

## **A new species of *Hyphessobrycon* (Characiformes, Characidae) from the río Uruguay basin, Argentina**

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**A new species of *Hyphessobrycon* (Characiformes, Characidae) from the río Uruguay basin, Argentina.** - *Hyphessobrycon isiri* sp. n., is described from the río Uruguay basin. *Hyphessobrycon isiri* sp. n. differs from the remaining species of the genus by the presence of teeth of the inner series of the premaxilla with 5 to 11 cusps, one maxillary tooth with 7 cusps; 16 to 22 branched anal-fin rays; one humeral spot vertically elongated, and a midlateral stripe ending in a conspicuous caudal spot.

**Keywords:** Characiformes - systematics - *Hyphessobrycon* - río Uruguay basin - Argentina.

### INTRODUCTION

The genus *Hyphessobrycon* includes small tetra fishes between 15 to 60 mm of length with attractive body colours. This genus comprises about 100 species (Lima *et al.*, 2003) distributed from Mexico to Argentina, ten of them are recorded in the southern area of the Río de la Plata basin (Almirón *et al.*, 2004).

*Hyphessobrycon* is currently identified by the presence of an adipose fin, incomplete lateral line, two tooth series in the premaxilla, and lack of scales on caudal fin (Eigenmann, 1917). The monophyly of *Hyphessobrycon* has not been demonstrated, therefore we conservatively include the new species in that genus as diagnosed by Eigenmann (1917).

### MATERIAL AND METHODS

Specimens cleared and counterstained (C&S) were prepared according to Taylor & Van Dyke (1985). Measurements were taken using digital calliper to the nearest 0.1 mm. All measurements are expressed as percentages of SL or indicated length. Peduncle length is the distance between the last branched anal-fin ray and the hypural joint. Vertebral count excludes the vertebrae corresponding to the Weberian apparatus and also the complex centrum. Asterisk indicates holotype.

Material is deposited in the Asociación Ictiológica, La Plata, Argentina (AI); Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, Argentina

(MLP); Museo Argentino de Ciencias Naturales Bernardino Rivadavia, Argentina (MACN-Ict); Muséum d'histoire naturelle, Genève, Switzerland (MHNG).

Comparative material examined (SL in mm). *Hyphessobrycon anisitsi* (Eigenmann, 1907): MHNG 2493.72, 12 ex., 41.4-42.7, (2 C&S), Paraguay, Caazapa, Arroyo Moroti 15 km SE from Tavai. MHNG 2493.063, 38 ex., 35.1-46.5, Paraguay, Caazapa, Arroyo Yvyra-pary, 2 km Tavai. MHNG 2493.86, 3 ex., 29.5-31.0, Paraguay, East of Guaira, arroyo Yhaca-ni, 2 km North of Nuni. MHNG 2054.2-43, 5 ex., 28.0-38.3, Paraguay, Asunción, stream in Colonia Thompson. MHNG 2493.88, 2 ex., 28.2-29.4, Paraguay, Guaira, arroyo Ovie, near of the road Villarica-Caazapa. AI 133 (ex MHNG 2493.063) 2 ex., 23.0-37.6, Paraguay, Caazapa, Arroyo Yvyra-pary, 2 km East of Tavai.

- *Hyphessobrycon arianae* Uj & Géry, 1989: MHNG 2412.79 (holotype), 1 ex. 22.7 mm SL, Paraguay, Caaguazu, río Güyrau-gua, affl. of the río Monday, 3 km East of Juan Frutos. MHNG 2412.80-81 (paratypes), 34 ex. 17.6-23.6, (2 ex. C&S), same locality as holotype.
- *Hyphessobrycon auca* Almirón, Casciotta, Bechara & Ruíz Díaz, 2004: MACN-Ict 8647 (holotype), 51.2, Argentina, Corrientes, Esteros del Iberá, pond in San Juan Poriahú farm.
- *Hyphessobrycon elachys* Weitzman, 1984: MLP 6431, 3 ex., 16.0-20.0, Argentina, Corrientes, San Cosme.
- *Hyphessobrycon eques* (Steindachner, 1882): MLP 8999, 3 ex., 23.3-27.9, Argentina, Corrientes, río Santa Lucía. JRC pers. collection, 2 ex., 28.7-29.6 (C&S), Argentina, Corrientes, Bella Vista, Riacho Carrizal.
- *Hyphessobrycon guarani* Mahnert & Géry, 1987: MHNG 2366.99 (holotype), 29.8, Paraguay, río Alto Paraná in Puerto Bertoni, Alto Paraná. MHNG 2366.100 (paratypes), 74 ex. 23.5-29.4, (2 ex. C&S), same locality as holotype.
- *Hyphessobrycon igneus* Miquelarena, Menni, López & Casciotta, 1980: JRC pers. collection, 3 ex., 25.9-29, Argentina, Corrientes, Esteros del Iberá, Laguna Fernández.
- *Hyphessobrycon luetkenii* (Boulenger, 1887): MLP 8796, 9 ex., 24.4-35.0, Argentina, Formosa, creek in the national road Formosa-Clorinda, 37 km from Clorinda. MLP 6451, 13 ex., 14.2-21.6, Argentina, Formosa.
- *Hyphessobrycon meridionalis* Ringuelet, Miquelarena & Menni, 1978: MLP 8407, 2 ex., 32.2-34.0, Argentina, Corrientes, pond in road Bella Vista-San Roque. JRC pers. collection, 3 ex., 33.0-40.9 (C&S), Argentina, Buenos Aires, Berisso, Los Talas ponds.
- *Hyphessobrycon wajat* Almirón & Casciotta, 1999: MLP 9321, (holotype), 27.6, Argentina, Corrientes, río Paraná basin, Laguna Brava. MLP 9322, 5 ex., 29.2-31.0, Argentina, Corrientes, Laguna Iberá. MHNG 2593.96, 5 ex., 28.5-30.0, Argentina, Corrientes, Laguna Iberá.

## RESULTS

### *Hyphessobrycon isiri* sp. n.

Figs 1-5, Table 1

HOLOTYPE: MACN-Ict 8907, 44.6 mm SL, female, Argentina, Entre Ríos, río Uruguay basin; Arroyo Ubajay, a place called 'Manantiales' within the farm 'Los Monigotes' (31°48,94' S - 58°12,41' W), coll. S. Körber & J. Fernández Santos, March 2004.

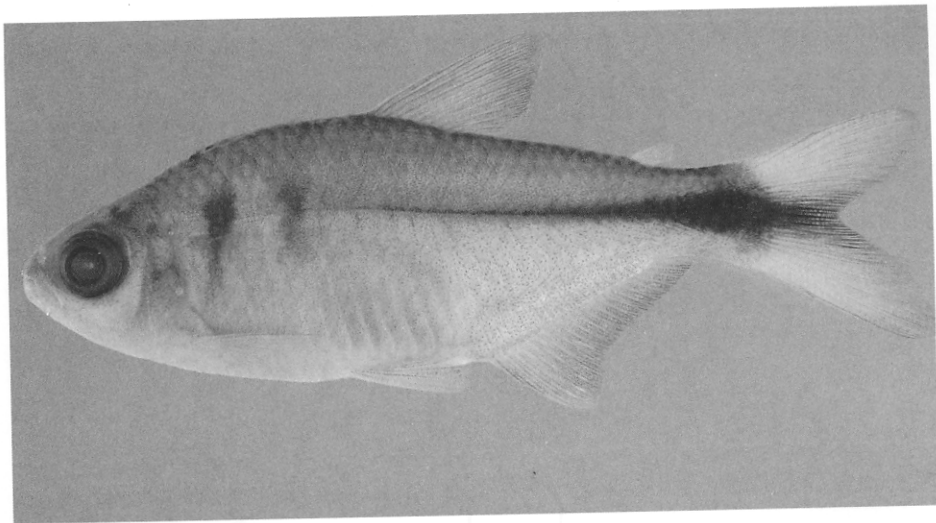


FIG. 1

*Hyphessobrycon isiri* sp. n., holotype: MACN-Ict 8907, 44.6 mm SL, female, Argentina, Entre Ríos, río Uruguay basin, Arroyo Ubajay.

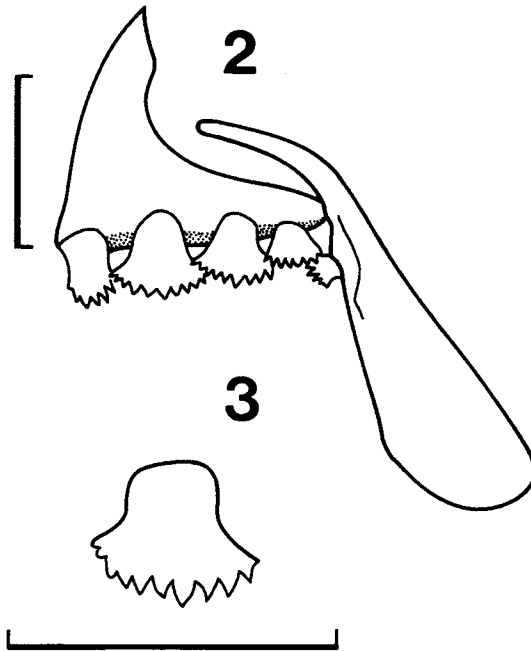
PARATYPES: AI 191, 1 ex., 31.5 mm SL, Argentina, Corrientes, río Uruguay basin, Arroyo Mota (30°28'55"S-57°59'12"W), coll. J. Pereyra, April 1990. MHNG 2666.080, 2 ex., 31.0-42.0 mm SL, Argentina, Entre Ríos, río Uruguay basin, Arroyo Mármol (32°03'44"S-58°15'44"W), coll. J. Pereyra, April 1990. AI 192, 19 ex., 3 (C&S) 18.8-48.1 mm SL, Argentina, Entre Ríos, río Uruguay basin, Arroyo Marmol (32°03'44"S-58°15'44"W), coll. J. Pereyra, April 2005. AI 193, 2 ex., 42.0-42.3 mm SL, same data as holotype.

ETYMOLOGY: The specific epithet *isiri*, a noun in apposition, comes from the Guaraní word *ysyry* meaning stream.

DIAGNOSIS: *Hyphessobrycon isiri* sp. n. is distinguished from its congeners by the following combination of characters: teeth of the inner series of the premaxilla with 5 to 10 cusps, one maxillary tooth with 7 cusps; 16 to 22 branched anal-fin rays; one humeral spot vertically elongated, and a midlateral stripe ending in a conspicuous caudal spot.

DESCRIPTION: Morphometrics of holotype and 14 paratypes are presented in table 1. Maximum body depth located immediately anterior to dorsal-fin origin (Fig. 1). Dorsal profile slightly convex from snout tip to base of first dorsal-fin ray. Dorsal profile slanting ventrally from dorsal-fin origin to caudal peduncle. Dorsal and ventral profile of caudal peduncle straight or slightly concave. Ventral profile of body arched from tip of lower jaw to anal-fin origin, posterodorsally slanted along anal-fin base. Vent between bases of pectoral and pelvic fins transversally rounded.

Dorsal-fin origin almost equidistant from tip of snout and base of caudal fin. Pelvic-fin base slightly anterior to vertical through dorsal-fin origin. Adipose fin slightly anterior to base of last branched anal-fin rays. Pectoral fin not reaching pelvic-fin origin and the later one not reaching the anal-fin origin.



FIGS 2-3

*Hyphessobrycon isiri* sp. n. (2) upper jaw in medial view. (3) detail of third tooth of inner premaxillary series in medial view. Scale = 1 mm.

Dorsal fin with ii, 8-9 rays, an additional small unbranched ray only visible in cleared and stained specimens; posterior margin of dorsal fin slightly curved, first and second branched dorsal-fin rays longest.

Anal fin with iii-iv, 16-22 rays; 16(1), 17(2), 18(2), 19(9), 20(6\*), 21(3), 22(2). Females with last unbranched and first seven branched rays produced forming a lobe.

Caudal fin with 1 unbranched and 9 branched principal rays in upper lobe; 8 branched and 1 unbranched principal rays in lower lobe. Lower lobe slightly longer than upper lobe.

Pectoral fin with i, 11\*-13 rays. Posterior margin of pectoral fin slightly rounded.

Pelvic fin with i, 7 rays, posterior margin of fin slightly rounded.

Head short, less than 1/3 of SL, mouth terminal and horizontal; snout short, blunt. Third infraorbital not reaching sensory canal of preopercle. Length of lower jaw nearly equal than upper jaw. Premaxillary ascending process triangular; alveolar process bearing two series of teeth. Teeth of outer row with a central cusp longer than the remaining. Outer row with 2 or 3 teeth with 3 to 5 cusps. Inner series of premaxilla with 4 or 5 wide teeth bearing low cusps (Figs 2-3); symphyseal tooth slender, with 6-7 cusps; remaining teeth with 5 to 10 cusps, central cusp slightly longer than the others. Maxilla with long anterodorsal and laminar processes, the last one reaching

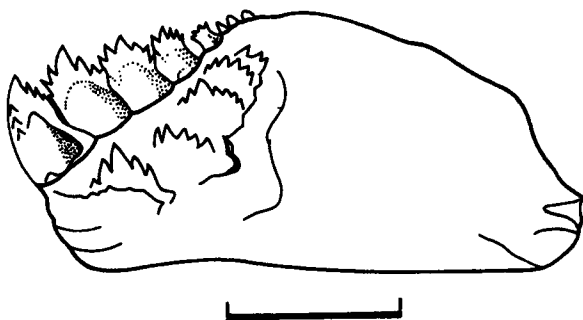


FIG. 4

*Hyphessobrycon isiri* sp. n., right lower jaw in medial view. Scale = 1 mm.

vertical through anterior orbital margin. One wide maxillary tooth with 7 cusps (Fig. 2). Dentary with 6 or 7 teeth decreasing in size anteroposteriorly. Three or four large teeth with 5 to 8 cusps, 1 smaller with 3 and 2 much smaller with 1 cusp (Fig. 4).

Scales cycloid. Lateral series with 33-37 scales; 33(1), 34(7), 35(14\*), 36(2), and 37(1). Lateral line with 6 to 29 perforated scales; 6(1\*), 7(4), 8(1), 9(10), 10(6), 11(7), 12(1), 29(1). Six\* (7 in 1 ex.) scales between dorsal-fin origin and lateral line; 4-5\* between lateral line and anal-fin origin. Eleven to fourteen scales between supraoccipital process and dorsal-fin origin. A single row of six to ten scales on anal-fin base. Gill rakers: 18. Vertebral counts: 30-31.

Color of specimens preserved in alcohol: Background pale brown, dorsal region of flanks and head darker, a dark midline stripe along dorsum. Dark humeral spot vertically elongated, a second lateral spot faint and vertically elongated. Dark narrow mid-lateral stripe extending from second lateral spot to caudal peduncle, ending in a caudal spot. Dorsum of head, premaxilla, and dorsal half of maxilla with dark chromatophores.

Dorsal fin hyaline with black chromatophores on unbranched rays, dark chromatophores on anterior and posterior margins of branched rays. Anal fin hyaline with small, black chromatophores. Black caudal spot on caudal peduncle extended on middle caudal-fin rays; remaining caudal-fin rays with scattered dark chromatophores on margins. Dark chromatophores on distal margin of caudal fin. Pectoral and pelvic fins hyaline, few chromatophores along ray surfaces.

Chromatophores completely covering scales surface on upper half of flank, more densely concentrated on posterior margin. Scales on lower half of flanks with scattered chromatophores on surface.

**DISTRIBUTION:** *Hyphessobrycon isiri* sp. n. is known from streams flowing in the río Uruguay basin (Fig. 5).

**HABITAT:** The arroyo Ubajay in its lower portion forms the limit of the 'Parque Nacional El Palmar' towards the south and 'Los Monigotes' farm towards the north. The upper portion is completely located on farm grounds. Its two springs are found in grassland hills typical for the area used for cattle. At the junction of the two brooks a

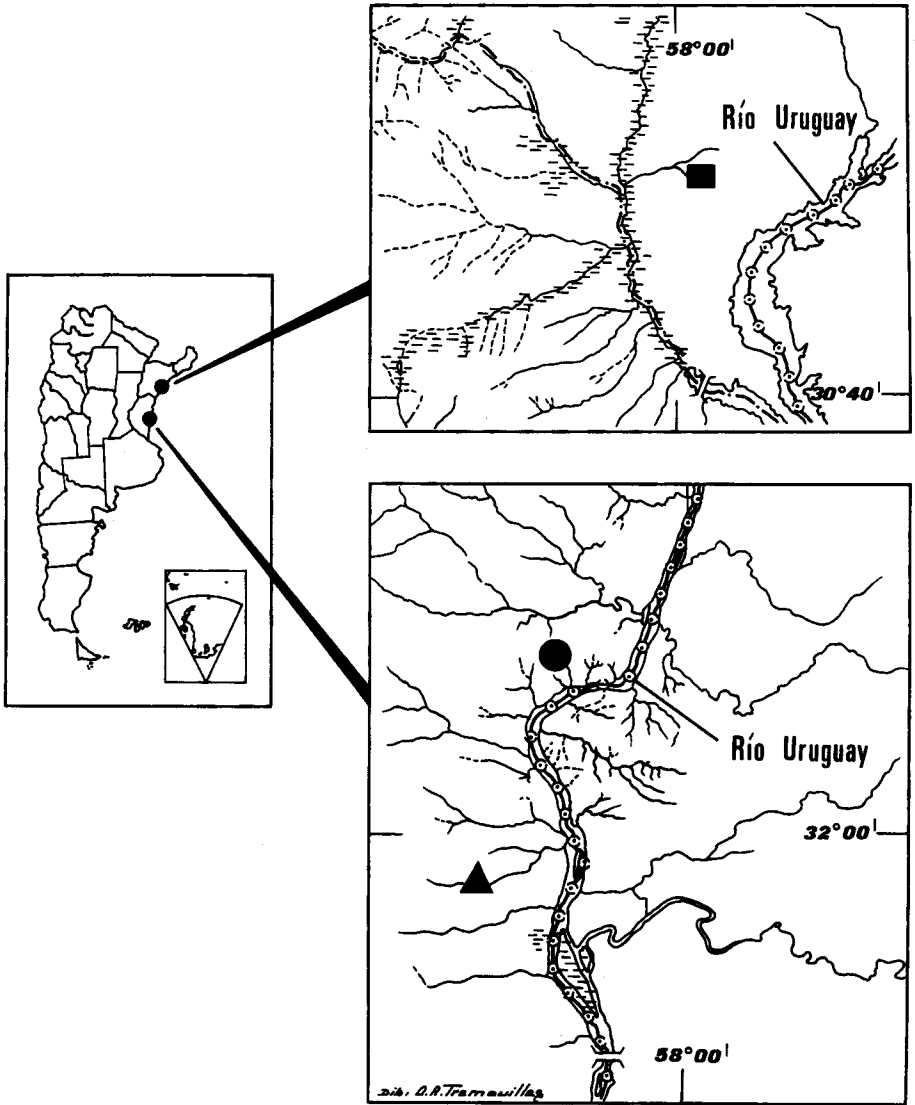


FIG. 5

Geographical distribution of *Hyphessobrycon isiri* sp. n., black circle: arroyo Ubajay (type locality), black triangle: arroyo Marmol and black square: arroyo Mota.

small farm dam 2 meters deep probably allowed the permanence of some species which apparently remaining length of the brooks (which are only 20 cm deep in average). This pond, located about 3 km from the Río Uruguay at  $31^{\circ}48.94' S$ - $58^{\circ}12.41' W$ , is the type locality of the new species. The bottom is covered with gravel

TABLE 1: Morphometric data of the holotype and 14 paratypes of *Hyphessobrycon isiri* sp. n. Standard length expressed in mm.

	Holotype	Range	Mean	SD
<b>Standard length</b>	44.6	26.8-48.1		
<b>% of standard length</b>				
Body depth	35.2	34.0-40.3	36.2	1.72
Head length	25.3	24.5-29.9	27.1	1.78
Predorsal distance	51.6	51.6-53.9	52.6	0.80
Caudal peduncle length	9.9	8.1-10.8	9.7	0.72
Caudal peduncle depth	11.7	11.0-12.9	12.2	0.52
Dorsal-fin base	13.0	12.2-15.9	13.9	0.98
Anal-fin base	26.7	24.1-30.6	27.8	1.92
<b>% of head length</b>				
Orbital diameter	42.5	38.7-42.9	41.1	1.22
Snout length	26.5	23.0-28.8	25.6	1.63
Interorbital distance	31.0	29.7-34.4	32.0	1.32

and rocks in the areas with current and with sand and mud in the stretches devoid of, or with low current. The vegetation is reduced to grasses hanging from the banks and aquatic species as *Nymphoides indica*, *Ludwigia* sp. and *Bacopa* sp. The pond was almost completely exposed to sunlight, except for small shadow provided by a few marginal bushes. At the time of collecting the water was turbid after rains during the previous days.

#### REMARKS

The following species of the genus *Hyphessobrycon* were registered from the Río de la Plata basin in Argentina: *H. anisitsi*, *H. auca*, *H. elachys*, *H. eques*, *H. guarani*, *H. igneus*, *H. luetkenii*, *H. meridionalis*, *H. reticulatus*, and *H. wajat*. All of them and also *H. isiri* sp. n., described herein, inhabit the eastern portion of that basin.

*Hyphessobrycon isiri* sp. n. is similar to *H. anisitsi* and *H. auca*, from which it can be diagnosed by having premaxillary teeth of the inner series much more expanded distally (Figs 2-3) with 5 a 10 cusps instead of 5 to 6 cusps in *H. anisitsi* and 4 to 9 in *H. auca* (see Almirón *et al.*, 2004, figs 4 and 5).

*Hyphessobrycon isiri* sp. n. differs from *H. eques*, *H. guarani*, *H. igneus*, and *H. reticulatus* in the color pattern. *Hyphessobrycon eques* has the ground colour of body red whereas *H. isiri* sp. n. is mostly silvery. *Hyphessobrycon guarani* bears a black spot on dorsal-fin rays, absent in *H. isiri* sp. n.; *H. igneus* has the caudal fin red whereas in *H. isiri* sp. n. the caudal fin is black, yellow and red. *Hyphessobrycon reticulatus* has a dark line along the base of anal fin whereas *H. isiri* sp. n. lacks a line along the anal-fin base.

Males of *H. isiri* sp. n. has the distal margin of the anal fin straight whereas males of *H. elachys* has anal fin with broad anterior lobe with rays thickened and flattened medially.

The number of maxillary teeth differentiates *H. isiri* sp. n. with only one tooth from *H. guarani*, 2 to 5; *H. luetkenii*, 2 or 3; and *H. wajat*, 3 to 5. Finally, *H. meridionalis* has 26 to 30 branched anal-fin rays whereas *H. isiri* sp. n. has 16 to 22.

Ahl (1923) described *Hemigrammus caudovittatus* from Buenos Aires. This species was considered a junior synonym of *Hyphessobrycon anisitsi* by Myers (1923) and a valid species by Eigenmann & Myers (1929). The type locality of this species has been intensely collected, and no *Hemigrammus* species is known for the area inhabiting this region. The only species similar to *H. caudovittatus* found in this area are identified as *Hyphessobrycon anisitsi* and, probably, *Hyphessobrycon isiri* sp. n. (see distribution). A decision about the validity of *Hemigrammus caudovittatus* with respect to *H. anisitsi* is rather difficult because the type specimens of *H. caudovittatus* were lost during or in the aftermath of World War II (Zarske & Gery, 2003). *Hyphessobrycon isiri* sp. n. differs from *H. caudovittatus* in having inner premaxillary teeth with 5 to 10 vs. 5 cusps, and one maxillary tooth with 4 vs. 3 cusps.

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