both approximately equal in width; single lower hypural plate and parahypural completely fused.

Head trapezoidal in dorsal view. Snout blunt. Mouth subventral. Maxilla slightly shorter than premaxilla. Teeth cylindrical, tips slightly pointed. Eye at middle of head. Nasal, maxillary and rictal barbels well developed. Tip of nasal barbel reaching posterior edge of opercular patch of odontodes. Tip of maxillary barbel reaching pectoral-fin base. Tip of rictal barbel reaching posterior portion of interopercular patch of odontodes. Seven branchiostegal rays. Interopercular odontodes 36–40; opercular patch of odontodes wide, with 12–20 odontodes; odontodes conical, opercular odontodes wider than interopercular odontodes; opercular odontodes arranged vertically.

Supraorbital canal continuous, with three pores; first pore in transverse line through anterior nostril, second in transverse line just posterior to posterior nostril, third supraorbital pore paired, each pore closer to symmetrical pore than to orbit in transverse line just posterior to orbit. Infraorbital divided into two sections, each with two pores, anteriormost section absent; first infraorbital pore in transverse line through anterior nostril, second in transverse line just anterior to posterior nostril, third and fourth 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.

Coloration: Side of body light orangish yellow, sometimes pale greenish yellow, with small dark brown to black rounded spots irregularly distributed, sometimes coalesced to form lateral stripe on anterior portion of lateral midline, sometimes forming transverse bars on dorsum; venter white. Side of head orangish yellow with dark brown spots; dark

chromatophores concentrated on preopercular region; opercular and interopercular patches of odontodes light yellow. Dorsal surface of head brown, with dark brown blotch on middle of dorsal surface of head in vertical through opercle, sometimes Y-shaped light area uniting anterior dorsal midline and anterior nares; dark chromatophores concentrated around nostrils; barbels dark gray; ventral surface of head white. Iris yellow. Dorsal fin pale yellow with small dark brown spots on basal portion. Caudal fin pale orange with small dark brown spots on basal portion. Anal and pelvic fins pale yellow. Pectoral fin yellow, with dark brown spot on basal region; pectoral filament white.

Distribution: Known only from the type locality, Rio da Prata, Rio Santa Maria da Vitória basin, Serra dos Polacos, southeastern Brazil.

Habitat notes: This new species was collected in a clear water stream below a waterfall. All specimens were found in shallow waters (about 30–40 cm deep), under marginal vegetation. In these places the bottom was composed of gravel and the current reached high velocity.

Etymology: From the Latin *pantherinus* (pertaining to the panther), an allusion to the color pattern of the new species.

***Trichomycterus caudofasciatus* new species**
(Fig. 2)

Holotype. UFRJ 6002, 48.5 mm SL; Brazil: Estado de Minas Gerais: Município de Alto Caparaó, Rio Caparaó, Rio Itabapoana basin, Alto Caparaó, 20°25’53.9”S 41°51’56.8”W, altitude 1047 m; W. J. E. M. Costa, B. B. Costa and C. P. Bove, 23 December 2002.

Paratypes. Brazil: Estado de Minas Gerais: Rio Itabapoana basin: MCP 35030, 2 ex., 39.4–40.0 mm SL; UFRJ 5655, 10 ex., 36.2–41,9 mm SL; UFRJ 5656, 5 ex. (c&s), 34.5–48.8 mm SL; collected with holotype. UFRJ 5657, 10 ex., 29.6–42.5 mm SL; Cachoeira do Chiador, Rio São Domingos, about 17 km N from Espera Feliz, 20°33’24.8”S 41°51’26.9”W, altitude 957 m; W. J. E. M. Costa, B. B. Costa and C. P. Bove, 23 December 2002. UFRJ 4070, 5 ex., 26.7–52.9 mm SL; waterfall in Rio São Domingos, about 3 km from Paraíso, near Espera Feliz; F. Pupo, 2 February.1997.

Diagnosis: Similar to *T. alternatus*, *T. longibarbatus* and *T. pantherinus* and distinguished from all other species of the genus by the combination of the following features: 7–8 pectoral-fin rays, long filamentous first pectoral-fin ray (about 50–70 % pectoral-fin length), 10–20 opercular odontodes, 30–52 interopercular odontodes, opercular patch of odontodes wide, and 6–7 branchiostegal rays. It is easily distinguished from *T. alternatus*, *T. longibarbatus* and *T. pantherinus* by having a single median last supraorbital pore (vs. paired pore). Distinguished from all other species of *Trichomycterus* from the Brazilian Shield river basins by a unique color pattern, consisting of four gray bars on the caudal fin.

FIGURE 2. *Trichomycterus caudofasciatus*, UFRJ 6002, live holotype, 48.5 mm SL; Brazil: Minas Gerais: Alto Caparaó (Photo by W.J.E.M. Costa).

Description: Morphometric data for holotype and paratypes given in Table 2. Body moderately deep, subcylindrical on anterior portion, compressed on caudal peduncle. Dorsal profile gently convex between snout and end of dorsal-fin base, straight to slightly convex 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.

TABLE 2. Morphometric data of *Trichomycterus caudofasciatus*. H: holotype.

	H	Paratypes (UFRJ 5655, 5657)										
Standard length (mm)	48.8	34.4	37.3	44.1	40.9	41.8	41.9	53.8	51.4	42.5	41.1	37.2	35.3
Percents of standard length													
Body depth	14.8	14.0	14.9	15.5	15.8	13.8	14.8	13.7	14.0	14.6	15.4	13.9	13.7
Caudal peduncle depth	10.4	9.4	9.8	10.3	10.4	9.4	10.9	8.9	10.4	9.8	10.2	9.9	8.7
Body width	9.4	7.8	9.9	9.9	9.7	9.0	10.6	8.6	8.7	9.1	10.2	7.9	8.3
Caudal peduncle width	1.9	2.1	2.2	2.3	2.5	2.5	2.5	2.1	2.3	2.0	2.0	1.8	2.3
Dorsal-fin base length	9.5	10.9	9.2	10.1	10.3	9.2	11.3	10.3	10.9	13.1	11.6	11.6	11.6
Anal-fin base length	6.8	8.3	8.8	7.6	7.7	8.0	7.5	8.8	9.0	7.7	7.2	7.6	7.7
Pelvic-fin length	10.1	10.2	10.3	10.1	10.5	9.7	10.7	9.8	10.1	10.2	11.1	11.6	10.4
Distance between pelvic-fin bases	1.9	1.6	1.3	1.9	1.7	1.6	1.6	1.5	1.8	1.8	1.6	1.4	1.9
Pectoral-fin length	15.3	16.4	17.1	14.7	14.5	14.5	14.3	15.1	14.2	14.0	17.3	14.9	17.0
Predorsal length	60.0	58.6	60.5	58.2	56.6	58.6	57.7	58.7	57.5	59.2	59.3	57.5	58.1
Prepelvic length	53.1	53.6	54.3	54.7	52.8	54.2	52.0	53.8	52.5	54.6	54.6	53.2	54.7
Head length	21.1	21.0	22.0	21.3	22.7	21.3	20.3	20.4	20.2	22.4	20.7	20.9	22.4
Percents of head length													
Head depth	49.9	52.7	46.1	48.9	46.1	51.0	51.9	48.8	51.2	49.2	53.3	48.6	48.8
Head width	91.9	97.5	89.0	87.0	87.5	92.7	97.9	88.8	97.9	85.4	98.0	85.5	85.7
Interorbital width	29.0	27.9	26.8	26.2	25.9	28.3	29.7	30.1	31.9	25.0	25.4	29.3	28.2
Preorbital length	40.6	35.5	41.2	36.8	36.0	39.9	40.3	41.0	42.0	36.9	40.6	40.5	39.3
Eye diameter	10.4	11.0	11.0	10.5	9.7	10.3	10.5	10.1	9.1	9.4	9.6	10.4	10.7

Dorsal and anal-fins subtriangular. Dorsal-fin origin at vertical through centrum of 17th vertebra. Anal-fin origin at vertical through base of 8th or 9th dorsal-fin ray and through centrum of 21st or 22nd vertebra. Pectoral fin about triangular, lateral and posterior edges slightly convex. First pectoral-fin ray terminating in long filament, about 50 % of pectoral-fin length. Pelvic-fin shorter than anal-fin, covering urogenital pore, tip not reaching anal fin, in vertical through base of 1st branched dorsal-fin ray; pelvic-fin bases separated by interspace; pelvic-fin origin in vertical through centrum of 14th or 15th vertebra. Urogenital papilla spherical, in vertical through anterior third of dorsal-fin base. Caudal fin truncate. Dorsal-fin rays 10–11; anal-fin rays 9; pectoral-fin rays 8; pelvic-fin rays 5; caudal-fin principal rays 13, dorsal procurrent rays 16–18, ventral procurrent rays 12–14. Total vertebrae 35–37; pleural ribs 9–11. Two upper hypurals, sometimes ankylosed; single lower hypural plate and parhypural completely fused. Upper hypural plates separated, both approximately equal in width; single lower hypural plate and parahypural completely fused.

Head subtriangular in dorsal view. Snout blunt. Mouth subventral. Maxilla slightly longer than premaxilla. Teeth cylindrical, tip slightly pointed. Eye at middle of head. Nasal, maxillary and rictal barbels well developed. Tip of nasal barbel reaching midlength between eye and anterior edge of opercular patch of odontodes. Tip of maxillary barbel reaching anterior margin of opercular patch of odontodes. Tip of rictal barbel reaching anterior margin of opercular patch of odontodes. Seven branchiostegal rays. Interopercular odontodes 30–40; opercular patch of odontodes wide, with 12–16 odontodes; odontodes conical, opercular odontodes wider than interopercular odontodes; opercular odontodes arranged vertically.

Supraorbital canal continuous, with three pores; first pore in transverse line through anterior nostril, second in transverse line just posterior to posterior nostril, single median third supraorbital pore in transverse line just posterior to orbit. Infraorbital divided into two sections, each with two pores, anterior section of infraorbital canal present; first infraorbital pore in transverse line through anterior nostril, second in transverse line just anterior to posterior nostril, third and fourth 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.

Coloration: Side of body light purplish brown with row of rectangular, or sometimes rounded, dark brown spots on lateral midline, and similar rows of paler spots above and below lateral midline; golden spots on posterior half of flank between midline spots; venter white. Head dark brown on dorsal, white on ventral surface; suborbital region light brown, preopercular region dark brown; opercular and interopercular patches of odontodes light yellow; nasal barbel dark gray, maxillary and rictal barbels light gray. Iris light yellow. Dorsal-fin yellowish hyaline with small dark brown spots on anterior and basal portions. Caudal-fin yellowish hyaline with four faint gray bars. Anal and pelvic-fins pale yellow. Pectoral-fin pale yellow, basal portion dark gray.

Distribution: Upper Rio Itabapoana basin, Serra do Caparaó, southeastern Brazil.

Habitat notes: This species was found in two localities: Rio São Domingos, the type locality, with turbid water, and in Rio Caparaó, with clear water. In both localities it was found in shallow waters (40–100 cm deep), sometimes swimming in daylight, but most specimens were collected under marginal vegetation or under vegetal debris on the bottom.

Etymology: From the Latin *cauda* (tail) and *fasciatus* (with bars), referring to the caudal-fin color pattern of the new species.

Discussion

Relationships among species of *Trichomycterus* are still unknown (de Pinna, 1998), and consequently, it is difficult to erect any hypotheses of relationships of *T. pantherinus* and *T. caudofasciatus*. The two new species share some possible apomorphic conditions, such as the long pectoral-fin filament and wide opercular patch of odontodes, which are absent in basal trichomycterids (e. g., copionodontines and trichogenines) and in most trichomycterines. However, these conditions and all other features used to diagnose species of *Trichomycterus* may occur in different genera and subfamilies of the Trichomycteridae, making uncertain the polarization of those characters.

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