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A new species of *Laetacara* from the northern Brazil coastal floodplains (Teleostei: Cichlidae)

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> Abstract

Laetacara flamannellus sp. n. is described from the northern Brazilian coastal floodplains. It differs from all its congeners by a combination of character states: presence of a dark brown or black spot located on dorsal-fin base; presence of a yellow stripe on the middle portion of the dorsal fin, crossing the whole fin; presence of an orange ring around the dorsal-fin base spot; absence of a red pigmentation on belly; absence of a red or purple zone on the anal-fin base; absence of a red zone on the caudal-fin base; cycloid scales on the opercle plate; and trunk scales above upper lateral line with few ctenii. The presence of a deep notch in the dorsal margin of the anterior ceratohyal, often used as diagnostic for *Laetacara*, is confirmed here for *L. flamannellus*.

> Resumo

Laetacara flamannellus sp. n. é aqui descrita para as planícies alagadas costeiras do norte do Brasil. Ela difere de todos os seus congêneres por uma combinação de estados de caracteres: presença uma mácula marrom escuro ou preta localizada na base da nadadeira dorsal; presença de uma faixa amarela na porção medial da nadadeira dorsal, ao longo de toda a nadadeira; presença de um anel alaranjado em torno da mácula da base da nadadeira dorsal; ausência de pigmentação avermelhada na barriga; ausência de uma zona vermelha ou roxa na base da nadadeira anal; ausência de zona avermelhada na base da nadadeira caudal; escamas ciclóides cobrindo as placas operculares; e escamas do tronco acima da linha lateral superior com poucas ctenas. A presença de uma depressão profunda na margem dorsal do ceratohial anterior, geralmente usada como caráter diagnóstico de *Laetacara*, é aqui confirmada para *L. flamannellus* sp. n.

> Key words

Amapá coastal rivers; Cichlinae; Cichlasomatini; *Laetacara curviceps*; *Laetacara dorsigera*; South American cichlids; systematics; taxonomy.

Introduction

Laetacara Kullander, 1986 comprises species of small size (reaching about 110 mm SL as maximum adult size). It was described by Kullander (1986) to include four species previously placed in *Aequidens* Eigenmann & Bray, 1894: *Laetacara curviceps* (Ahl, 1924), from tributaries of the lower rio Amazonas (Ottoni *et al*. 2009); *L. dorsigera* (Heckel, 1840), from the Guaporé and Mamoré river drainages of the rio Amazonas basin, rio Paraguay basin and middle rio Paraná basin (Ottoni & Costa, 2009); *L. flavilabris*

(Cope, 1870), from the western rio Amazonas basin (Kullander, 1986 and Ottoni & Costa, 2009); and *L. thayeri* (Steindachner, 1875) widespread along the upper and middle rio Amazonas basin (Kullander,1986 and Ottoni & Costa, 2009); which have been redescribed by Kullander (1986), Ottoni & Costa (2009) and Ottoni *et al*. (2009). In addition, two other species were recently described: *L. fulvipinnis* Staeck & Schindler, 2007, from the upper and middle rio Orinoco basin, and upper and middle rio Negro drainage of the rio Amazonas basin (Staeck & Schindler, 2007); and *L. araguaiae* Ottoni & Costa, 2009, from the rio Araguaia basin (Ottoni & Costa, 2009).

Laetacara is included in the tribe Cichlasomatini (Kullander, 1998; Musilová *et al*., 2008; and Smith *et al*. 2008), subfamily Cichlinae (Sparks & Smtih, 2004 and Smith *et al*. 2008), and has been considered as closely related to *Nannacara* Regan, 1905 and *Cleithracara* Kullander & Nijssen, 1989 (Kullander, 1998 and Smith *et al*. 2008). According to Kullander (1986), *Laetacara* is diagnosed by a combination of: a deep notch in the dorsal margin of the anterior ceratohyal (Kullander, 1986; fig. 149 and Ottoni *et al*. 2009; fig. 4), a character state only shared with *Cleithracara* among cichlid genera; preopercle with two scales on the horizontal and one (rarely two) on the vertical limb; two scales rows on cheek; and absence of posterior lateral ethmoid-palatine articulation and accessory caudal-fin lateral line. Later Ottoni & Costa (2009) and Ottoni *et al*. (2009) confirmed the presence of a deep notch on the dorsal margin of the anterior ceratohyal for *L. dorsigera*, *L. curviceps* and *L. araguaiae*. However, neither Casciotta (1998) for some populations of *L. dorsigera* in Argentina, nor Staeck & Schindler (2007) for *L. fulvipinnis* observed the presence of that notch.

A new species of *Laetacara* is herein described from the northern Brazil coastal floodplains, more specifically in isolated basins of the Amapá state, north of the rio Amazonas basin. The eastern plains of Amapá state is a complex mosaic of dry and flooded environments (Toledo & Bush, 2008). The flooded environments, representing about 10 % of the state area, have characteristic vegetation consisting of flooded forests and flooded grasslands (Pereira *et al*., 2002). Those environments are subject to seasonal variation caused by rain and wind annual regimes (Chellappa *et al*., 2005). In the dry season, from July to December, the water is restricted to the main river channel but during the rainy season, from January to June, the river overflows from its main channel (Pereira *et al*., 2002). Particularly in the flooded grasslands, during the rainy season as the river overflows many temporary lakes regionally known as "ressacas" are formed. This environment is peculiar because during the rise in the water level it is oxygen and nutrient enriched, favoring a rapid planktonic and vegetation growth, making it an ideal site for small fish breeding and feeding (Gama & Halboth, 2003).

Material and Methods

Material is deposited in IEPA, Instituto de Pesquisas Científicas e Tecnológicas do Amapá, Macapá; MNRJ, Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro; and UFRJ, Instituto de Biologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil.

Measurements and counts are made according to Ottoni *et al*. (2011), with addition of: number of teeth on the posterior margin of the ceratobranchial 5 and number of teeth on the transversal series of ceratobranchial 5 (Kullander, 1986); scale counts of the opercular plates and prepelvic scales series are made according Kullander (1983); and predorsal scales series (squ. Predorsal), a longitudinal count of scales, on a dorsal view, from the first dorsal-fin spine to the last scale on the dorsal profile. Precaudal vertebrae is equivalent to abdominal vertebrae *sensu* Kullander (1983; 1986). In description and table 2, the number of specimens exhibiting a character state is presented in parentheses.

Measurements are presented as percentages of standard length (SL), except for those related to head morphology, which are expressed as percentages of head length (HL). Measurements were taken on the left side of each specimen with digital calipers under a binocular microscope. Osteological studies were made on cleared and counterstained (C&S) specimens prepared according to Taylor & Van Dyke (1985), and the osteological nomenclature follows Costa (2006). Nomenclature related to colour pattern follows Kullander (1983). The lateral band sensu Kullander (1983) is here nominated longitudinal stripe. Colouration in life was observed in about 20 live specimens during field work, which five of them were photographed.

For species delimitation we adopted the population aggregation analysis (Davis & Nixon, 1992), a character-based method in which species are delimited by a unique combination of stable morphological character states occurring in one or more populations.

Comparative material is listed in Ottoni & Costa (2009) and Ottoni *et al.* (2009), with addition of: *Laetacara curviceps*: Brazil: Estado do Pará: UFRJ 7971, 22, 24.9–40.4 mm SL; UFRJ 8058, 2 C&S, 24.8–38.1 mm SL; Lago Utinga, Belém municipality; D. O. Castro, 12 Oct 2010. *Laetacara thayeri*: Brazil: Estado do Amazonas: MNRJ 2970, 4, 34.6–57.5 mm SL; Igarapé do Ananás, Lago Tefé; Mission Amazonie, 19 Nov 1962. MNRJ 29471, 15, 1 C&S, 41.8–59.1 mm SL; Petit Igarapé, tributary of rio Jacitara, Lago Grande de Manacapuru; Mission Amazonie, 12 Nov 1962.

Fig. 1. *Laetacara flamannellus* sp.n.: A, UFRJ 8060, 34.0 mm SL (holotype); and B, paratype collected with the holotype.

Laetacara flamannellus, new species

(Figs. 1a–b)

Holotype. UFRJ 8060, 34.0 mm SL; Brazil: Amapá state: lago Curiaú, following the road AP-70 to Santo Antônio da Pedreira, Macapá municipality, 0°0'54" N 51°2'26" W; P.H.N Bragança & P.F. Amorim, 10 Jan 2011.

Paratypes. Brazil: Amapá state: UFRJ 8005, 16, 10.4–38.2 mm SL; UFRJ 8057, 3, 26.7–37.8 mm SL; collected with the holotype, C&S. UFRJ 8010, 4, 15.6–17.3 mm SL; UFRJ 8056, 2, 21.4–29.1 mm SL; flooded area at the road BR-156, in direction to Oiapoque, 4 km before Tartarugal, Tartarugalzinho municipality, 1°21'45" N 50°55'34" W; P.H.N Bragança & P.F. Amorim, 16 Jan 2011, C&S. UFRJ 8038, 1, 35.8 mm SL; Igarapé do Davi, Amapá municipality, 1°56'39" N 50°51'52" W; P.H.N Bragança & P.F. Amorim, 16 Jan 2011. MNRJ 14570, 1, 20.4 mm SL; Igarapé de lago, tributary from the left side of rio Vila Nova or rio Anauerapucu, near Babolândia; G.W. Nunan & D.F. Moraes, Apr 1987. IEPA 1090, 2, 22.3–31.9 mm SL; IEPA 1092, 2, 29.6–34.9 mm SL; IEPA 0199, 6, 32.8–37.0 mm SL; lago Pracuúba, Pracuúba municipality; M.A.S. Lima, 18 Jul 1984. IEPA 1764, 4, 20.2–30.5 mm SL; rio Araguari, AMCEL area, Ferreira Gomes municipality, 0°50'46" N 51°4'42" W; C.S. Gama & D.A. Halboth, 2 Jun 2002. IEPA 2751, 8, 21.2–33.1 mm SL; Córrego Areal near BR-156, Mazagão municipality, 0°6'52" S 51°50'55" W; J.F.P da Silva *et al.*, 15 Jul 2008.

Diagnosis. *Laetacara flamannellus* sp. n. differs from all its congeners, except *L. curviceps* and *L. dorsigera*, by having a dark brown or black spot located on the dorsal-fin base, above trunk bar 5 (vs. spot absent); from *L. curviceps* and *L. dorsigera* by the presence of an orange flame ring around the dorsal-fin base spot (Fig. 1 B) (vs . orange ring absent); from *L. dorsigera* by the absence of a con-spicuous red belly in breeding specimens (vs. breeding males and females with conspicuous red cheeks, gill covers and belly); and from *L. curviceps* by the presence of a yellow stripe on the middle portion of the dorsal fin, along the whole

Table 1. Morphometric data of *Laetacara flamannellus* sp. n. **H** = holotype, **R** = range, **M** = mean and **SD** = standard deviation.

	H	R n = 19	M	SD
Standard length (mm)	34.0	24.6–38.2	30.1	0.4
Percentages of standard length (SL)				
Body depth	40.8	38.1–42.3	40.7	0.2
Predorsal length	38.8	38.5–43.9	41.2	0.1
Prepelvic length	43.8	42.5–45.1	43.8	0.1
Caudal peduncle depth	18.5	17.9–20.2	18.8	0.1
Caudal peduncle length	11.8	9.9–12.2	11.0	0.2
Dorsal-fin base length	55.6	55.6–59.0	56.9	0.1
Anal-fin base length	21.2	20.7–23.2	21.7	0.2
Pelvic-fin spine length	16.2	15.3–18.9	16.3	0.1
Pelvic-fin length	49.4	40.7–60.9	47.7	3.7
Last dorsal-fin spine length	16.8	14.8–18.1	16.6	0.1
Last anal-fin spine length	15.9	14.8–17.3	15.9	0.1
Caudal-fin length	38.2	32.1–39.0	35.7	0.2
Pectoral-fin length	27.9	27.9–31.7	29.1	0.6
Head depth	31.5	28.9–32.1	30.5	0.2
Orbital diameter	12.4	11.8–13.1	12.7	0.1
Snout length	11.5	11.2–12.1	11.8	0.2
Head width	17.9	17.2–19.5	18.9	0.1
Interorbital width	15.6	13.8–15.3	15.2	0.3
Preorbital depth	20.6	19.4–20.3	20.2	0.1
Upper jaw length	10.3	9.2–10.8	10.5	0.1
Lower jaw length	7.4	6.8–7.6	7.4	0.1
Head length (mm)	12.1	9.2–13.8	9.5	0.4
Percentages of head length (HL)				
Head depth	88.4	81.4–88.4	85.0	0.5
Orbital diameter	34.7	32.1–37.0	35.3	0.1
Snout length	32.2	31.9–34.8	32.8	0.3
Head width	50.4	48.7–55.6	52.6	0.4
Interorbital width	43.8	39.6–45.5	42.3	0.7
Preorbital depth	57.9	53.1–58.7	56.3	0.3
Upper jaw length	28.9	25.4–31.3	29.3	0.3
Lower jaw length	20.7	19.4–22.3	20.7	0.4

Table 2. Meristic variation data of *Laetacara flamannellus* sp. n.. **Pc** = procurrent rays.

	holo-type	range
Dorsal-fin spines	15	15 (40)–16 (4)
Dorsal-fin rays	9	8 (14)–9 (28)
Anal-fin spines	3	3 (44)
Anal-fin rays	9	8 (19)–9 (27)
Pelvic-fin spines	1	1 (44)
Pelvic-fin rays	5	5 (44)
Caudal-fin rays	–	3 + 8 + 8 +3 (5)
Pectoral-fin rays	–	12 (2)–13 (3)
Gill-rakers on first ceratobranchial	–	4 (1)–5 (3) + 9 (2)–10 (1)–12 (2)
Total vertebrae	–	24 (5)
Rib pairs	–	9 (3)–10 (2)
Precaudal vertebrae	–	12 (5)
Caudal vertebrae	–	12 (5)
Proximal radial on dorsal-fin base	–	22 (5)
Proximal radial on anal-fin base	–	9 (5)
Scales of upper lateral line series	15	13 (3)–14 (19)–15 (11)–16 (1)
Scales of lower lateral line serie	8	6 (7)–7 (16)–8 (11)–9 (1)
E0 series	20	19 (22)–20 (12)
E1 series	24	22 (6)–23 (14)–24 (13)–25 (1)
E2 series	25	22 (5) –23 (13)– 24 (13)–25 (3)
Scales of dorsal fin origin series	3	3 (34)
Scales of the end of superior lateral line to dorsal fin series	2	2 (34)
Scales of anal fin origin series	7	7 (34)
Scales between lateral lines	2	2 (34)
Scales of peduncle depth	7	7 (34)
Cheek scales rows	2	2 (34)
Squ. Op.	8	8 (23)–9 (12)
Squ. Iop.	3	3 (26)–4 (9)
Squ. Sop.	3	3 (25)–4 (6)
Squ. Pop.	3	3 (30)–4 (5)
Squ. Predorsal	8	8 (22)–9 (12)
Squ. Prv.	9	8 (15)–9 (19)

fin (Fig 1B) (vs. absence of a yellow stripe on the dorsal fin) (Ottoni *et al.* 2009, fig. 1 and 2; Fig. 2), cycloid scales on the opercle plates (vs . scales of the opercle plates ctenoids, with few ctenii), trunk scales above the upper lateral line with few ctenii (vs. trunk scales above the upper lateral line strongly ctenoids), absence of a red or purple region on the anal-fin base (Fig 1B) (vs . a red or purple region on anal-fin base) (Ottoni *et al.* 2009, fig. 1 and 2; Fig. 2) and absence of a red region on the caudal-fin base (Fig 1B) (vs . usual presence of a red region on the caudal-fin base) (Ottoni *et al.* 2009, fig. 1 and 2; Fig. 2).

Description. Morphometric data are summarized in Table 1, meristic data in Table 2. Dorsal profile slightly convex from snout to caudal-peduncle origin, leaner between snout and dorsal-fin origin. Ventral profile slightly convex from snout to caudal-peduncle origin. Caudal peduncle approximately straight ventrally and dorsally. Body profile elongate, laterally compressed. Lower jaw slightly shorter than upper one. Three rows of teeth on both upper and lower jaws. Jaw teeth caniniform. Teeth hyaline, reddish at tip. Opercle not serrated. Urogenital papilla externally visible, rounded.

Anterior portion of dorsal fin rounded, posterior region pointed. Tip of dorsal fin reaching vertical through end of caudal fin, in some specimens exceeding caudal fin. Anal fin rounded anteriorly, pointed posteriorly. Tip of anal fin reaching vertical through end of caudal

Fig. 2. *Laetacara curviceps*: Lago Utinga, Belém municipality, Pará state.

fin, in some specimens surpassing posterior margin of caudal fin. Caudal fin rounded. Pectoral fin rounded. Pectoral-fin base on vertical through dorsal-fin origin. Tip of pectoral-fin reaching vertical through vertical trunk bar 4. Pelvic fin pointed. Pelvic-fin base on vertical through second or third spine of dorsal fin. Tip of pelvic fin approximately reaching vertical through second anal-fin ray.

Trunk and caudal peduncle covered with strongly ctenoid scales, but scales above upper lateral line with few ctenii. Predorsal scales cycloids with a trisserial scaly pattern. No scales between dorsal and anal-fin rays, and caudal fin with few ctenoid scales on base (absent in some specimens). Pectoral and pelvic fins without scales. Two scales between lateral lines, upper and lower lateral lines scales not overlapping vertically. Opercular plate scales cycloid. Three vertical rows of scales on opercle plate, two horizontal rows on cheek, and one row on subopercle, interopercle and preopercle.

Ceratobranchials 1–4 without tooth plates. Ceratobranchial 5 partly medially sutured and relatively robust, with 6 (1), 7 (3) or 8 (1) teeth along midline and 20 (1), 21 (2), 22 (1) or 23 (1) teeth along posterior margin. Posterior teeth usually more compressed. Posterior and medial teeth larger than lateral and anterior teeth. Posterior teeth bicuspid, curved forward. Large laterally compressed teeth bicuspid. Presence of two supraneurals and one narrow ectopterygoid.

Colouration in alcohol. (Fig. 1A) Side of body light brown with seven dark brown bars between posterior limit of caudal peduncle and posterior margin of opercle. Trunk bars usually forked. Two dark spots; first spot divided in two bands, one larger and one smaller, located on base of caudal fin through lower lateral line, with two distinct patterns: bands elliptical, more common in juveniles (see Fig. 3A), and bands very elongated, like a bar (about 80 % of the specimens, mainly in the adults) (see Fig. 3B); second spot squared, located on junction between longitudinal stripe and vertical trunk bar 5. Interrupted longitudinal stripe brown between trunk bar 1 and margin of opercle, lighter and inconspicuous between bars, and darker anteriorly to trunk spot. Side of head with ground colouration as trunk, darker on opercle.

Dorsal fin with one black or dark brown spot located on its base, above trunk bar 5, and one spot above trunk bar 4 in some specimens. Dorsal and anal fins light brown, with small interrupted bars on posterior portion of fins, located anteriorly to trunk bar 2. Caudal fin hyaline, with small interrupted bars on whole fin. Pectoral fin hyaline, pelvic fin dark brown.

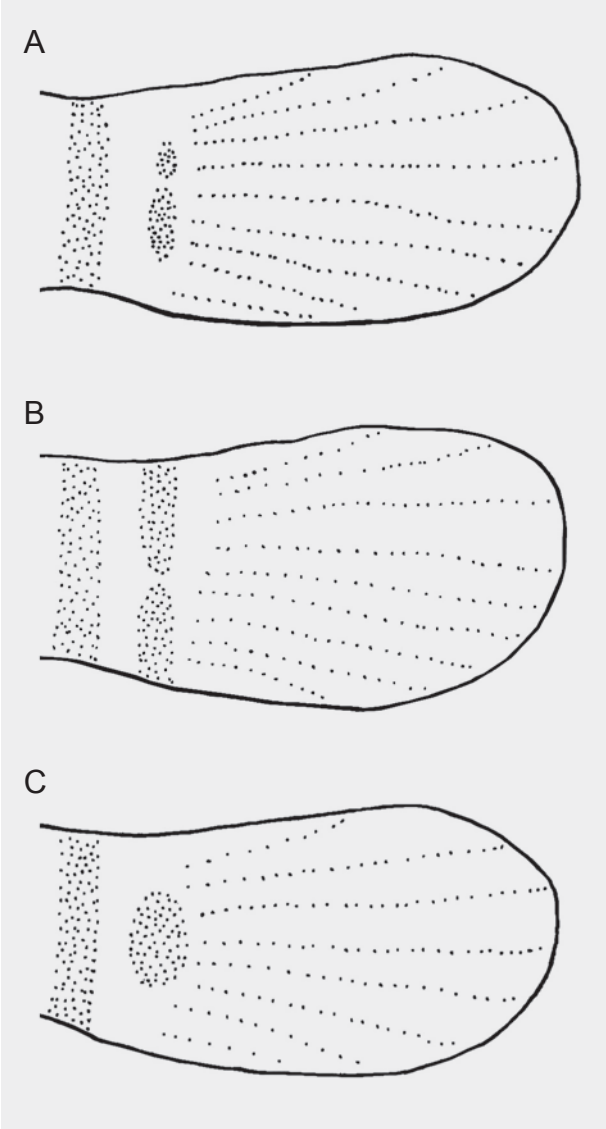

Fig. 3. Caudal-fin base spot of: **A** – some juveniles of *L. curviceps* and *L. flamannellus* sp.n., few specimens of *L. araguaiae* and specimens of *L. dorsigera*; **B** – 80 % of the specimens (mainly adults), of *L. curviceps* and *L. flamannellus* sp.n.; and **C** – majority of the specimens of *L. araguaiae.*

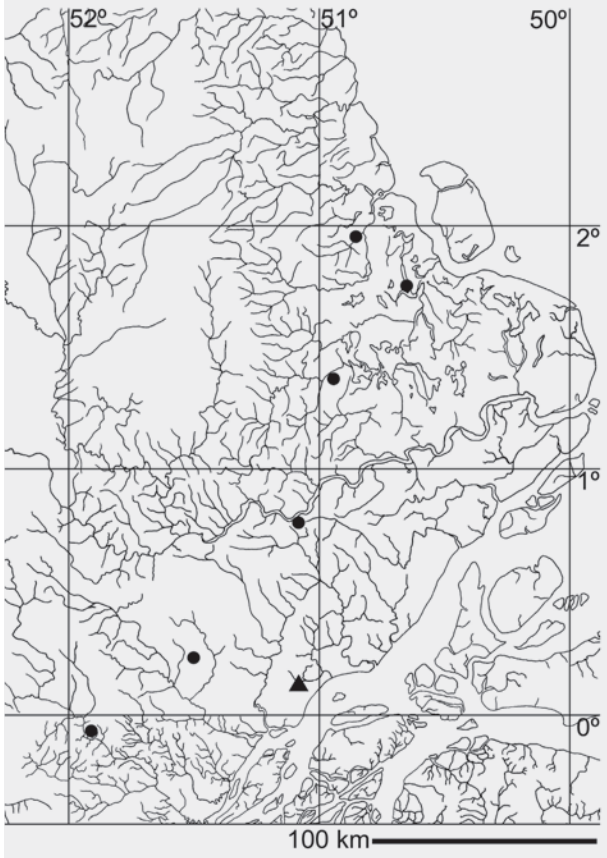

Fig. 4. Distribution map of *L. flamannellus* sp.n.. Triangle represents the collecting site of the holotype, and circles of paratypes.

Colouration in life. (Fig. 1B) Side of body light brown, with blue and green iridescence below and along longitudinal stripe. Caudal peduncle and caudal-fin base with blue iridescence. Bars, spots and longitudinal stripe dark brown.

Side of head with colouration as side of body, with blue or green iridescence on opercle. Two blue stripes below eye. Some blue marks on opercle, sometimes blue mark on snout. Snout yellow, upper jaw darker than lower. Iris with yellow or orange colouration.

Dorsal fin with blue background and intense yellow stripe crossing middle of fin, from first spine to distal tip of fin. Some transversal intense yellow bars located on soft portion of dorsal fin (rays regions), alternated by metallic blue dots. Dorsal-fin margin with orange or purple iridescence. Spot located on dorsal-fin base, above trunk bar 5, orange flame ring around spot. Anal fin intense yellow, with blue colouration on base and blue metallic dots on posterior region. Caudal fin blue, with intense yellow bars along entire fin, alternated by blue dots. Dorsal and ventral intense yellow regions located on posterior margin of caudal fin. Posterior margin of caudal fin with bright purple colouration. Dark red or purple region located on dorso-posterior margin of caudal fin. Pectoral fin bright yellow. Pelvic fin intense yellow, spine and first ray blue. Some blue stripes distributed along pelvic fin. Tip of pelvic-fin filament dark brown.

Distribution (Fig. 4). *Laetacara flamannellus* occurs along eastern coastal rivers of Amapá state, which overflows during the rainy season, originating huge floodplains. The northernmost record is from Igarapé do Davi, in Amapá municipality and the southernmost record is from córrego Areal, in Mazagão municipality

Habitat notes. *Laetacara flamannellus* was collected mainly, including the type locality, in lentic water near the bank, about 1.5 m from the margin in shallow places (0.3 – 0.5 m) where herbaceous vegetation Cyperaceae

Fig. 5. Photograph of the collecting site of the holotype. Photograph from Beatriz Camisão.

prevailed (see Fig. 5). This flooded grassland appears only during the rainy season, from January to June, as a consequence of river overflows. The annual air mean temperature is 28 °C (Pereira *et al.,* 2002). In the same biotope, we found *Rivulus schuncki* Costa & De Luca, 2011, juveniles of *Hoplerythrinus unitaeniatus* (Spix & Agassiz, 1829) and *Nannostomus* sp.

Only one locality, Igarapé do Davi, presented somewhat different conditions. It was a lotic water creek and *L. flamannellus* were collected in a shallow place (0.4 m) on the flooded margin. We found sympatrically *Apistogramma gossei* Kullander, 1982, *Crenicichla inpa* Ploeg, 1991, *Krobia* sp., *Mesonauta* sp., *Satanoperca jurupari* (Heckel, 1840) and *Fluviphylax palikur* Costa & Le Bail, 1999.

Etymology. The name *flamannellus* is a contraction from the Latin *flammeus*, meaning flame coloured, and from the Latin *annellus*, meaning ring, due to the presence of an orange flame ring around the dorsal-fin spot, one of the diagnostic character states of the new species.

Discussion

Laetacara flamannellus sp. n. is herein described from the coastal river floodplains of eastern Amapá, northern Brazil. It is included in *Laetacara* because it fits with all the diagnostic character states proposed by Kullander (1986) for the genus, as cited above. *Laetacara flamannellus* sp. n. is similar to *L. curviceps* in general counts and morphology, and similar to both *L. dorsigera* and *L. curviceps* in general colour pattern of preserved specimens. These three species differ from all their congeners by sharing a characteristic colour pattern: the presence of a dark brown or black spot on the dorsal-fin base, above trunk bar 5 (*vs*. absence). With the addition of the new species herein described, *Laetacara* currently comprises seven valid species, being the ninth more speciose genus of Cichlinae.

Ottoni *et al*. (2009) did not find ctenii on the opercular plate scales of *L. curviceps*, but re-examination of specimens of that species, including newly collected material, listed on the comparative material, demonstrated that few ctenii are present on the opercular plate scales.

Comparing the shape of the caudal-fin base spot among congeners, some differences can be observed: *Laetacara flamannellus* sp. n. and *L. curviceps* possess two patterns of caudal-fin base spot: spot divided in two elliptical bands or divided in two bands very elongated (see Fig. 3A–B) (the colour pattern of the caudal-fin base spot is detailed in the description of colour in alcohol above); *L. dorsigera* possesses only one pattern: spot divided in two elliptical bands (see Fig. 3A); *L. araguaiae* usually possesses usually spot not divided in two bands (Fig. 3C), with just few specimens possessing the spot divided in two elliptical bands (Fig. 3A); and *L. thayeri* does not possess any spot. No specimens of *L. flavilabris* and *L. fulvipinnis* were examined, impossibiliting any conclusion about the pattern of the caudal-fin base spot in these two species.

A deep notch in the dorsal margin of the anterior ceratohyal (Kullander, 1986: fig. 149 and Ottoni *et al*., 2009: Fig. 4) was treated as a synapomorphy of *Laetacara* by Kullander (1986), a condition subsequently confirmed for *L. dorsigera* and *L. araguaiae* by Ottoni & Costa (2009). However, Casciotta (1998) and Staeck & Schinlder (2007) contested this character state as diagnostic for the genus, claiming that it was not found in *L. fulvipinnis* and some populations of *L. dorsigera*, in Argentina. Later Ottoni *et al*. (2009) confirmed the presence of this character state in *L. curviceps*, but also contest the use of this character state as synapomorphy of *Laetacara*, because of the contrasting results presented by those contributions above. In the present paper, the presence of a deep notch in the dorsal margin of the anterior ceratohyal is confirmed for *L. flamannellus* sp. n., *L. thayeri* and in additional populations of *L. curviceps* (see comparative material).

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