

Hyphessobrycon pando sp. n., a new rosy tetra from northern Bolivia (Teleostei, Characiformes, Characidae)

Hyphessobrycon pando sp. n., ein neuer Rosensalmmler aus dem nördlichen Bolivien (Teleostei, Characiformes, Characidae)

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Summary: A new characid fish, *Hyphessobrycon pando* sp. n., from northern Bolivia, departamento Pando, is described. Having a red body colour, a distinct humeral spot and a characteristic black dorsal spot this species apparently belongs to the putative rosy tetra clade introduced by WEITZMAN & PALMER (1997). *Hyphessobrycon pando* sp. n. is distinguished from *H. eques* by the following characters: maxillary with six to eight (rarely five) conical to tricuspid teeth. The teeth of the premaxillary are solely conical to tricuspid as well. The dark margin of the anal fin is much less pronounced and does not reach the caudal base of the anal fin. The black dorsal spot often ends medially in a rounded tip and, at the posterior rays, is clearly separated from the base of the fin. The humeral spot is anterior and posterior margined by light zones. From all species of the extended *Hyphessobrycon bentosi*-group the new species is distinguished by the characteristically black humeral spot with light zones and the short dorsal fin of the male.

Key words: Characidae, *Hyphessobrycon*, Manuripi, Bolivia, Pando

Zusammenfassung: Es wird eine neue Salmmlerart, *Hyphessobrycon pando* sp. n. (Characidae) aus dem nördlichen Teil Boliviens, Departamento Pando, beschrieben. Die Art hat eine rote Körperfärbung, einen deutlichen Schulterfleck, einen charakteristischen schwarzen Dorsalfleck und wird der nach WEITZMAN & PALMER (1997) möglicherweise existierenden Rosy Tetra-Clade zugeordnet. Von *H. eques* unterscheidet sich *H. pando* sp. n. durch folgende Merkmale: Maxillare mit sechs bis acht, selten fünf, konischen bis dreispitzigen Zähnen, die Zähne im Prämaxillare sind auch ausschließlich konisch bis dreispitzig, der dunkle Randstreifen der Analflosse ist deutlich schwächer ausgeprägt und führt caudal nicht bis zur Basis, der schwarze Dorsalfleck läuft auf den mittleren Strahlen ventral zu einer abgerundeten zentralen Spitze aus und ist auf den caudal gelegenen Strahlen deutlich von der Basis entfernt. Der Schulterfleck ist anterior und posterior von hellen Zonen begrenzt. Von allen Arten der erweiterten *Hyphessobrycon bentosi*-Gruppe unterscheidet sich die neue Art durch Form und Farbe des Schulterflecks und die kurze Dorsalflosse des Männchens.

Schlüsselwörter: Characidae, *Hyphessobrycon*, Manuripi, Bolivien, Pando

Resumen: Se describe una especie de la familia Characidae – *Hyphessobrycon pando* sp. nov. – del Norte de Bolivia, Departamento Pando. A raíz de su color rojo, una marcada mancha humeral y una característica mancha dorsal negra, la especie debe pertenecer al presunto “Rosy Tetra Clade” establecido por WEITZMAN & PALMER (1997). De *H. eques* *H. pando* se diferencia por los siguientes caracteres: Maxilar con seis a ocho (rara vez cinco) dientes cónicos a tricúspides. Los dientes del premaxilar son todos cónicos a tricúspides. La banda marginal oscura de la aleta anal es mucho menos marcada y caudalmente no llega a su base. La mancha negra dorsal se prolonga en los radios mediales ventrales formando una punta redondeada y en los radios posteriores está claramente apartada de la base. Ala mancha humeral está enmarcada por zonas claras tanto en su extremo craneal como caudal. De las especies del grupo *Hyphessobrycon bentosi* la nueva especie se diferencia entre otros por la marcada mancha humeral negra con límites claros y una corta aleta dorsal del macho.

1. Introduction

Today about 120 valid characid species are assigned to the genus *Hyphessobrycon* Durbin, 1908 (ESCHMEYER 2008). Included are all taxa originally forming the genus *Megalampodus* Eigenmann, 1915. GERY (1977) has divided this large genus for practical reasons into several groups by using simple external features.

GERY (1977) introduced the *Hyphessobrycon callistus* group. WEITZMAN & PALMER (1997) synonymized *H. callistus* with *H. eques*. Accordingly, this group is dealt with as *H. eques* group herein. The species of the *H. eques* group are characterised by a conspicuous black dorsal spot, underlined by a white, yellow or reddish zone. All have a reddish body colour and a more or less distinct humeral spot. Two subgroups can be distinguished by the number of teeth on the upper jaw. The species of the *Hyphessobrycon eques* subgroup bear 2-3 teeth on the maxillary and maximally six in the inner row of the premaxillary. The fishes of the *Hyphessobrycon bentosi* subgroup are characterised by 4-11 teeth on the maxillary and 6-10 in the inner row of the premaxillary. WEITZMAN & PALMER (1997) extended this subgroup in their description of *Hyphessobrycon epicharis* by *Hyphessobrycon pyrhoneotus*, *Hyphessobrycon socolofi*, and *Hyphessobrycon weneri*.

2. Material and methods

Hyphessobrycon pando sp. n. was collected in Bolivia during a trip as part of a research agreement between the Centro de Investigación Recursos Acuáticos of the University of Trinidad, Bolivia, the Centro de Investigación y Preservation de la Amazonia of the University of Cobija, Bolivia, and the Staatliches Museum für Tierkunde in Dresden, Germany (figs. 1, 2).

Measurements were taken as described by FINK & WEITZMAN (1974) by using an analogue calliper. In addition, the distance between the most anterior point of the dorsal fin and the origin of the caudal fin base, the postdorsal distance, was measured. All morphometric

measurements other than standard length (SL) are expressed as a percentage of SL, with the exception of the four subunits of the head, which are presented as percentage of head length (tab. 1).

In the following text, the first morphometric data refer to the holotype, the second to the mean value of the specimens examined; the range is given in brackets. A simplified method after TAYLOR & VAN DYKE (1985) was used for clearing and staining. Counts for the vertebrae and gill rakers were taken from the cleared and stained specimens (n = 3). The Weberian apparatus (four vertebrae) and the urostyle (fig. 4 f) are included.

For the SEM photos the tissue was removed manually under a microscope (40 x). The bones were fixed and spattered with gold. The water parameters were measured with a Bischof L17 (conductivity) and a Selzle Pocketline (pH).

Abbreviations: CIPA = Centro de Investigación y Preservation de la Amazonia of the University of Cobija, Bolivia; CIRA-UTB = Centro de Investigación de Recursos Acuáticos de la Universidad del Beni (Trinidad), Bolivia; MTD F = Staatliche Naturhistorische Sammlungen Dresden, Museum für Tierkunde, Fischsammlung, Dresden, Germany; ZFMK = Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany; SL = Standard length

3. Results

Hyphessobrycon pando sp. n.

Holotype (fig. 3 a): ZFMK 41452, 35.4 mm SL, Bolivia, Departamento Pando, Rio Manuripi, near to Puerto Cardenas (11 20 083 S, 67 44 576 W), coll. G. HEIN, H. LÄNGERT, J. ZAPATA, A. ZARSKE, leg. 12.05.2001.

Paratypes: CIRA-UTB 973 a-c, three adults, 29.3-32.0 mm SL; same data as holotype MTD F 30756-30758, three adults 28.8-30.0 mm SL, same data as holotype; ZFMK 41453-41456, 4 adults, 27.4-36.7 mm SL, same data as holotype.

No types: ZFMK 41457-41459, 3 adults, same data as holotype, cleared and stained.

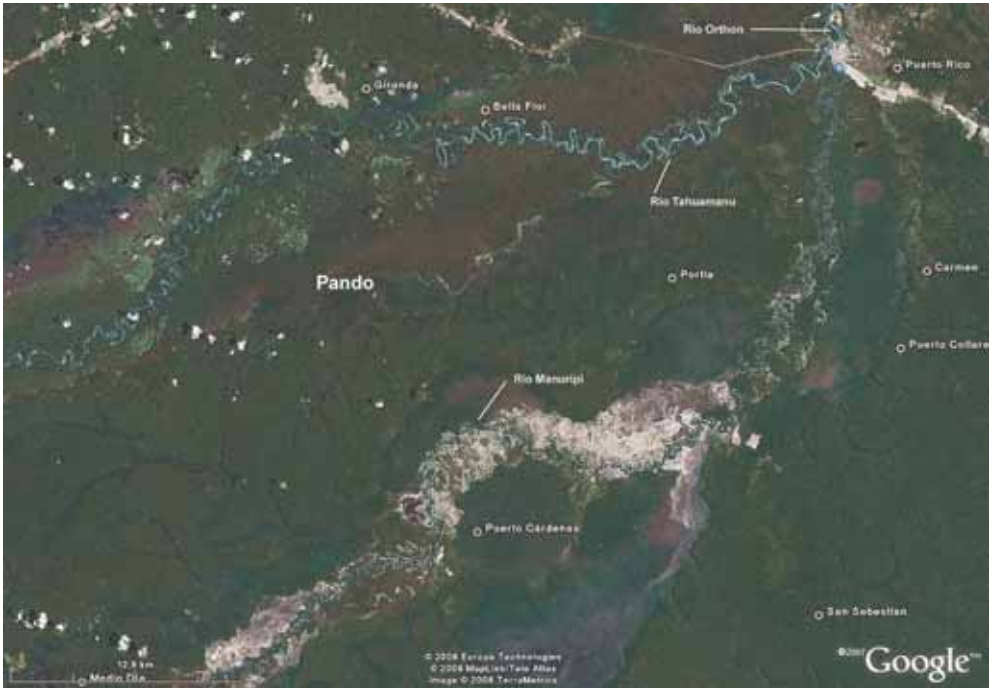


Fig. 1: Satellite map of the Bolivian Departamento Pando, showing Rio Manuripi and type locality near Puerto Cardenas (from Google Earth).

Abb. 1: Satellitenaufnahme der bolivianischen Provinz Pando mit dem Rio Manuripi und der Typuslokalität bei Puerto Cardenas (aus Google Earth).



Fig. 2: Type locality of *Hyphessobrycon pando*, Rio Manuripi, Bolivia.

Abb. 2: Typusfundort von *Hyphessobrycon pando*, Rio Manuripi, Bolivien.



3.1. Diagnosis

Two rows of teeth in the upper jaw, an unscaled caudal-fin and an incomplete lateral line are characteristics of the genus *Hyphessobrycon*. The red body colour, the black humeral and dorsal spot and a deep body assign *H. pando* sp. n. to the putative rosy tetra clade introduced by WEITZMAN & PALMER (1997).

The combination of the following characteristics is typical for *H. pando*. six to ten conical to tricuspid teeth on the inner row of the premaxillary and one to four conical teeth on the outer row. The maxillary shows five to eight conical to tricuspid teeth. Eight gill rakers are on the dorsal limb and thirteen on the ventral. The black humeral spot is anterior and

posterior margined by a light zone. A black dorsal spot converges ventrally to a more or less rounded tip. Within the *Hyphessobrycon bentosi* group there are only two congeners with similar tooth pattern and a distinct black humeral spot, *H. weneri* and *H. epicharis*. Both have a long horizontally extended humeral spot and prolonged dorsal fins in males vs a round spot often with small expansions above and below and a short dorsal fin in the new species. *H. pando* sp. n. has a well developed infraorbital four vs reduced to the laterosensory channel without dermal bones in *H. weneri*. The tips of the anterior rays of the pelvic and anal fins are white vs coloured in *H. epicharis*.

All species of the *H. bentosi* and *H. eques* subgroups including *Hyphessobrycon pando* sp.n.

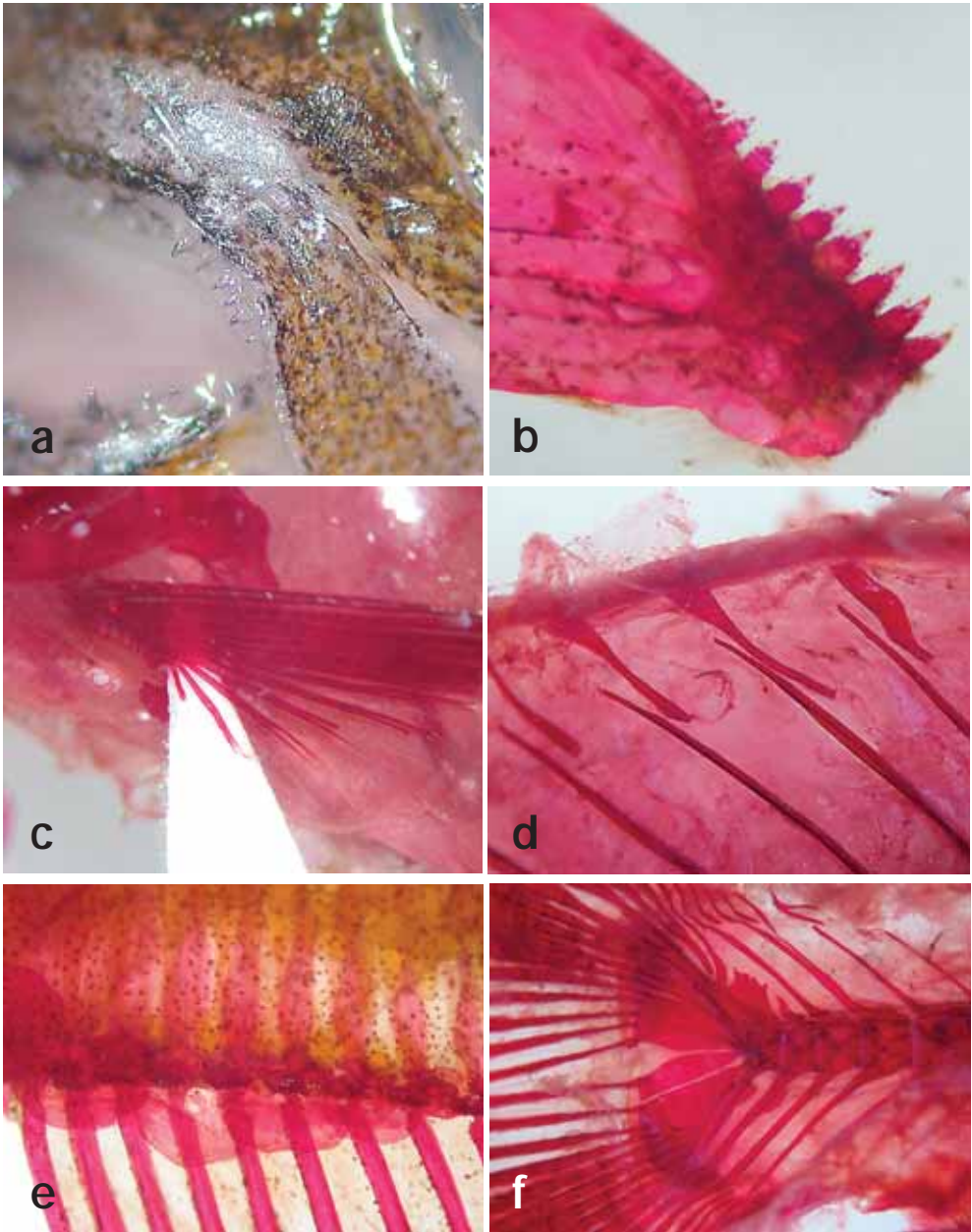
Tab. 1: Morphometrics of *Hyphessobrycon pando*.

Tab. 1: Morphometrie von *Hyphessobrycon pando*.

	Holotype	Mean n = 10	Sd	Range
Standard length (mm)	35.4	30.7	2.88	27.4 - 36.7
Body depth	34.7	34.5	1.25	32.1 - 35.9
Snout to dorsal-fin origin	47.5	47.5	0.77	46.3 - 49.0
Dorsal-fin origin to caudal fin base	57.3	56.8	1.42	54.2 - 58.8
Snout to pelvic-fin origin	43.8	44.5	1.67	41.6- 46.7
Snout to anal-fin origin	56.5	58.5	1.19	56.5 - 60.2
Anal-fin base length	36.7	34.5	1.62	32.9 - 37.6
Anal-fin lobe length	20.1	20.5	1.51	18.8 - 22.1
Dorsal-fin base length	16.9	14.8	1.01	13.1 - 16.9
Dorsal-fin lobe length	30.5	28.1	1.52	24.6 - 30.5
Pectoral-fin length	21.5	21.3	1.06	19.1 - 23.0
Pelvic-fin length	20.6	17.9	1.56	15.6 - 20.6
Caudal peduncle length	11.9	13.2	0.87	11.9 - 14.7
Caudal peduncle depth	9.6	10.0	0.67	8.3 - 10.6
Bony head length	26.3	26.1	1.16	24.0 - 27.0
Snout length	15.1	13.9	1.42	11.7 - 15.8
Maxillary length	46.2	41.9	3.64	35.8 - 48.7
Horizontal eye diameter	47.3	43.9	2.58	39.5 - 48.1
Least interorbital width	32.3	31.0	1.60	28.8 - 33.8

Figs. 3 a-d: *Hyphessobrycon pando*. **a** Holotype, ZFMK 51452; **b** specimen photographed at the collecting locality; **c** three year old male, F1, not preserved; **d** three year old female, F1.

Abb. 3 a-d: *Hyphessobrycon pando*. **a** Holotyp, ZFMK 51452; **b** am Fangplatz fotografiertes Exemplar; **c** drei Jahre altes Männchen, F1, nicht konserviert; **d** drei Jahre altes Weibchen, F1.



Figs. 4 a-f: Osteology of *Hyphessobrycon pando* sp. n. **a** Maxillary, external lateral view, left side, ZFMK 41456. **b** Dentary teeth, lateral view, right side, ZFMK 41457. **c** small unbranched ray of pectoral fin, left side, ZFMK 41457. **d** supraneuralia, lateral view, right side, 41457; **e** scales of anal sheath, left side, ZFMK 41457. **f** hypural bones and associated vertebral elements, lateral view, right side, ZFMK 41457.

Abb. 4 a-f: Osteologie von *Hyphessobrycon pando* sp. n. **a** Maxillare, äußere seitliche Ansicht, linke Seite, ZFMK 41456. **b** Mandibulare, seitliche Ansicht, rechte Seite, ZFMK 41457. **c** Kleiner, ungeteilter Strahl der Brustflosse, linke Seite, ZFMK 41457. **d** Supraneuralia, seitliche Ansicht, rechte Seite, 41457. **e** Schuppen des Analschildes, linke Seite, ZFMK 41457. **f** Hypurale Knochen und anschließende Wirbelelemente, seitliche Ansicht, rechte Seite, ZFMK 41457.

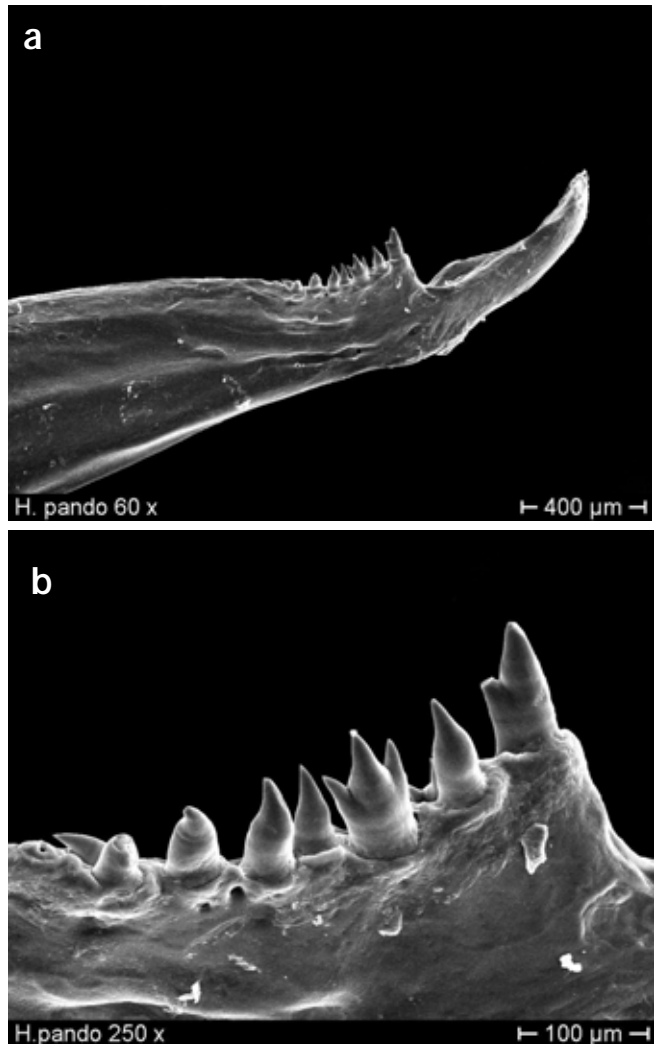
were assigned to a putative rosy tetra clade (WEITZMAN & PALMER 1997) including fishes of other genera like *Hemigrammus*, *Moenkhausia*, *Parapristella* etc.

3.2. Description

With a mean SL of 30.7 (27.4-36.7) mm *H. pando* is a medium sized member of the genus *Hyphessobrycon*. Body compressed, relatively deep. All investigated specimens were adults of both sexes. The dorsal head profile is straight to slightly convex; in the supraoccipital area it is concave, this is more expressed in larger

specimens. The straight basis of the dorsal fin is sloping.

From the anterior tip of the snout to the end of the anal fin the ventral body profile is more or less convex. The basis of anal fin is straight inclining; the caudal peduncle is slightly concave. The caudal fin is deeply forked, rays 1/17/1, rarely 1/16/1 (fig 4e). The mean head length 26.3; 26.1; (24.0-27.0) % of SL. Maxillary length declining obliquely, ending at a vertical line through the anterior margin of the orbital cavity, relatively long and ending with a triangular skinny prolongation in many specimens. Origin of dorsal fin (ii, 8-9 rays) slightly anterior to



Figs. 5 a-b: Dentition of *Hyphessobrycon pando* sp. n. **a** Maxillary, left side, external view, ZFMK 41459; **b** enlarged view.

Abb. 5 a-b: Bezahnung von *Hyphessobrycon pando* sp. n. **a** Maxillare, linke Seite, Ansicht von außen, ZFMK 41459; **b** vergrößerte Ansicht.

body midst, second branched ray longest, not elongated in males. There are eight predorsal scales in a straight line.

Anal fin (iii, 22-25 rays) originates nearly under the end of dorsal fin. The first five branched rays are prolonged, the first and second ones are the longest. The consecutive part of the fin is nearly straight or slightly concave. The length of the rays declines slightly. About one quarter of each ray is distally simply branched, all segments without hooks. Anal shield with five to six scales ending at the fifth branched ray.

The pectoral fin (i, 12 rays) overlaps the ventral fin slightly (smallest ray not branched, only detectable in the cleared and stained specimens (fig. 4 c). The ventral fin (i, 6-7 rays) overlaps the anal fin slightly.

Premaxillary with six to ten conical to tricuspid teeth in the inner row and 1-4 conical teeth in the outer row (figs. 4 a, b, 5 a, b).

Maxillary with five to eight conical to tricuspid teeth, often solely conical teeth. Row somewhat irregular, tricuspid teeth may be located in different positions (fig. 4 b). Six to eight tricuspid teeth on the mandibular (figs. 4 a, b), slightly graduated distally to symphysis, followed by three to ten very small conical teeth. All teeth are narrow with a dominating central cusp.

The lateral line is slightly declining, rarely nearly straight, five to six scales are perforated. 5-6/1/3 transverse scales and 29-32 longitudinal scales, 12 scales around the caudal peduncle and 8 predorsal ones. 34 vertebrae and 8/13 gillrakers, four branchiostegals and four supraneuralia (fig. 4 d).

3.3. Colour in life

The body colour is red except for the silvery shining breast (figs. 3 b, c, d). A dusky vertical line proceeds through the eye. Basis of dorsal-fin yellowish to reddish brown, sometimes even red. A black dorsal spot at the first 5-6 rays, converging at the base, ending distinctly before the base of the fin. Tips of anterior 2-4 rays white, last 4-5 rays nearly hyaline with some dark chromatophores. The black humeral spot is anteriorly and posteriorly margined by a light

zone. The spot is rounded, often with a converging less dusky ventral extension with less chromatophores. Pectoral fins hyaline with very few chromatophores, ventral fins red with a dusky margin, about one third of the unbranched ray white. Anal fin red, margined by a small dusky line not diverging posterior and not reaching the base of the fin. No white margin, only about one third of the longest unbranched ray is black and white margined. Adipose fin reddish. Caudal fin red, margined dusky.

3.4. Colour in alcohol

The body colour is light brown scattered with dark brown chromatophores with the exception of the breast. The breast is light with lightly tanned colouration caused by better visible chromatophores. The scales of the upper body half are margined dark brown. Black humeral and dorsal spot present. Base of dorsal fin and about one third of caudal fin and anal fin reddish brown.

3.5. Habitat

In its lower part, the Rio Manuripi is a typical blackwater river with loamy banks and without rooting water plants (fig. 2). Only an undetermined *Utricularia* species was found. At the type locality a pH of 5.9 and a conductivity of 15 $\mu\text{S}/\text{cm}$ were measured. At the upper part of the stream the water became lighter and the pH and the conductivity increased.

The Rio Manuripi is extremely rich in fishes with a large variety of small characid species, e.g. *Carnegiella myersi*, *C. strigata*, *Hemigrammus unilineatus*, *H. lunatus*, *H. neptunus*, *Moenkhausia sanctaefilominae*, *M. coletti*, *M. oligolepis*, *M. dichroua*, *Gymnocorymbus thayeri*, *Nannostomus trifasciatus*, *Iguanodectes spilurus*, *Paragoniates alburnus*, *Prionobrama filigera*, *Pyrrhulina vittata* etc.

3.6. Distribution

The distribution of *H. pando* seems not to be limited to northern Bolivia. In an article about

their excursion across the Rio Manu system in the southern part of Peru HOFFMANN & HOFFMANN (2007) have presented a photo of a fish very similar to *H. pando* in all visible characters. However, they did not preserve the specimen for further examination.

3.7. Etymology

The name is derived from Departamento Pando, federal state in Bolivia, where the type locality of *H. pando* at the Rio Manuripi is situated.

4. Discussion

Hyphessobrycon pando sp. n. has 5-8 teeth on the maxillary, 6-10 teeth in the inner row of the premaxillary and should therefore be assigned to the *Hyphessobrycon bentosi*-subgroup, which at present includes *Hyphessobrycon bentosi*, *H. epicharis*, *H. erythrostigma*, *H. pyrronotus*, *H. rosaceus*, *H. socolofi*, *H. weneri*, and *H. pando*. All subgroup species are distinguished from *H. pando* by the colour and shape of the humeral spot and the elongated dorsal fin of the males. The “bleeding heart” tetras *H. erythrostigma*, *H. pyrronotus* and *H. socolofi* possess a red humeral spot whilst alive. *H. rosaceus* and *H. bentosi* have a faint humeral spot and a dentary with pentacuspoid teeth (EIGENMANN 1917-1927). *H. epicharis* and *H. weneri* (GERY & UJ 1987) are closely related to *H. pando*, but have longitudinally extended humeral spots and the males have prolonged dorsal fins.

H. eques and all species of the *H. eques* subgroup have 2-3 maxillary teeth vs. 5-8 in *H. pando*. Additional distinguishing characters are: *H. copelandi* has light margins at the humeral spot, but is distinguished from *H. pando* by five tricuspid to pentacuspoid inner premaxillary teeth vs. six to ten conical to tricuspid teeth.

H. eques is a variable species. The humeral spot may vary, but the dorsal spot and the black margin of the anal fin seem hardly to change. This is based on descriptions of populations from French Guyana, most probably introduced by aquarists (PLANQUETTE et al. 1996), Brazil

(Estado de Mato Grosso do Norte) and Uruguay (ZFMK 51460-51463). The base of the dorsal spot approaches posterior the base of the fin. The black margin of the anal fin extends to the posterior base of the fin.

The base of the dorsal spot in *H. haraldschultzi* (TRAVASSOS 1960) is parallel to the body profile. *H. takasei* has a very large humeral spot. *H. georgettae* has no humeral spot at all.

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