### Acknowledgments

I am grateful to Mr. Ross Socolof for specimens of both species herein described and for attempting to obtain good locality data for them. W. L. Fink and Robert Kanazawa helped to photograph the specimens while Marilyn Weitzman provided technical assistance. Naércio Menezes translated the summary into Portuguese.

This research was partially supported by the Smithsonian Institution Amazonian Ecosystem Research Program under the direction of Clifford Evans.

### Resumo

Neste trabalho descreve-se um novo characideo, *Hyphessobrycon socolofi*, coletado no Rio Negro em Barcelos, Estado do Amazonas, Brasil. É feita também a redescrição de *Hyphessobrycon erythrostigma* Fowler (1943), espécie que tem sido coletada para o comércio de peixes ornamentais nas áreas de Leticia, Colombia e Tabatinga, Brasil e que tem uma grande afinidade com a nova espécie.

Exemplares vivos de ambas as espécies podem ser separados dos outros membros do grupo "rosy tetra" de Hyphessobrycon porque possuem uma mancha vermelha no corpo, logo atrás da mancha humeral escura e uma faixa branca estreita ao longo da base da nadadeira anal. Exemplares fixados das duas espécies distinguem-se das outras espécies de Hyphessobrycon por meio da seguinte combinação de caracteres: nadadeira dorsal com uma mancha negra grande que cobre cerca de <sup>2</sup>/<sub>3</sub> de sua parte distal; nadadeira anal escura sem uma parte distal branca ou clara envolvendo o terceiro e quarto raios; partes basais dos raios anteriores da nadadeira anal brancas (ou claraes em exemplares fixados a longo tempo, não tão densamente pigmentadas de marron escuro como no restante da nadadeira); mancha humeral escura seguida posteriormente por uma área pálida (que é vermelha em exemplares vivos) e depois por uma área escura difusa que corresponde aproximadamente à parte dorsal posterior da cavidade do corpo; maxilar com 3 a 10 dentes em exemplares adultos; premaxilar com 2 e ocasionalmente 3 dentes na série externa, 5 a 7 dentes na série interna; todos os dentes são tricúspides; altura do corpo cerca de 40% a 50% do comprimento padrão; escamas perfuradas da linha lateral, 7 a 14; escamas laterais em uma série longitudinal, 31 a 35; raios da nadadeira anal iv, 27 a 30; vértebras, 32 ou 33.

As duas espécies podem ser separadas com base nas seguintes características: os machos de *H. socolofi* possuem numerosos ganchos ósseos pequenos nos raios das nadadeiras dorsal e anal (quase totalmente ausentes em *H. erythrostigma*); os machos adultos de *H. socolofi* tem os raios anteriores da nadadeira dorsal e os lobos anteriores da nadadeira anal mais curtos que os machos de *H. erythrostigma*; a área branca no lobo anterior da nadadeira anal em ambos os sexos se estende por uma área maior na nadadeira de *H. erythrostigma* do que na nadadeira de *H. socolofi*.

Estas duas espécies exibem um padrão de colorido apomórfico único e muito semelhante e por isso parecem ser mais intimamente relacionadas entre si do que a qualquer outro characideo do grupo "rosy tetra." As duas espécies são extremamente semelhantes em vida. Ambas são bem maiores que as demais espécies conhecidas deste grupo. *H. socolofi* atinge um comprimento padrão de pouco mais de 39 mm, enquanto que *H. erythrostigma* atinge pelo menos 60 mm.

# Literature Cited

- Eigenmann, C. H. 1917. The American Characidae, part 1. Mem. Mus. Comp. Zool. Harvard College 43(1):102 pp.
- Fink, W. L., and S. H. Weitzman. 1974. The so-called cheirodontin fishes of Central America with descriptions of two new species (Pisces: Characidae). Smithsonian Contrib. Zool. No. 172:1–46.
- Fowler, H. W. 1943. Description of a new South American characin referred to *Hemigrammus*. Fish Culturist (Pennsylvania Fish Culturists' Assoc.) 22(5): 33-34.
- Géry, J. 1965. Poissons characoïdes sud-américains du Senckenberg Muséum, II. Characidae et Crenuchidae de Igarapé Préto (Haute Amazonia). Senckenbergiana Biol. 46(1):11-45.

—. 1972. Corrected and supplemented descriptions of certain characoid fishes by Henry W. Fowler, with revisions of several of their genera. Studies on the Neotropical Fauna 7(1972):1–35.

Hoedeman, J. J. 1954. Über die Verbreitung der Hyphessobrycon-callistus-Gruppe und die systematische Stellung der sechs Formen. Aquarien-und Terrarien-Zeitschrift 7(5):109–112.

-. 1956. Hyphessobrycon rubrostigma, neue Species. Eine höchst interessante und farbenfreudige Form der Callistus-Gruppe aus Kolumbien. Aquarien-und Terrarien-Zeitschrift 9(12):312-313.

- Sterba, G. 1970. Süsswasserfische aus alles Welt, Teil 1. 2nd edition, Urania Verlag, Leipsig, Jena, Berlin. 350 pp. 144 plates.
- Weitzman, S. H., and W. L. Fink. (in press). Interrelationships of the neon tetras, a unique group of South American characids (Pisces), with comments on the interpretation of the phylogeny of New World characoid fishes. Smithsonian Contrib. Zool.

Department of Vertebrate Zoology, National Museum of Natural History, Washington, D.C. 20560.

Addendum.—After this paper went to press two large live specimens, about five or six years old, (USNM 216969, a male 55.6 mm and a female 56.3 mm SL) of H. socolofi were received from Mr. Rosario La Corte. These specimens indicate that H. socolofi, as H. erythrostigma, reaches between 50 and 60 mm in standard length. The morphological characters distinguishing H. socolofi from H. erythrostigma are evident in these additional specimens.

PROC. BIOL. SOC. WASH. 90(2), pp. 348–357

# A NEW SPECIES OF CHARACOID FISH, HYPHESSOBRYCON DIANCISTRUS, FROM THE RÍO VICHADA, ORINOCO RIVER DRAINAGE, COLOMBIA, SOUTH AMERICA (TELEOSTEI: CHARACIDAE)

### Stanley H. Weitzman

The new species of characid fish described here, *Hyphessobrycon diancistrus*, was found in a small collection of South American fishes donated to the Smithsonian Institution by Mr. Ross Socolof. The specimens came from the Río Vichada and from small isolated lakes along a short distance of its course. The Río Vichada is a tributary of the Río Meta in Colombia.

Hyphessobrycon diancistrus is another example of a small, elongate species of freshwater fish, especially ostariophysans, having parts of the distal caudal-fin lobes black. There are many freshwater fishes with black markings on their dorsal and ventral caudal-fin lobes. For example, certain species of the African characoid genera Paraphago Boulenger and Eugnathichthys Boulenger, the South American characoid genera Leporellus Lütken and Prochilodus Agassiz, and the southeast Asian cyprinid genus Barbus Cuvier bear contrasting black markings on their caudal-fin lobes. Among the catfishes, the Asian bagrid genus Leiocassis Bleeker, the South American pimelodid genus Microglanis Eigenmann, the callichthyid genera Corydoras Lacépède and Dianema Cope, and the loricariid genera Hemiancistrus Bleeker and Otocinclus Cope, among several others, have member species with contrasting black marks on their caudal fins. Convergence towards this type of color pattern appears fairly common in freshwater fishes. There are many species of freshwater fishes which have their caudalfin lobes of other strongly contrasting colors. For example the distal white tips on the lobes of the South American characids Hemigrammus nanus (Lütken) and Boehlkea fredcochui Géry contrast with the golden body color of the former and with the reflected blue of the latter. The red caudal-fin lobes (and red dorsal fin) of southeast Asian Rasbora heteromorpha Duncker show very strongly at least to human eyes in contrast to the deep blue to black mark on the posterior half of the body. The many species in the African cyprinodontid genus Aphyosemion Myers and its relatives have a variety of contrasting colors in their dorsal and ventral caudalfin lobes.

Many additional fishes with distinctly contrasting caudal-fin colors could be listed but the numbers with a single black patch or large spot confined to the distal portion or center of each caudal-fin lobe (often contrasted by a white spot or spots) are relatively few. Such a pattern is found

#### VOLUME 90, NUMBER 2

in the southeast Asian cyprinid fish *Rasbora trilineata* Steindachner and the South American characids *Moenkhausia dichoroura* (Kner) and *Hemigrammus rhodostomus* Ahl.<sup>1</sup> A similar color-contrasting pattern occurs in *Hyphessobrycon diancistrus* although there is no information about the presence of white in the caudal fin of this fish.

The behavioral significance of this color pattern remains unstudied in nearly all the mentioned fishes and its behavioral role undoubtedly varies much among them. Brittan (1954:83) has noted that for Rasbora trilineata the color patern is obvious in life and in this particular species the caudal-fin lobes "flick" toward each other when the fish suddenly moves. He speculates that possibly this provides a sudden and confusing diversion while the fish moves away from a predator or perhaps the pattern serves a function of communication during courtship or both. Hemigrammus rhodostomus apparently does not display the same kind of swimming motion as Rasbora trilineata. However, members of the characoid genus Prochilodus bearing black and white marked caudal-fin lobes do have a somewhat similar swimming motion or tail "flick" as they begin movement. I have not seen Moenkhausia dichoroura alive. Whatever the function or functions of the various contrasting marks in caudal-fin lobes may be in the species bearing them, it is a pattern of repeated convergence occurring in a wide variety of families and genera of freshwater fishes.

# Hyphessobrycon diancistrus, new species Figs. 1–5, Table 1

Holotype.—USNM 216607, male 25.2 mm SL: Colombia, State of Vichada, Río Vichada, about 50 km west of San José de Ocuné (70°20'W, 4°14'N), Orinoco river basin, collected by Ross Socolof, July 3–5, 1974.

*Paratypes* (all with the same locality data as holotype).—MZUSP 13179 and 13180, 1 male 25.9 and 1 female 25.0 mm SL; BMNH 1977.1.12.1–2, 1 male 23.2 and 1 female 24.1 mm SL; USNM 216606, 1 male 25.9 and 1 female 24.8 mm SL.

*Diagnosis.*—This species may be distinguished from all other known members of genus *Hyphessobrycon* by its possession of two very large bony hooks (in males) curving dorsally on each side of its anal fin (see Figs. 2 and 3), anterior hook longest, being a process of fourth anal-fin ray and posterior, smaller hook a process of fifth (first dichotomous) analfin ray. Caudal-fin rays black for part of distal one-third of their length. Distal tips of caudal-fin rays and adjoining membrane translucent, without black pigment.

*Description.*—See Table 1 for morphometrics of all specimens. Methods of counting and measuring characoids follow Fink and Weitzman (1974). Body elongate, slender, with sides compressed. Greatest depth at anterior



#### VOLUME 90, NUMBER 2

	Paratypes							
	Holotype රි	8	8	8	Ŷ	ę	ę	x
Standard length	25.2	23.2	24.9	25.9	24.1	25.0	25.8	24.9
Greatest depth	21.8	20.7	22.0	21.2	19.9	22.4	22.5	21.5
Snout to dorsal-fin origin	50.8	50.9	48.6	52.1	50.6	50.8	51.6	50.8
Snout to pectoral-fin origin	26.2	26.3	26.9	25.9	26.1	25.6	26.4	26.2
Snout to pelvic-fin origin	47.2	49.1	48.6	49.0	47.7	47.6	49.6	28.4
Snout to anal-fin origin	65.9	67.2	66.7	66.4	66.4	65.6	67.4	66.5
Peduncle depth	10.3	9.1	10.4	9.7	8.7	10.4	9.3	9.7
Peduncle length	17.9	16.8	15.7	17.0	18.7	17.6	17.1	17.3
Pectoral-fin length	20.6	21.6	19.7	21.2	17.0	19.2	19.0	19.8
Pelvic-fin length	17.9	17.7	16.9	18.9	16.2	17.2	16.3	17.3
Dorsal-fin length	23.8	25.0	24.1	24.7	22.0	25.2	23.3	24.0
Anal-fin length	15.1	17.7	15.3	15.4	14.5	16.0	15.9	15.7
Head length	25.0	25.0	25.3	25.1	24.1	23.6	24.0	24.6
Eye diameter	9.5	9.9	9.2	9.7	9.5	9.2	9.7	9.5
Snout length	5.6	6.5	5.6	6.6	6.2	6.0	6.2	6.1
Interorbital width	7.9	6.9	7.6	7.3	7.1	8.0	7.4	7.5
Upper jaw length	8.3	9.1	8.8	8.9	8.7	8.4	8.9	8.7
Eye to dorsal-fin origin	36.5	35.8	37.4	38.6	36.9	37.6	37.6	37.2
Dorsal-fin origin to								
caudal-fin origin	52.8	51.3	53.0	52.1	49.4	54.0	53.1	52.2

Table 1. Morphometrics of *Hyphessobrycon diancistrus*, new species. Standard length is expressed in mm. Other figures are percentages of standard length.

dorsal-fin origin. Predorsal body profile slightly convex from nape to anterior dorsal-fin origin. Dorsal head profile slightly convex. Body profile at base of dorsal fin nearly straight and slightly convex between posterior termination of dorsal fin and adipose fin. Posterior to adipose fin, body profile slightly concave as it is between posterior termination of anal fin and origin of ventral caudal-fin lobe. Base of anal fin nearly straight. Ventral head profile convex, especially in area ventral to opercular region. Belly from region of pectoral girdle to vent nearly straight. Head of moderate length, snout blunt and mouth terminal. Posterior tip of maxillary bone extends to a point nearly reaching a line extending ventrally from anterior border of eye. Ventral maxillary border nearly parallels ventral mandibular profile with mouth closed. Eye large in proportion to head, about 2.5–2.7 in head (about 38% of total head length).

Teeth mostly multicuspid, usually in 2 rows on premaxillary; 2 rows in holotype (1 row in one specimen, 2 rows in four specimens); outer row of 1 or 2 usually tricuspid teeth. Inner premaxillary row with 4 large teeth bearing 4 or 5 cusps. Some specimens with a very small laterally placed conic to tricuspid fifth tooth which can usually be seen only in alizarin preparations (see Fig. 4). Maxillary bone toothless. Dentary with one row 352





Fig. 3. Anterior six rays of anal fin of a male, 24.9 mm SL, USNM 216606, a paratype of Hyphessobrycon diancistrus. The fifth ray, bearing the second hook is the first fin ray to be dichotomously branched.

of eight teeth; anterior 3 very large and with 4 to 5 cusps; fourth tooth intermediate in size and with 2 to 3 cusps; fifth through eighth teeth small, unicuspid (see Fig. 5). All palatine and pterygoid bones toothless. Branchiostegal rays 4; ceratohyal with 3 rays, epihyal with 1 ray. Gill rakers moderately elongate 8/16 in all specimens. Frontal-parietal fontanel well developed, separating parietals completely. Frontals in contact only at



Fig. 4. Lateral view of the maxillary and premaxillary bones of a male, 24.9 mm SL, paratype, USNM 216606, of Hyphessobrycon diancistrus. Anterior is to the right. Note that the third tooth is the only tooth of the outer row. The fourth and smallest tooth of the inner row is in a state of dissolution preparatory to being replaced.

353

their junction with ethmoid and at epiphyseal bar. Antorbitals well ossified, but fifth and sixth infraorbital bones ossified around sensory tubes only. Third infraorbital bone not in contact with sensory tube of preopercle. Lateral extrascapular bone present, primary and secondary pectoral girdle bones not markedly reduced.

Dorsal fin ii,8,i and anal fin iv,14 in all specimens. Pectoral fin i,11,i in holotype (i,10 in one specimen, i,10,i in four specimens, and i,11,i in one specimen). Pelvic fin ii,7 and principal caudal-fin rays 10/9 in all specimens. Adipose fin present. Anal fin of males with 2 enlarged hooks mostly buried in thick flesh (see Figs. 2 and 3). Anterior and largest hook always on fourth and largest undivided ray; second and smaller hook on fifth ray (first branched ray).

Scales belonging to third horizontal scale series and lying ventral to dorsal fin, having exposed field of concentric circulae and 5 to 6 exposed radii; 7 to 8 radii visible in scale removed from body so that dorsal and ventral fields have one radial groove each. Scales in a lateral series 32 in holotype (31 to 33); 4 scales above lateral line to anterior dorsal-fin base and 3 scales below lateral line to anal-fin base; 6 to 7 perforated lateral-line scales; 10 median predorsal scales (11 in one specimen). Total vertebrae 32 (32 in two and 33 in three specimens).

Color in alcohol.-Ground color pale yellowish white with dark narrow midside horizontal stripe extending from just posterior to dorsal termination of opercular opening to dark blotch on posterior termination of caudal peduncle. Stripe occurs along junction between epaxial and hypaxial muscle masses. Stripe very narrow anterior to an imaginary vertical line taken from midbase of dorsal fin. Posterior to that point horizontal stripe increases in width until it merges with caudal-peduncle spot. Scales on back (from nape to dorsal caudal-fin origin) bordered by dark brown chromatophores. Anterior to dorsal fin this includes only median predorsal scales and posterior borders of each scale of scale row just ventral to median row. Scale row just ventral to dorsal-fin base and dorsal portion of borders of scales in scale row just ventral to this row also posteriorly bordered by dark brown chromatophores. These same scale rows continue to adipose fin with same pigmentation. From adipose fin to dorsal area of caudal-fin root, scales of dorsal median scale row and scale row of each side just lateral to median row bordered by dark brown chromatophores. Body along anterior two-thirds of anal-fin base outlined in dark pigment at junctions of inclinator muscle masses with each other (see Fig. 2). No well-developed humeral spot but a few scattered dark chromatophores in humeral area posterior to operculum. Belly nearly white.

Head with dense patch of dark brown chromatophores dorsal to brain in region of frontal-parietal fontanel just posterior to epiphyseal bar. Anterior to epiphyseal bar, skin dorsal to frontal-parietal fontanel with thinly

354



Fig. 5. Medial view of the anterior tooth-bearing portion of the dentary of a male 24.9 mm SL, paratype, USNM 216606. The replacement teeth of the large teeth are placed in pits posterior to their respective large functional teeth. The replacement teeth of the smaller unicuspid teeth are not in pits but simply lie in the flesh posterior to their respective functional teeth.

scattered dark brown chromatophores and these nearly absent along midline in this area. Scattered dark brown chromatophores dorsal to snout, between nares, in skin external to premaxillary bones, on dorsal portion of maxillary bones and on symphyseal area of lower jaw. Small dark brown chromatophores along posterior ventral border of orbit. Remainder of head white.

Dorsal fin with a distal dark brown blotch confined to fourth through ninth fin rays; a few scattered dark chromatophores along proximal half of each of first 6 dorsal-fin rays (see Fig. 1). Adipose fin with scattered dark brown chromatophores along its dorsal border. Anal fin with dark brown chromatophores along most of length of second through fifth branched fin rays, otherwise fin hyaline. Caudal fin hyaline except for a dark blotch in midregion of both dorsal and ventral lobes (see Fig. 1). Pectoral and pelvic fins hyaline. Distribution of dark pigment same in both sexes. Color in life unknown.

Etymology.—From the Greek prefix *di*- meaning two and the Greek ankistron meaning fishhook.

Relationships.—The relationships of this species to other species of characids remain unknown. It is here placed in the genus Hyphessobrycon Durbin only on the basis of its possession of the characters used by Eigenmann (1917) to define that genus (few if any teeth on maxillary, an adipose fin present, an incomplete lateral line, with the third orbital bone [second



Weitzman, Stanley H. 1977. "A new species of characoid fish Hyphessobrycon diancistrus, from the Rio Vichada River drainage, Colombia, South America (Teleostei: Characidae)." *Proceedings of the Biological Society of Washington* 90, 348–357.

View This Item Online: <u>https://www.biodiversitylibrary.org/item/120622</u> Permalink: <u>https://www.biodiversitylibrary.org/partpdf/50091</u>

**Holding Institution** Smithsonian Libraries and Archives

**Sponsored by** Biodiversity Heritage Library

**Copyright & Reuse** 

Copyright Status: In copyright. Digitized with the permission of the rights holder. Rights Holder: Biological Society of Washington License: <u>http://creativecommons.org/licenses/by-nc-sa/3.0/</u> Rights: <u>https://biodiversitylibrary.org/permissions</u>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at https://www.biodiversitylibrary.org.