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A NEW MINIATURE RIVULINE FISH FROM THE UPPER NEGRO RIVER BASIN, NORTHERN BRAZIL (TELEOSTEI, CYPRIDONTIFORMES, RIVULIDAE) [1]

(With 3 figures)

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ABSTRACT: *Rivulus romeri* sp.nov. is described from a small stream tributary of Igarapé Iauiari, upper Negro river drainage, Amazonian basin, northern Brazil. It seems to be closely related to *R. atratus* Garman, 1895 and *R. ornatus* Garman, 1895 by all sharing apomorphic frontal squamation and head color pattern. It is diagnosed by the long and pointed anal fin of male, also present in *R. gransabanae* Lasso, Taphorn & Thomerson, 1992, and constitutes the smallest species of the genus. The long and narrow basihyal of *R. romeri* sp.nov. seems to be unique among congeners.

Key words: Teleostei, Cyprinodontiformes, Rivulidae, *Rivulus romeri* sp.nov., Negro river, Taxonomy.

RESUMO: Um novo peixe rivulíneo miniatura da bacia do alto rio Negro, Norte do Brasil (Teleostei, Cypridontiformes, Rivulidae)

Rivulus romeri sp.nov., coletada num pequeno riacho tributário do Igarapé Iauiari, drenagem do alto rio Negro, é descrita. Parece proximamente relacionada a *R. atratus* Garman, 1895 e *R. ornatus* Garman, 1895 por todas compartilharem escamação frontal e padrão de colorido de cabeça apomórficos. É diagnosticada pela nadadeira anal do macho longa e pontiaguda, também presente em *R. gransabanae* Lasso, Taphorn & Thomerson, 1992, e constitui a menor espécie do gênero. O longo e estreito basial de *R. romeri* sp.nov. parece ser exclusivo entre as congêneres.

Palavras-chave: Teleostei, Cyprinodontiformes, Rivulidae, *Rivulus romeri* sp.nov., Rio Negro, Taxonomia.

INTRODUCTION

With a course of about 1,700km draining the southeastern portion of the Guyana Shield into central Brazilian Amazon, the Negro river is the largest tributary of the Amazonian river system, and the third largest river in the world. The high diversity of fishes of the Negro river basin has been recently reported (GOULDING, CARVALHO & FERREIRA, 1988), but records of rivulid species are rare, especially for the upper section of the river basin. Among the 212 Wallace's Negro river fish illustrations made during his historical trip to the Amazon (1848-1852), only one rivulid species was reported, which was collected in the upper Negro river and is presently identified as *Rivulus tecminae* Thomerson, Nico & Taphorn, 1992 (WALLACE, 2002). The purpose of the present paper is to describe a new, distinctive species of *Rivulus* Poey, 1860 from the Uaupés river drainage, upper Negro river basin, Brazil.

MATERIAL AND METHODS

Measurements and counts are made according to COSTA (1995), except body depth measured just posteriorly to pelvic-fin base; measurements are presented as percentages of standard length (SL), except parts of head, expressed as percentages of head length. Counts of pectoral, pelvic and caudal fin-rays, vertebrae, vomerine teeth, gill-rakers, and branchiostegal rays were made only on cleared and counterstained specimens (c&s) prepared according to TAYLOR & VAN DYKE (1985); in vertebral counts, the compound caudal centrum was counted as a single element. Osteological features presented in the description are those considered phylogenetically informative for *Rivulus* as discussed by COSTA (1998). Terminology for frontal squamation pattern is according to HOEDEMAN (1958), and nomenclature and identification of homologous cephalic neuromasts is according to COSTA (2001). Comparative material is listed in

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COSTA (1998). Institutional abbreviations are: (MCP) Museu de Ciências e Tecnologia, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, and (UFRJ) Universidade Federal do Rio de Janeiro, Rio de Janeiro.

Rivulus romeri sp.nov.
(Fig. 1)

Holotype – BRAZIL: AMAZONAS: brook tributary to Igarapé Iauiari (about 0°14.31'N, 68°03.48'W), which is a tributary of Uaupés river, itself a tributary of Negro river, Amazonian basin, MCP 29751, ♂, 19.0mm SL, U.Römer col., 21/II/1995.

Paratypes – Same data as holotype: MCP 29752, 1♀, 21.7mm SL; UFRJ 5447, 1♂, 19.9mm SL, and 1♀, 20.9mm SL; UFRJ 5448, 4♀, 16.0-20.6mm SL (c&s).

Diagnosis – Similar to *Rivulus ornatus* Garman, 1895 and *Rivulus atratus* Garman, 1895 and distinguished from all other species of the genus by possessing frontal scales arranged transversally (*vs.* circularly), small top scale just posterior to rostral neuromast (*vs.* top scale near center of frontal region), and oblique infraorbital dark gray bar below lower jaw through chin (*vs.* anterior infraorbital dark gray stripe through lower jaw). Easily distinguished from *R. ornatus* and *R. atratus* by having anal fin pointed and long in male, tip reaching vertical through caudal-fin base (*vs.* rounded and short, tip reaching caudal peduncle), and dorsal-fin origin in a vertical between base of sixth and eighth anal-fin rays (*vs.* posterior to anal-fin base).

Description – Morphometric data of holotype and four paratypes are given in table 1. Largest examined specimen, female, 21.7mm SL. Dorsal profile slightly convex between snout and dorsal-fin base end, approximately straight on caudal peduncle. Ventral profile slightly convex from lower jaw to end of anal-fin base, nearly straight on caudal peduncle. Body slender, cylindrical, body depth approximately equal to body width. Greatest body depth on vertical through pelvic-fin base. Jaws short, snout blunt.

Tip of dorsal fin rounded. Tip of anal fin pointed and long in male, reaching caudal-fin base, and rounded and short in female. Caudal fin elliptical. Pectoral fin elliptical, tip not reaching pelvic-fin base. Pelvic fin short, tip reaching between anus and urogenital papilla in male, and not reaching anus in female. Dorsal-fin origin in vertical between base of sixth and eighth anal-fin rays. Dorsal-fin rays 7-8, anal-fin rays 9-10, caudal-fin rays 21-23, pelvic-fin rays 7, pectoral-fin rays 14.

TABLE 1
Morphometric data of *Rivulus romeri* sp.nov.

	HOLOTYPE	PARATYPES			
	MCP 29751 ♂	UFRJ 5447 ♂	MCP 29752 ♀	UFRJ 5447 ♀	UFRJ 5448 ♀
SL (mm)	19.0	19.9	21.7	20.9	20.6
In percents of standard length					
Body depth	21.2	21.1	19.5	23.1	21.3
Caudal peduncle depth	13.9	15.0	13.6	14.5	14.5
Predorsal length	74.5	72.3	72.6	73.9	75.8
Prepelvic length	56.0	54.3	54.0	56.7	55.7
Length of dorsal-fin base	9.5	10.3	9.0	9.0	9.7
Length of anal-fin base	16.1	16.5	15.1	13.5	14.0
Caudal-fin length	36.6	-	37.3	40.5	-
Pectoral-fin length	21.6	-	18.4	19.9	19.9
Pelvic-fin length	10.1	10.0	8.8	8.5	9.3
Head length	24.8	25.2	22.9	25.4	25.2
Head depth	18.0	17.9	17.0	19.0	17.8
Head width	20.6	20.8	21.0	21.8	21.6
In percents of head length					
Snout length	11.4	12.9	14.9	12.8	11.6
Lower jaw length	18.6	20.3	21.6	21.1	18.7
Eye diameter	39.1	33.6	38.8	34.3	35.1

Scales large, cycloid. Body and head entirely scaled, except on chin. Scales restricted to caudal-fin base; no scales on dorsal and anal fins. Frontal squamation (Fig.2) with top scale just posterior to rostral neuromast; scales arranged transversally, without distinctive central scale. Longitudinal series of scales 29-30, transverse series of scales 7, scale rows around caudal peduncle 12. Contact organs absent. Supraorbital neuromasts 3+3.

Rostral cartilage broad, its width about 80% of length. Basihyal (Fig.3) long, narrow, greatest width about 30% of length; basihyal cartilage short in length, about 20% of total basihyal length. Five branchiostegal rays. No teeth on second pharyngobranchial. First epibranchial slightly bent. First hypobranchial medially bifid. Gill-rakers of first branchial arch 1+6. No vomerine teeth. Interhyal not ossified. Ventral process of posttemporal absent. Dorsal-fin origin between neural spines of vertebrae 17-19. Dorsal and ventral hypural plates separated by interspace. Epipleural ribs not bifid. Total vertebrae 29.

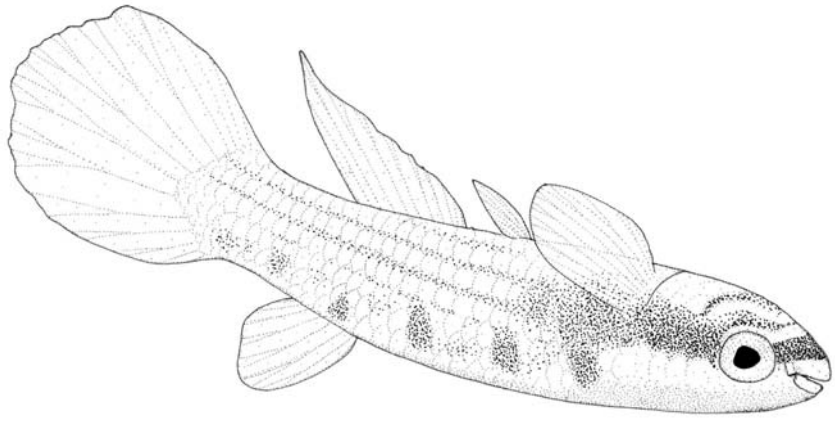
Coloration in life – ♂: Side of body light metallic yellowish green with three horizontal rows of red dots between humeral region and caudal peduncle end, the dorsalmost row on lateral line scales, the ventralmost row with smaller and paler dots; interrupted row of red dots along scale series just above lateral line; sometimes wide dark gray stripe between posterior edge of orbit and flank above pelvic-fin base; laterodorsal portion of flank with oblique brown blotches. Dark gray oblique preorbital stripe just below lower jaw through chin. Unpaired fins dark reddish orange. Pectoral fin hyaline. Pelvic fin yellow. ♀: Side of body light brown above midline, white below midline; wide dark gray stripe between posterior edge of orbit and flank above pelvic-fin base; laterodorsal portion of flank with oblique brown bars. Dark gray oblique preorbital stripe just below lower jaw through chin. Unpaired fins hyaline with brown spots; dark gray distal stripe on anal fin. Paired fins hyaline.

Distribution – Known only from the type locality, small stream tributary to Igarapé Iauiari, upper Negro river drainage, Amazonian basin, Brazil.

Etymology – The name is in honor of Uwe Römer, the first collector of the new species.

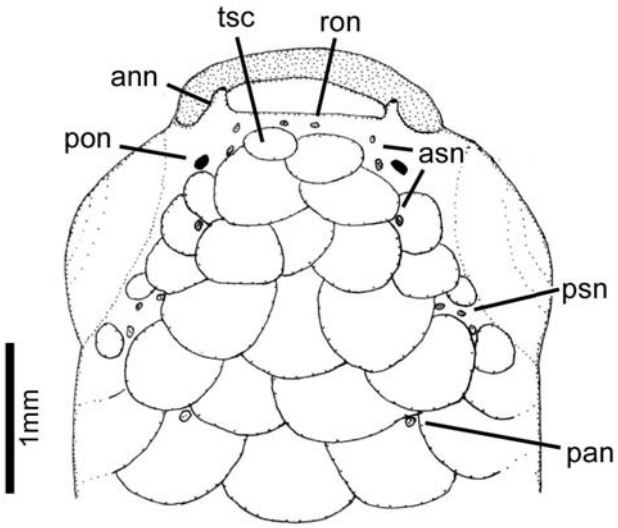
DISCUSSION

Rivulus romeri sp.nov. seems to be more closely related to *R. atratus* and *R. ornatus*, two widespread Amazonian species, by all the three species sharing frontal scales arranged transversally (Fig.2), with small scale just posterior to rostral neuromast with all borders free (Fig.2), and an oblique infraorbital bar below lower jaw through chin (Fig.1), features not present in other species of *Rivulus*, in which that infraorbital bar is absent, frontal scales are circularly arranged, and the scale with all borders free is placed near the center of the frontal region (*e.g.*, HOEDEMAN, 1958), as occurring in most other rivulines (COSTA, 1998). The pointed and long anal fin of the male *R. romeri* sp.nov. strongly contrasts with the short and rounded fin in other congeners. Although long pointed male anal fin is a condition rather frequent among some rivulid genera (*Pterolebias* Garman, 1895, *Moema* Costa, 1989, *Aphyolebias* Costa, 1998), *Rivulus*

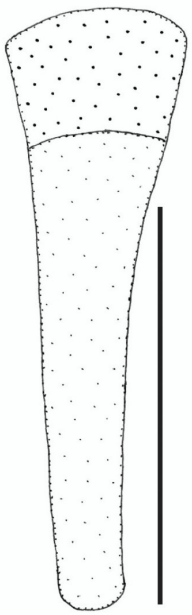


Rivulus romeri sp.nov.: fig.1- drawing based on photos of live male paratype about 20mm SL.

gransabanae Lasso, Taphorn & Thomerson, 1992 is the only other species of the genus exhibiting a similar anal fin morphology. However, *R. gransabanae* does not possess those putative apomorphic features shared by *R. romeri* sp.nov., *R. atratus* and *R. ornatus*. In addition, the basihyal of *R. romeri* sp.nov. is extremely long and narrow (Fig.3), contrasting with the broad basihyal of all other species of the genus examined, probably constituting an autapomorphy.



Rivulus romeri sp.nov.: fig.2- frontal squamation and cephalic laterosensory system. (ann) anterior nostril, (asn) anterior supraorbital neuromasts, (pan) parietal neuromast, (pon) posterior nostril, (psn) posterior supraorbital neuromasts, (ron) rostral neuromast, (tsc) top scale.



Rivulus romeri sp.nov.: fig.3- basihyal, dorsal view. Larger stippling indicates cartilage. Scale bar = 1mm.

Rivulus romeri sp.nov. is the smaller species of the genus, the largest specimen examined with 21.7mm SL. This species was maintained in aquaria and specimens did not surpass this size (U.Römer, Bielefeld, Germany, person. commun.). All other species of *Rivulus* reach at least about 30mm SL, thus miniaturization in *R. romeri* sp.nov. constitutes a unique event within the genus.

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