

A New *Pristella* (Characiformes: Characidae) from the Río Orinoco Basin, Colombia, with a Redefinition of the Genus

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A new species of *Pristella* is described from the Río Meta drainage, Río Orinoco basin, Colombia. *Pristella ariporo*, new species, is described as the second known species of the genus and differs from *P. maxillaris* by lacking maxillary teeth, possessing all teeth of premaxilla and dentary conical, by the absence of a dark blotch on the pelvic fin and the absence of a humeral blotch. The evaluation of the relationships of the new taxon within Characidae through an extensive phylogenetic analysis recovered *Pristella* as a monophyletic clade, sister to *Bryconella pallidifrons*. A new diagnosis of *Pristella* is provided. *Hyphessobrycon axelrodi*, the only species of this genus possessing only conical teeth, may actually be a species of *Pristella*.

Una nueva especie de *Pristella* es descrita para la cuenca del Río Meta, cuenca del Río Orinoco, Colombia. *Pristella ariporo*, nueva especie, es descrita como la segunda especie conocida del género y difiere de *P. maxillaris* por la ausencia de dientes maxilares, todos los dientes de la premaxila y dentario cónicos, ausencia de una mancha oscura en la aleta pélvica y ausencia de mancha humeral. La evaluación de las relaciones del nuevo taxón a través de un amplio análisis filogenético de Characidae, recuperó a *Pristella* como un clado monofilético, formando el grupo hermano de *Bryconella pallidifrons*. Se proporciona una nueva diagnosis para *Pristella*. Se sugiere que *Hyphessobrycon axelrodi*, la única especie de este género que presenta sólo dientes cónicos, es una especie de *Pristella*.

THE genus *Pristella* currently includes a single valid species, *P. maxillaris*, a species distributed from the lower Río Orinoco basin in Venezuela to northern Brazil (Eigenmann, 1912; Géry, 1960; Planquette et al., 1996; Mol, 2012), in coastal river drainages. The genus was erected by Eigenmann (1908: 99) and defined as similar to *Hemigrammus*, but differing from it by possessing numerous conical teeth along the maxilla. Géry (1960: 16–18) described the dentition of the species and remarked that while the specimens from French Guiana presented a single tooth row on the premaxilla, Eigenmann (1918: 131) reported two premaxillary tooth rows for specimens from Guyana (identified by him as *Pristella riddlei*), the first one with three teeth, and the second one with eight teeth. Thus, *Pristella maxillaris* is apparently polymorphic in the number of premaxillary tooth rows. The genus has been considered as monotypic for some time (see Weitzman and Palmer, 1997: 237).

Recently, a singular-looking characid, with small conical teeth in the premaxilla and dentary, a large black blotch on the dorsal fin, and a small black blotch on the anal fin (of females) was discovered at the Río Ariporo, a tributary of the Río Meta, Departamento Casanare, Colombia. The examination and inclusion of the species in a large data matrix of the family Characidae recovered it as the sister taxon of *Pristella maxillaris*. This new taxon is herein described as the second known species of the genus *Pristella*. Also, a new diagnosis of *Pristella* is provided.

MATERIALS AND METHODS

Measurements and counts were taken according to Fink and Weitzman (1974), with the exception of the scale rows below lateral line, which were counted to the insertion of pelvic fin. The count of horizontal scale rows between the dorsal-fin origin and lateral line does not include the scale of the median predorsal series situated just anterior to the first dorsal-fin ray. In the description, the frequency of each count is given in parentheses after the respective count, and an asterisk indicates the count of the holotype. Numbers of supraneurals, vertebrae, procurrent caudal-fin rays, unbranched dorsal- and anal-fin rays, branchiostegal rays, gill rakers, maxillary, and dentary teeth were taken only from cleared and stained paratypes (CS), prepared according to Taylor and Van Dyke (1985). Vertebrae of the Weberian apparatus were counted as four elements, and the fused PU1+U1 of the caudal region as a single element. In the list of Material Examined, the total number of specimens in the lot is followed by the number of those cleared and stained (if any). Institutional abbreviations follow Sabaj (2016).

Phylogenetic analysis.—Relationships of the new taxon within the Characidae were evaluated through an extensive phylogenetic analysis, combining 520 morphological characters and eight molecular markers taken from Mirande (2019). The dataset includes 446 species representing all characiform families, characid subfamilies, and characid tribes. The morphological partition of the dataset includes

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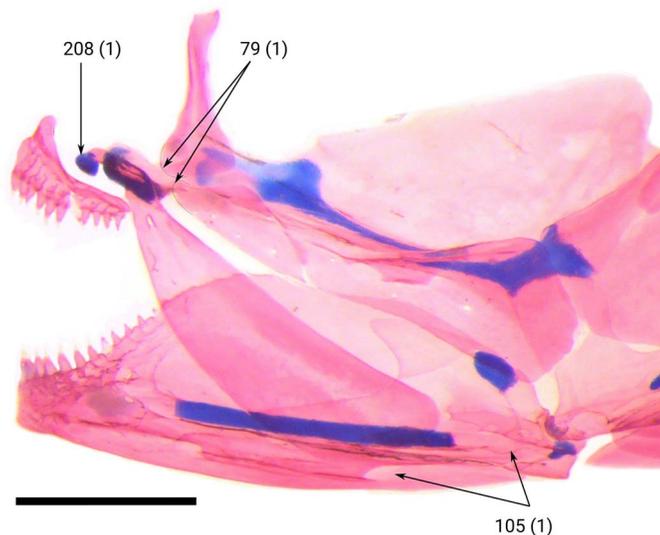


Fig. 1. *Pristella ariporo*, paratype, CZUT-IC 5208, 23.4 mm SL. Outer view of jaws, infraorbital, and suspensorium, left side. Scale bar: 1 mm.

information for 391 terminals, including the new species herein described. Most taxa, but not the new species, had DNA data in the matrix (see Mirande, 2019 for details of the data on each molecular partition). Analyses were done under equal and extended implied weighting (Goloboff, 1993, 2014) with TNT software (Goloboff et al., 2008). Molecular characters were collectively weighted according to the average homoplasy of entire partitions of data (details in Mirande, 2017, 2019), and analyses were made in a broad range of concavity constants (K-values; Goloboff, 1993; Mirande, 2009). Support was calculated through symmetric resampling (300 resamplings and probability of change 0.33), searching with sectorial searches, and tree fusing in each resampled matrix (Goloboff, 1999). Results are expressed as GC-values (differences of frequencies “Group present/Contradicted;” Goloboff et al., 2003) calculated on the consensus of the most parsimonious trees. The morphological partition of the dataset, the combined matrix, and the consensus of the most parsimonious trees obtained both under implied and equal weighting are available online at MorphoBank (O’Leary and Kaufman, 2011; see Data Accessibility).

RESULTS

Genus *Pristella* Eigenmann, 1908

Pristella Eigenmann, 1908: 99. Type species: *Holopristes riddlei* Meek, 1907. Type by original designation (also by monotypy). Gender: feminine.

Diagnosis.—The monophyly of *Pristella*, as herein recognized, is supported by 15 morphological synapomorphies: (1: ch. 40, state 0) ethmoid cartilage anterior to frontal lobe of the brain reaching close to lateral ethmoid (Mirande, 2010: fig. 2); (2: ch. 55, state 1) a ventral oblique ridge in the prootic reaching the auditory foramen (Mirande, 2019: appendix S1, fig. 5); (3: ch. 73, state 1) two well-separated exoccipital foramina for glossopharyngeal and vagus nerves (Mirande, 2019: appendix S1, fig. 8); (4: ch. 79, state 1) first infraorbital almost reaching anterior margin of antorbital (Fig. 1); (5: ch. 105, state 1) absence of anguloarticular laterosensory canal (Fig. 1); (6: ch. 193, state 0) maxillary teeth with three cusps or less; (7: ch. 201, state 0) dentary teeth with three cusps or

less; (8: ch. 207, state 0) dentary teeth gradually decreasing in size; (9: ch. 228, state 1) pseudobranch artery piercing metapterygoid through an oblique canal (Mirande, 2019: appendix S1, fig. 14); (10: ch. 252, state 1) pronounced concavity of posterior margin of opercle; (11: ch. 305, state 1) lateral lamellae of urohyal less expanded than anterior region of bone (Mirande, 2019: appendix S1, fig. 20B); (12: ch. 448, state 1) bony hooks on first, unbranched, pelvic-fin ray of adult males; (13: ch. 485, state 1) pseudotympanum anterior to first pleural rib; (14: ch. 486, state 1) pseudotympanum between first and second pleural ribs; (15: ch. 496, state 1) dark blotch on dorsal fin.

Pristella was recovered as the sister group of *Bryconella pallidifrons* as supported by 29 molecular characters, plus three morphological synapomorphies. (1: ch. 116, state 1) parietal branch of laterosensory canal absent; (2: ch. 182, state 1) six or more teeth on inner premaxillary row; (3: ch. 292, state 1) two rows of gill rakers on second ceratobranchial.

Pristella ariporo, new species

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Figures 1–3

Holotype.—CZUT-IC 19972, female, 29.7 mm SL, Colombia, Departamento Casanare, Maní, La Porfía, Río Ariporo, 06°00’37”N, 71°17’32”W, 160 masl, F. A. Villa-Navarro, 14 October 2010.

Paratypes.—All from Colombia, Departamento Casanare: ANSP 205807, 2, 1 male, 20.6 mm SL, 1 female, 22.4 mm SL, CI-FML 7502, 2 CS, 20.2–23.4 mm SL, CZUT-IC 5208, 29, 1 CS, 8 males, 16.1–22.0 mm SL, 21 females, 18.5–24.2 mm SL, IAvH-P 21919, 2, 1 male, 19.0 mm SL, 1 female, 20.1 mm SL, ZUEC 16871, 2, 1 male, 17.1 mm SL, 1 female, 20.9 mm SL, same data as holotype; IAvH-P 17424, 2, 1 male, 19.2 mm SL, 1 female, 20.1 mm SL, Paz de Ariporo, Cañada El Pavón, 5°30’23”N, 71°2’1”W, A. Méndez-López and A. Urbano-Bonilla, 27 September 2016.

Non-type material.—All from Colombia, Departamento Casanare: IAvH-P 13264, 1 male, 19.0 mm SL, Hato Corozal, Caño Los Aceites, vereda La Chapa, 5°55’57”N, 71°27’33”W, M. Roa-Cubillos, J. G. Albornoz-Garzón, and D. Montoya-Ospina, 29 November 2014; IAvH-P 13346, 5 juveniles, 14.6–15.2 mm SL, Hato Corozal, Estero la Charretela, vereda Santa Maria, 5°59’41”N, 71°31’9”W, M. Roa-Cubillos, J. G. Albornoz-Garzón, and D. Montoya-Ospina, 20 February 2015.

Diagnosis.—*Pristella ariporo* can be diagnosed from *P. maxillaris* (Fig. 4) by lacking maxillary teeth (vs. 14–22 maxillary teeth present; Fig. 5), by possessing all teeth of the premaxilla and dentary conical (vs. larger teeth of the premaxilla and dentary tricuspid; Fig. 5), by the absence of a dark blotch on the pelvic fin (vs. small dark blotch on the pelvic fin present), and by the absence of a humeral blotch (vs. small humeral blotch present).

Pristella ariporo is similar in overall color pattern to the species of *Hyphessobrycon* in the “rosy tetra clade” (*sensu* Weitzman and Palmer, 1997). It can be distinguished from all species suggested to belong to this clade by Weitzman and Palmer (1997), except *Hyphessobrycon axelrodi*, by the combination of a single row of premaxillary teeth (vs. two rows of



Fig. 2. *Pristella ariporo*, holotype, CZUT-IC 19972, 29.7 mm SL, female, Colombia, Casanare, Maní, La Porfía, Río Ariporo.

premaxillary teeth in the majority of the species assigned to the rosy tetra clade) and teeth of the premaxillary and dentary all conical and similar in size (vs. larger teeth of the premaxillary and dentary at least tricuspid). *Pristella ariporo* can be distinguished from *H. axelrodi* by lacking maxillary teeth (vs. three maxillary teeth present) and by females possessing anal fin with a small elongated blotch at the medial portion of the anteriormost branched anal-fin rays (vs. dark pigmentation at the anterior portion of the fin restricted to a small blotch).

Pristella ariporo is superficially similar to *Hemigrammus unilineatus*, sharing with the latter species the presence of a conspicuous dark blotch on the dorsal fin and a dark stripe on the anal fin. Besides the differences in tooth morphology and number of premaxillary teeth rows mentioned above, *Pristella ariporo* can be distinguished from *Hemigrammus unilineatus* by lacking a humeral blotch (vs. a narrow, vertically elongated blotch present), by possessing a pseudotympanum (vs. pseudotympanum absent), and by possessing

pigmentation on the anterior portion of anal fin as a short stripe, restricted to the middle portion of the fin (vs. pigmentation on the anterior portion of anal fin as an elongated stripe, extending from anal-fin base to its distal portion).

Description.—Morphometric data for holotype and paratypes in Table 1. Body compressed, moderately high. Greatest body depth at vertical through dorsal-fin origin. Dorsal profile of head slightly convex from upper lip to vertical through posterior nostril, straight to slightly concave from that point to posterior tip of supraoccipital spine. Dorsal profile of body slightly convex from supraoccipital spine tip to dorsal-fin origin. Dorsal-fin base straight to slightly convex, posteriorly slanted, approximately straight from posterior terminus of dorsal fin to adipose-fin insertion, and slightly concave between adipose-fin insertion and origin of anterior-most dorsal procurent caudal-fin ray. Ventral profile of head and body convex from tip of lower jaw to anal-fin origin.



Fig. 3. *Pristella ariporo*, paratype, CZUT-IC 5208, 19.3 mm SL, male, Colombia, Casanare, Maní, La Porfía, Río Ariporo.

Table 1. Morphometric data for holotype and paratypes ($n = 39$) of *Pristella ariporo*. SD = standard deviation.

	Holotype	Paratypes	Mean	SD
Standard length (mm)	29.7	16.1–24.2	20.5	1.9
Percentages of standard length				
Depth at dorsal-fin origin	32.7	32.4–39.8	36.1	1.8
Snout to dorsal-fin origin	51.2	48.9–54.2	51.6	1.2
Snout to pelvic-fin origin	48.4	45.4–53.5	48.4	1.7
Snout to anal-fin origin	63.9	54.9–64.8	61.4	1.9
Caudal peduncle depth	11.0	9.0–12.1	10.6	0.6
Caudal peduncle length	12.3	11.5–15.5	13.2	0.8
Pectoral-fin length	21.4	17.6–23.7	20.9	1.4
Pelvic-fin length	19.5	16.7–24.2	18.9	1.3
Dorsal-fin length	28.8	26.1–34.9	30.4	1.9
Anal-fin base length	28.4	27.8–32.9	30.6	1.3
Head length (mm)	31.7	28.5–33.0	30.2	0.9
Percentages of head length				
Postorbital head length	44.5	49.4–49.7	45.4	2.4
Snout length	20.6	18.2–23.8	21.3	1.4
Least interorbital width	30.4	30.6–37.8	33.9	1.8
Upper jaw length	36.6	33.2–42.5	38.9	1.9
Horizontal eye diameter	29.7	31.4–38.4	35.5	1.5

Anal-fin base straight, posterodorsally slanted. Ventral profile of caudal peduncle slightly concave.

Jaws unequal, dentary extending slightly beyond premaxillary, mouth slightly upturned. Posterior terminus of maxilla not reaching vertical through anterior margin of eye. Nostrils close to each other, anterior opening round, posterior opening elliptical. Premaxillary teeth in single row, with 11(3) conical teeth. Maxilla without teeth. Dentary with 11(1) or 14(2) conical teeth, anteriormost teeth larger, teeth decreasing gradually in size towards posterior portion of dentary (Fig. 5).

Scales cycloid. Three to five *radii* strongly marked, *circuli* well marked anteriorly, absent posteriorly. Lateral line slightly deflected downward and incompletely pored, with 5*(3) or 6(18) perforated scales. Longitudinal scale series including lateral-line scales 30(2), 31*(5), 32(6), or 33(6). Longitudinal scale rows between dorsal-fin origin and lateral

line 5*(17). Longitudinal scale rows between lateral line and pelvic-fin origin 3*(37). Scales in median series between tip of supraoccipital and dorsal-fin origin 8(2), 9*(17), or 10(5). Circumpeduncular scales 12*(9). Caudal fin with scales basally on each lobe.

Dorsal-fin rays ii, 9*(36), or ii,10(1). Dorsal-fin origin slightly anterior to middle of standard length. First dorsal-fin pterygiophore main body located posterior to neural spine of 9th(3) vertebrae. Adipose fin present. Anteriormost anal-fin pterygiophore inserting posterior to haemal spine of 14th(1), 15th(1), or 16th(1) vertebra. Anal-fin rays iv, 18(1), 20*(1), 21(13), 22(8), 23(12), or 24(2). Last unbranched and first to third anteriormost branched rays distinctly longer than remaining rays, forming elongated lobe; subsequent rays gradually decreasing in size. Pectoral-fin rays i, 9(4), 10*(25), 11(7), or 12(1). Pelvic-fin rays i,6*(37). Tip of pelvic fin not reaching to anal-fin origin. Caudal fin forked, lobes roughly rounded. 9(1) or 10(2) dorsal procurrent caudal-fin rays, and 7(2) or 8(1) ventral procurrent caudal-fin rays.

Vertebrae 32(1), 33(1), or 34(1). Supraneurals 3(1) or 4(2). Branchiostegal rays 4. First gill arch with 2(3) hypobranchial, 10(1) or 11(2) ceratobranchial, 1(3) on cartilage between ceratobranchial and epibranchial, and 7(3) epibranchial gill rakers. Pseudotympanum present, both anterior to first pleural rib and between first and second ribs. Dorsal margin of pseudotympanum limited by *lateralis superficialis*.

Color in alcohol.—Overall ground coloration of head and body light beige (Figs. 2, 3). Dorsal portion of head and tip of dentary with relatively dense concentration of dark chromatophores. Predorsal region and dorsal area between dorsal-fin terminus and anteriormost dorsal procurrents rays with moderate concentration of dark chromatophores. Lateral portion of body above midline with dark chromatophores concentrated along scale margin. Diffuse, scattered dark chromatophores along midline, especially posterior to vertical through dorsal-fin terminus. Lateral side of head and abdominal region almost devoid of dark chromatophores. Relatively large chromatophores concentrated at dorsal portion of pseudotympanum, though not forming humeral blotch. Opercle translucent, presumably due to loss of

**Fig. 4.** *Pristella maxillaris*, ZUEC 16507, 20.9 mm SL, Brazil, Amapá, rio Oiapoque basin.

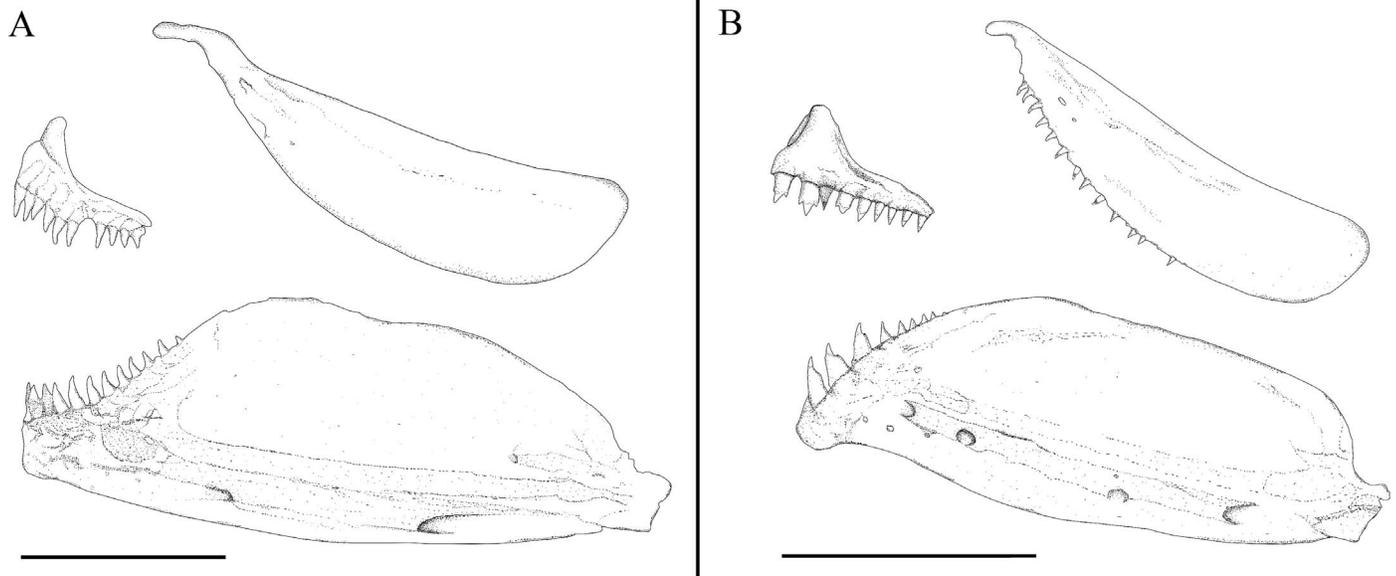


Fig. 5. Premaxillary, maxillary, and lower jaw of *Pristella ariporo*, paratype, CZUT-IC 5208, 23.4 mm SL (A), and *P. maxillaris*, ZUEC 12916, 19.2 mm SL (B), left side, in outer view. Scales bars: 1 mm.

guanine pigmentation during preservation. Dorsal fin with conspicuous dark blotch at middle to distal portion of last unbranched to anteriormost four branched rays. Remaining portion of dorsal fin hyaline. Anal fin with conspicuous, vertically elongated dark blotch at middle portion of anteriormost three branched rays. Remaining portion of anal fin hyaline, with scattered dark chromatophores at interradial membranes. Pectoral, pelvic, and caudal fins hyaline, with small scattered dark chromatophores.

Sexual dimorphism.—Females possess a small elongated blotch at the medial portion of the anteriormost branched anal-fin rays, which is typically absent in males (Fig. 3). Four males (CZUT-IC 5208, 16.1–21.8 mm SL) possess the anal-fin blotch, however less conspicuous than in females. Additionally, mature males possess hooks on the pelvic and anal fins. Four to seven hooks are present on the unbranched ray and anterior 3–6 branched rays of pelvic fin. Branched rays with hooks present only on posterior branch, with a single hook present per ray segment. Four to eight hooks are present on the unbranched ray and anterior 5–8 branched rays of anal fin. Branched rays with hooks present in both anterior and posterior branches, but more numerous and larger on posterior branches, with a single hook per ray segment.

Distribution.—*Pristella ariporo* is known so far from three localities at the Río Ariporo, a tributary of the Río Casanare, and one locality at the Río Guachíria, both tributaries of the Río Meta drainage, Río Orinoco basin, Departamento Casanare, Colombia (Fig. 6).

Ecological notes.—The type locality of *Pristella ariporo* is a flooded savannah associated with the Río Ariporo. *Pristella ariporo* was collected syntopically with *Astyanax* sp., *Ctenobrycon spilurus*, *Gymnocorymbus bondi*, *Hoplosternum littorale*, *Odontostilbe splendida*, *Roeboides dientonito*, and *Steindachnerina argentea*. The collection was made in October, corresponding to the end of the rainy season. Both males and females were sexually mature, with males displaying fin hooks (see Sexual dimorphism, above) and females possess-

ing ripe gonads. The remaining localities from which the species is known are all flooded areas in the Llanos.

Etymology.—The specific name, *ariporo*, comes from the Río Ariporo drainage, where the first specimens of this species were found. The word “ariporo” is probably derived from some indigenous language, but we were unable to trace its origin or meaning. The Río Ariporo is an important tributary of the Río Casanare because of its extensive wetlands, which help to maintain a rich biodiversity and the connectivity among regional fish communities. A noun in apposition.

Remarks.—Lots IAvH-P 13264 and IAvH-P 13346 were excluded from the type-series because they include only small, relatively poorly-preserved specimens.

Phylogenetic relationships.—The same set of six most parsimonious trees of 52,719 steps were obtained under K-values = 26–32 (fit = 947.12314 with K = 30), although the relationships of *Pristella ariporo* were stable along all the explored values of K (20 to 56). Under all those conditions, *Pristella ariporo* was obtained as sister to *P. maxillaris*, with both species forming the sister group of *Bryconella pallidifrons*. The subtree of the Stethaprionini is shown in Figure 7.

DISCUSSION

Pristella is herein defined as a monophyletic and well-supported unit composed of two species: *Pristella maxillaris* (the type species) and *P. ariporo*, and included in the tribe Stethaprionini (Characidae: Stethaprioninae; Fig. 7). The genus was consistently recovered as the sister group of *Bryconella*, although with weak support.

According to the present definition, *Pristella* may be diagnosed by the presence of one irregular row of mostly unicuspid premaxillary teeth (some tricuspid teeth in *P. maxillaris*), first infraorbital extended to anterior margin of antorbital, pseudotympanum extended anterior to the first pleural rib, bony hooks on first pelvic-fin ray of males, and a dark blotch on the dorsal fin. In *Pristella*, a gap separates infraorbital 3 and the preopercle, laterosensorial pore

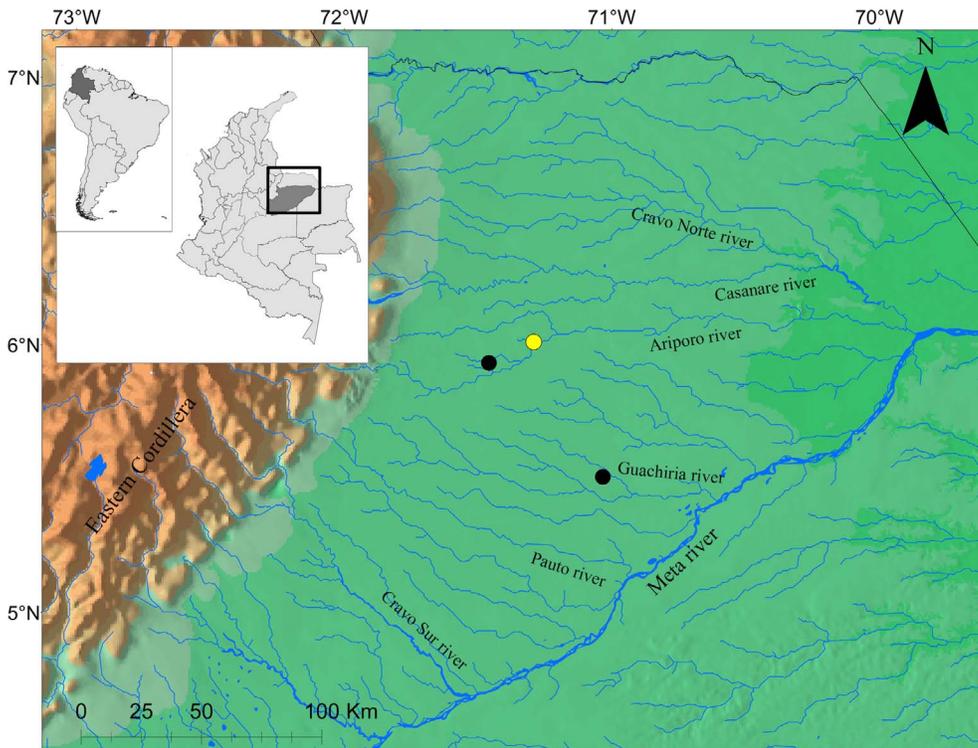


Fig. 6. Río Meta basin, Colombia, showing the distribution of *Pristella ariporo*. Yellow dot indicates type-locality; black dots indicate remaining localities.

anterior to dilatator fossa oriented dorsomedially (see Mirande, 2019: appendix S1, figure 11C), the presence of nine branched dorsal-fin rays, and an interrupted lateral line. Several of the synapomorphies are visible only in CS specimens (see Results), but the combination of other osteological non-synapomorphic features are also useful to distinguish the species of *Pristella* from remaining characids: presence of a bony rhinosphenoid (ch. 34, state 1; Mirande, 2010: figure 34), a conspicuous ethmopalatine cartilage (ch. 208, state 1), cartilage of first epibranchial articulating with anterior region of second pharyngobranchial (ch. 278, state 1; Mirande, 2019: appendix S1, figure 18B), up to four supraneurals (ch. 391, state 1), three rays articulating with first dorsal-fin pterygiophore, with the anteriormost minute and visible only in CS specimens (ch. 404, state 1), and only one pair of uroneurals (ch. 427, state 0). The character used by Eigenmann (1908: 99) to define the genus *Pristella*, the high number of maxillary teeth, is herein considered to be restricted to *P. maxillaris*, since *P. ariporo* possesses a toothless maxilla.

Pristella ariporo is similar in color pattern to several species of the genus *Hyphessobrycon* (the rosy tetra clade; Weitzman and Palmer, 1997) and to *Hemigrammus unilineatus* by sharing with these taxa a well-developed, conspicuous dark blotch on the dorsal fin. As mentioned in the Diagnosis, most species of the rosy tetra clade possess two premaxillary tooth rows, whereas *Pristella ariporo* possesses a single premaxillary tooth row. Exceptions include some species previously assigned to the genera *Megalampodus* and *Pseudopristella*, viz., *Hyphessobrycon axelrodi*, *Hyphessobrycon roseus*, *Hyphessobrycon simulatus*, and *Hyphessobrycon sweglesi* (Weitzman and Palmer, 1997). *Hyphessobrycon axelrodi* apparently always possesses a single premaxillary tooth row (Travassos, 1959), whereas the latter three species possess either a single row or a poorly developed outer tooth row (Géry, 1960, 1961). With the exception of *Hyphessobrycon axelrodi*, the remaining aforementioned species possess the

largest dentary and premaxillary teeth tri- to pentacuspoid. *Hyphessobrycon axelrodi* shares with *Pristella ariporo* the presence of a single row of premaxillary teeth and the possession of exclusively conical teeth. Both species can be distinguished by the characters mentioned in the Diagnosis. *Hyphessobrycon axelrodi* is a poorly known species, so far only reported from the island of Trinidad (Phillip et al., 2013: 17). The species shares with *P. maxillaris* and *P. ariporo* the presence of a blotch on the anterior portion of the anal fin (Travassos, 1959: 6). Specimens of *Hyphessobrycon axelrodi* were not available for direct examination, but a picture of one paratype (MNRJ 9121) shows that the species also shares with *P. ariporo* and *P. maxillaris* the possession of a pseudotympanum (also apparent in Géry, 1977: 572, lower photo). It is likely that *Hyphessobrycon axelrodi* actually belongs to the genus *Pristella*, a possibility that needs to be examined.

MATERIAL EXAMINED

All from Brazil, unless otherwise noted.

Hemigrammus unilineatus: ZUEC 12888, 13, 17.8–42.5 mm SL, Pará, Primavera, rio Morcego; ZUEC 12924, 8, 18.0–32.1 mm SL, ZUEC 12940, 23, 12.9–36.3 mm SL, Pará, Primavera, rio Tabocal; ZUEC 15203, 7, 27.5–30.2 mm SL, Amazonas, Atalaia do Norte, rio Javari.

Hyphessobrycon roseus: ZUEC 16427, 21, 16.1–33.0 mm SL, Amapá, Oiapoque, rio Caciporé; ZUEC 16725, 74, 2 CS, 15.8–28.3 mm SL, Amapá, Calçoene, rio Caciporé.

Hyphessobrycon simulatus: ZUEC 16424, 61, 1 CS, 12.4–25.7 mm SL, Amapá, Oiapoque, rio Caciporé.

Hyphessobrycon sweglesi: ZUEC 9896, 5, 24.6–32.2 mm SL, Rondônia, Porto Velho, rio Abunã; ZUEC 13230, 39, 1 CS,

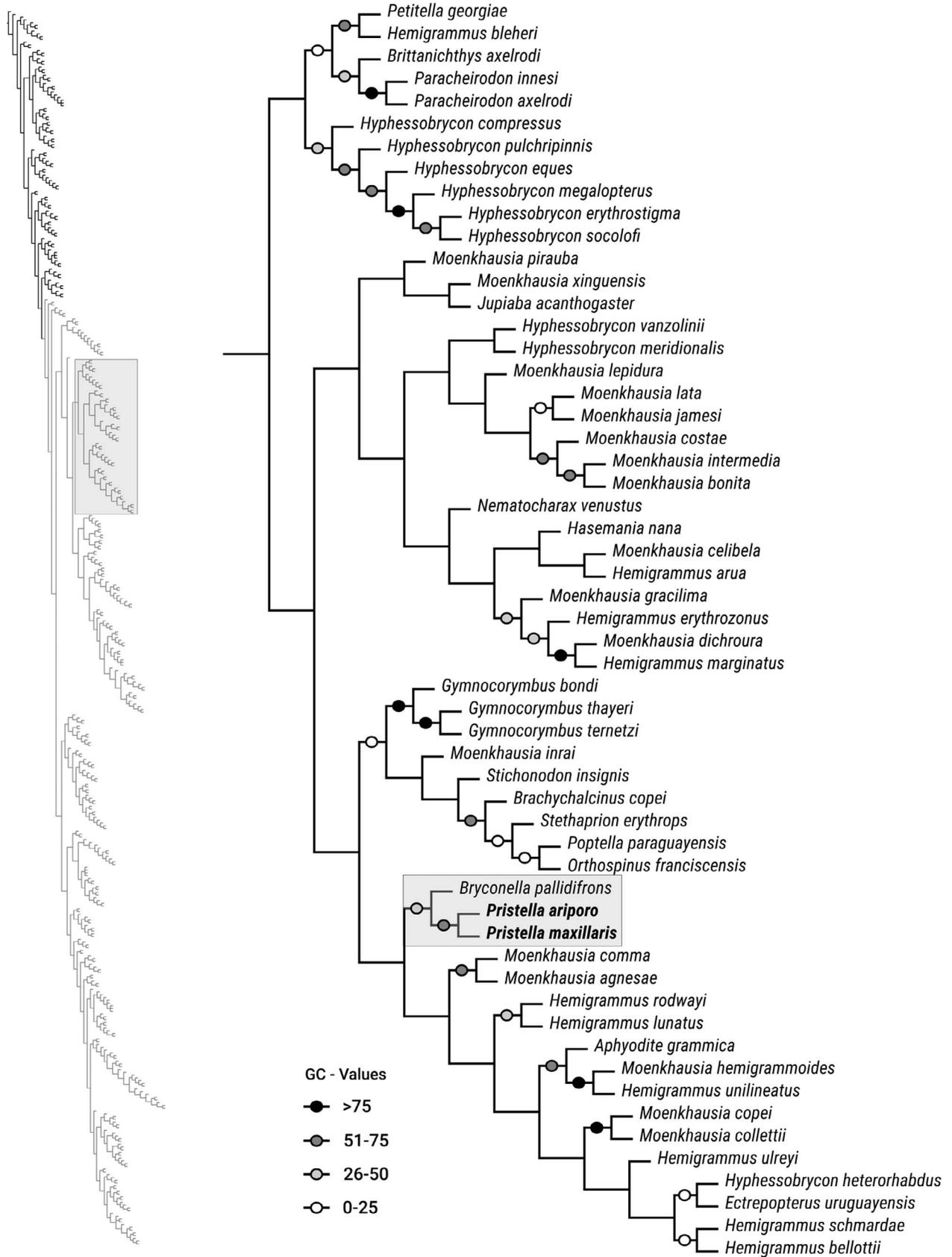


Fig. 7. Phylogenetic relationships among the Stethaprionini as obtained from the combined phylogenetic analysis under parsimony and extended implied weighting (K = 30; Fit = 947.12314, Length = 52 719 steps). See Data Accessibility for tree file.

25.4–29.0 mm SL, Acre, Cruzeiro do Sul, rio Croa; ZUEC 15612, 2, 26.7–28.0 mm SL, Amazonas, Atalaia do Norte, rio Javari; ZUEC 16926, 25, 3 CS, 14.1–19.5 mm SL, Venezuela, Delta Amacuro, Caño Paloma.

Pristella maxillaris: ZUEC 12916, 60, 3 CS, 13.5–20.2 mm SL, Pará, Primavera, Rio Bacabal; ZUEC 16009, 140, 6 CS, 14.9–19.4 mm SL, Amapá, Tartarugalzinho, Rio Cobre; ZUEC 16507, 51, 16.7–22.7 mm SL, Amapá, Oiapoque, Igarapé Serrapini; ZUEC 16775, 96, 17.2–22.7 mm SL, Amapá, Ferreira Gomes, rio Araguari.

DATA ACCESSIBILITY

Supplemental material is available at <https://morphobank.org/permalink/?P3285> and <https://www.copeiajournal.org/ci-18-147>.

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