Simpsonichthys suzarti sp. n. (Teleostei: Cyprinodontiformes: Rivulidae): a new annual fish from the Rio Pardo floodplains, northeastern Brazil

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Abstract

Simpsonichthys suzarti, new species, from the floodplains of the lower Rio Pardo, northeastern Brazil, is described. It is a member of a clade, herein termed S. constanciae species group, which is diagnosed by the eyes laterally positioned on the head and a derived pattern of cephalic neuromast arrangement, in which the supraorbital series is interrupted by a median interspace. It differs from all other species of the group in having the anal fin rounded in males and by the distinctive color pattern of males, including the presence of reddish brown bars along the whole flank, reticulate dark brown marks on the dorsal fin and oblique dark brown bars on the anal fin. A key to the species of the S. constanciae group is provided.

Key words: Fish, Cyprinodontiformes, Rivulidae, Simpsonichthys, Neotropica, Atlantic forest, systematics, taxonomy, new species, killifish

Resumo

Simpsonichthys suzarti, espécie nova, da várzea do baixo rio Pardo, nordeste do Brasil, é descrita. Ela é um membro de um clado, aqui chamado de grupo de espécies S. constanciae, o qual é diagnosticado pelos olhos posicionados lateralmente na cabeça e pelo padrão derivado de arranjo de neuromastos cefálicos, no qual a série supra-orbital é interrompida por um espaço mediano. Ela difere de outras espécies do grupo por possuir a nadadeira anal arredondada em machos e pelo distinto padrão de colorido dos machos, incluindo a presença de barras castanho avermelhadas em todo o flanco, marcas reticuladas castanho escuras na nadadeira dorsal e barras castanho escuras na nadadeira anal. Uma chave para as espécies do grupo S. constanciae é fornecida.
Introduction

*Simpsonichthys* Carvalho is a speciose clade of South American killifishes, with a total of 40 species inhabiting seasonal pools of central, northeastern and southeastern Brazil and northern Paraguay (Costa, 1998, 2003). A subclade, here called *S. constanciae* species group, is diagnosed by the lateral position of eye on the head and by a derived arrangement of supraorbital neuromasts (Costa, 2003), and is endemic to the coastal river basins of northeastern and southeastern Brazil. It comprises *S. constanciae* (Myers), *S. bokermanni* (de Carvalho and da Cruz), *S. perpendicularis* Costa, Nielsen and De Luca, and *S. rosaceus* Costa, Nielsen and De Luca. A fifth species of this assemblage is herein described.

Materials and methods

Measurements and counts follow Costa (1995). Measurements are presented as percentages of standard length (SL), except for head measurements which are expressed as percentages of head length. Counts of pectoral, pelvic and caudal-fin rays, gill-rakers and vertebrae were made only on cleared and stained (c&s) specimens, prepared in accordance with Taylor and Van Dyke (1985). For the vertebral counts, the compound caudal centrum was counted as a single element. Osteological features included in the description are those considered phylogenetically informative in recent studies on *Simpsonichthys* (Costa, 2003) and closely related genera (Costa, 2001, 2002). Nomenclature for frontal squamation follows Hoedeman (1958) and for cephalic neuromasts Costa (2001). Institutional abbreviations are: MCP, Museu de Ciências e Tecnologia, PUC-RS, Porto Alegre, and UFRJ, Universidade Federal do Rio de Janeiro, Rio de Janeiro.

*Simpsonichthys suzarti* new species

(Figs. 1–2)

**Holotype.** MCP 34088, male, 28.6 mm SL; Brazil: Estado da Bahia: temporary pool near Canavieiras, Rio Pardo floodplains (approximately 15°45’S 39°00’W; altitude about 4 m); D. B. Lara, 2002.

**Paratypes.** UFRJ 5810, 1 female, 28.5 mm SL; UFRJ 5811, 1 male, 28.9 mm SL, and 1 female, 24.7 mm SL (c&s); collected with holotype.

**Diagnosis:** Similar to *S. constanciae*, *S. bokermanni*, *S. perpendicularis*, and *S. rosaceus*, and distinguished from the remaining congeners by possessing eye laterally positioned on head (vs. dorsolaterally positioned), and anterior and posterior series of supraorbital neuromasts separated by interspace (vs. anterior and posterior series of supraorbital neuromasts continuous). Readily distinguished from *S. constanciae*, *S. bokermanni*, *S. perpendicularis*, and *S. rosaceus* by possessing rounded anal fin in males (vs.
pointed), reddish brown bars alternated with bright greenish blue bars for the whole length of the flank of males (vs. restricted to anterior portion of flank in *S. bokermannii*, *S. perpendicularis*, and *S. rosaceus*, bars absent in *S. constanciae*), dark brown reticulation on dorsal fin of male (vs. reticulated marks absent), and oblique dark brown bars on anal fin of male (vs. bars absent).

**FIGURE 1.** *Simpsonichthys suzarti*, MCP 34088, male, holotype, 28.6 mm SL (about one month after collection); Brazil: Bahia: Canavieiras.

**FIGURE 2.** *Simpsonichthys suzarti*, UFRJ 5810, female, paratype, 28.3 mm SL (about one month after collection); Brazil: Bahia: Canavieiras.

**Description:** Morphometric data given in Table 1. Male larger than female, largest male 28.9 mm SL. Dorsal profile slightly concave on head, convex from nape to end of dorsal-fin base, approximately straight on caudal peduncle. Ventral profile convex from lower jaw to end of anal-fin base, nearly straight on caudal peduncle. Body moderately deep, compressed, depth about 1.5 times body width in larger males. Greatest body depth at level of pelvic-fin base. Caudal peduncle short, about half length of head.
TABLE 1. Morphometric data of *Simpsonichthys suzarti*. H: holotype.

<table>
<thead>
<tr>
<th></th>
<th>males</th>
<th>females</th>
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<tbody>
<tr>
<td></td>
<td>MCP</td>
<td>UFRJ</td>
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<tr>
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<td>Percents of standard length</td>
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<tr>
<td>Body depth</td>
<td>31.4</td>
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<td>Caudal peduncle depth</td>
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<td>Prepelvic length</td>
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<tr>
<td>Length of dorsal-fin base</td>
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<tr>
<td>Length of anal-fin base</td>
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<tr>
<td>Eye diameter</td>
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<td>32.8</td>
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Female: Side of body brownish orange, with 10–12 gray bars; venter pale pink; 2–3 rounded black spots alternated with light blue narrow bars on anterocentral portion of flank. Opercular region pale greenish golden. Iris light yellow, with dark gray bar. Dorsal fin hyaline with faint gray spots; anal fin pink with gray spots; caudal fin hyaline; small pale blue spots on posterior portion of dorsal and anal fins, and on dorsal portion of caudal fin. Paired fins hyaline.

**Distribution:** Known only from the type locality, floodplains of lower rio Pardo, Estado da Bahia, northeastern Brazil (Fig. 3).

**Etymology:** The name *suzarti* in honor of Rogério Suzart, who sent me the type material of the new species.

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**Key to species of the *S. constanciae* group**

1. No black spots on male flank; dorsal and anal fins of male with short filamentous rays, tip never reaching vertical through posterior margin of caudal fin; male with contact organs on flank scales and inner surface of upper pectoral-fin rays .......................... 2

   - Four longitudinal rows of round black spots on male flank; dorsal and anal fins of male with long filamentous rays, tip posteriorly surpassing posterior margin of caudal fin; .......................... 2
fin; contact organs of flank and pectoral fin absent ......................................... *S. constanciae*

2 Anal fin pointed in male; bars restricted to anterior portion of male flank; no bars on male anal fin ................................................................................................................. 3

- Anal fin rounded in male; reddish brown bars alternated with bright greenish blue bars on whole male flank; oblique brown bars on male anal fin .............................. *S. suzartii*

3 No bright dots on caudal and anal fins of male .............................................................. 4

- White dots on dorsal fin and concentrated on dorsal half of male caudal fin ................. ......................................................................................................................... *S. bokermanni*

4 Three horizontal stripes on posterior half of male flank; 4 + 14 gill-rakers on first branchial arch; 16-18 dorsal-fin rays in female; male unpaired fins yellow .............................................................................................................. *S. perpendicularis*

- Usually no stripes, sometimes faint median stripe on posterior half of male flank; 3–4 + 11 gill-rakers on first branchial arch; 13–15 dorsal-fin rays in female; male unpaired fins red .................................................................................................................. *S. rosaceus*

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**FIGURE 3.** Geographic distribution of species of the *S. constanciae* group.
Discussion

Simpsonichthys suzarti is a member of the *S. constanciae* species group, possessing the two apomorphic features diagnosing the group: supraorbital series of neuromasts interrupted by a median interspace and eyes laterally placed on the head. In all other congeners and in all species of closely related genera (i.e., *Austrolebias* Costa, *Cynolebias* Steindachner, *Megalebias* Costa), the supraorbital series of neuromasts is continuous and eyes are dorsolaterally placed on the head. However, relationships within this clade are unclear at the present. The presence of bars on the entire flank of males as occurring in *S. suzarti* is a plesiomorphic condition for cynolebiatines (e.g., Costa, 2001, 2002, 2003), possibly indicating a basal position of *S. suzarti* among species of the *S. constanciae* group.

Acknowledgments

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