

***Bryconamericus pyahu* sp. n. (Characiformes, Characidae), a new species from the río Iguazú basin, in Argentina**

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***Bryconamericus pyahu* sp. n. (Characiformes, Characidae), a new species from the río Iguazú basin, in Argentina.** - A new species of the genus *Bryconamericus* is described from río Iguazú basin in Misiones, Argentina. *Bryconamericus pyahu* sp. n. is distinguished from all other species by the following combination of characters: low body depth (28.0-34.5 in % of SL); premaxillary teeth of the inner series with 3 to 5 cusps; aligned 3 premaxillary teeth of the outer row tricuspidate, and 3-5 maxillary teeth with 1 to 3 cusps. Also, the new species has 18-20 branched anal-fin rays, large black subcircular humeral spot, wide black lateral band, and 37-39 perforated scales on the lateral line. The new species was collected in the arroyo Tateto, headwaters of the río San Antonio, Iguazú basin.

Key-words: Characiformes - Characidae - *Bryconamericus* - Argentina - Misiones - Iguazú basin.

INTRODUCTION

The genus *Bryconamericus* in Argentina includes 9 species reported from the basins of the ríos Paraguay, Paraná, Uruguay, and Río de la Plata; it is present also in endorrheic basins of central and western Argentina and Atlantic drainages in the south of Buenos Aires Province (Miquelarena & Aquino, 1995; Casciotta *et al.*, 1999; Braga, 2000; Azpeliqueta & Almirón, 2001; Casciotta *et al.*, 2002). The río Iguazú basin is the only one in which the genus *Bryconamericus* was not known.

The río Iguazú, one tributary of the río Paraná, runs from the East to the West through 1.320 km. The last 115 km flow between Argentina and Brasil and have an amazing drop 78 m high with numerous falls, known as Cataratas del Iguazú (Severi & Cordeiro, 1994). These falls have been an effective fish-fauna barrier since its origin in the Oligocene-Miocene.

The aim of this paper is to describe a new species of *Bryconamericus* found in one stream, tributary of the río Iguazú.

MATERIAL AND METHODS

Measurements are straight line distances taken with calliper. Standard length (SL) was measured from tip of snout to hypural joint, head length includes the opercular flap, caudal peduncle length is taken from last anal-fin ray to hypural joint. Specimens were cleared and stained (C&S) for cartilage and bone following Taylor & Van Dyke (1985). Vertebrae count includes those corresponding to the Weberian apparatus and also the complex centrum as one element.

The specimens examined belong to Asociación Ictiológica, La Plata, Argentina (AI); Fundación Miguel Lillo, Tucumán, Argentina (FML); Muséum d'histoire naturelle, Genève, Switzerland (MHNG); Facultad de Ciencias Naturales y Museo, La Plata, Argentina (MLP); Staatliches Museum für Tierkunde, Dresden, Germany (MTD F).

COMPARATIVE MATERIAL EXAMINED

Bryconamericus agna Azpelicueta & Almiron, 2001: FML 3700, holotype, 61.5 mm SL, Argentina, Misiones, arroyo Tabay, Paraná basin. MHNG 2611.46, 4 ex., 54.3-60.0 mm SL, collecting data as holotype. *Bryconamericus iheringii* (Boulenger, 1887): MLP 9073, 110 ex., 39.9-44.3 mm SL, Argentina, Buenos Aires, Sierra de la Ventana. MLP 9103, 15 ex., 34.8-49.2 mm SL, Argentina, Buenos Aires, Berisso, Los Talas (man-made ponds connected to Río de la Plata). *Bryconamericus exodon* Eigenmann, 1907: MLP 18-IX-80-1, 2 ex., 39.0-43.5 mm SL, Argentina, Buenos Aires, Río de la Plata in Punta Lara. *Bryconamericus mennii* Miquelarena et al., 2002: AI 102, 3 ex., 43.0-55.9 mm SL, Argentina, Misiones, arroyo Cuñapirú. *Bryconamericus thomasi* Fowler, 1940: FML 1969, 94 ex. (5 measured, 2 males and 3 females), 40.3-55.4 mm SL, Argentina, Salta, río Piedras. *Bryconamericus uporas* Casciotta et al., 2002: MLP 9568, holotype, 51.5 mm SL. Argentina, Misiones, Uruguay basin, arroyo Once Vueltas. *Hypobrycon poi* Almiron et al., 2001: MLP 9573, 50.5 mm SL, Argentina, Misiones, Uruguay basin, arroyo Once Vueltas.

RESULTS

Bryconamericus pyahu sp. n.

Figs 1-5, Table 1

Holotype. AI 101, 50.6 mm SL, Argentina, Misiones, arroyo Tateto (25° 47' 12.8" S - 53° 58' 12.9" W), Iguazú basin. Coll. J. Casciotta, A. Almiron & M. de las M. Azpelicueta, February 2002.

Paratypes. MHNG 2639.48, 10 ex., 45.5-52.3 mm SL, Argentina, Misiones, arroyo Tateto (25° 47' 12.8" S - 53° 58' 12.9" W), Iguazú basin. Coll. A. Almiron, J. Casciotta & M. de las M. Azpelicueta, February 2002. MTD F 27048-27051, 4 ex., 47.0-50.9 mm SL, same data as type locality. Coll. J. Casciotta & A. Almiron, February 2001.

Diagnosis. *Bryconamericus pyahu* is distinguished from other species of the genus by the following combination of characters: low body (28.0-34.5 % of SL); premaxillary teeth of the inner series slender with 3 to 5 cusps; premaxillary teeth of the outer row 3, aligned, tricuspidate, and 3-5 maxillary teeth, conic to tricuspidate. Also, the new species has 18-20 branched anal-fin rays, males without hooks on fins; lateral series with 37-39 perforated scales, large black subcircular humeral spot, and wide black lateral band.

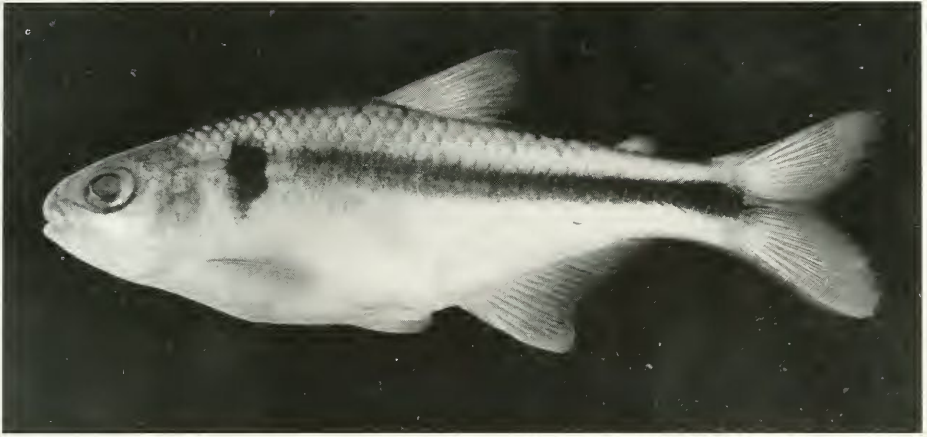


FIG. 1

Bryconamericus pyahu sp. n., holotype, AI 101, 50.6 mm SL.

Description. Morphometrics of holotype and 14 paratypes are presented in table 1. Body elongate and laterally compressed (Fig. 1). Greatest body depth approximately at dorsal-fin origin. Dorsal profile of body slightly convex from upper lip to dorsal-fin origin, almost straight and slanted ventrally from dorsal-fin base to caudal peduncle. Ventral profile of body slightly convex from mouth to branchiostegal area, straight from this last point to anal-fin origin. Ventral profile straight from anal-fin origin to caudal peduncle. Dorsal and ventral profiles of caudal peduncle straight.

Dorsal-fin origin nearer snout tip than base of caudal-fin rays, dorsal-fin origin behind vertical through last pelvic-fin ray insertion. Adipose fin present. Usually, tip of pectoral fin not reaching pelvic-fin origin. Tip of pelvic fin in adults never reaching anal-fin origin.

Dorsal fin with ii,8 rays; posterior margin of dorsal fin straight, second unbranched and first branched dorsal-fin rays of same length.

Anal fin with iii-iv,18-20 rays (3 ex.= 18, 7 ex.= 19, 5 ex.= 20), males without hooks on rays. Many specimens with last unbranched and first five branched rays forming an anterior lobe, independently from sex.

Pectoral fin with i,11-12 rays (5 ex.= 11, 10 ex.= 12), posterior pectoral-fin margin rounded.

Pelvic fin with i,7 rays, males without hooks on it.

Caudal fin with 1 unbranched and 9 branched principal rays on upper lobe; 1 unbranched and 8 branched principal rays on lower lobe. Lower caudal lobe scarcely longer and more rounded.

Dorsal profile of head straight, concave over supraoccipital spine. Snout rounded, upper jaw distinctly longer than lower jaw. Mouth placed at level of lower orbital margin. Maxilla surpassing anterior orbital margin. Maxilla with ascending process short, lateral process long, wide, and laminar. Maxilla with 3-5 teeth, bearing 1-3 cusps (Fig. 2); in one specimen (C&S) maxilla with 6 teeth on one side. Premaxilla with as-

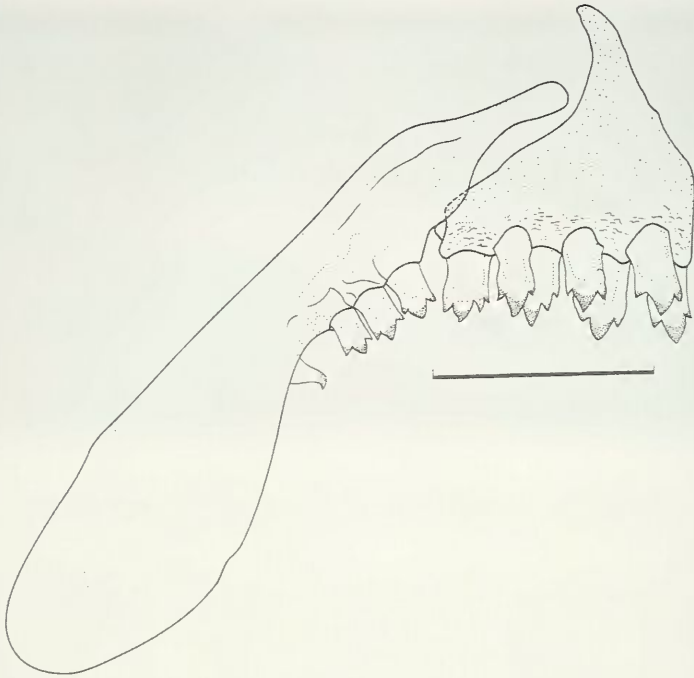


FIG. 2

Bryconamericus pyahu sp. n., external view of right maxilla and premaxilla. Scale bar = 1 mm.

ending process short, bearing 2 series of teeth, with stronger median cusp (Fig. 2). Outer series with 3 aligned teeth, all tricuspidate (1 ex. with 4 teeth). Inner series of premaxillary teeth consisting of 4 teeth (1 ex. with 5 teeth on both sides), with 3 to 5 cusps; symphyseal tooth narrower. Dentary bearing 8-10 teeth decreasing in size anteroposteriorly, most of them tricuspidate, although last ones conic (Fig. 3).

Eye longer than snout. Postero-ventral edge of third infraorbital not in contact, but very closed, with sensory tube of preopercle.

Scales cycloid. Lateral series with 37-39 perforated scales (1 ex.= 37, 8 ex.= 38, 6 ex.= 39). Five scales between dorsal-fin origin and lateral line, 3.5-4 scales between lateral line and pelvic-fin origin. Fourteen scales around caudal peduncle. Eleven to fourteen scales forming a regular median series between supraoccipital process and dorsal-fin origin in most specimens. Seven to ten scales in one row, covering proximal portion of the anal-fin rays.

In four cleared and stained specimens, gill-rakers on first branchial arch 4-5 + 9. Caudal fin with 11-13 dorsal and 10-12 ventral procurrent rays. Vertebrae counts 37-38. Dorsal fin with 9 pterygiophores, placed between neural spines of vertebrae 11 or 12 and 18; anal fin with 20-21 pterygiophores, placed between hemal spines of vertebrae 17-18 and 28. Ten or 12 pairs of ribs.

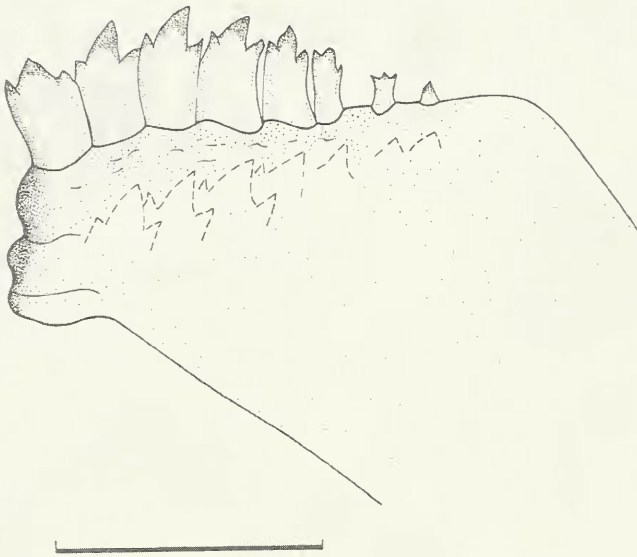


FIG. 3

Bryconamericus pyahu sp. n., medial view of right dentary. Scale bar = 1 mm.

Colouration in alcohol preserved specimens: Ground color pale yellow, with upper area of flanks slightly darker; margin of scales over lateral band with dark chromatophores forming a reticular pattern, in most specimens. Lower half of flanks with small isolated chromatophores, some of them concentrated over anal fin and other ones following myosepta. Dorsum of head with gray chromatophores, also placed on snout with low density. Scattered chromatophores on maxilla and lower jaw. Ventral region of head and vent whitish. A large subcircular black humeral spot, placed on or behind second scale of longitudinal series. A wide dark lateral band extended on middle flank, 1 or 2 scales deep, and continuing onto a caudal spot. Lateral band extending over medial caudal-fin rays. Posterior margin of eye with a silvery half-moon shaped spot. Dorsal fin with chromatophores, especially concentrated on distal half; dorsal-fin rays with chromatophores on their margins. First unbranched dorsal-fin ray completely covered with dark chromatophores. Anal fin with chromatophores on distal portion of membranes and along anterior ray margins. Adipose with very few small scattered chromatophores. Caudal fin with chromatophores, especially concentrated on ray margins and close to distal edges. Pectoral fins with dark chromatophores concentrated on ray margins, pelvic fins with very few chromatophores.

Etymology. The specific name *pyahu* is a guaraní word meaning new.

Distribution. This species is only known from arroyo Tateto, a tributary of the arroyo Deseado which flows into the río San Antonio. This river is the most important affluent of the Iguazú basin, in Argentina (Fig. 4).

The arroyo Tateto has rapids and pools, with clear flowing water. The depth of the stream was variable from 40 cm to 2 m, and the bottom is composed of mud, sand, and mostly stones. Some areas have scarce submerged vegetation. The temperature of the water near surface was 26 °C.

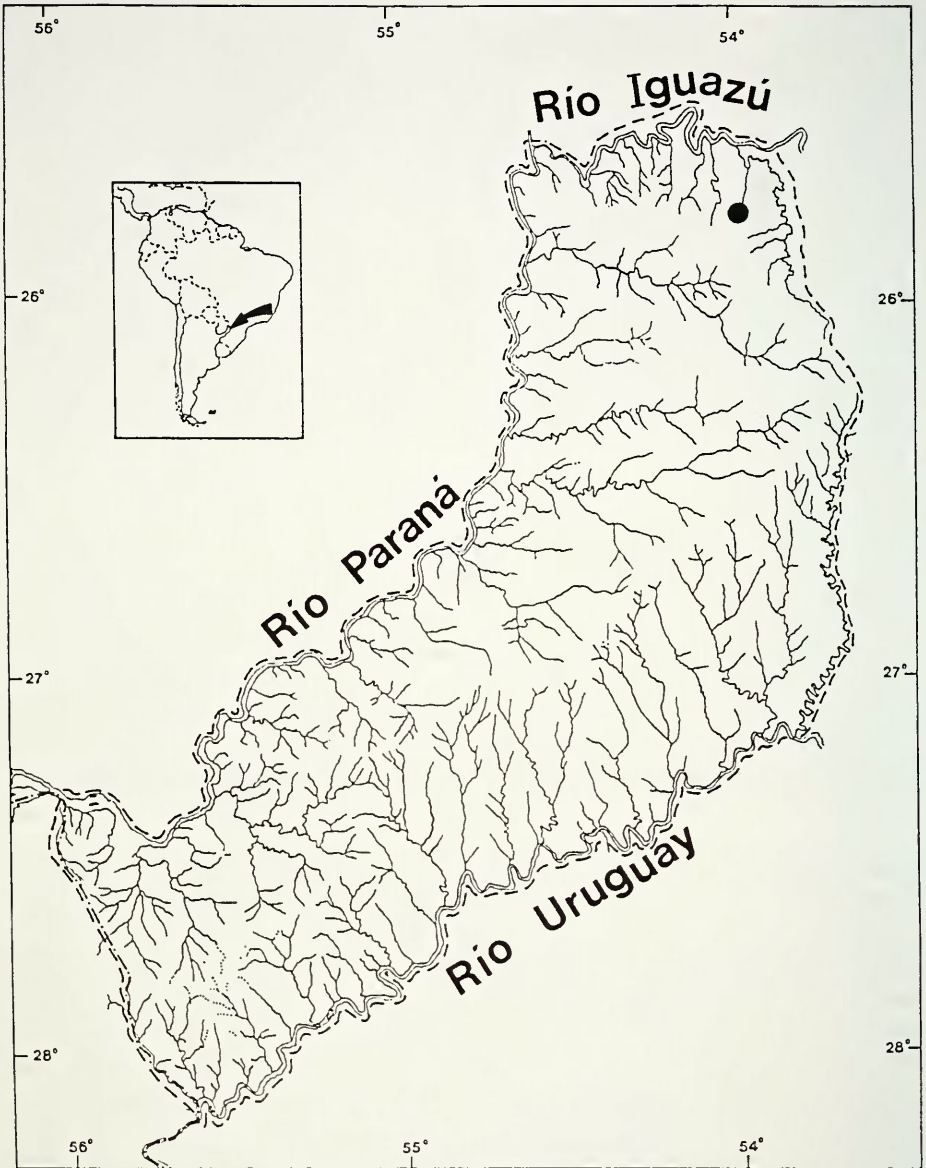


FIG. 4

Map showing the type locality of *B. pyahu* sp. n., Argentina, Misiones, Iguazú basin, arroyo Tateto.

DISCUSSION

Among species of the genus *Bryconamericus* cited in the streams and rivers of Southeastern Brazil and the Río de la Plata basin, the following species have lower number of branched anal-fin rays than *B. pyahu* (18-20): *Bryconamericus eigenmanni*

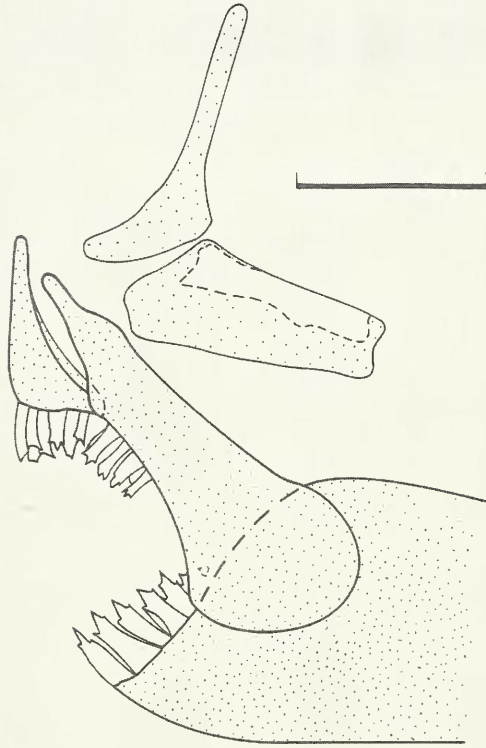


FIG. 5

Bryconamericus pyahu sp. n., outlines of upper and lower jaw, showing the shape of the bones. Scale bar = 1 mm.

Everman & Kendall, 1906 (15-17), *B. iheringii* (15-17), *B. rubropictus* (Berg, 1901) (13-17), and *B. thomasi* (10-17). *Bryconamericus sylvicola* has high number of branched anal-fin rays (22-25 vs. 18-20).

Other species with the same number of branched anal-fin rays that *B. pyahu* are *B. agna*, *B. exodon* (*B. stramineus* a junior synonym of *B. exodon*?), *B. lambari*, *B. mennii*, and *B. uporas*.

Bryconamericus pyahu differs from *B. exodon* in having an aligned outer row of premaxillary teeth, a subcircular humeral spot, and deeper body (28.0-34.5 vs. 22.9-26.8 % in SL). The wide dark lateral band present in *B. pyahu* distinguishes this species from *B. lambari*, but a similar band occurs in *B. agna*. *Bryconamericus pyahu* differs from *B. agna* in having lower body (28.0-34.5 vs. 34.1-39.8 % in SL), longer caudal peduncle length (14.7-18.3 vs. 12.9-14.6 % in SL), and higher number of dentary teeth (8-10 vs. 6-7).

Among all species examined, *B. pyahu* looks like *B. uporas* from the río Uruguay basin. Counts and measurements are very similar in both species, and also in *B. mennii*. However, the shape of dentary, maxillary, and premaxillary teeth are very

TABLE 1. Morphometrics of the holotype and 14 paratypes of *Bryconamericus pyahu* sp. n. Standard length is expressed in mm. SD: standard deviation.

| | Holotype | Range | mean | SD |
|--|----------|-----------|------|------|
| Standard length | 50.6 | 45.5-52.3 | | |
| Percentage of SL | | | | |
| Body depth | 32.6 | 28.0-34.5 | 30.4 | 1.82 |
| Head length | 26.7 | 25.1-28.1 | 26.9 | 0.85 |
| Predorsal length | 50.6 | 50.0-53.8 | 52.0 | 1.18 |
| Preventral length | 44.9 | 44.5-50.0 | 47.4 | 1.58 |
| Preanal length | 61.5 | 58.9-63.9 | 61.6 | 1.69 |
| Dorsal-fin base | 14.4 | 12.0-14.7 | 13.4 | 0.88 |
| Anal-fin base | 26.9 | 25.2-29.1 | 27.2 | 1.23 |
| Pelvic-fin length | 14.0 | 13.7-15.1 | 14.4 | 0.48 |
| Pectoral-fin length | 20.4 | 19.9-22.6 | 21.0 | 0.78 |
| Caudal peduncle depth | 12.1 | 10.5-12.2 | 11.3 | 0.54 |
| Caudal peduncle length | 15.2 | 14.7-18.3 | 16.2 | 0.97 |
| Distance between pectoral and pelvic fin origins | 22.1 | 20.7-24.9 | 22.8 | 1.13 |
| Distance between pelvic and anal fin origins | 17.8 | 14.5-18.4 | 16.2 | 1.22 |
| Percentage of head length | | | | |
| Interorbital width | 26.7 | 25.0-29.2 | 27.1 | 1.46 |
| Head depth | 81.5 | 74.2-83.6 | 80.3 | 2.41 |
| Orbital diameter | 31.1 | 30.4-38.6 | 34.2 | 3.00 |
| Snout length | 27.4 | 22.9-27.9 | 24.9 | 1.57 |
| Premaxillary+maxillary length | 34.1 | 30.5-36.7 | 33.5 | 1.61 |
| Maxillary length | 23.0 | 23.0-27.2 | 25.0 | 1.19 |

different in *B. uporas* (Casciotta *et al.*, 2002, figures 2-5). There are tricuspidate teeth in maxilla and the outer premaxillary series of *B. pyahu* whereas teeth are pentacuspitate in the same bones of *B. uporas*. Also, the teeth of the inner premaxillary series of *B. pyahu* are tricuspidate to pentacuspitate whereas they are heptacuspitate in *B. uporas*. The dentary of *B. pyahu* bears tricuspidate to conic teeth which are tricuspidate to pentacuspitate in *B. uporas*.

The ascending maxillary process of *B. pyahu* is shorter than that of *B. uporas* and *B. mennii*. The anterior portion of the lateral maxillary process is deeper than that of *B. uporas* and *B. mennii*. In *B. pyahu*, the deeper anterior portion of the maxilla scarcely covers the posterior edge of the premaxilla (Figs. 2, 5). The shape and position of the maxilla seems an intermediate state between *B. uporas* and *Hypobrycon poi* (Almirón *et al.*, 2001).

In comparison with *B. mennii*, *B. pyahu* has shorter premaxillary ascending process (vs. long), three tricuspidate premaxillary teeth in the outer row aligned and with similar length (vs. 4-5 teeth, irregularly placed, and two of them longer). Also the dentary teeth decrease in size anteroposteriorly; most of the teeth have three cusps and the last ones are conic (vs. four large teeth followed by several smaller teeth, pentacuspitate to tricuspidate).

Bryconamericus pyahu is the first species of the genus described from the río Iguazú basin. This new taxon belongs to the group of species with restricted distribution (Casciotta *et al.*, 2002), being present in one stream of the río San Antonio, in Misiones Province, Argentina.

ACKNOWLEDGEMENTS

Authors thank C. Tremouilles for the drawings. This paper was supported by grant of the Comisión de Investigaciones Científicas de la Provincia de Buenos Aires (CIC).

REFERENCES

- ALMIRÓN, A. E., CASCIOTTA, J. R., AZPELICUETA, M. de las M. & CIONE, A. L. 2001. A new species of *Hypobrycon* (Characiformes: Characidae) from Uruguay basin in Misiones, Argentina. *Neotrópica* 47: 33-40.
- AZPELICUETA, M. de las M. & ALMIRÓN, A. E. 2001. A new species of *Bryconamericus* (Characiformes, Characidae) from Paraná basin in Misiones, Argentina. *Revue suisse de Zoologie* 108: 275-281.
- BRAGA, L. 1998. Una nueva especie de *Bryconamericus* (Ostariophysi, Characidae) del río Uruguay-i, Argentina. *Revista del Museo Argentino de Ciencias Naturales Bernardino Rivadavia, Hidrobiología* 8: 21-29.
- CASCIOTTA, J., ALMIRÓN, A., CIONE, A. & AZPELICUETA, M. 1999. Brazilian freshwater fish assemblages from southern pampean area, Argentina. *Biogeographica* 75: 67-78.
- CASCIOTTA, J. R., AZPELICUETA, M. de las M. & ALMIRÓN, A. E. 2002. *Bryconamericus uporas* sp. n. (Characiformes, Characidae), a new species from the río Uruguay basin, in Argentina. *Revue suisse de Zoologie* 109: 155-165.
- MIQUELARENA, A. M. & AQUINO, A. E. 1995. Situación taxonómica y geográfica de *Bryconamericus thomasi* Fowler, 1940 (Teleostei, Characidae). *Revista Brasileira de Biologia* 55: 559-569.
- MIQUELARENA, A. M., PROTOGINO, L. C., FILIBERTO, R. & LÓPEZ, H. L. 2002. A new species of *Bryconamericus* (Characiformes: Characidae) from the Cuiña-Pirú creek in north-eastern Argentina, with comments on accompanying fishes. *Aqua, Journal of Ichthyology and Aquatic Biology* 6: 69-82.
- SEVERI, W. & CORDEIRO, A. A. M. 1994. Catálogo de peixes da bacia do rio Iguaçú. *IAP/GTZ, Curitiba*, 128 pp.
- TAYLOR, W. R. & VAN DYKE, G. C. 1985. Revised procedures for staining and clearing small fishes and other vertebrates for bone and cartilage study. *Cybiurn* 9: 107-119.