

Scientific results of the Brazilian-Peru Expedition, Dr. K. H. Lüling, 1974.

## Notes on Certain Characoid Fishes (Order Cypriniformes) from Eastern and Southeastern Brazil <sup>1)</sup>

by

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During his ecological researches in Brazil, 1974, K. H. Lüling collected a few samples of fishes in the following rivers: (1) Riacho Campo Bello and riacho Itatiaia, into rio Paraíba do Sul, in the Parque Nacional do Itatiaia, about 170 km west of Rio de Janeiro, altitude 600—800 m. (2) Lower rio Jaguaripe, east of Salvador (formerly Bahia), and riacho Capivari, into rio Paraguaçu, about 5 km from Cruz das Almas, State of Bahia (Fig. 1).

The ichthyofauna of these basins is relatively poorly known, as compared with that of other parts of South America. The following report on the Characoids may thus be of interest. The species will be briefly

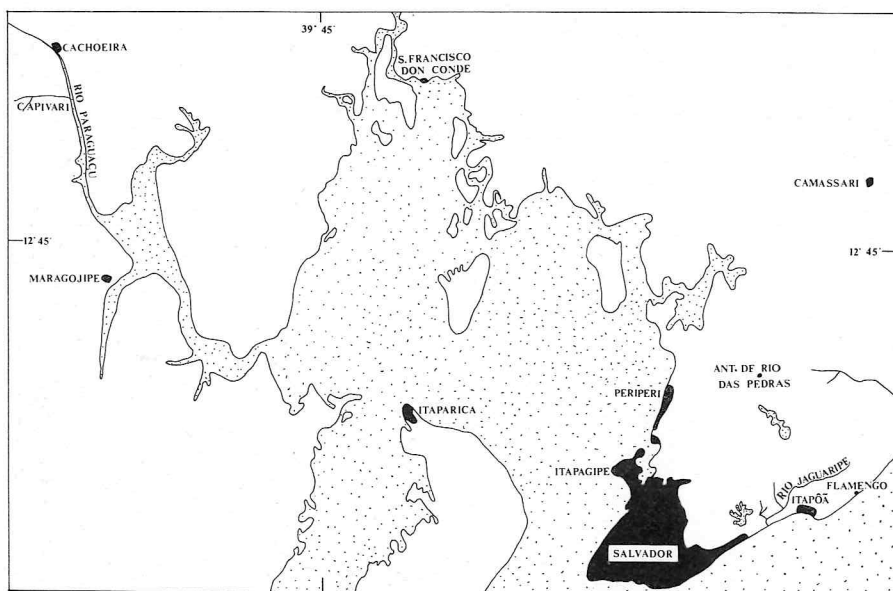


Fig. 1: Eastern Part of the State of Bahia.  
(Drawing: K. H. Lüling)

<sup>1)</sup> N° 68 of the author's series: Studies on characoid Fishes.

described, with emphasis put on the lesser-known ones, or the ones new for the region.

H. H. Lüling collected also in the rio Mage-Roncador (emptying into the Bay of Rio), which he already had described (Lüling, 1974). Besides *Oligosarcus hepsetus* and *Hyphessobrycon reticulatus*, which were already known from the brook, the 1974 collect brought back unpigmented specimens of a *Hyphessobrycon* (*reticulatus* ?) which will be discussed along with the other species from basins referred to above.

Dr. K. H. Lüling is here friendly thanked for his interest in the systematics of the fishes he is studying biologically, an interest that is too rare to be not celebrated, as well as for his excellent photographs of biotops (fig 2, 3 and 5).

Fam. **Erythrinidae**

*Hoplias macrophthalmus* (Pellegrin, 1907)

2 ex., largest 107 mm in standard length (S. L.), from a small riacho (Fig. 2) of the lower rio Jaguaripe (Fig. 3), east of Salvador, State of Bahia, coll. K. H. Lüling, June 26, 1974 (St. SA 3).



Fig. 2: Lower Rio Jaguaripe just before its mouth into the Atlantic.  
(Photo: K. H. Lüling)

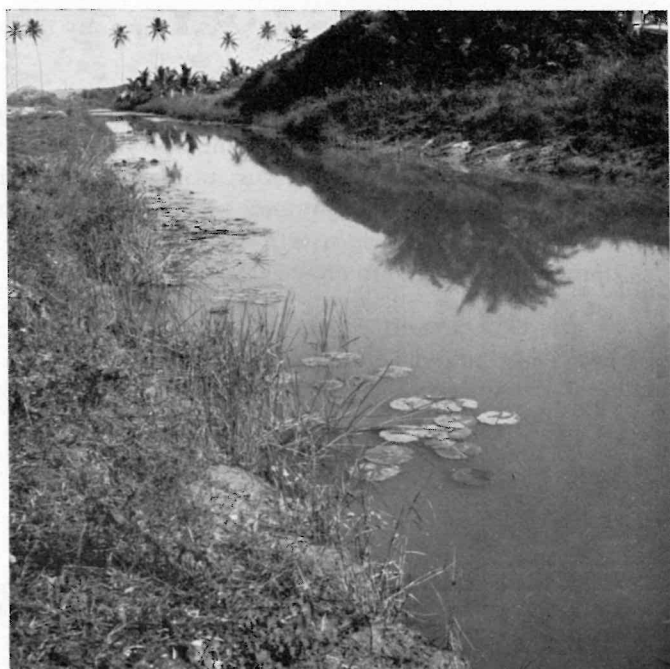


Fig. 3: A small riacho discharging into the lower Rio Jaguaripe.  
(Photo: K. H. L  ling)

Eye large, 16.7 in the S. L., oblique, partly visible from above; abdomen flat, not colored.

These characters suffice to separate the present small examples from the very common *H. malabaricus*, which has the eye vertical, somewhat smaller (18 to 20 in the S. L.), and the abdomen round and marbled. As far as known, the species is new for Eastern Brazil.

#### Fam. Lebiasinidae

*Nannostomus* sp. of the *beckfordi* G  nther, 1872 complex

Ca. 100 ex., largest 22 mm in S. L., from a small pound besides a riacho of the lower rio Jaguraibe, east of Salvador, State of Bahia, coll. K. H. L  ling, June 26, 1974 (St. SA 2).

3 small ex., id. (St. SA 3).

1 small ex., id., near a petrol station (Petrobras), not far from the lower rio Jaguaripe, coll. K. H. L  ling, June 29, 1974.

The present specimens are characteristic of the well-known "species" *N. beckfordi*, which, according to several karyotypes studied by J. J. Scheel (pers. comm.), could eventually be composed of 2 or more "bio-species".

According to the best student of the systematics of the Pencil-fishes, S. Weitzman (1966: 53; see also Weitzman and Cobb, 1975), they are restricted to the Amazon basin and the regions north of it, mainly Guianas, Colombia and Venezuela. It is very surprising to find such a characteristic species so far South and East. It may have propagated along the coast, starting from Belem do Para and surroundings, where *N. beckfordi* is common. However, there is a possibility that an aquarist (for example an engineer working at the Petrobras) released some in a neighbouring brook.

Fam. **Characidiidae**

*Characidium* cf. *oiticica* Travassos, 1967

1 ex., 23 mm in S. L., Eigeheiro Passos, Ribeiro Itatiaia, 13 km from Itatiaia, coll. K. H. Lüling, June 19, 1974 (St. RJ 7).

Body depth 4.6, pectoral fin 3.55, ventral fin 4.4 and head length 3.5 in the S. L.; predorsal 1.05 in postdorsal, preventral .9 in postventral, peduncle depth 1.45 in its length; eye somewhat ovate, the vertical diameter 1.2 in the horizontal diameter, 4.35 in the head length; bony interorbital 7.3, maxilla 5.45 and snout 4.7 in the head length.

Lateral line complete, with about 36 scales,  $4\frac{1}{2}/2$  in a transverse series, 9 or 10 in predorsal series (somewhat irregular), and 14 around caudal peduncle; isthmus not scaled, apparently 3 scales missing. Fins formulae: D. ii, 8; A. ii, 5 (?); P. iii, 11; V. i, 71. Mouth inferior; teeth tricuspidate, 7 on premaxilla on each side; two rows of teeth on mandible; pterygoid teeth not seen.

About 10 dark-brown transverse bars, well delimited on back; the three first and the two following ones united on the flank; a small, horizontally elongate caudal spot. Compared with the description of *C. oiticica*, the present small specimen differs mostly in not having the transverse spots united along the body axis, to form a more or less regular longitudinal band, but this could be a matter of preservation. In this species, the adipose fin is clearly in regression (none in the two paratypes, very small adipose fin in the present specimen).

*Jobertina bahiensis* (Almeida, 1971)

(Fig. 4)

2 ex., largest 20 mm in S. L., black-water brook Capivari (Fig. 5), about 5 km from Cruz das Almas (west of Salvador and south of Cachoeira), State of Bahia, coll. K. H. Lüling, July 3, 1974.

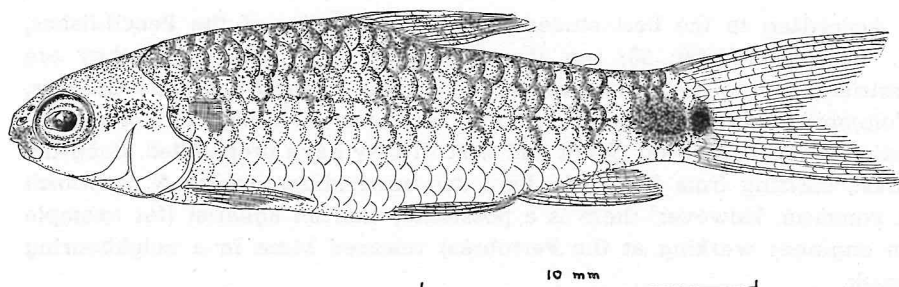
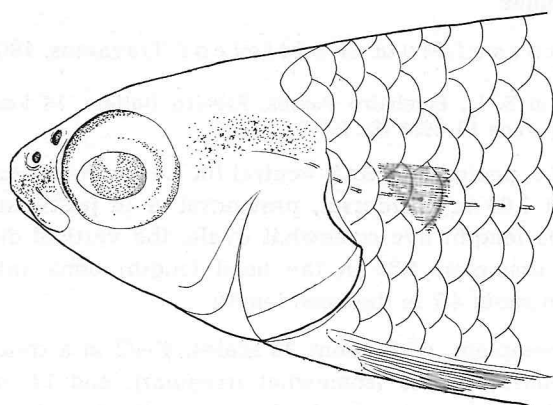
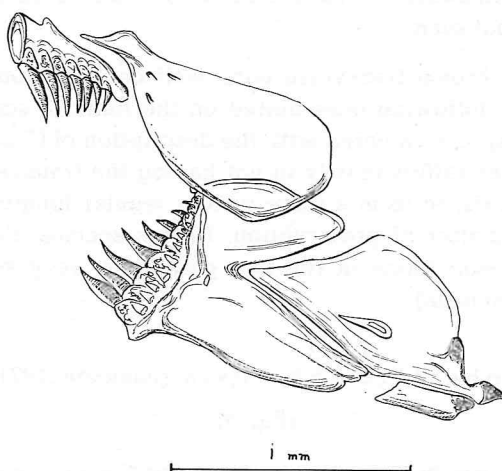
Fig. 4 a: *Jobertina bahiensis*; habitus.Fig. 4 b: *Jobertina bahiensis*; head.Fig. 4 c: *Jobertina bahiensis*; semi-schematic assemblage of the left jaws, external view.



Fig. 5: Bank of the Riacho Capivari in the neighbourhood of Cruz das Almas. The clear darkish water near the bank of the Riacho Capivari in the foreground. (Photo: K. H. Lüling)

A moderately elongated characidiid, body depth 3.15—3.4 in the S. L., the caudal peduncle short and compressed, its depth 1.15 in its length; predorsal .95—1.05 in postdorsal, preventral .85—.85 in postventral, ventral fins behind dorsal fin level; head length 3.35—3.55 in the S. L.; eye 3.1—3.35, bony interorbital 3.55, maxilla 5.3—5.45 and snout 4.3—4.6 in the head length.

Lateral line incomplete, with 9—10 scales, 31 in total in a longitudinal series, 4/4 scales in a transverse series, 9—10 in predorsal series and 12 around caudal peduncle. Isthmus clearly scaled. Fins formulae: D. II, 9; A. II, 6; P. obliquely set, short (longest ray 1.35—1.4 in the head length), III, 6—7; V. I, 7(I). Mouth small, subinferior, well visible from below; teeth conical, 7 on premaxilla, ca. 9 on mandible; no second mandibular series; a few, blunt pterygoid teeth; dentary bone not fenestrated. A large caudal spot, astride on peduncle and beginning of middle caudal rays, somewhat divided in two parts (the smaller and darker one corresponding to the rays); other color-pattern of the type usually found in the Characidiidae: A longitudinal line and a series of 8 or 9 transverse bars, those of the front part more or less mixed together; no humeral spot (replaced by a humeral hiatus); some black chromatophores on snout and on postocular part of head; two very faint bars across dorsal fin.

*Jobertina bahiensis* differs from the other "true" *Jobertina* species from the Southeastern part of South America (described or redescribed in the following recent papers: Travassos, 1952, Trewavas, 1960 and G é r y, 1960) in having a conspicuous caudal spot. As pointed out by Virginia Almeida (1971), who had a much more abundant material, it is clearly apart from *J. rachovi* and *J. theageri*, two southern forms, in having only 11 dorsal rays instead of 13 or more, and acute, strictly conical teeth on jaws, as well as in having a few pterygoid teeth. It differs from the type-species *J. interrupta* (possible synonym *J. dubia*), in having only one series of conical mandibular teeth. The nearest species, at least phenotypically, seems to be *J. lateralis* (Boulenger, 1909), from the upper Paraguay, which has been redescribed and figured by Trewavas (l. c.). Apart from the distinct coloration, *J. bahiensis* would differ from *J. lateralis* in the following way: peduncle much deeper, dorsal fin at midbody (instead of clearly in front), pectoral fin shorter (reaching next fin on *lateralis*), as well as less anal and ventral rays (respectively 8 and 8, total number, instead of 10—11 and 9, total number).

The discovery by Almeida of sexual hooks on ventral and pectoral fins, in a group where they are usually lacking, may indicate the oldness of the species. Indeed, in other characoid groups without sexual hooks (for example the Serrasalminidae), only the most primitive species, or supposedly so, that is the closest to the original stem (which in the case of the Serrasalminidae could be some Tetragonopterine-like fish of the *Hemibrycon*-group), do have some hooks on anal fin.

The species is said to be an annual fish.

The "true", non Amazonian *Jobertina* may be identified by means of the following key:

- a. Only one mandibular series of teeth, usually or mostly conical
  - b. 11 dorsal rays; teeth present on ectopterygoid bone
    - c. 8 anal and ventral rays; dorsal fin at midbody; pectoral fin not reaching ventral fin; a conspicuous caudal spot
      - ..... *J. bahiensis* (state of Bahia)
    - c.c 10—11 anal rays, 9 ventral rays; dorsal fin in front of midbody; pectoral fin reaching ventral fin; no caudal spot
      - ..... *J. lateralis* (upper Paraguay)
  - bb. 13 or more dorsal rays; no teeth on ectopterygoid bone
    - d. Angular bone triangular; dentary bone with a small "window"
      - dd. Angular bone rectangular; dentary bone well fenestrated
        - ..... *J. rachovi* (Paraguay)
        - (Parana, possibly Uruguay)
- aa. Two mandibular series as in most Characium species, the outer teeth tricuspidate
  - ..... *J. interrupta*, syn. *dubia*?  
(Rio de Janeiro)



Fam. Characidae

*Astyanax (Astyanax) fasciatus parahybae*

Eigenmann, 1908

8 ex., largest 75 mm in S. L., Engeheiro Passos, Ribeiro Itatiaia, 13 km from Itatiaia, coll. K. H. Lüling, June 19, 1974 (St. R. J. 7).

Depth 2.45—2.55 in the S. L., Maxilla reaching to pupil's level; anal fin III, 25—26; scales 8/39—41/8; predorsal series with 10 or 11 scales, regularly set. Premaxilla with 3 outer and 5 pentacuspitate, inner teeth; maxilla with one tooth at the angle. Dorsal fin just at midbody or very slightly nearer snout than base of caudal fin.

A humeral spot, ovale, vertically elongate; a lozenge-shaped caudal spot, prolonged up to the tips of the middle caudal rays; tips of first dorsal and anal rays dark.

*Astyanax (Astyanax) taeniatus* (Jenyns, 1842)

18 ex., largest 41.5 mm in S. L., sympatric with the preceding ones.

Depth 2.55—2.7 in the S. L. Maxilla long, reaching to pupil's level; anal fin III or IV, 16—20; scales 6/36/5; predorsal series regular. Premaxilla with 3 outer and 5 inner teeth, the latter ones broad, with up to seven cuspids; maxilla with two broad teeth. Dorsal fin like the preceding form.

A humeral spot and a caudal band up to the end of the fin, as in the other species. The great suborbital (SO<sup>3</sup>) is spotted, unlike that of the next species.

*Astyanax (Astyanax) scabripinnis* (Jenyns, 1842)

5 ex., largest 70 mm in S. L. (a female), riacho Campo Bello in the Parque Nacional de Itatiaia, Ultimo Adeus point, coll. K. H. Lüling, June 18, 1974.

5 ex., largest 55.5 mm in S. L., sympatric with the two preceding samples.

The specimens from Campo Bello (allopatric with the preceding ones) have the following characteristics: Depth 3.05 in the S. L. in the largest; head heavy, about 3.7 in the S. L., the lower jaw prominent, the cheek broad (but the great suborbital incomplete); maxilla rather vertical, not quite reaching to pupil's level; anal fin IV, 15—18 (more often IV, 16); scales 6/35/5; predorsal scales in a very regular series of 12.

Premaxilla with 4 outer teeth and 5 inner, pentacuspitate ones (the last one quite small and un conspicuous); maxilla with 2 small teeth at the angle.



Dorsal fin clearly in front of midbody; caudal base covered by a few, large scales (a character approaching that of *Moenkhausia*, where the scalation is nevertheless more extended and composed of smaller scales).

A very anterior humeral bar; a dark, longitudinal band, a caudal spot and a band up to the tip of the middle caudal rays.

The specimens from Engeheiro Passos, which come from the same river drainage, and which are sympatric with the two preceeding forms, have the body depth about 2.85 in the S. L., the head less heavy, the eye larger (smaller specimens) and 19—20 branched anal rays (instead of 15—18 in the Campo Bello sample). They might represent what Eigenmann (1908) called *Astyanax scabripinnis intermedius*, whereas the Campo Bello specimens would represent the nominal form *scabripinnis scabripinnis*. It may be noted that both subspecies have been described from the same river (rio Parahyba), which is in favor of their genetic isolation.

The three sympatric *Astyanax* of the Ribeiro Itatiaia, with regularly set predorsal scales (typical subgenus) and caudal band up to the tip of the middle rays, may be identified as follows:

- a. Scales 8 / 39—41 / 8; anal fin III, 25—26 . . . . . *A. fasciatus parahybae*
- aa. Scales 6 / ca 36 / 4<sup>1</sup>/<sub>2</sub>—5; anal fin III, 15—20
  - b. Dorsal fin at midbody; body depth 2.55—2.7 in the S. L., maxilla long, with two broad teeth; inner premaxillary teeth with seven cuspids; SO<sup>3</sup> spotted . . . . . *A. taeniatus*
  - bb. Dorsal fin in front of midbody; body depth 2.85—3 in the S. L., maxilla short, with 2 narrow teeth; inner premaxillary teeth with five cuspids; SO<sup>3</sup> plain . . . . . *A. scabripinnis intermedius*

#### *Hyphessobrycon piabinhas* Fowler, 1941

13 ex., largest 28.5 mm in S. L., from a small pond on the side of lower rio Jaguaripe, east of Salvador, State of Bahia, coll. K. H. Lüling, june 26, 1974 (St. SA 2).

6 ex., largest 21 mm in S. L., id. (St. SA 3).

32 ex., largest 24 mm in S. L., id., near the Oil Company Petrobras, coll. K. H. Lüling, june 29, 1974.

33 ex., largest 19.5 mm, brook Capivari about 5 km from Cruz das Almas, coll. K. H. Lüling, july 3, 1974 (St. SA 7).

Most of the above cited specimens are parasited by some Trematod and are of a shiny copper color (so-called "Bronze Tetras").

Body depth 2.8—3 in the S. L.; dorsal fin at midbody; paired fins rather lont, each reaching next respective fin; about 32 longitudinal scales, 6 or 7 of which are perforated; about iii, 19 anal rays.

Mouth opening somewhat above middle of eye's level; maxilla of moderate length, reaching to front margin of pupil's level; 3 or 4 outer premaxillary teeth, 5 pentacuspitate ones in the inner row; only one maxillary tooth; 4 pentacuspitate mandibular teeth in front, the 2nd one somewhat forward, the 4th one retrorse, followed by about 4 much smaller teeth on the side. Great suborbital not quite complete, leaving a narrow naked zone on cheek.

Color-pattern masked by the pathological bronze tint and the abundance of black parasites on most specimens, as said above. There is an inconstant, large dark caudal spot on the end of caudal peduncle which, when present, is very conspicuous; the middle caudal rays are apparently always black at their beginning. There is no humeral spot, but a conspicuous pseudotympanum.

The types of *H. piabinhas* (from Fortaleza, Ceara) have been redescribed recently (Géry, 1972: 8—9). It was suggested that they might be composite (only the type having a very characteristic deep anal fin and caudal peduncle). The present sample shows that the observed polymorphism might be a matter of age or sex. Here too the smaller specimens have normally developed anal rays and a narrow peduncle, whereas the largest ones tend to the habitus of the type of *H. piabinhas* (a male, despite the absence of sexual hooks?), though not so accentuated. At the same time, the peduncular spot, very broad and intense on most of the small specimens (chiefly those from rio Capivari), tends to disappear on specimens 25 mm in S. L. and more.

*Hyphessobrycon parvellus* Ellis, 1911? (juvenals)

4 ex., largest about 12 mm in S. L., from a small pond beside the lower rio Jaguaripe, east of Salvador, State of Bahia, coll. K. H. Lüling, June 26, 1974 (St. SA 2).

These very small specimens, almost post-larvae, have a large, conspicuous, lozenge-shaped caudal spot, about 20 branched anal rays, and two rows of tiny, acute teeth on premaxilla. *H. parvellus* seems the best "choice" for an identification, the species being already known from Southeastern Brazil.

*Hyphessobrycon bifasciatus* Ellis, 1911? (juvenals)

2 ex., largest 21 mm in S. L., rio Mage-Roncador (into northern part of the Bay of Rio de Janeiro), coll. K. H. Lüling, June 12, 1974.

Body depth 2.7—2.75 and head length 3.1—3.35 in the S. L. Dorsal fin at midbody; caudal peduncle relatively deep, its depth 1.05—1.25 in its

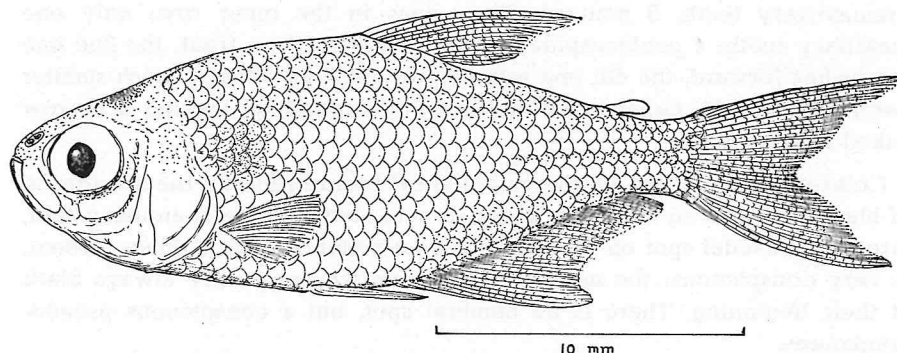


Fig. 6: Unpigmented, young specimen of *Hyphessobrycon bifasciatus* (?).

length. Eye large (juvenals), the pupil well pigmented, 3—3.1 in the head length; bony interorbital 3.1—3.15 and snout 4.85—5.15 in the head length; maxilla rather broad, not quite reaching to pupil's level, 3.65—3.7 in the head length.

D. II, 9; A. iv, 28—29; ventral fins overlapping first anal rays; pectoral fins not quite developed; 35 or 36 scales in a longitudinal series, of which 7 or 8 are perforated; transverse scales numerous, 7/1/6 from dorsal to ventral fins; predorsal line naked (juvenile character?); preventral region flat. Teeth rather narrow, 3—4 small ones, conical or tricuspidate, in the outer premaxillary row and 5, quincuspidate ones in the inner row; a small tooth at maxillary angle.

Color pale, without conspicuous marks; a few chromatophores scattered along dorsal part of the body, as well as above the anal fin base and on the fin itself; humeral region a little darker than the rest, owing to the presence of a pseudotympanum.

These small individuals have the meristics and the teeth of *H. bifasciatus* (already known from the rio Roncador, see Lüling, 1974), but not the coloration: they are devoid of pigment, though not albinos. A similar case was signaled by Eigenmann (1921: 215): "The very young specimens (of *H. bifasciatus*), 16—24 mm, from Cacequy, had all the markings very poorly developed, the chromatophores being more evenly distributed." On the other hand, the same species is also known to be at the origin of the most common "Bronze-Tetra" of the aquarists (a genetical or pathological copper tint of the body). The pigmentation of *Hyphessobrycon bifasciatus* seems to be variable or unstable, for a reason that is not yet understood.

### Summary

The following species are redescribed: (1) From Eastern Brazil, *Hoplias macrophthalmus*, *Nannostomus beckfordi* (both new for the territory), *Jobertina bahiensis* (first collect since the types), *Hyphessobrycon piabinhas* (id.) and *H. cf. parvellus*. (2) From Southeastern Brazil *Characidium oiticicae* (first collect since the type), *Astyanax fasciatus parahybae*, *taeniatus* and *scabripinnis*, and *Hyphessobrycon cf. bifasciatus* (without its typical coloration). A key to the genus *Jobertina*, and another to the three sympatric *Astyanax* species, are provided.

### Zusammenfassung

Die folgenden Fischarten werden hier beschrieben: (1) Von Ostbrasilien, *Hoplias macrophthalmus*, *Nannostomus beckfordi* (beide Arten sind neu für das Gebiet), *Jobertina bahiensis* (erste Sammlung nach dem Auffinden des Typus), *Hyphessobrycon piabinhas* (id.) und *H. cf. parvellus*. (2) Von Südostbrasilien, *Characidium oiticicae* (erste Sammlung nach dem Auffinden des Typus), *Astyanax fasciatus parahybae*, *taeniatus* und *Hyphessobrycon cf. bifasciatus* (ohne seine typische Färbung). Es wird ein Schlüssel für die Gattung *Jobertina* und ein anderer für die drei sympatrischen *Astyanax*-Arten beigegeben.

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