

***Trichomycterus pauciradiatus*, a new catfish species from the upper
rio Paraná basin, southeastern Brazil
(Siluriformes: Trichomycteridae)**

ALINE R. ALENCAR¹ & WILSON J. E. M. COSTA²

Laboratório de Ictiologia Geral e Aplicada, Departamento de Zoologia, Universidade Federal do Rio de Janeiro, Caixa Postal 68049, CEP 21944-970, Rio de Janeiro, Brasil. E-mail: ¹alinealencar@biologia.ufrj.br; ²wcosta@acd.ufrj.br

Abstract

Trichomycterus pauciradiatus, new species, is described from the rio Paraná basin, southeastern Brazil. It differs from all other species of *Trichomycterus* by having four pelvic-fin rays. The new species is possibly closely related to *T. reinhardti* (Eigenmann, 1918), since both share a unique color pattern consisting of a yellow body with a broad dark brown stripe along the lateral midline. The stripe is bordered dorsally by a longitudinal bright yellow zone lacking dark chromatophores.

Key words: catfishes, Neotropical, new species, rio Paraná, trichomycterinae, taxonomy

Resumo

Trichomycterus pauciradiatus, nova espécie, é descrita para a bacia do rio Paraná, sudeste do Brasil. Ela difere de todas as espécies de *Trichomycterus* por possuir quatro raios na nadadeira pélvica. A nova espécie é possivelmente aparentada com *T. reinhardti* (Eigenmann, 1918), visto que ambas apresentam um padrão único de colorido consistindo de corpo amarelo com faixa marrom escuro ao longo da linha média lateral, dorsalmente margeada por uma zona longitudinal amarelo brilhante sem cromatóforos.

Introduction

Trichomycterus Valenciennes comprises small catfishes, usually about 50–150 mm SL, inhabiting mountain rivers of South America and southern Central America. Each species often is restricted to a short section of a river drainage (Eigenmann, 1918; Costa, 1992;

Barbosa & Costa, 2003; Alencar & Costa, 2004; Lima & Costa, 2004). Although known to contain many species, *Trichomycterus* is poorly known (de Pinna, 1998) with many of the known species based on brief descriptions and many others undescribed (*e. g.*, Barbosa & Costa, 2003; Alencar & Costa, 2004; Bockmann & Sazima, 2004; Bockmann *et al.*, 2004; Lima & Costa, 2004). In spite of many studies on *Trichomycterus*, the genus still is diagnosed by the absence of apomorphic characters present in other genera of the subfamily. A new species with a reduced number of pelvic-fin rays and an uncommon color pattern is herein described.

Material and methods

Measurements and counts follow Costa (1992). Measurements are presented as percentages of standard length (SL) except parts of the head which are expressed as percentages of head length (HL). Counts and osteological observations were only made in cleared and stained specimens (c&s) prepared according to Taylor & Van Dyke (1985). Abbreviations for institutions are: MCP, Museu de Ciências e Tecnologia da Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre; and UFRJ, Universidade Federal do Rio de Janeiro, Rio de Janeiro.

Comparative material: *Trichomycterus reinhardti* Brazil: Estado de Minas Gerais: Município de Rio Acima, rio São Francisco basin: UFRJ 1149, 1 ex., 23.3 mm SL; UFRJ 5774, 1 ex., 66.6 mm SL; headwater of rio Piolho; M. C. C. de Pinna & A. Carvalho, 18 May 1985. UFRJ 1132, 1 ex., 61.5 mm SL; Córrego Poço d'Antas, rio Paraíba do Sul basin, Município de Juiz de Fora; M. C. C. de Pinna, 11 Feb. 1985. UFRJ 1144, 3 ex., 27.9–56.1; UFRJ 4553, 3 ex. (c&s), 31.3–42.7 mm SL; UFRJ 5651, 2 ex. (c&s), 44.3–46.7 mm SL; Córrego Poço d'Antas, rio Paraíba do Sul basin, Município de Juiz de Fora, 20 Feb. 1985. UFRJ 580, 3 ex., 30.7–44.8 mm SL; UFRJ 644, 1 ex. (c&s), 48.9 mm SL; stream near Ibitipoca, Município de Lima Duarte; W.J.E.M. Costa & G. Souza, 22 Aug. 1991. UFRJ 1297, 3 ex., 39.5–51.9 mm SL; UFRJ 4557, 1 ex. (c&s), 38.6 mm SL; tributary of rio Grande, 2 km N of Santo Antonio, rio Paraná basin; W.J.E.M. Costa & C.P. Bove, 24 Nov. 1992. UFRJ 1309, 3 ex., 29.5–53.2 mm SL; UFRJ 4555, 1 ex. (c&s), 44.1 mm SL; stream tributary of rio Grande, 4 km N of Santo Antonio, rio Paraná basin; W.J.E.M. Costa & C.P. Bove, 24 Nov. 1992. UFRJ 1313, 2 ex., 26.3–43.6 mm SL; tributary of rio Grande, 2 km S of Santo Antonio, rio Paraná basin, W.J.E.M. Costa, 2 Sept. 1983.

Trichomycterus pauciradiatus, new species

(Fig. 1)

Holotype. UFRJ 5831, 52.0 mm SL; Brazil: Estado de Minas Gerais: Município de Carrancas, córrego Debaixo da Serra, stream tributary of córrego Água Limpa, rio Paraná

basin, 21°26'40"S 44°36'09"W; R. Campos da Paz, 27 March 2001.

Paratypes. MCP 38978, 6 ex., 31.2–33.9 mm SL; UFRJ 5830, 1 ex., 49.2 mm SL; UFRJ 5807, 22 ex., 24.6–42.7 mm SL; UFRJ 5808, 6 ex., 35.7–39.3 mm SL (c&s); all collected with holotype.

Diagnosis: Distinguished from all other species of the genus in having four pelvic-fin rays (*vs.* five). Similar to *T. reinhardti* (Eigenmann) by having a unique color pattern composed of a broad dark brown stripe on the flank, dorsally bordered by a bright yellow zone without dark marks. The new species differs from *T. reinhardti* by possessing a more slender body (body depth 12.6–15.1% SL *vs.* 10.5–12.9% SL) and a shorter preorbital length (25.7–39.3% HL *vs.* 41.7–46.2% HL) (Tables 1 and 2).



FIGURE 1. *Trichomycterus pauciradiatus*, UFRJ 5831, holotype, 52.0 mm SL; Brazil: Minas Gerais: Município de Carrancas, rio Paraná basin (Photo by Rafael Paiva).

Description: Morphometric data of holotype and paratypes are given in Table 1. Body elongated, 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 between lower jaw and end of anal-fin base, straight on caudal peduncle. Greatest body depth on vertical just in front of dorsal-fin origin. Skin papillae minute. Urogenital papilla conical, in vertical through anterior third of dorsal-fin. Dorsal-fin approximately triangular, origin on vertical through centrum of 20th or 21st vertebra. Anal fin triangular, origin on vertical through base of dorsal-fin ray 7–8 and through centrum of 24th or 25th vertebra. Pectoral-fin small, about triangular, lateral and posterior edges slightly convex. First pectoral-fin ray terminating in filament about 5–10% of pectoral-fin length. Pelvic-fin about half of anal fin, covering urogenital pore, tip not reaching anal fin, in vertical through anterior portion or middle of dorsal fin; pelvic-fin bases separated; pelvic-fin origin in vertical through centrum of 18th or 19th vertebra. Caudal fin truncate. Dorsal-fin rays 10–12; anal-fin rays 9; pectoral-fin rays 6; pelvic-fin rays 4; caudal fin principal rays 13, dorsal procurent rays 14–16, ventral procurent rays 11–13. Total vertebrae 36–38; pleural ribs 14–16. Upper hypural plates ankylosed; single lower hypural plate and parhypural completely fused.

Head depressed, longer than wide, about quadrate in dorsal view. Snout blunt. Mouth subterminal. Maxilla short, slightly longer or equal to premaxilla. Teeth incisor. Eye approximately at middle of head. Tip of nasal barbel reaching

posterior margin of opercular patch of odontodes. Tip of maxillary barbel reaching posterior margin of interopercular patch of odontodes. Tip of rictal barbel reaching between posterior portion of head and pectoral-fin insertion. Eight branchiostegal rays. Interopercular patch of odontodes long, with 30–34 odontodes; opercular patch of odontodes wide, with 14–18 odontodes; odontodes conical, opercular odontodes about equal interopercular odontodes; opercular odontodes arranged vertically. Medial margin of autopalatine slightly concave, with median expansion; posterior process of autopalatine equal in size autopalatine without posterior process. Lacrimal about one fourth of supraorbital length.

TABLE 1. Morphometric data of *Trichomycterus pauciradiatus*.

| | H | Paratypes | | | | | | | | |
|-----------------------------------|-------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|
| | UFRJ | UFRJ | UFRJ | UFRJ | UFRJ | UFRJ | UFRJ | UFRJ | UFRJ | UFRJ |
| | 5831 | 5807 | 5807 | 5807 | 5807 | 5807 | 5807 | 5807 | 5807 | 5807 |
| Standard length (mm) | 52.02 | 43.17 | 47.10 | 43.57 | 38.49 | 43.45 | 35.28 | 38.89 | 38.73 | 33.63 |
| Percentage of standard length | | | | | | | | | | |
| Body depth | 15.0 | 14.7 | 13.6 | 14.0 | 12.6 | 14.2 | 15.1 | 13.7 | 13.2 | 14.7 |
| Caudal peduncle depth | 11.8 | 12.0 | 11.2 | 11.1 | 11.0 | 11.7 | 10.6 | 11.3 | 10.0 | 11.2 |
| Body width | 8.3 | 8.8 | 7.7 | 8.0 | 8.1 | 7.8 | 8.9 | 8.6 | 8.0 | 9.3 |
| Caudal peduncle width | 2.3 | 2.0 | 2.2 | 2.1 | 1.8 | 2.0 | 2.3 | 2.1 | 2.1 | 2.3 |
| Dorsal-fin base length | 11.5 | 11.4 | 12.6 | 11.2 | 12.7 | 11.9 | 13.3 | 12.8 | 12.4 | 11.0 |
| Anal-fin base length | 7.7 | 8.0 | 9.6 | 10.1 | 10.1 | 10.1 | 8.2 | 9.3 | 8.7 | 9.2 |
| Pelvic-fin length | 8.1 | 7.9 | 7.6 | 7.5 | 7.5 | 7.2 | 7.5 | 8.5 | 7.7 | 6.5 |
| Distance between pelvic-fin bases | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pectoral-fin length | 10.8 | 13.1 | 8.7 | 10.5 | 11.1 | 11.0 | 11.0 | 13.1 | 12.4 | 12.8 |
| Predorsal length | 60.7 | 65.5 | 63.3 | 60.0 | 64.0 | 62.6 | 60.2 | 65.8 | 62.1 | 62.0 |
| Prepelvic length | 56.1 | 60.5 | 56.1 | 55.6 | 58.7 | 59.7 | 57.2 | 60.5 | 59.3 | 55.9 |
| Head length | 17.3 | 20.0 | 18.1 | 16.4 | 19.4 | 16.9 | 18.6 | 18.6 | 17.8 | 18.8 |
| Percentage of head length | | | | | | | | | | |
| Head depth | 47.9 | 43.6 | 46.1 | 46.1 | 49.8 | 47.7 | 49.9 | 49.5 | 48.6 | 47.7 |
| Head width | 81.7 | 76.3 | 65.2 | 65.2 | 68.0 | 78.3 | 83.2 | 83.0 | 83.6 | 78.7 |
| Interorbital width | 23.2 | 25.1 | 23.9 | 23.9 | 24.1 | 28.6 | 26.7 | 26.7 | 26.4 | 24.5 |
| Preorbital length | 39.3 | 38.0 | 34.0 | 34.0 | 27.7 | 36.8 | 25.7 | 25.7 | 26.1 | 33.2 |
| Eye diameter | 6.7 | 5.8 | 6.4 | 6.4 | 6.4 | 6.5 | 7.0 | 6.8 | 7.2 | 6.3 |

Supraorbital canal with three pores; first pore in transverse line through anterior nostril, second in close proximity to posterior nostril, third pore symmetrical to pore and

orbit. Infraorbital canal with four pores; first pore in transverse line through anterior nostril, second one in transverse line just posterior to posterior nostril, third and fourth pores 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 on vertical just posterior to pectoral-fin base.

TABLE 2. Morphometric data of *Trichomycterus reinhardti*.

| | UFRJ | UFRJ | UFRJ | UFRJ | UFRJ | UFRJ | UFRJ |
|-----------------------------------|------|------|------|------|------|------|------|
| | 5774 | 1132 | 1144 | 580 | 580 | 1309 | 1297 |
| Standard length (mm) | 66.6 | 61.5 | 56.1 | 44.8 | 44.2 | 53.2 | 51.9 |
| Percentage of standard length | | | | | | | |
| Body depth | 14.7 | 14.4 | 15.2 | 13.8 | 13.3 | 14.1 | 14.1 |
| Caudal peduncle depth | 12.9 | 12.5 | 12.1 | 11.6 | 10.6 | 11.9 | 11.2 |
| Body width | 6.2 | 7.5 | 6.1 | 5.4 | 5.0 | 6.6 | 6.7 |
| Caudal peduncle width | 2.6 | 2.9 | 3.0 | 1.8 | 2.3 | 3.4 | 3.3 |
| Dorsal fin base length | 8.9 | 10.6 | 11.1 | 9.6 | 10.6 | 10.9 | 10.2 |
| Anal fin base length | 7.7 | 8.8 | 7.5 | 7.4 | 7.5 | 8.2 | 8.5 |
| Pelvic fin length | 7.4 | 8.5 | 8.4 | 7.4 | 7.7 | 7.9 | 7.5 |
| Distance between pelvic fin bases | 0.5 | 0.4 | 0.3 | 0.2 | 0.2 | 0.4 | 0.4 |
| Pectoral fin length | 10.7 | 14.3 | 10.1 | 12.5 | 11.3 | 11.1 | 12.1 |
| Predorsal length | 64.7 | 69.4 | 63.9 | 60.5 | 61.3 | 63.9 | 64.2 |
| Prepelvic length | 60.8 | 64.5 | 60.4 | 57.1 | 56.6 | 58.0 | 58.4 |
| Head length | 18.0 | 17.7 | 17.5 | 17.4 | 16.4 | 17.6 | 17.9 |
| Percentage of head length | | | | | | | |
| Head depth | 43.3 | 47.2 | 48.8 | 38.5 | 47.9 | 51.4 | 40.9 |
| Head width | 74.2 | 80.0 | 83.4 | 70.5 | 77.5 | 74.3 | 71.0 |
| Interorbital width | 28.3 | 35.0 | 33.1 | 30.8 | 31.0 | 31.6 | 31.2 |
| Preorbital length | 41.7 | 42.9 | 41.5 | 46.2 | 43.7 | 44.5 | 45.2 |
| Eye diameter | 5.8 | 12.2 | 9.5 | 9.0 | 9.9 | 10.6 | 8.6 |

Coloration: Side of body yellow with broad dark brown stripe along lateral midline, dorsally bordered by a bright yellow zone lacking dark chromatophores; longitudinal row of dark brown small spots sometimes coalescent; below lateral stripe some dark brown dots irregularly distributed along ventral the portion of flank. Venter light yellow. Head yellow with dark brown spots on dorsal surface; dark brown blotch between eyes sometimes prolonged to posterior portion. Small spots sometimes coalescent around eye, and short dark brown bar in front of opercle. Ventral surface of head yellow with few dark brown dots. Nasal barbel brown, maxillary and rictal barbels light yellow. Pectoral fin pale

yellow. Dorsal, anal and pelvic fins pale yellow. Caudal fin light yellow with central portion light brown.

Distribution: Known only from the type locality, córrego Debaixo da Serra, tributary of córrego Água Limpa, upper rio Paraná basin, southeastern Brazil.

Etymology: From the Latin *pauci* (few) and *radiatus* (with rays), referring to the reduced number of pelvic-fin rays.

Discussion

Some authors have tentatively defined putative monophyletic assemblages within the genus *Trichomycterus* based on the possession of unique morphological features (*e. g.*, Costa, 1992; Barbosa & Costa, 2003; Bockmann & Sazima, 2004). However, no phylogenetic studies encompassing all species of this genus are available, making it difficult to discuss phylogenetic relationships of most species, especially those not exhibiting features used in previous studies.

Color pattern has been considered by some authors to be unreliable to diagnose species of *Trichomycterus*. However, color pattern has been showed to be a powerful instrument not only to diagnose species but also to establish, in agreement with other characters, possible monophyletic groups among species of the genus (Barbosa & Costa, 2003). In this regard, *Trichomycterus pauciradiatus* is possibly more closely related to *T. reinhardti*, which is endemic to the upper rio São Francisco basin, than to other congeners due to both species sharing a derived color pattern not found among congeners. This color pattern consists of a broad dark brown stripe along the lateral midline, bordered above by a light yellow longitudinal zone lacking dark marks.

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Literature cited

- Alencar, A.R. & Costa, W.J.E.M. (2004) Description of two new species of the catfish genus *Trichomycterus* from southeastern Brazil (Siluriformes: Trichomycteridae). *Zootaxa*, 744, 1–8.
- Barbosa, M.A. & Costa, W.J.E.M. (2003) *Trichomycterus potschi* (Siluriformes: Loricarioidei): a new trichomycterid catfish from coastal streams of southeastern Brazil. *Ichthyological Exploration of Freshwaters*, 14, 281–287.
- Bockmann, F.A., Casatti, L. & de Pinna, M.C.C. (2004) A new species of trichomycterid catfish

- from Rio Paranapanema basin, southeastern Brazil (Teleostei: Siluriformes), with comments on the phylogeny of the family. *Ichthyological Exploration of Freshwaters*, 15, 225–242.
- Bockmann, F.A. & Sazima, I. (2004) *Trichomycterus maracaya*, a new catfish from the upper rio Paraná, southeastern Brazil (Siluriformes: Trichomycteridae), with notes on the *T. brasiliensis* species complex. *Neotropical Ichthyology*, 2, 61–74.
- Costa, W.J.E.M. (1992) Description de huit nouvelles espèces du genre *Trichomycterus* (Siluriformes: Trichomycteridae), du Brésil oriental. *Revue Française d'Aquariologie*, 18, 101–110.
- Eigenmann, C.H. (1918) The Pygididae, a family of South American catfishes. *Memoirs of the Carnegie Museum*, 7, 259–398.
- Lima, S.M.Q. & Costa, W.J.E.M. (2004) *Trichomycterus giganteus* (Siluriformes: Loricarioidea: Trichomycteridae): a new catfish from the Rio Guandu basin, southeastern Brazil. *Zootaxa*, 761, 1–6.
- de Pinna, M.C.C. (1998) Phylogenetic relationships of neotropical Siluriformes (Teleostei: Ostariophysii): historical overview and synthesis of hypotheses. In: Malabarba, L.R., Reis, R.E., Vari, R.P., Lucena, Z.M.S. & Lucena, C.A.S. (Eds.) *Phylogeny and Classification of Neotropical Fishes*, Edipucrs, Porto Alegre, pp. 279–330.
- Taylor, W.R. & Van Dyke, G.C. (1985) Revised procedures for staining and clearing small fishes and other vertebrates for bone and cartilage study. *Cybium*, 9, 107–109.

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1269