

Hyphessobrycon uaiso*: new characid fish from the rio Grande, upper rio Paraná basin, Minas Gerais State (Ostariophysi: Characidae), with a brief comment about some types of *Hyphessobrycon

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Hyphessobrycon uaiso is described from the upper rio Paraná basin, rio Grande drainage, Minas Gerais State. The new species differs from its congeners by the short anal fin with 12-17 branched rays, and dorsal fin with ii,7-8 rays. Besides, it can be distinguished by the presence of i,5-6 pelvic fin rays, and by the coloration of the eyes (in life), slightly blue on the lower half and blackish on the upper half. New records of *Hyphessobrycon* are recognized for the upper rio Paraná basin: *H. eilyos* Lima & Moreira, *H. guarani* Mahnert & Géry, and *H. herbertaxelrodi* Géry. The knowledge status about the ichthyofauna from the upper rio Paraná basin and comments about the type material of some species of *Hyphessobrycon* are briefly discussed.

Hyphessobrycon uaiso é descrito da bacia do alto rio Paraná, drenagem do rio Grande, Minas Gerais. A espécie nova difere de seus congêneres por apresentar nadadeira anal curta, com 12-17 raios ramificados, e nadadeira dorsal com ii,7-8 raios. Além disso, a espécie nova pode ser distinguida pelo número de raios da nadadeira pélvica, com i,5-6 e padrão de colorido do olho (quando vivo), levemente azulado na parte inferior e escurecido na parte superior. Ocorrências novas de *Hyphessobrycon* são registradas para a bacia do alto rio Paraná: *H. eilyos* Lima & Moreira, *H. guarani* Mahnert & Géry e *H. herbertaxelrodi* Géry. O estado da arte da ictiofauna da bacia do alto rio Paraná e comentários sobre alguns exemplares-tipo de *Hyphessobrycon* são discutidos brevemente.

Key words: Characiformes, Conservation status, Headwaters, New records, Systematics.

Introduction

Hyphessobrycon Durbin is one of richest genus of Characidae, with approximately 130 valid species, widely distributed on the Neotropical region from Mexico to Argentina (Eschmeyer, 2013). Since the genus was proposed by Durbin (1908) [in Eigenmann, 1908] more than one century ago, few proposals for inter- and intra relationships within *Hyphessobrycon* were suggested. Current phylogenetic hypotheses to Characidae (Mirande, 2009, 2010 - morphological analysis; Oliveira *et al.*, 2011 - molecular analysis), which encompass some species of *Hyphessobrycon*, failed to include its type species, *Hyphessobrycon compressus* Meek. Malabarba *et al.* (2012), in the revalidation of *Ectrepopterus* Fowler, previously considered a synonym of *Hyphessobrycon*, analyzed its relationships in the Mirande's (2010) Characidae context, and also included *H. compressus* for the first time in a phylogenetic

analysis. The results (Mirande, 2009, 2010; Malabarba, 2012), clearly showed that the genus *Hyphessobrycon* is not monophyletic and its type species is not close related to some species of *Hyphessobrycon* [e.g. *H. anisitsi* (Eigenmann), *H. bifasciatus* Ellis, *H. elachys* Weitzman, *H. herbertaxelrodi* Géry, *H. luetkenii* (Boulenger)], but to some taxa belonging to the putative 'rosy tetra clade' of Weitzman & Palmer (1997), such as *H. eques* (Steindachner), *H. pulchripinnis* (Ahl), *H. socolofi* (Weitzman), and *Hemigrammus unilineatus* (Gill). One of the characters supporting the monophyly of this group is the presence of a dark conspicuous spot on the dorsal fin, as suggested by Weitzman & Palmer (1997). This result partially answered the question raised by Lucena (2003) about the relationships of *H. compressus* with its congeneric species. Despite this initial evidence, there is not a robust proposal for the relationships within the genus *Hyphessobrycon*, which continues to be diagnosed by the combination of non-exclusive characters first presented by Eigenmann (1917):

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lateral line incomplete; premaxillary teeth in two series, the inner series with five teeth; second suborbital (= third infraorbital *sensu* Weitzman, 1962) not in contact with the preopercle ventrally; few maxillary teeth; caudal fin naked, and adipose fin present.

The new species described herein is not a member of the genus *Hyphessobrycon sensu stricto* (which includes those species related to the type species), but presents the traditional diagnostic characters proposed by Eigenmann (1917, 1918). Due to the urgency for the description of new taxa of Neotropical fishes whose habitats are facing increasing and deleterious anthropogenic changes, we herein describe this new species in the traditional concept of the genus *Hyphessobrycon* until the proposal of the relationships of the genus, an ongoing study by the senior author, is presented.

Material and Methods

Measurements and counts follow Fink & Weitzman (1974), Lima & Moreira (2003), and Carvalho *et al.* (2010). Measures were made with a caliper rule to the nearest 0.05 mm on the left side of the specimen whenever possible, and are presented as percents of standard length (SL) or head length (HL). In the description, counts are followed by their frequency in parentheses, and an asterisk indicates the count of the holotype. In the list of paratypes and material examined, the number of all specimens in the lot is followed by the number of those examined and cleared and stained (c&s) individuals, if any. Counts for vertebrae, supraneurals, gill-rakers on the first branquial arch, branchiostegal rays, procurrent caudal-fin rays, and small dentary teeth were taken from six c&s specimens prepared according to Taylor & Van Dyke (1985). Vertebral count includes the four vertebrae in the Weberian apparatus and the fused PU1+U1 of the caudal region as a single element. The pattern of *circuli* and *radii* was defined on scales sampled from the region between the lateral line and the insertion of pelvic-fin. Comparisons and data of species not available for examination were taken from the literature. Catalog numbers are followed by the total number of specimens, number of specimens measured and counted in parentheses, and SL range of all specimens of the lot.

Comparative material examined include the most valid species of *Hyphessobrycon*. For the type material herein analyzed, including some junior synonyms of *Hyphessobrycon* species and other genera, the names are listed according to the original description; see also Carvalho *et al.* (2010) for additional examined Characidae taxa.

Institutional abbreviations follow Reis *et al.* (2003), with addition of Asociación Ictiológica, La Plata, Argentina (AI); Departamento de Zoología e Botánica, Universidad Estadual Paulista “Júlio de Mesquita Filho”, câmpus de São José do Rio Preto, São José do Rio Preto (DZSJRP); Núcleo de Pesquisas em Limnologia, Ictiologia e Aquicultura, Universidade Estadual de Maringá, Maringá (NUP); Departamento de Zoologia, Universidade Federal do Rio Grande do Sul, Porto Alegre (UFRGS), and coleção ictiológica da Fundação Universidade Federal de Rondônia, Porto Velho (UFRO-I).

Hyphessobrycon uaiso, new species

Figs. 1-3

Holotype. DZSJRP 16460, 50.2 mm SL, Brazil, Minas Gerais, Ponte Alta District, municipality of Uberaba, headwaters of rio Uberaba, near BR-262 road, 19°40'58.7"S 47°40'7.3"W, 1020 m a.s.l., 8 Sep 2006, F. R. Carvalho, F. Langeani, H. F. Chaves, F. O. Martins & C. P. Ferreira.

Paratypes. DZSJRP 8731, 272, 17.6-47.4 mm SL, 3 c&s, 28.5-49.8 mm SL; LIRP 9298, 15, 27.4-41.5 mm SL; MCP 47520, 20, 26.3-52.9 mm SL; MZUSP 112117, 20, 26.7-46.1 mm SL; UFRGS 17013, 15, 25.7-40.9 mm SL; MNRJ 40368, 20, 27.1-46.6 mm SL; MZUEL 6593, 15, 27.3-41.1 mm SL; NUP 1090, 15, 24.9-45.8 mm SL; INPA 38114, 15, 25.7-47.7 mm SL; same data as holotype; DZSJRP 15804, 105, 25.7-43.6 mm SL, 3 c&s, 32.5-33.6 mm SL, 6 (ethyl alcohol anhydrous), 25.0-32.3 mm SL, same locality as holotype, 11 Mar 2012, F. R. Carvalho, F. Langeani & F. O. Martins.

Diagnosis. The new species, *Hyphessobrycon uaiso*, promptly differs from most congeners [except *H. amaronensis* García-Alzate, Róman-Valencia & Prada-Pedredos, *H. arianae* Uj & Géry, *H. balbus* Myers, *H. boulengeri* (Eigenmann), *H. brumado* Zanata & Camelier, *H. coelestinus* Myers, *H. cyanotaenia* Zarske & Géry, *H. diancistrus* Weitzman, *H. duragenys* Ellis, *H. eilyos* Lima & Moreira, *H. elachys* Weitzman, *H. eos* Durbin, *H. frankei* Zarske & Géry, *H. hamatus* Bertaco & Malabarba, *H. isiri* Almirón, Casciotta & Koerber, *H. langeanii* Lima & Moreira, *H. mavro* García-Alzate, Róman-Valencia & Prada-Pedredos, *H. melanostichos* Carvalho & Bertaco, *H. metae* Eigenmann & Henn, *H. minimus* Durbin, *H. negodagua* Lima & Gerhard, *H. niger* García-Alzate, Róman-Valencia & Prada-Pedredos, *H. notidanos* Carvalho & Bertaco, *H. poecilioides* Eigenmann, *H. reticulatus* Ellis, *H. rutiliflavus* Carvalho, Langeani, Miyazawa & Troy, *H. santae* Eigemann, *H. sovichthys* Schultz, *H. stegemanni* Géry, *H. taurocephalus* Ellis, *H. tenuis* Géry, *H. togoi* Miquelarena & Lopez, *H. tukunai* Géry, *H. vinaceus* Bertaco, Malabarba & Dergam, and *H. weitzmanorum* Lima & Moreira] by the short anal fin with 12-17 branched rays (mode 14) [vs. less than 11 in *H. albolineatus* Fernandez-Yépez and more than 18 on the remaining species], and dorsal fin with ii,7-8 rays [except *H. arianae* Uj & Géry, *H. guarani* Mahnert & Géry, *H. otrynus* Benine & Lopes, *H. procerus* Mahnert & Géry, *H. stramineus* Durbin, and *H. wajat* Almirón & Casciotta] (vs. dorsal fin ii,8,i, ii,9, ii,10, iii,8, iii,9, or iv,9 rays on the remaining species). From these species with the same range of branched anal-fin and dorsal-fin rays, *Hyphessobrycon uaiso* differs by the presence of i,5-6 rays on the pelvic-fin (vs. i,7 in *H. amaronensis*, *H. arianae*, *H. boulengeri*, *H. balbus*, *H. diancistrus*, *H. duragenys*, *H. eos*, *H. hamatus*, *H. langeanii*, *H. mavro*, *H. melanostichos*, *H. minimus*, *H. niger*, *H. otrynus*, *H. poecilioides*, *H. reticulatus*, *H. santae*, *H. sovichthys*, *H. stegemanni*, *H. tenuis*, *H. togoi*, and *H. vinaceus*), a conspicuous black humeral spot (vs. humeral spot absent, faint or barely discernible in *H. brumado*, *H. eilyos*, *H. elachys*, *H. guarani*, *H. procerus*, *H. stramineus*, *H.*



Fig. 1. *Hyphessobrycon uaiso*, holotype, DZSJRP 16460, 50.2 mm SL, headwaters of rio Uberaba, near BR-262 road, Ponte Alta District, municipality of Uberaba, Minas Gerais State, Brazil.

tukunai, and *H. wajat*), one or rarely two maxillary teeth with up to seven cusps (*vs.* two or more maxillary teeth with up to six cusps in *H. coelestinus*, *H. metae*, *H. notidanos* - which can also have up to seven cusps, but never only one teeth in the maxillary, and *H. rutiliflavidus*), and adipose fin present (*vs.* adipose fin absent in *H. negodagua* and *H. taurocephalus*). Furthermore, *Hyphessobrycon uaiso* can be distinguished from the congeners by the color pattern of the eyes in life, slightly blue on the lower half and blackish on the upper half, on males and females.

Description. Morphometric data are presented in Table 1. Body compressed, moderately short, greatest body depth at vertical through dorsal-fin origin or straightway after. Dorsal profile of head convex from tip of upper jaw to vertical through anterior nostril; slightly straight or concave from that point to tip of supraoccipital spine. Dorsal profile of body slightly convex from posterior tip of supraoccipital spine to base of last dorsal-fin ray, and straight to adipose-fin origin. Ventral profile of body convex from tip of lower jaw to pelvic-fin origin, straight or slightly convex from that point to anal-fin origin, and straight and/or subtly rounded along anal-fin base. Dorsal and ventral profile of caudal peduncle slightly straight.

Eyes moderate, without distinct adipose eyelid. Jaws equal in size, mouth terminal. Maxilla extending posteriorly surpassing anterior margin of orbit until vertical through crystalline lens anterior margin, slightly curved, aligned approximately at 45 degrees angle relative to longitudinal axis of body. Nostrils close to each other, anterior opening small and circular, posterior one twice in size and slightly reniform or elongate. Nostrils separated by skin flap. Frontals united anteriorly or not, with a triangle-shaped fontanel; parietal fontanel large, extending from epiphyseal bar to supraoccipital spine. Infraorbital series with five or six elements, fourth infraorbital reduced dorsally (triangle-shaped), rectangular,

or fused with fifth infraorbital. Laterosensorial canal from first to sixth infraorbital close to inner margin of orbital rim. Third infraorbital largest, double size of others (in length and depth), contacting laterosensory canal of preopercle ventrolaterally.

Premaxillary teeth in two rows: outer row with 3(4) or 4*(48), tri- to pentacuspoid teeth; inner row with 5*(53) penta- to heptacuspoid teeth. Dentary with 5*(53) large, penta- to heptacuspoid teeth, followed by a series of 4-6 (6) small teeth, conical or tricuspid, abruptly smaller than the anterior largest teeth. Dorsal border of maxilla relatively straight. Maxilla with 1*(48) or 2 (5) penta- to heptacuspoid teeth along anteroventral margin (Fig. 2). Central median cusp of all teeth longer than remaining lateral cusps; cusp tips slightly curved inwardly on dentary teeth, and outwardly on premaxillary teeth.

Scales cycloid, with few *radii* (3-6), relatively small; *circuli* marked anteriorly and marginally (dorsal and ventral). Lateral line incomplete, extending to vertical through pelvic fin; perforated scales of lateral line 9(15), 10(8), 11*(4), 12(9), 13(6), 14(4), 15(3), 16(1), or 17(3); longitudinal scales series including pored scales 33(8), 34(13), 35*(19), or 36(13); 6*(48) or 6.5(5) scale rows between dorsal-fin origin and lateral line; 5*(53) scale rows between lateral line and pelvic-fin origin. Predorsal scales 10(6), 11*(24), 12(18), or 13 (5). Scale sheath along anal-fin base 5(12), 6*(21), 7(11), 8(6), 9 (4), or 10(1) in a single row. Circumpeduncular scales 14(47) or 15(6). Axillary scale small or absent.

Dorsal-fin rays ii,7(3) or 8*(50); first unbranched ray approximately one-half of second one or shorter. Dorsal-fin origin at midbody or posterior to that point, at vertical through anterior third of pelvic fin base. Base of last dorsal-fin ray at vertical through distal tip of pelvic fin, anterior to origin of anal fin. Tip of longest ray of adpressed dorsal fin at vertical through base of first two branched anal-fin rays. First dorsal-fin pterygiophore inserting between neural spine of 7th and 8th

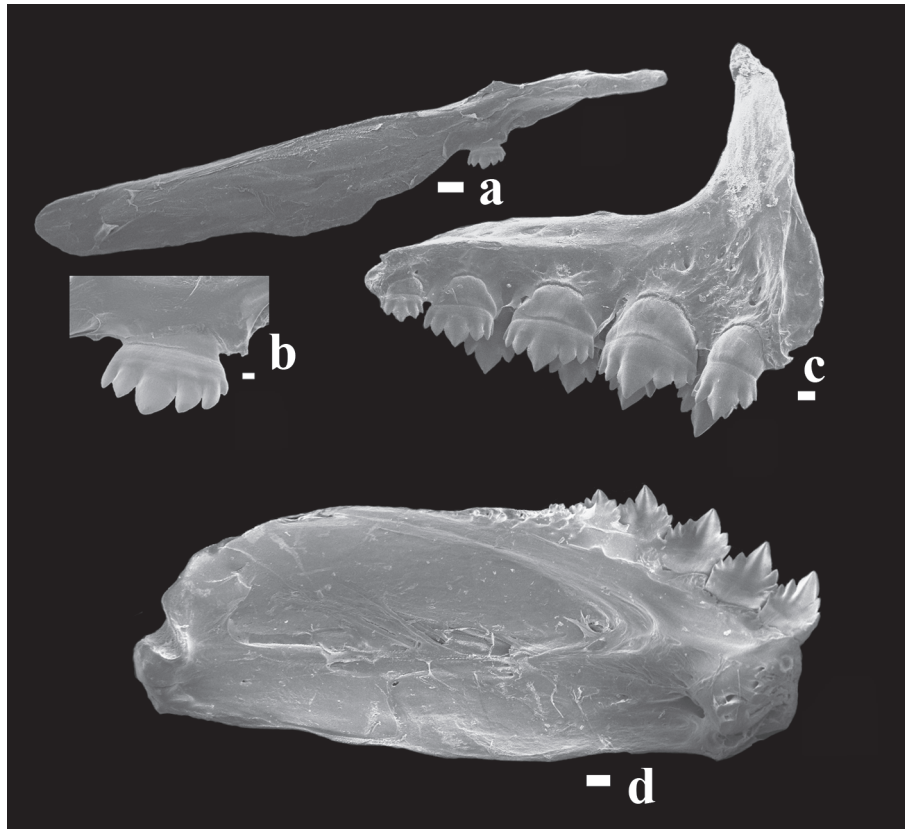


Fig. 2. *Hyphessobrycon uaiso*, paratype, DZSJRP 8731, 36.4 mm SL. Scanning electronic micrograph of lower and upper jaws in mesial view, left side: **a.** maxillary; **b.** maxillary tooth in detail; **c.** premaxillary, and **d.** dentary. Scale bars: (a-d) = 200 μm ; b = 30 μm , and c = 100 μm .

(6) precaudal vertebra. In some specimens, tips of fin rays deformed (*e.g.*, slightly bent). Adipose fin present, sometimes reduced (just one paratype specimen with adipose fin absent). Pectoral fin with i,9(14), 10*(35), or 11(3) rays, not extending to pelvic fin origin. Pelvic fin with i,5(1) or 6*(52) rays. Pelvic-fin origin located anterior or just anterior to vertical through dorsal-fin origin. Tip of longest ray never reaching anal-fin origin. Anal-fin rays iii, 12(2), 13(5), 14(18), 15*(17), 16(9), or 17(2). Anal fin of males and females without bony hooks. Caudal fin forked, lobes slightly rounded, similar in size, with i,8/8,i(3), i,9/7,i(1), i,9/8,i*(46), or i,10/8,i(1) rays. Caudal fin naked, scales restricted to its base. Dorsal procurrent caudal-fin rays 10(2), 11(3), or 12(1), and ventral procurrent caudal-fin rays 9(3), 10(1), 11(1), or 12(1).

Branchiostegal rays 4. First gill arch with 6 gill rakers on epibranchial, 1 between epibranchial and ceratobranchial, 7(2) or 8(4) on ceratobranchial, and 2(5) or 3(1) on hypobranchial. Precaudal vertebrae 16(1) or 17(5) and caudal vertebrae 17(3), 18(2), or 19(1). Supraneurals 5(2) or 6(4), filiform, some with dorsal portion expanded.

Color in alcohol. Overall body color yellowish to brownish. Body scales slightly reticulated, especially on anterior

portion of scales. Head dusky to dark brown dorsally. Region of infraorbitals and opercle with small chromatophores, scattered uniformly, except on upper and posterior region with more concentration of spots. Top of head, from lips to supraoccipital process blackish, with high concentration of chromatophores. Humeral spot conspicuous, origin just after opercular opening and extending through five or six transversal scale series, vertically elongated on young specimens (up to 34 mm SL) and approximately vertically rounded on adults (larger than 34 mm SL). When vertically rounded, spot extending through five or six horizontal scale series, above lateral line; on young specimens (up to 32.4 mm), humeral spot slender ventral to lateral line. Lateral side of body with scattered melanophores except at abdominal region. Longitudinal stripe dark, one or one-half scale wide, extending from vertical through middle of pectoral fin, passing through end of caudal peduncle end, extending onto proximal one-third of middle caudal-fin rays. Longitudinal stripe more conspicuous posterior to vertical through middle of dorsal-fin base. Caudal peduncle spot merged to longitudinal stripe. Fins darkish, with scattered melanophores on rays and interradial membrane.



Fig. 3. *Hyphessobrycon uaiso*: (a) paratype, DZSJRP 15804, specimen just after fixation, 39.3 mm SL, and (b) specimen in aquarium, ca. de 40.0 mm SL, showing life coloration, not preserved. Photo (b) by Angelo Manzotti.

Color in life. Overall body and head color pattern yellowish, slightly brown (Fig. 3). Pattern of melanophores distribution on head, body and fins similar to that described for specimens in alcohol. Dorsal, caudal, pelvic, and pectoral fins with anterior portion yellowish and posterior reddish. Adipose fin yellowish. Longitudinal stripe more conspicuous along caudal peduncle. Color pattern of eyes composed by slightly blue coloration on lower half and blackish on upper half of iris, on males and females (Fig. 3b).

Sexual dimorphism. The mature males and females of *Hyphessobrycon uaiso*, confirmed by visual and histological analyses, do not present bony hooks on fins. No difference (morphological or color pattern) was found between males and females. Also, gill glands (Burns & Weitzman, 1996) were not found macroscopically on first gill arch on both sexes.

Distribution. *Hyphessobrycon uaiso* is known from rio Uberaba, rio Grande drainage, upper rio Paraná basin (Fig. 4). The upper rio Paraná basin is a well sampled Neotropical basin (Langeani *et al.*, 2007), and even though the upper rio Paraná basin can be considered a well sampled hydrographic system, we are unable to locate any additional samples of the species in the fish collections that hold most material from this river system.

Etymology. The specific name, *uaiso*, of Portuguese “uai sô”, is a common colloquial interjection used by most people living in Minas Gerais State, Brazil, to express surprise, confirmation, awe, amazement, in special those from the “Triângulo Mineiro”, region where the new species was found. A name in apposition.

Ecological notes. The headwaters of rio Uberaba are a marshland mainly dominated by Cyperaceae, with some Poaceae, Nymphaeaceae, Melastomataceae, Asteraceae,

Table 1. Morphometric data for holotype and paratypes of *Hyphessobrycon uaiso* from the rio Grande drainage, upper rio Paraná basin. SD = standard deviation; N = number of specimens (including the holotype).

	Holotype	Paratypes	Mean	SD	N
Standard Length (mm)	50.2	32.4-50.2	38.8	-	53
Percentages of Standard Length					
Body depth	33.0	33.0-40.2	36.8	1.5	53
Head length	27.6	26.7-29.7	28.1	0.6	53
Head depth	28.4	28.4-34.5	31.6	1.2	53
Predorsal length	53.1	53.1-58.5	55.9	1.1	53
Prepelvic length	52.4	50.4-55.7	52.6	1.0	53
Pelvic fin to anal distance	18.7	17.3-21.5	19.4	0.9	53
Caudal peduncle depth	11.4	11.3-13.4	12.4	0.4	53
Dorsal-fin base length	12.8	11.1-14.0	12.5	0.7	53
Anal-fin base length	20.6	16.0-21.5	19.7	1.3	53
Pectoral-fin length	19.0	17.6-21.6	19.5	0.8	53
Pelvic-fin length	13.9	12.9-18.4	14.7	0.9	53
Dorsal-fin length	23.3	21.3-27.3	23.7	1.3	48
Anal-fin length	15.4	14.6-19.8	17.2	1.2	53
Caudal peduncle length	15.8	13.8-18.8	16.4	1.0	53
Dorsal fin to adipose-fin distance	35.1	30.7-35.5	33.7	1.2	53
Eye to dorsal-fin origin	39.8	39.5-44.1	41.4	1.0	53
Dorsal origin to caudal origin	50.9	46.6-52.4	49.7	1.1	53
Percentages of head length					
Interorbital width	31.1	29.2-35.3	31.5	1.1	53
Snout length	23.6	21.4-25.5	23.4	1.1	53
Orbital diameter	35.4	31.6-39.6	37.2	1.7	53
Upper jaw length	49.9	45.6-51.0	48.7	1.5	53

and Pteridophyta. When the bottom is not disturbed, the water is clear (Fig. 5). *Hyphessobrycon uaiso* was found living in schools, occasionally solitary, at average depth of one meter. Schools were mainly found in open areas, devoid of vegetation (Cyperaceae, mainly). Stomach

contents of three c&s specimens contained mostly aquatic insect (apparently Diptera larvae), followed by algae, vegetal matter, Acari, and Thecamoebina. More details about the site of collection of *H. uaiso* are given by Langeani *et al.* (2007: 120).

Conservation remarks. Recently, Villa-Verde *et al.* (2012) described *Listrura costai* and classified this species as vulnerable according to the IUCN categories and criteria for evaluation of threatened species (IUCN, 2001, 2011). Nowadays, it seems important, whenever possible, to evaluate the conservation status of newly described species right at their descriptions. For *Hyphessobrycon uaiso*, as *L. costai*, the extremely restricted distribution (until now the headwater of rio Uberaba), together with a specificity of habitat, relative proximity of human settlements, the use of surrounding land for agriculture, and human water consumption, defining potential threats to the species, allow to apply the criterion D2 (area of occupation less than 20 km²) for the category Vulnerable (VU). Nevertheless, deficiency about population studies or geographical range reductions are not available for the species. Accordingly, it is preferable to consider *H. uaiso* as data deficient (DD) until more information about its biology and occurrence on the basin is available.

The establishment of conservation measures for the rio Uberaba headwaters is important to conserve its surprisingly diverse restricted ichthyofauna, which include, besides *Hyphessobrycon uaiso*, another three putative endemic, and so far undescribed taxa: a new Characidae related to *Hasemania crenuchoides* (of Langeani *et al.*, 2007), a new Crenuchidae, and a possibly undescribed species of *Rivulus* (Rivulidae).

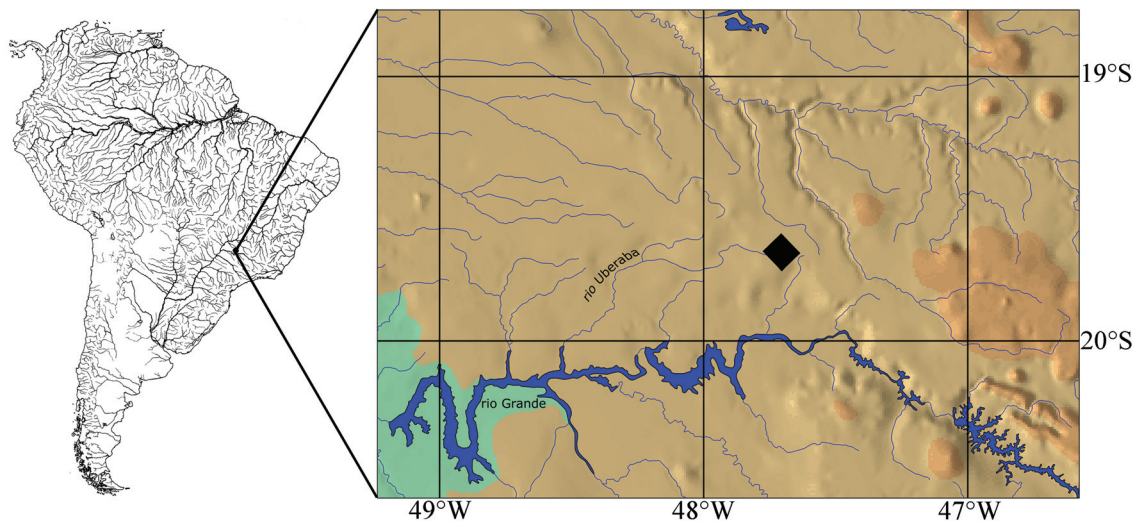


Fig. 4. Distribution map of *Hyphessobrycon uaiso* (square) in rio Uberaba (detail), rio Grande drainage, upper rio Paraná basin, Brazil. Base map of South America prepared by Marilyn Weitzman.



Fig. 5. Type locality of *Hyphessobrycon uaiso*, Brazil, Minas Gerais State, headwaters of rio Uberaba, near BR-262 road.

Discussion

Hyphessobrycon is clearly a non-monophyletic genus (Mirande 2009, 2010; Malabarba *et al.*, 2012). The detection of monophyletic groups housed in *Hyphessobrycon* is expected, however, indicatives of smaller monophyletic units will require a well-supported analysis of relationships among most of the valid species of *Hyphessobrycon*, avoiding the numerous generic taxa proposed without autapomorphic characters. This is the justification for the description of this taxon in the *Hyphessobrycon sensu* Eigenmann (1917). Furthermore, we are in need to describe the components of the Neotropical ichthyofauna rapidly, given the advance of deleterious anthropogenic interference in the aquatic environments.

Some characteristics of *Astyanax scabripinnis* species complex (*e.g.*, head heavy, reduced number of branched anal-fin rays, presence of one humeral spot, and a dark, midlateral, body stripe extending to the tip of the middle caudal-fin rays), like delimited by Bertaco & Lucena (2006), also are present in *Hyphessobrycon uaiso*, but the body depth (mean 36.8% SL) and mainly the lateral line incomplete in all specimens differ the new species from *Astyanax scabripinnis* species complex (*vs.* body depth mean 30-33% of SL and lateral line complete). On the other hand, besides presenting some characters as in *Hasemania* Ellis (*e.g.*, lateral line incomplete, caudal fin naked), *Hyphessobrycon uaiso* differs from all *Hasemania* species by presenting adipose fin (*vs.* absent in *Hasemania*, except in some specimens of *Hasemania nana*, and just one specimen of *Hyphessobrycon uaiso*) a conspicuous humeral spot (*vs.* absent in *H. hanseni* Fowler, *H. melanura* Ellis, and *H. nana* Lütken); dorsal fin with ii,8 rays (*vs.* dorsal fin with ii,9 rays in *H. maxillaris*); humeral spot vertically rounded in superior portion on adults and anal fin with bony hooks on mature males (*vs.* humeral spot vertically elongated and absence of bony hooks on mature males of *H. crenuchoides* Zarske & Gery); and by presence of scale sheath along anal-fin (*vs.* absent in *H. kalunga* Bertaco & Carvalho and *Hasemania piatan* Zanata & Serra).

The condition of dorsal fin with ii,7-8 rays is uncommon among the species of the genus *Hyphessobrycon*. It is present only in *H. arianae*, *H. guarani*, *H. otrynus*, *H. procerus*, *H. stramineus*, and *H. wajat*. In fact, some of these species (*i.e.*, *H. guarani*, *H. procerus*, and *H. wajat*) are clearly not *Hyphessobrycon*, because they also present four teeth in the inner row of the premaxilla. These characters define a group inside the family Characidae first proposed by Malabarba & Weitzman (2003) as the Clade A, and posteriorly corroborated and named by Mirande (2009, 2010) as Stevardiinae. Indeed, *Hyphessobrycon procerus* seems to be close related to *Lepidocharax* Ferreira, Menezes & Quaguio-Grassiotto; also, *H. guarani* and *H. wajat* are probably Stevardiinae members. Furthermore, we agree with Malabarba (1998:205) in considering *Hyphessobrycon arianae* as junior synonym of '*Cheirodon stenodon*', because all characters examined in the *H. arianae* types (*e.g.*, pseudotympanum, arrangement of teeth in the premaxilla, tricuspid teeth, and color pattern) are also present in '*Cheirodon stenodon*'. *Hyphessobrycon stramineus*, on the other hand, is known by a unique specimen, relatively well preserved (but with superior jaw missing), and according to the analysis of the holotype (MCZ 20772 - by FRC), we concluded that *H. stramineus* may be close related to *Hemigrammus ora* Zarske, Le Bail & Géry, based on the dentition (five, tri to pentacuspids, teeth in dentary), color pattern (pale humeral spot, and conspicuous caudal peduncle spot - original description in Ellis in Eigenmann, 1918: 190 and direct observation of holotype), and dorsal fin ii,8 (see redescription of *Hemigrammus ora* in Jerep *et al.*, 2011). *Hyphessobrycon otrynus* is a typical *Hyphessobrycon sensu* Eigenmann (1917). *Hyphessobrycon arianae* and *H. procerus*, differ from *H. uaiso* by having tricuspid maxillary teeth (*vs.* maxillary teeth pentacuspids or with more cuspids).

Some others species such as *H. cyanotaenia* Zarske & Géry, *H. hasemani* Fowler, *H. isiri* Almirón, Casciotta & Koerber, *H. khardinae* Zarske, *H. pando* Hein, *H. pytai* Géry & Manhart, may have ii,8-9 dorsal-fin rays, with ii,9 as the modal condition. *Hyphessobrycon uaiso* differs from *H. cyanotaenia*, *H. khardinae*, *H. pando*, and *H. pytai* by the presence of one (rarely two) maxillary tooth (*vs.* two or more); and from *H. hasemani* and *H. isiri* by i,5-6 pelvic-fin rays (*vs.* i,7).

Thirteen species of *Hyphessobrycon* are herein recognized for the upper rio Paraná basin: *H. anisitsi*, *H. balbus*, *H. bifasciatus*, *H. coelestinus*, *H. duragenys*, *H. eilyos* (new record), *H. eques*, *H. flammeus* Myers, *H. guarani* (new record), *H. herbertaxelrodi* (new record), *H. moniliger* Moreira, Lima & Costa (mentioned by Zawadzki *et al.*, 2008: 400), *H. reticulatus*, and *H. uaiso*, new species. *Hyphessobrycon uaiso* differs from all those species by the dorsal fin with ii,8 rays (*vs.* ii,9, except *H. wajat*) and pelvic fin with i,5-6 rays (*vs.* i,7, except *H. coelestinus*, *H. eilyos*, *H. guarani*, and *H. flammeus*).

Hyphessobrycon uaiso is described from the upper rio Paraná basin, one of the most sampled basins in the Neotropical region. Langeani *et al.* (2007) registered 316 species from the upper rio Paraná basin, and about 50 additional species were

listed as new taxa awaiting for description. After five years approximately, 26% of those 50 new species were described and 30 other species not listed in that paper (including new species or new records) were recorded to the basin. Thus, the current number of species from the upper rio Paraná basin is around 360, including *Hyphessobrycon uaiso*. This fact reinforces that the upper rio Paraná basin is a substantial restricted geographic component for the ichthyofauna and it shows that each portion of the basin, *i.e.*, a stream or a small river, can have a particular and specific ichthyofauna. This is evidenced by the new species described in the last five years, including *H. uaiso*, most of them with restricted distribution (*i.e.* one stream/river or in some cases a single collection site). Initiatives to preserve and maintain these areas are important for the Neotropical ichthyic diversity conservation.

Comparative material examined. *Astyanax scabripinnis paranae*: CAS 22555, holotype, 113.8 mm SL, Brazil, Paraná. *Aphyocorax [sic] heteresthes*: CAS 76377, 4 syntypes, 14.3-17.7 mm SL, Brazil. *Aphyocorax axelrodi*: MNRJ 9121, male, holotype, 22.4 mm SL, Trinidad and Tobago, near Piarco, Trinidad B. W.; MNRJ 9122, male, paratype, 19.7 mm SL; MNRJ 9123, male, paratype, 17.4 mm SL; MNRJ 9124, male, 18.9 mm SL; MNRJ 9125, male, paratype, 18.8 mm SL; MNRJ 9126, female, paratype, 20.1 mm SL; MNRJ 9127, paratype, 18.3 mm SL; MNRJ 9128, female, paratype, 18.0 mm SL; MNRJ 9129, female, paratype, 18.4 mm SL; MNRJ 9130, female, paratype, 16.5 mm SL - all lots same data as MNRJ 9121. *Cheirodon troemneri*: ANSP 70157, holotype, 26.3 mm SL, an aquarium fish without locality, thought to have been obtained in Brazil. The holotype of *Cheirodon troemneri* is missing, and the specimen in the bottle of holotype is, indeed, *Hemigrammus stictus* (Durbín). *Chirodon [sic] eques*: NMW 59810, 2 syntypes, 23.0-23.3 mm SL, Brazil, Amazonas, Villa Bella [Parintins]; NMW 62693, 6 syntypes, 17.3-22.7 mm SL, Brazil, Pará, Óbidos; NMW 95056, 1 syntype, 18.9 mm SL, same data as NMW 62693. *Dermatocheira catablepta*: FMNH 53553, holotype, 14.8 mm SL, Guyana, above the fall, Tumatumari. *Hasemania crenuchoides*: DZSJRP 14185, 20, 36.3-78.2 mm SL, ribeirão da Contagem, REBIO Contagem, rio Maranhão affluent, Tocantins drainage; MZUSP 52732, holotype, male, 64.1 mm SL, córrego Planaltina, upper rio São Bartolomeu (tributary of rio Corumbá, affluent of rio Paranaíba, La Plata system). *Hasemania kalunga*: MCP 44289, female, holotype, 53.3 mm SL, Brazil, Goiás State, Cavalcante, córrego in the road GO-241 between Cavalcante and Minaçu, tributary of rio das Almas, rio Paraná drainage, upper rio Tocantins basin. *Hasemania maxillaris*: FMNH 54303, holotype, 22.6 mm SL, Brazil, Paraná, Porto União, rio Iguaçu. *Hasemania melanura*: FMNH 54384, holotype, 27.6 mm SL, Brazil, Paraná, Porto União, rio Iguaçu. *Hasemania nambiquara*: MCP 38390, holotype, 28.6 mm SL, Brazil, Mato Grosso, Comodoro, rio Doze de Outubro on the highway BR-364 between Comodoro and Vilhena, tributary of rio Juruena, upper rio Tapajós drainage. *Hasemania piatan*: DZSJRP 11933, 17 of 20 paratypes, 23.2-34.73.5 mm SL, Brazil, Bahia, municipality of Piatã, córrego das Piabas, south of Piabas farm, tributary of rio de Contas. *Hemigrammus anisisti*: CAS 11984, holotype with 30.9 mm SL and 2 paratypes with 22.2-26.5 mm SL (in the same bottle), Paraguay, Villa Rica, Paraná basin; CAS 44366, 7 paratypes, 18.8-25.2 mm SL, Paraguay, Estancia La Armonia, Caapucu State?, arroyo Carambey. *Hemigrammus boulengeri*: CAS 44379, holotype, 30.5 mm SL, Brazil, Rio Grande do Sul. *Hemigrammus compressus*: BMNH 1905.12.6.4-5, 2 paratypes, male, 31.5-32.5 mm SL, Mexico, Oaxaca, Obispo; CAS 70114 (ex IU 10798, IU 11126), 5, 26.6-32.0 mm SL, Mexico, Obispo, Veracruz; CAS 70116 (ex IU 10929), 1, 31.6 mm SL, Mexico, Veracruz, Perez (probably rio Tesechocán,

tributary of rio Papaolapan); FMNH 4641, holotype, male, 31.2 mm SL, Mexico, Oaxaca, rio Papaloapan, El Hule; FMNH 4642, 17 paratypes, 26.6-35.7 mm SL, Mexico, Oaxaca, El Hule, rio Papaloapan; FMNH 4662, 11 paratypes, 26.2-31.8 mm SL, 1 c&s, no length (disjointed and in poor condition), Mexico, Oaxaca, Obispo, rio Obispo; FMNH 105930 (ex FMNH 4642), 2 paratypes, 28.8-30.8 mm SL, same data as FMNH 4642; MCZ 29911 (ex IU 11126), 2 paratypes, 29.0-30.3 mm SL, Mexico; MHNG 2181.076, 1 paratype, 29.2 mm SL, same data as FMNH 4642; USNM 55728, 2 paratypes, missing, Mexico, Obispo. USNM 204387, 3 paratypes, male, 30.0-31.3 mm SL, 1 c&s paratype, *ca.* 31.0 mm SL, México, Oaxaca; El Hule. *Hemigrammus inconstans*: USNM 34591, holotype, 41.9 mm SL, Brazil, Pará [error, corrected in Eigenmann (1918:199) to Colombia]; USNM 306824, 4 paratypes, 37.2-44.1 mm SL, same data as USNM 34591. *Hemigrammus melasopterus*: FMNH 52668, 2 paratypes, 22.6-24.2 mm SL, Paraguay, arroyo Pypucú. *Hemigrammus robustulus*: ANSP 8037, lectotype, 40.6 mm SL, Ecuador, Pebas; ANSP 8038-ANSP 8052, 15 paralectotypes, *ca.* 40.0-50.0 mm SL, same data as ANSP 8037. *Hemigrammus santae*: USNM 55652, holotype with 53.4 mm SL and paratype with 34.1 mm SL, Brazil, Minas Gerais, Lagoa Santa. *Hyphessobrycon agulha*: ANSP 39232, holotype, 32.8 mm SL, Brazil, rio Madeira about 200 miles east of longitude 62°20'W; ANSP 39233 to ANSP 39283, 52 paratypes, 14.3-23.6 mm SL, same data as ANSP 39232. *Hyphessobrycon amandae*: MZUSP 37637, holotype, 18.9 mm SL, Brazil, Mato Grosso, rio das Mortes, some 100 km before its confluence with the Braço Maior of the rio Araguaia (the western border of the Ilha do Bananal); MZUSP 37368, paratype, 16.7 mm SL, same data as MZUSP 37637. *Hyphessobrycon amapaensis*: MZUSP 52730, holotype, 30.1 mm SL, Brazil, Amapá, about 45 km north of Macapá, savannah at the BR-156 of sítio Camaipi to Santa Clara, about 11 kilometers from sítio Camaipi (affluent of rio Preto). *Hyphessobrycon arianae*: MHNG 2412.079, holotype, 22.5 mm SL, Paraguay, Departamento Caaguazú, rio Guyraugua affluent of rio Monday at 3 km E of Juan Frutos. MHNG 2412.080, 30, 19.6-22.8 mm SL, same data as MHNG 2412.079; MHNG 2412.081, 4 c&s, 23.1-23.2 mm SL, same data as MHNG 2412.079. *Hyphessobrycon auca*: MHNG 2644.023, 4 paratypes, 42.2-52.5 mm SL, Argentina, Corrientes, pond in San Juan Porriahu, Esteros del Iberá. *Hyphessobrycon balbus*: ANSP 134780, paratype, c&s, 36.1 mm SL, Brazil, Goyas [Goiás], Planaltina, Lagoa Fervedeira; CAS 51789, holotype, 37.9 mm SL, same data as ANSP 134780; CAS 118069 (ex SU 18069), 9 paratypes, 24.5-45.1 mm SL, same data as ANSP 134780; MCZ 31570, 2 paratypes, 31.8-40.8 mm SL, same data as ANSP 134780. *Hyphessobrycon bentosi*: CAS 42682, 3 syntypes, 16.1-27.6 mm SL, Brazil, Pará, Obidos, rio Amazonas basin at Obidos; MCZ 20842, 13 syntypes, 15.7-21.8 mm SL, same data as CAS 42682; USNM 120270, 3 syntypes, 22.3-24.4 mm SL, same data as CAS 42682. *Hyphessobrycon bifasciatus*: CAS 51790, 5 paratypes, 21.4-33.0 mm SL, Brazil, Rio de Janeiro, São João da Barra, rio Parayba [rio Paraíba do Sul] drainage; CAS 51791, 5 paratypes, 15.6-19.9 mm SL, Brazil, Rio Grande do Sul, rio Ibicuihy [rio Ibicuí], into rio Uruguay at Cacequy [Cacequi]; FMNH 15041, paratype, 28.5 mm SL, same data as CAS 51970; FMNH 15042, paratype, 30.5 mm SL, same data as CAS 51970; FMNH 15043, paratype, 27.9 mm SL, same data as CAS 51970; FMNH 15044, paratype, 32.4 mm SL, same data as CAS 51970; FMNH 15045, paratype, 28.0 mm SL, same data as CAS 51970; FMNH 54302, 42 paratypes, 14.9-36.7 mm SL, Brazil, Espírito Santo, Muniz Freire; FMNH 54374, 22 paratypes, 11.7-31.6 mm SL, same data as CAS 51791; FMNH 54404, holotype, 33.5 mm SL, Brazil, Rio de Janeiro, Campos, rio Parahyba [rio Paraíba do Sul]; FMNH 54405, 28 paratypes, 22.5-35.0 mm SL, same data as CAS 51970 (in 22 Jun 1908); FMNH 96014 (ex FMNH 54404), paratype, 27.6 mm SL, Brazil, Rio de Janeiro, Campos, 1908. *Hyphessobrycon cachimbensis*: MNRJ 9196, holotype, 29.5 mm SL,

Brazil, Pará, rio Cachimbo - Cachimbo - FAB airport, below of small falls; MNRJ 9197, paratype, 19.0 mm SL, same data as MNRJ 9196; MNRJ 9198, paratype, 24.5 mm SL, same data as MNRJ 9196. *Hyphessobrycon compressus milleri*: CAS 70115 (ex IU 11255), holotype, male, 31.3 mm SL, Guatemala, Los Amates (possibly the swamp 0.5 miles to the East). This type was as 'whereabouts unknown' in Lima *et al.* (2003). *Hyphessobrycon columbianus*: MTD F 25497, holotype, 45.7 mm SL, Colombia, Darien, small stream about 6 kilometers downstream from Acandi, entry of the rio Acandi. MTD F 25498, 1 paratype, 40.9 mm SL, same data as MTD F 25498. *Hyphessobrycon coelestinus*: CAS 60476, holotype, 22.8 mm SL, Brazil, Distrito Federal, lago do rio São Bartholomeu [Bartolomeu] (formerly Lagoa Bonita). *Hyphessobrycon copelandi*: CAS 42683, 5 syntypes, 15.9-27.4 mm SL, Brazil, Amazonas, rio Solimões at Tabatinga; MCZ 20771, 88 syntypes, 15.4-33.5 mm SL, Brazil, Amazonas, Tabatinga [rio Solimões at Tabatinga (aka Sapurara) and environs]; USNM 120271, 6 syntypes, 14.7-28.4 mm SL, same data as MCZ 20771. *Hyphessobrycon diancistrus*: MZUSP 13179, 2 paratypes, 26.3 mm SL, Colombia, State of Vichada, rio Vichada, about 50 km west of San José de Ocuté; USNM 216607, holotype, 24.4 mm SL, same data as MZUSP 13179. *Hyphessobrycon duragenys*: CAS 51792, 2 paratypes, 38.1-55.9 mm SL, Brazil, São Paulo, Mogi das Cruzes, rio Tietê; FMNH 54402, 5 paratypes, 34.4-42.4 mm SL, Brazil, São Paulo, Mogi das Cruzes, rio Tietê [one specimen with 35.7 mm SL is an *Astyanax* species]; FMNH 54403, 8 paratypes, 24.0-31.9 mm SL, Brazil, São Paulo, Jacarehy [Jacareí, rio Paraíba do Sul basin; one specimen with 24.0 mm SL is *Hyphessobrycon* aff. *luetkenii*]. *Hyphessobrycon ecuadoriensis*: CAS 61602, holotype, 23.2 mm SL, Ecuador, forest pools near Vinces; CAS 122776 (ex SU 22776), 16 paratypes, 16.5-22.1 mm SL, same data as CAS 32454; FMNH 56601, 83 paratypes, 17.3-24.3 mm SL, same data as CAS 61602; MCZ 30951, 29 paratypes, 15.3-21.1 mm SL, same data as CAS 32454. *Hyphessobrycon eilyos*: MNRJ 24781, 1 of 5 paratype, 20.7 mm SL, Brazil, Mato Grosso, municipality of Alto Araguaia, córrego do Rancho (headwaters), swamp near the road, ca. 17°16'S 53°24'W; MZUSP 75126, holotype, 22.6 mm SL, Brazil, Mato Grosso, municipality of Alto Araguaia, ribeirão do Sapó, km 464.04 of Ferronorte railroad; NUP 838, 180, 16.6-24.6 mm SL, Brazil, Goiás, Chapadão do Céu/Baús, Capivara Falls (Parque Nacional das Emas), rio Formoso affluent. *Hyphessobrycon elachys*: MZUSP 28655, 2 paratypes, 14.0-14.5 mm SL, same data as USNM 232393; USNM 232393, holotype, 15.8 mm SL, male, Paraguay, Departamento San Pedro, swamp 3 km northwest of Lima, rio Aguaray-Guazu system. *Hyphessobrycon eos*: CAS 60401, 5 paratypes, 26.6-31.0 mm SL, same data as FMNH 52795; FMNH 7354, 2 paratypes, 16.4-17.2 mm SL, same data as FMNH 52795; FMNH 52795, holotype, 28.1 mm SL, Guyana, Creek between Potaro Landing & Kangaruma, lower Potaro River, Essequibo River basin; FMNH 52796, 9 paratypes, 16.7-24.2 mm SL, Guyana, Tukeit; FMNH 52797, 2 paratypes, 24.3-30.7 mm SL, same data as FMNH 52795; FMNH 69689, 5 paratypes, 15.3-16.7 mm SL, Guyana, Lower Potaro River, Tukeit; MCZ 30036, 2 paratypes, 16.4-17.9 mm SL, Guyana, Mazaruni-Potaro, Potaro River at Tukeit Fall; USNM 66195, paratype, 25.6 mm SL, same data as FMNH 52795; USNM 66196, 2 paratypes, 17.5-18.2 mm SL, Guyana, Tukeit; USNM 165449, paratype, 26.8 mm SL, same data as FMNH 52795. *Hyphessobrycon epicharis*: MZUSP 42379, 2 of 55 paratypes, 28.6-31.6 mm SL, Venezuela, Departamento Amazonas, small caño off Caño Urami, just upstream along rio Negro from Santa Lucia. *Hyphessobrycon erythrostigma*: ANSP 70208, holotype, 48.0 mm SL, Brazil?, aquarium fish without locality. *Hyphessobrycon flammeus*: USNM 92969, 2 syntypes, 24.1-25.4 mm SL, Brazil, Rio de Janeiro, vicinity Rio de Janeiro. *Hyphessobrycon frankei*: MHNG 2586.033, 54 paratypes, 23.6-31.6 mm SL, Peru, tributary for rio Negro, Aguaytia, Pampa de Sacramento; MTD F 1770, holotype, 33.0 mm SL, Peru, Departamento de Loreto, brook at Carretera Central, 10 kilometers west of Aguaytia, rio Ucayali area. *Hyphessobrycon georgetti* [sic]: ANSP 112186, 2 paratypes, 13.9-16.5 mm SL, Brazil, Pará, rio Paru do Oeste, igarape E of Tirio, 6 km from border of Surinam; ZMA 103269, holotype, 16.3 mm SL, Suriname, side branch of Sipaliwini River, a swampcreek in Paru savannah. *Hyphessobrycon griemi*: ZMA 101936a, holotype, 19.0 mm SL, Brazil, Gojas [probably an error]; ZMA 101936b, 2 paratypes, 23.4-25.8 mm SL, same data as ZMA 101936a. *Hyphessobrycon guarani*: MHNG 2366.99, holotype, 29.1 mm SL, Paraguay, Departamento Alto Paraná, rio Alto Paraná at Puerto Bertoni, in an oxbow of the river; MZUSP 38399, 2 paratypes, 29.2-30.9 mm SL; USNM 290840, 3 paratypes, 25.8-29.1 mm SL, same data as MHNG 2366.99; NUP 3669, 17, 24.1-32.4 mm SL, Brazil, Mato Grosso do Sul, Taquaruçu, lagoon of Ventura, rio Ivinhema tributary; NUP 6345, 10, 23.8-27.1 mm SL, Brazil, Paraná, Porto Rico, 'ressaco do Pau Véio' (Porto Rico Island), rio Paraná tributary. *Hyphessobrycon hamatus*: MCP 34000, holotype, male, 44.5 mm SL, Brazil, Goiás, Mambai, córrego Cana Brava, tributary of rio Vermelho, rio Tocantins drainage. *Hyphessobrycon haraldschultzi*: MNRJ 9207, holotype, 14.3 mm SL, Brazil, Goiás, Ilha do Bananal; MNRJ 9210, 6 paratypes, 14.9-17.7 mm SL, same data as MNRJ 9207. MNRJ 9211, 33 paratypes, 12.3-17.6 mm SL, same data as MNRJ 9207. *Hyphessobrycon hasemani*: ANSP 39230, holotype, 20.4 mm SL, Brazil, rio Madeira above Falls of Guajara-Mirim [Rondônia]; MCP 41223, 50 of 100, 25.4-31.6 mm SL, 3 c&s, 28.4-29.7 mm SL, Brazil, Mato Grosso, Pontes e Lacerda, stream affluent rio Galera, ca. 71 km North of rio Guaporé, on BR-174; UFRGS 12337, 3, 26.4-30.9 mm SL, Brazil, Mato Grosso, Vila Bela da Santíssima Trindade, road MT-199 between Vila Bela and Casalvasco municipalities. *Hyphessobrycon heliacus*: MZUSP 52891, holotype, male, 25.6 mm SL, Brazil, Mato Grosso, Cláudia, ribeirão Macuco (= córrego Duas-Bocas), tributary of the rio Teles Pires, rio Tapajós basin, 71.9 km North from Sinop, at the BR-163 road in direction to Santarém. *Hyphessobrycon herbertaxelrodi*: USNM 196089, holotype, 31.2 mm SL, Brazil, Mato Grosso, Coxim, rio Paraguay basin, Coxim on the rio Taquary, ca. 1960. DZSJRP 11741, 2, 24.9-26.0 mm SL, Brazil, Goiás, Itajá, ribeirão Grande, farm of Mr. Lázaro; DZSJRP 11813, 4, 16.6-23.7 mm SL, Mato Grosso do Sul, Cassilândia, córrego Galheiro. *Hyphessobrycon hexastichos*: MCP 37648, holotype, 55.5 mm SL, Brazil, Mato Grosso, Comodoro, rio Mutum on road BR-364 to cidade de Vilhena, tributary of rio Juruena, upper rio Tapajós drainage. *Hyphessobrycon igneus*: MLP 8413 (ex Col. Ict. Mus. La Plata N° 23-IX-80-7), holotype, 26.7 mm SL, Argentina, Corrientes, lagoon in front to School N° 12, road Bella Vista-San Roque; USNM 256727 (ex Col. Ict. Mus La Plata N° 23-IX-80-8), paratype, 23.8 mm SL, same data as MLP 8413. *Hyphessobrycon iheringi*: ANSP 69579, holotype, 32.2 mm SL, Brazil, Ceará, Fortaleza. *Hyphessobrycon isiri*: AI 192, 3 of 19 paratypes, 37.8-45.3 mm SL, Argentina, Entre Ríos, rio Uruguay basin, arroyo Marmol. *Hyphessobrycon itaparicensis*: MNRJ 29944, 2, 25.0-27.6 mm SL, Brazil, Sergipe, Estância, riacho do Macaco (rio Fundo sub-basin), rio Fundo tributary, bridge at BR-101. *Hyphessobrycon khardinae*: UFRO-I 14404, 20 of 36, 22.3-30.4 mm SL, rio Ipixuna, in front of rio Purus. *Hyphessobrycon langeanii*: MZUSP 75127, holotype, 49.8 mm SL, Brazil, Mato Grosso, municipality of Alto Araguaia, córrego Mosquito, km 476.3 of Ferronorte railroad; DZSJRP 5467, 5 paratypes, 28.9-34.0 mm, same data as MZUSP 75127. *Hyphessobrycon latus*: ANSP 69578, holotype, 37.6 mm SL, Brazil, Ceará, Fortaleza. *Hyphessobrycon loweae*: MZUSP 45749, 2 paratypes, 22.1-22.3 mm SL, Brazil, Mato Grosso, Lago do Leo, rio Suizinho drainage, rio Xingu basin. *Hyphessobrycon melanostichos*: MCP 39510, holotype, female, 36.6 mm SL, Brazil, Mato Grosso, Comodoro, rio Doze de Outubro on road BR-364 between Comodoro and Vilhena. *Hyphessobrycon melasemeion*: ANSP 71584, holotype, 40.0 mm SL, lower Amazon? - aquarium fish. *Hyphessobrycon melazonatus*: MCZ 20737, lectotype,

29.2 mm SL, Brazil, Pará, lagoa do Maximo [Lago Maximo, small lake near Parintins]; MCZ 21069, paralectotype, missing, Brazil, Amazonas, Silva, Lago Saraca [Lago Saraca at Silves]. *Hyphessobrycon meridionalis*: MLP 8339 (ex Col. Ict. Mus. La Plata N° 30-III-77-1), holotype, 44.1 mm SL, Argentina, Provincia de Buenos Aires, Los Talas, quarry on road Provincial N° 15, 70 m S of Delgado Channel, 30 m of the road towards the rio de la Plata. *Hyphessobrycon metae*: CAS 61751, holotype, 25.7 mm SL, Colombia, rio Meta at Barrigona, rio Orinoco basin. *Hyphessobrycon minimus*: CAS 61753, 2 paratypes, 14.8-16.1 mm SL, same data as FMNH 52794; FMNH 52794, holotype, 14.0 mm SL, Guyana, Cane grove corner (sand bank below Tukeit), Potaro River, Essequibo River basin. *Hyphessobrycon minor*: CAS 61754, paratype, 19.3 mm SL, Guyana, Essequibo River at Konawaruk, 6 Nov 1908; FMNH 52789, holotype, missing, same data as CAS 61754. *Hyphessobrycon moniliger*: MZUSP 67466, holotype, 26.5 mm SL, Brazil, Tocantins, Araguaçu, farm Praia Alta 2, Araguaçu to Barreira do Piqui road, 27 km N from Araguaçu, pool behind farm's house, rio Água Fria basin. DZSJRP 9000, 70, 19.3-31.1 mm SL, Brazil, Mato Grosso do Sul, Aparecida do Taboado, córrego Brejo Comprido, Ilha Solteira dam. *Hyphessobrycon mutabilis*: MZUSP 45292, 5 of 8 paratypes, 19.3-20.7 mm SL, Brazil, Mato Grosso, tributary of rio Sete de Setembro, rio Xingu basin, 107 km SW of Canarana; MZUSP 45752, 4 paratypes, 25.4-26.6 mm SL, Brazil, Mato Grosso, Buriti palm Cabiseru, rio Suiá-Missú drainage, rio Xingu basin. *Hyphessobrycon negodagua*: MNRJ 19149, 1 of 5 paratypes, 26.3 mm SL, same data as MZUSP 53983; MZUSP 53983, holotype, male, 26.7 mm SL, Brazil, Bahia, Iraquara, rio Pratinha at fazenda Pratinha. *Hyphessobrycon nicolasi*: ILPLA 1808, holotype, female, 49.1 mm SL, Argentina, Entre Ríos Province, Colón Department, El Pelado stream; ILPLA 1811, 8 paratypes, 37.5-43.6 mm SL, same data as ILPLA 1808. *Hyphessobrycon notidanos*: MCP 39511, holotype, male, 29.8 mm SL, Brazil, Mato Grosso, Comodoro, rio Doze de Outubro on road BR-364 between Comodoro and Vilhena. *Hyphessobrycon otrynus*: USNM 349418, holotype, 30.1 mm SL, Venezuela, Portuguesa, rio Portuguesa drainage, rio Las Marias, at Quebrada Seca, approximately 45 min upstream by car from Highway 5, 22 km NNW Guanare, 28 Feb 1998, J. Armbruster & O. Leon; LIRP 6040, 7 of 8 paratypes, 22.9-26.3 mm SL, Caño Falcon, rio Portuguesa. *Hyphessobrycon panamensis*: MCZ 20688, 5 syntypes, 20.6-23.5 mm SL, Panama, Matachin, Boqueron River [all specimens dried, held wrapped on cotton in the bottle]; USNM 120416, 2 syntypes, 25.4-25.7 mm SL, same data as MCZ 20688. *Hyphessobrycon parvellus*: FMNH 54298, paratype, 14.3 mm SL, ribeirão Azul, lagoon; FMNH 54299, 7 paratypes, 9.3-13.7 mm SL, Brazil, Bahia, Queimadas, rio Itapicuru [parched specimens]; FMNH 54392, holotype, 22.0 mm SL, Brazil, Bahia, Alagoinhas, rio Catu; FMNH 54393, 3 paratypes, 15.3-16.7 mm SL, same data as FMNH 54392 [one specimen with 16.6 mm SL is a *Serrapinnus piaba*, as annotated by L. R. Malabarba in 18 Dec 1992 in a label into bottle]. FMNH 54394, paratype, 16.3 mm SL, Brazil; FMNH 54395, paratype, 14.3 mm SL, Brazil, Água Quente. *Hyphessobrycon piabinhas*: ANSP 69580, holotype, 24.3 mm SL, Brazil, Ceará, Fortaleza; ANSP 69581, 12 paratypes, 22.4-30.0 mm SL, same data as ANSP 69580; ANSP 69594 - ANSP 69598, 5 paratypes, 13.9-22.7 mm SL, Brazil, Ceará, rio Salgado, Ico; MHNG 2178.018, 2 paratypes, 14.7-16.3 mm SL, same data as ANSP 69580. *Hyphessobrycon poeciloides*: FMNH 56290, holotype, 41.2 mm SL, Colombia, Valle del Cauca, Cali; FMNH 56291, 17 paratypes, 37.9-51.3 mm SL, same data as FMNH 56290; FMNH 75150, 19 paratypes, 32.3-45.6 mm SL, same data as FMNH 56290; USNM 79214, 4 paratypes, 38.4-41.4 mm SL, same data as FMNH 56290. *Hyphessobrycon procerus*: MZUSP 38400, 2 paratypes, 24.0-27.8 mm SL, Paraguay, Caaguazú Department, Guyrau-Gua, a Ltr. Juan m. Frutos; USNM 290841, 1 of 3 paratype, 28.7 mm SL, same data as MZUSP 38400. *Hyphessobrycon pulchripinnis*: ZMB 20849, holotype, 25.3 mm SL, Brazil, Amazon River? (aquarium specimens). ZMB 32425,

paratype, 28.2 mm SL, same data as ZMB 20849. *Hyphessobrycon pyrthonotus*: MZUSP 45714, holotype, 42.0 mm SL, Brazil, [Barcelos or Santa Isabel do Rio Negro] rio Erere, a tributary to the rio Negro; USNM 326184, 8 paratypes, 36.6-45.0 mm SL, same data as MZUSP 45714. *Hyphessobrycon reticulatus*: CAS 57604, 2 paratypes, 16.7-33.6 mm SL, Brazil, São Paulo, Iguape, rio Ribeira [rio Ribeira de Iguape], fresh water by the sea; FMNH 54308, paratype, 21.4 mm SL, Brazil, Rio Grande do Sul, Cacequy [Cacequi]; FMNH 54397, holotype, 36.9 mm SL, Brazil, Rio de Janeiro, Campos [Campos dos Goytacazes], rio Parahyba [rio Paraíba do Sul]; FMNH 54398, paratype, 38.0 mm SL, Paraná, Morretes; FMNH 54399, 7 paratypes, 30.6-32.9 mm SL, Brazil, Espírito Santo, Muniz Freire, Itapemirim; FMNH 54400, paratype, 35.4 mm SL, Brazil, São Paulo, Mogy das Cruzes, rio Tietê; FMNH 54401, 6 paratypes, 15.0-35.5 mm SL, same data as CAS 57604; FMNH 54921, paratype, 23.5 mm SL, Brazil, Minas Gerais, rio Doce. *Hyphessobrycon rosaceus*: CAS 61755, 4 paratypes, 16.4-29.8 mm SL, Guyana, Essequibo River at Gluck Island; FMNH 52791, holotype, 28.6 mm SL, Guyana, Gluck Island; FMNH 52792, 5 paratypes, 18.1-34.1 mm SL, same data as FMNH 52792; FMNH 52793, paratype, 28.4 mm SL, Guyana, Rockstone, 1908; FMNH 69534, 2 paratypes, 13.4-15.1 mm SL, same data as CAS 61755; FMNH 7352, 2 paratypes, 15.9-17.4 mm SL, same data as CAS 61755; MCZ 30038, 2 paratypes, 16.8-17.8 mm SL, Guyana, E Demerara-WC Berbice, tributary of Essequibo River on Gluck Island, across from Rockstone, Essequibo drainage; SU 21919, 2 paratypes, 16.0-16.9 mm SL, same data as FMNH 52791; USNM 66194, paratype, 16.2 mm SL, Guyana, Gluck Island. *Hyphessobrycon rubrostigma*: ZMA 101.935A, holotype, 26.5 mm SL, Colombia. ZMA 101.935B, 6 paratypes, 22.7-36.8 mm SL, Colombia. *Hyphessobrycon rutiliflavus*: DZSJRP 7444, holotype, female, 50.7 mm SL, Brazil, Mato Grosso, Cuiabá, córrego Pipa, rio Paraguai drainage, next to Serra de São Vicente. *Hyphessobrycon saizi*: USNM 198647, holotype, 22.0 mm SL, Colombia, rio Manacacias into upper rio Meta, at Restrepo, ca. 200 miles (320 km) E of Bogota. *Hyphessobrycon savagei*: ANSP 164253, 30 of 100, 27.5-32.6 mm SL, 2 c&s, 29.2-29.3 mm SL Costa Rica, Puntarenas Providence, culvert pool ar Inter American Highway, ca. 20 km S of Palmar Norte. *Hyphessobrycon schauenseei*: ANSP 90878, holotype, 23.2 mm SL, Brazil, Pará, rio Inhangapi; ANSP 90879, 3 paratypes, 20.4-21.7 mm SL, same data as ANSP 90878. *Hyphessobrycon scholzei*: ZMB 20798, lectotype, 30.9 mm SL, Brazil, Pará, rio Amazon at Pará. ZMB 32430, paralectotype, 29.0 mm SL, same data as ZMB 20798. *Hyphessobrycon scutularis*: MCP 33333, holotype, male, 35.1 mm SL, Brazil, Mato Grosso, rio Kaiapá, MT-320 road, about 5 km from Nova Canaã do Norte, rio Teles Pires drainage, rio Tapajós system. *Hyphessobrycon serpae*: CAS 42684 (ex IU 12652), 5 syntypes, 21.0-23.0 mm SL, Brazil, Amazonas, Serpa [rio Amazonas at Itacoatiara]; MCZ 20985, 33 syntypes, 20.5-23.5 mm SL, same data as CAS 42684; USNM 120269, 6 syntypes, 20.1-23.1 mm SL, same data as CAS 42684. *Hyphessobrycon socolofi*: MZUSP 13181, holotype, male, 38.6 mm SL, Brazil, Amazonas, rio Negro, Barcelos; USNM 216612, 5 paratypes, 30.5-39.2 mm SL, same data as MZUSP 13181. *Hyphessobrycon sovichthys*: MCZ 37239, 5 paratypes, 26.2-28.7 mm SL, Venezuela, Zulia, rio Apon, ca. 35 km by road S of Rosario. USNM 121534, holotype, 26.6 mm SL, Venezuela, Cienago del Guanavana, about 10 km N of Sinamaica; USNM 121536, 14 paratypes, 21.6-30.2 mm SL, Venezuela, rio Negro below mouth of rio Yasa. *Hyphessobrycon stegemanni*: USNM 195942, holotype, 31.1 mm SL, Brazil, savannahs of northeastern Brazil, between the lower rio Tocantins and the rio Capim. *Hyphessobrycon stramineus*: MCZ 20772, holotype, 27.6 mm SL, Brazil, Amazonas, Tabatinga [rio Solimões at Tabatinga (aka Sapurara) and environs]. *Hyphessobrycon takasei*: USNM 198138, holotype, female?, 30.0 mm SL, Brazil, Amapá, Serra do Navio above Macapá, lower Amazon basin. *Hyphessobrycon taurocephalus*: CAS 22778 (ex IU 13277), 5

paratypes, 30.0–43.3 mm SL, same data as FMNH 54389 (but with wet label of locality Serrinha, Paraná, probably an error); FMNH 15091, paratype, 41.7 mm SL, Brazil, Paraná, Serrinha, Paraná; FMNH 15092, paratype, 32.3 mm SL, same data as FMNH 15091; FMNH 15093, paratype, 33.4 mm SL, same data as FMNH 15091; FMNH 54389, holotype, 43.3 mm SL, Brazil, Paraná, into rio Paraná at Serrinha, Paraná: either river or nearby creek, [rio Iguazu basin]; FMNH 54391, 22 paratypes, 22.6–34.9 mm SL, Brazil, Porto União, rio Iguassu [Iguazu]. *Hypheobrycon tenuis*: ANSP 139708, paratype, 22.8 mm SL, Peru, Peruvian Amazon, small brook connecting ‘Zapote Cocha’ with Caño Yarina at edge of río Pacaya, affluent of Canal de Puinahua (arm of the lower río Ucayali). *Hypheobrycon togoi*: ILPLA 1704, holotype, 59.5 mm SL, Argentina, Buenos Aires Province, Chascomús lagoon; ILPLA 1705, 4 paratypes, 62.5–69.8 mm SL, same data as holotype; ILPLA 1232, paratype, 65.2 mm SL, Argentina, Buenos Aires Providence, Lobos lagoon. *Hypheobrycon tortuguerae*: ANSP 80986, 2 paratypes, 25.2–26.6 mm SL, Costa Rica, Tortuguero River and lagoon at Tortuguero, 2 miles from inlet; ANSP 80987, paratype c&s, 26.4 mm SL, same data as ANSP 80986. *Hypheobrycon tropis*: USNM 198639, holotype, 21.1 mm SL, Brazil, Amazonas, near Tapurucuara, upper rio Negro. *Hypheobrycon vilmae*: MHNG 2229.004, holotype, 27.3 mm SL, Brazil, Mato Grosso, small stream in the road Cuiabá to upper rio Arinos; USNM 198137, paratype, 27.2 mm SL, same data as MHNG 2229.004. *Hypheobrycon vinaceus*: MCP 40916, 56.5 mm SL, holotype, male, Brazil, Minas Gerais, São João do Paraíso, rio São João, tributary of the upper rio Pardo. *Hypheobrycon wajat*: MLP 7853, 10 paratypes, 24.8–25.0 mm SL, Argentina, Chaco Province, Resistencia city, rio Negro; MLP 7875, 10 paratypes, 21.6–26.8 mm SL, Argentina, Chaco Province, Resistencia city, Laguna Blanca; MLP 9321, holotype, 27.2 mm SL, Argentina, Corrientes Province, Laguna Brava; MLP 9322, 5 paratypes, 28.2–30.2 mm SL, Argentina, Corrientes Province, Laguna Iberá. *Hypheobrycon weitzmanorum*: MNRJ 24782, 1 of 5 paratype, 20.4 mm SL, Brazil, Mato Grosso, municipality of Alto Araguaia, córrego Gordura, km 491.4 of Ferronorte railroad; MZUSP 73315, holotype, male, Brazil, Mato Grosso, municipality of Alto Araguaia, córrego Mosquito, km 476.3 of Ferronorte railroad. *Hypheobrycon weneri*: MZUSP 42365, holotype, 32.2 mm SL, Brazil, Pará, rio Guamá basin, forest stream between Santa Maria do Pará and São Miguel de Guamá, about 120 km from Belém (Pará), on highway BR-010. *Megalampodus ecuadorensis*: IU 13628, missing. [The holotype of *M. ecuadorensis* never was registered in CAS (David Catania, pers. comm.). The characters of *M. ecuadorensis* (= *Hypheobrycon ecuadorensis*) are the same of *Hypheobrycon ecuadoriensis*, therefore, *H. ecuadorensis* can be a junior synonym of *H. ecuadoriensis*]. *Megalampodus megalopterus*: CAS 78887, paratype, 27.1 mm SL, same data as FMNH 57823; FMNH 57823, holotype, 26.9 mm SL, Brazil, Mato Grosso, creek six miles back of San Luiz de Cáceres [Cáceres]; FMNH 57824, 2 paratypes, 18.2–28.3 mm SL, same data as FMNH 57823. *Megalampodus micropterus*: CAS 98918, 6 paratypes, 21.3–23.7 mm SL, Brazil, Pirapora, rio São Francisco basin; FMNH 57916, holotype, 23.5 mm SL, Brazil, rio São Francisco, Lagoa do Porto; FMNH 57917, 14 paratypes, 17.4–24.1 mm SL, same data as FMNH 57917; FMNH 57918, 9 paratypes, Brazil, Santa Rita, rio São Francisco; FMNH 57920, paratype, 20.8 mm SL, Brazil, rio Salitre. *Megalampodus roseus*: ANSP 112496, 2 paratypes, 13.7–14.5 mm SL, French Guiana, upper Maroni, stream near Gaa Kaba, creek from le. Tampoc; ANSP 139704, paratype, 15.2 mm SL, French Guiana, stream near Gaa Kaba, Maroni. *Megalampodus sweglesi*: USNM 196090, holotype, 29.9 mm SL, Colombia, upper Amazon, surroundings of ‘Leticia’ (Columbian District). *Megalampodus (Ectreopopterus) uruguayensis*: ANSP 70331, holotype, 29.6 mm SL, Uruguay. *Pristicharax hanseni*: ANSP 72104, holotype, 31.4 mm SL, Goiaz [Goias].

Pseudopristella simulata: ANSP 112203, paratype, 31.8 mm SL, French Guiana, River Kourou at Kourou (coast); ANSP 139703, 4 paratypes, 15.5–26.2 mm SL, French Guiana, stream near Sinnamary (coast); SMF 4786, holotype, 31.5 mm SL, same data as ANSP 112203. *Tetragonopterus callistus*: BMNH 1900.4.14.63–68, 6 syntypes, 17.3–27.0 mm SL, Brazil, Matto Grosso [Mato Grosso], Carandasinho; MSNG 37718, 2 syntypes, 25.9–28.6 mm SL, same data as 1900.4.14.63–68. MZUT 1365, 11 syntypes, 20.4–27.7 mm SL, same data as 1900.4.14.63–68. *Tetragonopterus heterorhabdus*: CAS 44415, 9 syntypes, 9.6–20.0 mm SL; CAS 102174 (ex SU 2174), syntype, 58.6 mm SL, Brazil, Pará [specimen is an *Astyanax* species, probably *Astyanax* cf. *anterior*. The specimen is damaged between dorsal fin end and adipose fin origin. A note in label explains this: “bottle broken during earthquake”. *Tetragonopterus luethenii*: BMNH 1885.2.3.78–80, 3 syntypes, 34.2–35.5 mm SL, Brazil, Rio Grande do Sul, San Lorenzo [São Lourenço] [one specimen with 34.4 mm SL is a *Hypheobrycon igneus*]; BMNH 1886.15.35–38, 4 syntypes, 55.6–63.0 mm SL, same data as BMNH 1885.2.3.78–80. *Tetragonopterus nanus*: USNM 44958, 4 syntypes, 14.3–18.2 mm SL, Brazil, [Minas Gerais], lagoa Santa.

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