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# *Priocharax nanus*, a new miniature characid from the rio Negro, Amazon basin (Ostariophysi: Characiformes), with an updated list of miniature Neotropical freshwater fishes

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*Priocharax nanus*, new species, is described from the rio Negro, Brazil. It is a miniature fish that retains as an adult the larval rayless pectoral fin, a diagnostic character of the genus. *Priocharax nanus* possesses fewer reductive features compared to congeners, *P. ariel* and *P. pygmaeus*, from which it can be distinguished by the presence of i,6 pelvic-fin rays (*vs*. i,5), the presence of the claustrum (*vs*. claustrum absent) and the presence of two postcleithra (*vs*. postcleithra absent). An updated list of 213 species of miniature Neotropical freshwater fishes is presented. The greatest diversity among them is represented by the Characiformes with 87 miniature species.

*Priocharax nanus*, espécie nova, é descrita do rio Negro, Brasil. É um peixe miniatura que retém no adulto a forma larval da nadadeira peitoral, um caráter diagnóstico do gênero. *Priocharax nanus* possui um número menor de caracteres redutivos quando comparado aos congêneres, *P. ariel* and *P. pygmaeus*, dos quais pode ser distinguida pela presença de i,6 raios na nadadeira pélvica (*vs.* i,5), presença do claustrum (*vs.* claustrum ausente) e presença de dois pós-cleitros (*vs.* pós-cleitros ausentes). Uma lista atualizada de 213 espécies de peixes miniatura de água doce neotropicais é apresentada. A maior diversidade entre eles é representada pelos Characiformes, com 87 espécies miniatura.

**Key words:** Heterocharacinae, Miniaturization, Reductive characters.

## Introduction

*Priocharax* Weitzman & Vari is a characid genus that includes two miniature species from the Amazon and Orinoco basins: *P. ariel* Weitzman & Vari from the upper reaches of the ríos Orinoco and Negro in Venezuela, whose maximum length is 17.1 mm standard length (SL), and *P. pygmaeus* Weitzman & Vari from the upper río Amazonas in Leticia, Colombia reaching 16.4 mm SL (Weitzman & Vari, 1987). More recently, *Priocharax ariel* was also recorded in the region of Santa Isabel do Rio Negro, rio Negro basin (Lima & Toledo-Piza, 2001) and *P. pygmaeus* was collected from a small tributary of rio Solimões, in Amazonas, Brazil (Oliveira *et al.*, 2009).

Weitzman & Vari (1987) listed six diagnostic characters for *Priocharax*, the most conspicuous of which is the presence of a rayless pectoral fin fold in the adult, which is otherwise restricted to larval stages of characiforms and teleosts in general. *Priocharax* species also have the upper and lower jaws with a high number of tiny conical teeth, the adults are diminutive in size being among the smallest characiforms known, specimens have 16-22 branched anal-fin rays and only five branched pelvic-fin rays. In addition to the two species of *Priocharax*, the only other Characidae known to us that consistently has i,5 pelvic-fin rays is *Cyanogaster noctivaga* Mattox, Britz, Toledo-Piza & Marinho, another miniature characid from the rio Negro (Mattox *et al.*, 2013).

One year after describing the diminutive *Priocharax*, Weitzman & Vari (1988) provided a comprehensive review on miniaturization of South American freshwater fishes including a list of 85 species that either matured under 20 mm SL or did not exceed a maximum of 26 mm SL. The authors included 49 species of Characiformes in that original list,

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nearly 60% of the total number of miniature species in South American freshwaters. Of their 49 miniature Characiformes, 46 were classified in the Characidae (including eight species of characidiines now considered to belong to the Crenuchidae) and three in the Lebiasinidae. Over a decade later, Costa & Le Bail (1999) added 24 Neotropical freshwater fish species to that list including four characiforms, seven siluriforms and 13 cyprinodontiforms. Since then, a great number of miniature Neotropical freshwater fishes have been discovered (*e.g.*, Moreira, 2005; Schaefer *et al.*, 2005; Caires & Figueiredo, 2011; Dutra *et al.*, 2012; Román-Valencia *et al.*, 2012; Netto-Ferreira *et al.*, 2013a), quite a number of which were placed into new monotypic genera (*e.g.*, Géry & Romer, 1997; Bührnheim *et al.*, 2008; Zarske, 2010; Ribeiro *et al.*, 2012; Netto-Ferreira *et al.*, 2013b; Mattox *et al.*, 2013). Since Weitzman & Vari's (1988) and Costa & Le Bail's (1999) lists, the Check List of Freshwater Fishes of South and Central America has been published (Reis *et al.*, 2003), which helped to organize knowledge on Neotropical species and highlighted many miniature forms (*sensu* Weitzman & Vari, 1988) not included in previous lists.

During a recent expedition to Santa Isabel do Rio Negro, a small town on the left bank of the rio Negro, State of Amazonas, we collected a number of specimens clearly assignable to the genus *Priocharax*, based among other features on the remarkable larval pectoral-fin. However, their characters did not fully match those of the two known species. A detailed study of their external and skeletal anatomy revealed that they represent a new species of *Priocharax* which we describe herein. We also use this opportunity of the discovery of another miniature characiform to provide an updated list of miniature Neotropical freshwater fish species.

## Material and Methods

Counts and measurements follow Fink & Weitzman (1974) and were taken on the left side of each specimen whenever possible. All measurements other than standard length (SL) are expressed as percentages of SL, except for subunits of the head which are expressed as percentages of head length (HL). Measurements were taken point to point with a precision of 0.1 mm from digital photographs of specimens taken under the stereomicroscope. Counts of vertebrae, teeth, and gill-rakers were obtained from 11 specimens cleared and double stained for cartilage and bone following the protocol of Taylor & Van Dyke (1985). Total vertebral number includes the four vertebrae of the Weberian apparatus. The compound ural centrum was counted as a single vertebra. The gill-raker at the junction of the ceratobranchial and epibranchial is considered as the posteriormost gill raker on the lower branch of the gill arch. Photographs were made with a Zeiss Discovery V20 stereomicroscope with a Zeiss Axiocam digital camera attached. Osteological terminology follows Weitzman (1962) except for inner arm of the os suspensorium instead of os suspensorium, and outer arm of the os suspensorium instead of rib of fourth vertebra, following Conway & Britz (2007). In the description, the frequency of each count is provided in parentheses after the respective count, with the count of the holotype indicated by an asterisk. Information on meristic and morphometric data of *P. ariel* and *P. pygmaeus* were taken from Weitzman & Vari (1987). Specimens examined for this study are deposited in the Museu de Zoologia da Universidade de São Paulo (MZUSP), Instituto Nacional de Pesquisas da Amazônia (INPA) and the National Museum of Natural History, Smithsonian Institution (USNM).

In our updated list of miniature Neotropical freshwater fishes (Appendix I) we adopted the cut-off point of 26 mm SL for miniatures, used by Weitzman & Vari (1988). We agree with them that although this number is arbitrary, it may serve as a preliminary guide to the study of miniature fishes. We included in the list all miniature species described after the last update made by Costa & Le Bail (1999). We also checked the recent literature in search for updated records of maximum lengths of species included in the lists of Weitzman & Vari (1988) and Costa & Le Bail (1999). If the maximum length of a species was reported to exceed 26 mm SL, it was excluded from our list. If the recorded length was still under 26 mm SL, but larger than the record presented by previous authors, we included the new recorded length and cited the source of the information. A few nominal species in the previous lists have been recently synonymized. In those cases we included only the valid species name with its respective recorded maximum length. For ease of comparison we listed separately all species that were removed from the lists of Weitzman & Vari (1988) and Costa & Le Bail (1999) (Appendix II). We also updated many species names to reflect current classification. Much of the information used in our list was taken from Reis *et al.* (2003) which had the benefit to include in a single volume information previously scattered throughout the ichthyological literature, when the previous lists were compiled. Because the checklist of Reis *et al.* (2003) included freshwater fishes from the entire Neotropical region, we were also able to gather information on miniature freshwater fishes from drainages outside South America, so that our list encompasses a broader geographical area than that covered by the list of Weitzman & Vari (1988) which was restricted to South America. The list of Reis *et al.* (2003) also revealed additional apparently miniature species from South American drainages that were not previously listed by Weitzman & Vari (1988) or Costa & Le Bail (1999). We have chosen to include in our list all species that are recorded in Reis *et al.* (2003) as not reaching beyond 26 mm SL, so that the information would be more easily available.

### *Priocharax nanus*, new species
### Figs. 1-4

**Holotype.** MZUSP 114014, 13.8 mm SL, Brazil, Amazonas, Santa Isabel do Rio Negro, rio Negro basin, lake at right bank of rio Urubaxi, near igarapé Tapage, 0º33'44.2"S 64º49'40.8"W, 26 Oct 2011, M. Toledo-Piza, G. Mattox, M. Marinho & R. Britz.

**Paratypes.** MZUSP 114015, 9, 12.1-15.3 mm SL (3 c&s, 14.1-15.3 mm SL), same data as holotype. MZUSP 114016, 5, 12.6-14.6 mm SL (2 c&s, 13.4-13.8 mm SL), Brazil, Amazonas, Santa Isabel do Rio Negro, rio Negro basin, igarapé Tapage at left bank of rio Urubaxi, 0º30'5.3"S 64º49'11.7"W, 26 Oct 2011, M. Toledo-Piza, G. Mattox, M. Marinho & R. Britz. MZUSP 114017, 3, 13.5-14.6 mm SL (1 c&s, 14.6 mm SL), Brazil, Amazonas, Santa Isabel do Rio Negro, rio Negro basin, first tributary of rio Negro above rio Daraá, 0º27'24.2"S 64º46'54.1"W, 27 Oct 2011, M. Toledo-Piza, G. Mattox, M. Marinho & R. Britz. INPA 39891, 4, 12.5-13.9 mm SL; MZUSP 114018, 11, 11.1-15.4 mm SL (5 c&s, 12.0-14.0 mm SL); USNM 427007, 4, 12.1-13.3 mm SL; Brazil, Amazonas, Santa Isabel do Rio Negro, rio Negro basin, rio Negro and tributaries near Santa Isabel do Rio Negro, 23-30 Oct 2011, M. Toledo-Piza, G. Mattox, M. Marinho & R. Britz.

**Diagnosis.** *Priocharax nanus* is distinguished from *P. ariel* and *P. pygmaeus* by the presence of i,6 pelvic-fin rays (*vs.* i,5), the presence of the claustrum (*vs.* claustrum absent) and the presence of two postcleithra (*versus* postcleithra absent). *Priocharax nanus* can be further distinguished from *P. ariel* by the lower number of gill rakers on the lower limb of the first branchial arch (9-10, n=11 *vs.* 11-13) and by the relatively shorter caudal peduncle (13.5-16.8 % SL *vs.* 18.1-23.7 % SL). Although there is some overlap between the species, *Priocharax nanus* has a higher number of branched anal-fin rays compared to *P. ariel* (21-26, mean = 22.5, n = 36 *vs.* 16-21, mean = 18.5, n = 96 respectively).

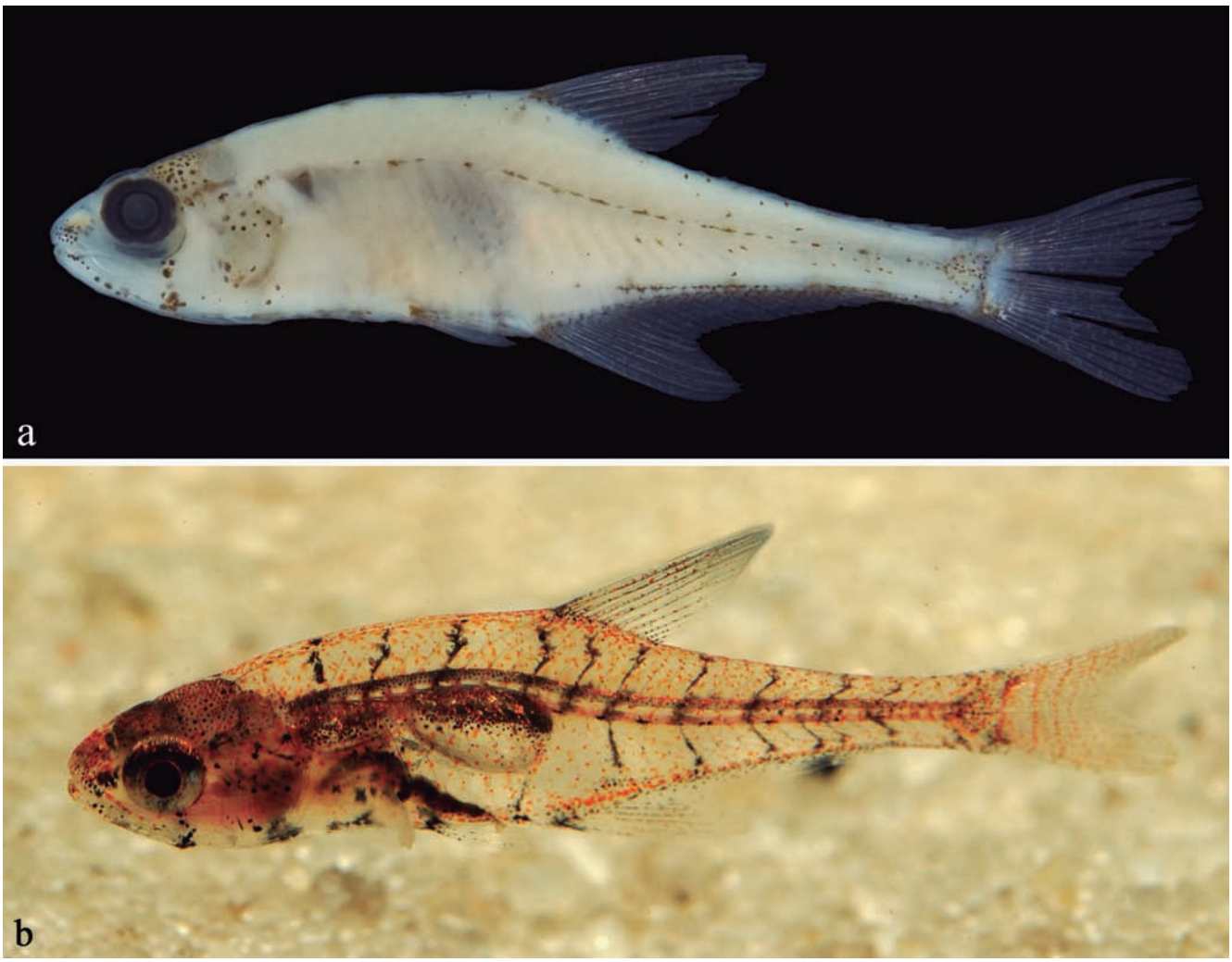


**Fig. 1.** *Priocharax nanus*, **(a)** holotype, MZUSP 114014, 13.8 mm SL; Brazil, Amazonas, Santa Isabel do Rio Negro, rio Negro basin, lake at right bank of rio Urubaxi, near igarapé Tapage; **(b)** live specimen, one of the paratypes, photographed right after capture. Photograph by Ralf Britz.

**Table 1.** Morphometric data of *Priocharax nanus* (n=25, except for anal-fin length with n=23, range does not include holotype); SD = Standard Deviation.

| | holotype | range | mean | SD |
|---|---|---|---|---|
| Standard length (SL) (mm) | 13.8 | 11.1-15.4 | | - |
| Percentages of SL | | | | |
| Depth at dorsal-fin origin | 26 | 21-27 | 24.2 | 1.1 |
| Snout to dorsal-fin origin | 53 | 52-55 | 54.0 | 0.9 |
| Snout to pelvic-fin origin | 40 | 38-42 | 40.0 | 0.9 |
| Snout to anal-fin origin | 53 | 52-55 | 53.5 | 1.0 |
| Dorsal-fin length | 25 | 24-28 | 26.1 | 1.0 |
| Dorsal-fin base | 12 | 11-14 | 12.5 | 0.7 |
| Pelvic-fin length | 13 | 11-14 | 12.5 | 0.8 |
| Anal-fin length | 23 | 21-25 | 22.8 | 1.0 |
| Anal-fin base | 33 | 31-36 | 33.4 | 1.2 |
| Caudal-peduncle depth | 8 | 7-9 | 7.9 | 0.6 |
| Caudal-peduncle length | 17 | 14-17 | 15.0 | 0.9 |
| Head length (HL) | 25 | 25-27 | 25.4 | 0.6 |
| Percentages of HL | | | | |
| Orbital diameter | 38 | 34-39 | 36.4 | 1.2 |
| Interorbital distance | 32 | 24-32 | 27.8 | 2.2 |
| Snout length | 24 | 19-25 | 22.2 | 1.5 |
| Upper jaw length | 53 | 46-55 | 50.8 | 2.5 |
| Caudal peduncle depth as percent of caudal peduncle length | 48 | 42-61 | 53.0 | 4.7 |

**Description.** For overall appearance see Figure 1. Morphometric data provided in Table 1.

Body laterally compressed. Greatest body depth at vertical through dorsal-fin origin. Dorsal-fin origin approximately at midbody, at vertical through anal-fin origin. Pelvic-fin origin approximately midway between posterior margin of opercle and anal-fin origin. Dorsal profile of head and body gently convex from tip of snout to dorsal-fin origin. Dorsal profile of body along dorsal-fin base nearly straight, gently sloping posteroventrally; straight and posteroventrally inclined from latter point to caudal peduncle. Dorsal profile of caudal peduncle gently concave to base of dorsal procurrent rays. Ventral profile of head and body gently convex from symphysis of lower jaw to vertical through pectoral-fin origin; straight to slightly convex from latter point to pelvic-fin origin. Ventral profile of body posteroventrally inclined from pelvic-fin to anal-fin origin; straight and posterodorsally slanted along anterior one-half of anal-fin base, gently concave from latter point to base of ventral procurrent rays. Caudal peduncle elongate. Pseudotympanum present, located anterior to rib of fifth vertebra.

Snout blunt in lateral view. Eye about one-third of head length. Infraorbitals 1 to 6 and supraorbital absent, antorbital present. Mouth terminal with lower jaw slightly included. Tip of maxilla elongate, posterior border reaching vertical through posterior border of pupil. Premaxillary teeth in single series with 23(2), 24(4), 25(2), 27(1), or 29(2) teeth. Maxilla with 32(1), 33(1), 34(1), 35(2), 36(2), 37(1), 38(1), 39(1), or 41(1) teeth. Dentary with 33(2), 34(1), 35(2), 36(1), 38(2), 39(2), or 40(1) teeth. Dentary teeth in single series, with few anterior teeth slightly displaced anteriorly. All jaw teeth small, conical and lingually curved to a moderate extent (Fig. 2).

Dorsal-fin rays ii.8(2) or 9*(35). Pectoral fin with larval structure (Fig. 3). Cartilaginous pectoral radial plate incompletely divided longitudinally, articulating anteriorly with vertically elongated scapulocoracoid cartilage and posteriorly with larval-like pectoral-fin fold supported only by actinotrichia. Pectoral-fin rays absent. Endoskeletal bones of pectoral girdle absent, exoskeletal part with posttemporal, supracleithrum, cleithrum and two postcleithra. Cleithrum with posteriorly directed process at region immediately below ventral tip of supracleithrum. Pelvic-fin rays i,6* in all specimens (n=37). Posterior tip of pelvic fin falling short of origin of anal fin but extending slightly beyond anus. Anal-fin rays iv-v, 21(7), 22*(13), 23(12), 24(3), 25(1), or 26(1). Anal-fin margin concave with anterior elongate lobe and posterior section of short rays. Caudal-fin rays i,9,8,i (16), dorsal procurrent rays 8 (8) or 9 (3), ventral procurrent rays 6 (4) or 7 (7). Caudal fin forked. Adipose fin absent.

Squamation present in almost all specimens, but scales highly deciduous and easily lost during handling. Scales cycloid, very thin, with no obvious *circuli* or *radii*. Scales in midlateral row 28(1), 29(2), 30(2), 31(1), or 32(1); no canal bearing lateral-line scales on body. Scale rows between dorsal-fin origin and pelvic-fin origin 7(1) or 8(7). Scale rows around caudal peduncle 9(4) or 10(2). Predorsal scales typically absent with one or two scales just anterior to dorsal fin in few specimens. Scales restricted to base of caudal-fin rays, not covering caudal-fin lobes.

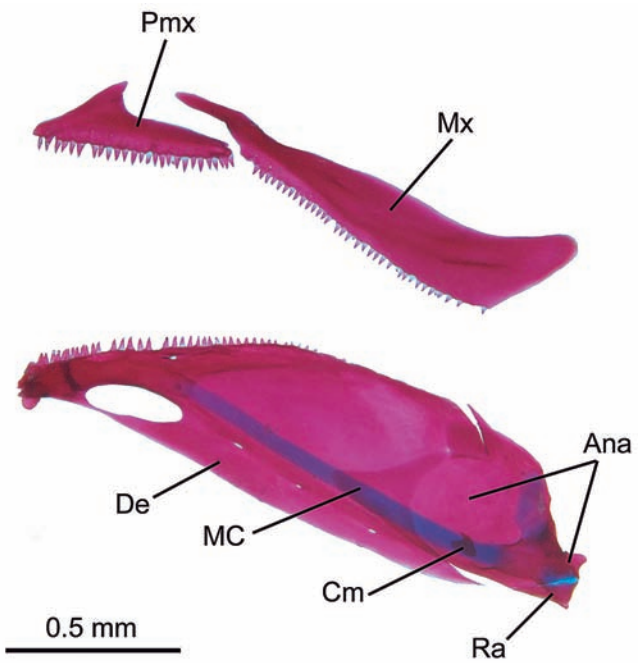


**Fig. 2.** *Priocharax nanus*, paratype, MZUSP 114018, 13.2 mm SL, c&s; jaws in lateral view illustrating dentition. Ana = anguloarticular; Cm = coronomeckelian; De = dentary; MC = Meckel's cartilage; Mx = maxilla; Pmx = premaxilla; Ra = retroarticular. Scale bar = 0.5 mm.

Total vertebrae 32(2), 33(7), or 34(2); abdominal vertebrae 14(10) or 15(1); caudal vertebrae 18(3), 19(6), or 20(2). Upper limb gill-rakers 3(7) or 4(4), lower limb gill-rakers 9(6) or 10(5). Weberian apparatus well developed, all components ossified. Claustrum present as tiny, circular bone (Fig. 4). Large gap present between neural arches 3 and 4, with gap partially filled by dorsally projecting pointed process from vertebral centrum 3. Inner arm of os suspensorium large, projecting forward to vertical through middle of second centrum.

**Color in alcohol.** Overall ground color pale yellow (Fig. 1a). Patch of dark chromatophores present on dorsal portion of head and scattered dark chromatophores on opercle. Head with two dark stripes radiating from eye, one anteriorly to tip of snout and another ventrally. Line of dark chromatophores extends along dentary and on anterior tip of lower jaw. Iridophores present in orbit of some specimens. Longitudinal line of dark chromatophores along midlateral side of body. Triangular patch of dark chromatophores at base of caudal fin forming inconspicuous spot. Scattered dark chromatophores on posterior half of body, probably remnants of chevron-shaped dark thin lines present in live specimens. Dark chromatophores along predorsal midline forming two incomplete separate lines. Bases of anal-fin rays dark and forming irregular line along fin. Line of dark, more deeply located chromatophores slightly dorsal to base of anal-fin rays and also extending along fin base. Another dark line, dorsal and more superficial than latter, extending posteriorly from vertical through third to fourth branched anal-fin ray. These three lines more evident and better separated anteriorly and merging posteriorly. Three patches of dark chromatophores ventrally on body anterior to pelvic fin. Posteriormost patch elongated and located anterior to basipterygium, middle one more rounded and located at point of contact of contralateral pectoral girdles, anteriormost in form of a small spot on isthmus. Few dark chromatophores present in region around anus. Dark chromatophores at origins of dorsal, pelvic, and anal fins. All fins except pectoral with scattered dark chromatophores along borders of fin rays.

**Color in life.** Body mostly transparent (Fig. 1b). Pattern of distribution of dark chromatophores on head, along lateral sides of body, on caudal peduncle, and on all fins except pectoral as described above for color in alcohol. Dark chromatophores also scattered on dorsal surface of swim bladder and along anterior half of vertebral column. Approximately 10 vertical dark narrow bars along body from vertical through posterior margin of opercle to vertical through tip of posteriormost anal-fin ray, more or less evenly spaced and in a chevron-shaped pattern. Most narrow bars extend from dorsal to ventral margins of body, occasionally incomplete. Each bar W-shaped, following course of myoseptum. Numerous, tiny bright orange spots scattered over entire head and body, frequently forming longitudinal lines along anterior predorsal line and dorsal-fin base, anal-fin base and vertebral column. Patch of similar orange spots on dorsal surface of swim bladder and base of caudal fin. Orange spots forming approximately five vertical lines along caudal-fin rays, anterior lines better defined than more diffuse posterior lines. Orange spots scattered mainly along anterior four or five dorsal-fin rays. Iridophores covering swim bladder dorsally. Eye silvery, dorsal margin with dark and orange chromatophores.

**Sexual dimorphism.** Gonads not checked. Hooks absent in dorsal-, pectoral-, pelvic-, and anal-fins of all examined specimens (n=37).

**Geographic distribution.** *Priocharax nanus* is presently known from the rio Negro basin, Amazonas, Brazil (Fig. 5), in the surroundings of Santa Isabel do Rio Negro. The type locality near igarapé Tapaje is located in the rio Urubaxi basin, near its confluence with the rio Negro (Fig. 6). The new species was also collected from two other localities: one near the type locality in the rio Urubaxi, a right bank tributary of rio Negro and the other in a tributary of the left bank of the rio Negro. Specimens from a fourth locality also located in a tributary of the left margin of the rio Negro were only recorded from photographs. This locality (Igarapé Tibarrá, approximately 300 m above confluence with rio Negro, 0º26'28.4"S 64º56'57.5"W) the western most point in the map on Fig. 5, is the nearest to Santa Isabel do Rio Negro.

**Ecological notes.** All specimens were collected between 9:00 and 17:00h, during the dry season (October), in the black acidic waters of the rio Negro basin. Three of the four localities were in shaded areas, close to the shore line where there was emergent and marginal vegetation. In the latter case trunks and branches were partially submerged (Fig. 6). Specimens were caught with dip nets around the submerged vegetation, at depths of approximately 1 m or less. In the other locality, located in the first tributary of the rio Negro above rio Daraá (0º27'24.2"S 64º46'54), the vegetation on the river bank had been recently burnt and some newly grown submerged and emergent vegetation was present along with scattered tree trunks. The specimens were collected from an area exposed to the sun in warm, shallow water, approximately 50 cm deep.

**Etymology.** The species name is derived from the Latin, *nanus*, meaning a dwarf and alludes to the tiny size of adult specimens of the species. A noun in apposition.

## Discussion

Adults of *Priocharax nanus* retain the larval rayless structure of the pectoral fin characteristic of the other two species of the genus (Weitzman & Vari, 1987). Weitzman & Vari (1987) noted that species of *Roeboides* and *Cynopotamus* retained their larval pectoral fin structure in juveniles up to relatively large body sizes (*i.e.*, 26 and 41 mm SL, respectively) and suggested that this feature could be a possible synapomorphy for an assemblage that included at least those three genera. Lucena (1998) analyzed this character in a broader context of the subfamily Characinae and hypothesized that the retention of a larval pectoral fin at larger body sizes is synapomorphic for a clade including *Acanthocharax*, *Acestrocephalus*, *Charax*, *Cynopotamus*, *Galeocharax*, *Phenacogaster*, and *Roeboides*. The Characinae (*sensu* Lucena, 1998 and Lucena & Menezes, 2003) also included *Priocharax*, *Gnathocharax*, *Heterocharax*, *Hoplocharax*, and *Lonchogenys*. According to the scheme of phylogenetic relationships proposed for the Characinae by Lucena (1998), the retention of the larval pectoral fin in adults of *Priocharax* is autapomorphic for that genus, because *Gnathocharax*, *Heterocharax*, *Hoplocharax*, and *Lonchogenys* have a pectoral fin with the typical adult anatomical structure. Moreira *et al.* (2002) noted that the presence of a larval pectoral fin in the adult could be alternatively interpreted as a synapomorphy for the Characinae with a reversion in *Gnathocharax*, *Heterocharax*, *Hoplocharax*, and *Lonchogenys*, and in this case the retention of the larval pectoral fin in *Priocharax* would be primitive for the latter genus. A more recent assessment of the phylogenetic relationships of all those genera included *Priocharax* together with *Gnathocharax*, *Heterocharax*, *Hoplocharax*, *Lonchogenys*, within the Heterocharacini, a taxon not related to the Characinae (Mattox & Toledo-Piza, 2012). In the context of the latter hypothesis, the ontogenetic retention of the larval pectoral fin in adults of *Priocharax* should be interpreted as autapomorphic for the genus. Within the Characidae, a retention of a larval pectoral fin at larger body sizes has been reported for *Hyphessobrycon catableptus* (Durbin) and *H. moniliger* Moreira, Lima & Costa (Weitzman & Vari, 1987; Moreira *et al.*, 2002).

*Priocharax nanus* also has numerous small conical teeth in the upper and lower jaws arranged in a more or less irregular single row as in the other two congeners, *P. ariel* and *P. pygmaeus*. The number of dentary teeth was listed as a diagnostic character by Weitzman & Vari (1987) to distinguish *P. ariel* from *P. pygmaeus* (38-55 *vs.* 28-36, respectively). *Priocharax nanus* has a dentary tooth count of 33-40, intermediate between that of *P. ariel* and *P. pygmaeus* with some overlap on each end of the range. Other meristic characters of *P. nanus* also show a similar degree of intermediateness and overlap with the other two species: premaxillary teeth (23-29, in *P. nanus vs.* 22-34 and 19-24 in *P. ariel* and *P. pygmaeus*, respectively); maxillary teeth (32-41, *vs.* 38-58 and 27-41) and upper limb gill rakers (3-4, *vs.* 3-5 and 2-3).

The color pattern of preserved specimens of *Priocharax nanus* is similar to that of *P. ariel* and *P. pygmaeus*. Recently collected specimens of *Priocharax nanus* have more dark chromatophores, but these fade away the longer they are in preservative. However, *P. nanus* seems to differ from both *P. ariel* and *P. pygmaeus* in life coloration, which is characterized by the presence of the vertical W-shaped dark lines along the body. Information about live coloration of *Priocharax pygmaeus* is largely missing with the exception of the statement that it was "transparent faint pink" in life (Weitzman & Vari, 1987: 648). Description of the life coloration of *P. ariel* was based on a large number of specimens without mention of the presence of vertical lines on the body by Weitzman & Vari (1987).

*Priocharax nanus* is clearly a miniature species (*sensu* Weitzman & Vari, 1988), with the largest specimen reaching 15.4 mm SL (n=26). Like *P. ariel* and *P. pygmaeus* it also has a number of reductive anatomical characters associated with miniaturization such as the loss of the laterosensory canal system on the head and body, the loss of the bones of the infraorbital series and the presence of a gap in the Weberian apparatus between neural arches 3 and 4 (Weitzman & Vari, 1987: fig 3; Mattox *et al.*, 2013). However, *P. nanus* possesses more bones in the pectoral girdle and in the Weberian apparatus than do *P. ariel* and *P. pygmaeus*. In *P. ariel* and *P. pygmaeus*, the cleithrum, supracleithrum, and posttemporal are the only bones in the pectoral girdle (Weitzman & Vari, 1987). In addition to those three pectoral girdle bones, *P. nanus* also has two postcleithra. Its ventral postcleithrum has the splint-like shape typical of postcleithrum 3 in many characiforms. The dorsal postcleithrum of *P. nanus* is a flat, relatively large bone located medial to the posterior process of the cleithrum. The dorsal margin of the bone contacts the ventral tip of the supracleithrum, a topographical position characteristic of postcleithrum 1 (*e.g.*, Weitzman, 1962:74). The ventral margin of the dorsal postcleithrum is in contact with the dorsal tip of postcleithrum 3, which is, however, typical of postcleithrum 2. Based on its position only, it is therefore, unclear if the dorsal postcleithrum of *P. nanus* represents postcleithrum 1 or 2. We noted that in characiforms that possess only two postcleithra, these are either postcleithra 1 and 2, or postcleithra 2 and 3, with no examples of a species with only postcleithra 1 and 3 (*e.g.*, characters 132-134 of Zanata & Vari, 2005; 247-249 of Mirande, 2010; and 122-124 of Mattox & Toledo-Piza, 2012). Based on this observation, the flat large postcleithrum of *P. nanus* is most likely postcleithrum 2, although additional information is necessary to better clarify the identity of this element. Among the Heterocharacini, species of *Heterocharax*,

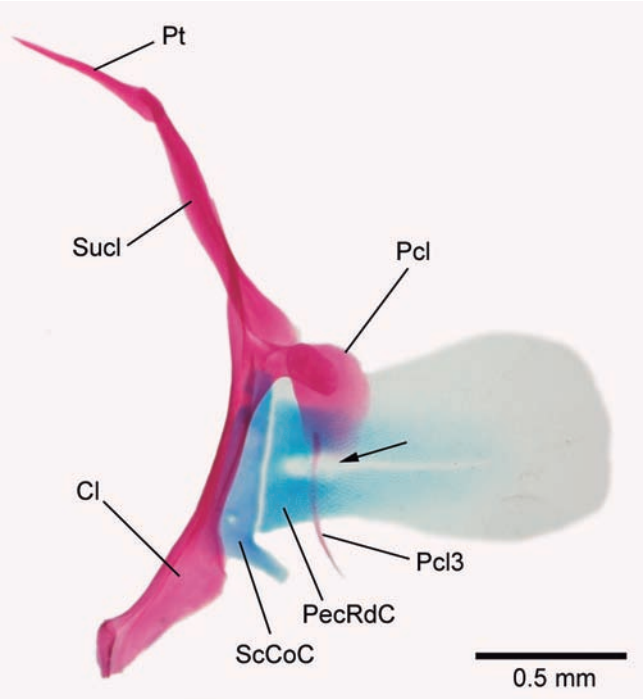


**Fig. 3.** *Priocharax nanus*, paratype, MZUSP 114015, 14.9 mm SL, c&s; shoulder girdle in lateral view. Cl = cleithrum; PecRdC = pectoral-fin radial cartilage; Pcl = unidentified postcleithrum; Pcl3 = postcleithrum 3; Pt = posttemporal; ScCoC = scapulocoracoid cartilage; Sucl = supracleithrum. Arrow points to middle incision on pectoral-fin radial cartilage. Scale bar = 0.5 mm.

*Hoplocharax*, and *Lonchogenys* all possess three postcleithra, and only *Gnathocharax steindachneri* Fowler lacks all three ossifications. The latter species, however, possesses a highly modified pectoral girdle with a well-developed and keeled coracoid, and the loss of postcleithra in that species could be related to this extreme modification.

The Weberian apparatus of *Priocharax nanus* is well-developed and similar to that of *P. ariel* and *P. pygmaeus*. In the latter two species all components are well ossified with the exception of the claustrum (Weitzman & Vari, 1987). In *P. nanus* instead, the claustrum is clearly present, although poorly ossified. *Priocharax ariel* and *P. pygmaeus* share with *P. nanus* the gap between neural arches 3 and 4, with the gap partially filled by a dorsally projecting pointed process from vertebral centrum 3, a feature not described, however, but illustrated by Weitzman & Vari (1987: fig. 3).

Even though *Priocharax nanus* is a miniature species, it shows fewer reductive characters, *i.e.*, it has lost fewer bones in the skeleton compared to its two congeners. Although the presence of six branched pelvic-fin rays in *P. nanus* represents a reduction in comparison with the common condition of seven branched pelvic-rays rays in most members of the Characidae, it shows a less reduced state than *P. ariel* and *P. pygmaeus* which have only five branched pelvic-fin rays. *Cyanogaster noctivaga* is the only other characid that consistently has only five branched pelvic-fin rays (Mattox *et al.*, 2013). On the other hand, other characids have six branched pelvic-fin rays (Mirande, 2010), and within the Heterocharacini (*sensu* Mattox & Toledo-Piza, 2012) this condition is present in *Hoplocharax goethei* Géry contrary to Géry (1966:293) who mentioned: "ventrals probably i,7" (Toledo-Piza, pers. obs.). A few specimens of *Gnathocharax steindachneri* and of all three species of *Heterocharax* also may have only six branched pelvic-fin rays, while the vast majority of specimens of these species have seven branched-pelvic fin rays (Toledo-Piza, 2000; Toledo-Piza, pers. obs.). All species of *Roestes* and *Gilbertolus* have seven branched pelvic-fin rays. These two genera together with the Heterocharacini were proposed to form a monophyletic taxon within the Characidae, the Heterocharacinae (*sensu* Mattox & Toledo-Piza, 2012). *Priocharax nanus* shares with *P. ariel* and *P. pygmaeus* the presence of a pseudotympanum restricted to the region anterior to the rib of the fifth vertebra and the possession of the inner arm of the os suspensorium extending to a vertical through the second centrum and aligned in an approximately vertical plane, both characters interpreted as synapomorphic for the Heterocharacinae (*sensu* Mattox & Toledo-Piza, 2012).

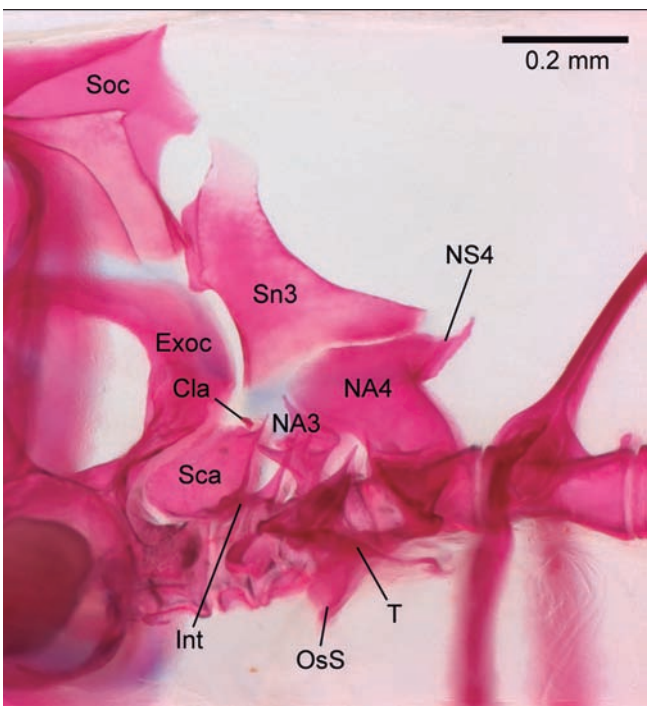


**Fig. 4**. *Priocharax nanus*, paratype, MZUSP 114015, 14.9 mm SL, c&s; Weberian apparatus in lateral view. Cla = claustrum; Exoc = Exoccipital; Int = intercalarium; NA3-4 = neural archs3-4; NS4 = neural spine 4; OsS = os suspensorium; Sca = scaphium; Sn3 = supraneural 3; Soc = supraoccipital; T = tripus. Scale bar = 0.2 mm.

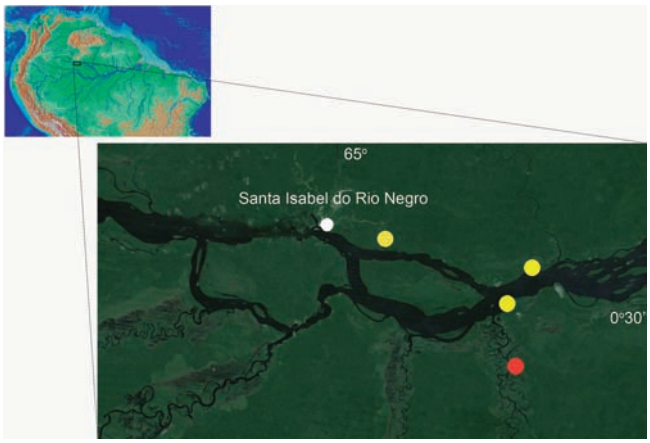


**Fig. 5.** Map of northern South America and surroundings of Santa Isabel do Rio Negro, rio Negro basin (detail), showing the distribution of *Priocharax nanus*. Type locality (red dot), other localities (yellow dots).

Whether the absence of the two postcleithra and the claustrum, and the presence of five branched pelvic-fin rays in *Priocharax ariel* and *P. pygmaeus* are indicative of a closer relationship between these two species relative to *P. nanus* is a question that is difficult to answer due to the fact that these characters are reductive in nature and could have been the result of independent cases of reduction (Weitzman & Fink, 1983). A detailed study of relationships among the three species in search for potential progressive characters (*sensu* Britz & Conway, 2009; *i.e.*, derived character states relative to the last common ancestor of the taxon and that are not affected by developmental truncation) may highlight potential synapomorphies that could help understand the relationships among *Priocharax* species and the evolution of their reductive characters. In order to carry out such a study, more properly preserved, recently collected specimens, especially of *P. pygmaeus*, would be necessary. In the absence of any other data, however, such reductions could be tentatively used to support a hypothesis of a sister group relationship of *P ariel* and *P. pygmaeus*.

With the description of *Priocharax nanus* another species can be added to the list of miniature Neotropical freshwater fishes. A total of 213 species are included in our list (Appendix I), a major increase from the 85 species listed by Weitzman & Vari (1988), the first attempt to summarize information on miniature species within the South American freshwater fish fauna. Subsequently, Costa & Le Bail (1999) updated Weitzman & Vari's (1988) list and added 24 species. Sixteen species of those originally listed were not included in our list (Appendix II). Specimens larger than 26 mm SL were recorded for 14 of those 16 species, 13 originally listed by Weitzman & Vari (1988) and one by Costa & Le Bail (1999). In addition, two species names have since been synonymized with other species in the list of Weitzman & Vari (1988). Since the last update made by Costa & Le Bail (1999), 50 miniature Neotropical freshwater fishes have been described.

The largest diversity of miniature Neotropical freshwater fishes is still represented by the Characiformes (87 species, comprising 40.8%). We added 40 characiform species to the list, almost doubling the number previously listed by Weitzman & Vari (1988) and Costa & Le-Bail (1999). As noted by Weitzman & Vari (1988), it is interesting that miniature species are restricted to only a few families within the order, the Characidae and the Lebiasinidae in their account (with members of the Characidiinae listed by them in the Characidae, currently classified within the Crenuchidae). In our current list, the family Characidae accounts for the bulk of miniature characiform species (67 of the 87 miniatures), followed by the Crenuchidae, with 15 miniatures. The Lebiasinidae is represented by only three miniatures. Weitzman & Vari (1988) also included three lebiasinid species in their list, however *Nannostomus marginatus* Eigenmann originally listed by those authors was not included in our list, following Weitzman & Weitzman (2003:245) who recorded the species as reaching 35 mm SL. *Nannostomus britskii* Weitzman was included in our list based on Weitzman & Weitzman's (2003:244) record of its maximum length of 24 mm SL. Weitzman & Vari (1988) mentioned that within the Gasteropelecidae, several species of *Carnegiella* display numerous apparently paedomorphic features but did not include them in their list of miniatures. More recently (Weitzman & Palmer, 2003:101) recorded the maximum lengths of *Carnegiella myersi* Fernández-Yépez and *C. schereri* Fernández-Yépez as 21.5 and 26.0 mm SL, respectively, and based on that information these two species were included in our list. Hence, within the Characiformes, miniature Neotropical freshwater fishes are now represented in the families Characidae, Crenuchidae, Gasteropelecidae, and Lebiasinidae.

A major increase in the number of miniature species is noted in the order Cyprinodontiformes, represented by 62 species in our list. Five species were originally listed by Weitzman & Vari (1988) and Costa & Le Bail (1999) later added 13 more. Of those 18 species we excluded *Phallotorynus jucundus* Ihering, a poeciliid recorded to reach up to 29.7 mm SL (Lucinda *et al.*, 2005). Forty-two cyprinodontiform species were added to our list based mainly on information provided by Lucinda (2003). As a consequence the Cyprinodontiformes now represent 29.1% of the total miniatures (compared to almost 6% listed by Weitzman and Vari, 1988) exceeding the number of miniatures recorded for the Siluriformes. The latter order includes 52 miniatures or 24.4% of the total. Interestingly, within siluriforms there was a significant increase in the number of families that include miniatures, from the original six families in Weitzman & Vari's (1988) list to 11 in our updated list (Appendix I). From the previous 33 siluriform miniatures listed by Weitzman and Vari (1988) and Costa & Le Bail (1999), eight were excluded based on more recent records of their maximum length and 27 species were

added. In a recent list of smallest known loricariids, Ribeiro *et al.* (2012) listed five miniatures, all of them included in the present list except for *Corumbataia britskii* Ferreira & Ribeiro, which has been recorded as reaching 27 mm SL (Ferreira & Ribeiro, 2007).

Finally, 10 miniatures are included from the families Cichlidae (3) Eleotridae (6) and Gobiidae (1). From those, only three species of eleotrids were previously listed (Weitzman & Vari, 1988), of which *Microphilypnus amazonicus* Myers was excluded by us because it was considered to be a synonym of *M. macrostoma* Myers (Caires & Figueiredo, 2011). Within Clupeiformes, miniatures are still represented only by two engraulid species, *Amazonsprattus scintilla* Roberts and *Anchoviella manamensis* Cervigón.

Published lists of miniature freshwater fishes are available for other continental regions of the world. More than 50 miniature freshwater species occur in South and Southeast Asia (Kottelat & Vidthayanon, 1993), 24 miniature species were listed by Conway & Moritz (2006) for Africa, and there are only seven miniatures in freshwaters of North America (Bennett & Conway, 2010). Even though those lists are clearly out of date for some areas, with more miniatures having been described for example in Asia (Kottelat *et al.*, 2006; Britz 2009; Britz *et al.*, 2009; 2012; Conway *et al.*, 2011) the diversity of miniature freshwater fishes in the Neotropical region exceeds by far that of other continents for which similar lists have been compiled.

Weitzman & Vari (1988) also considered size at maturity (under 20 mm SL) as a criterion to include the species in their list of miniatures even if the species was known to exceed the 26 mm SL cut-off point, a procedure that was followed later by Kottelat & Vidthayanon (1993). In both cases the maximum sizes exceeding 26 mm SL were recorded from aquarium specimens. If only maximum known size was used as criterion, only one of the seven species listed by Bennett & Conway (2010) would be considered as miniature. The problems related to adhering strictly to the criterion of small body size were also discussed by Weitzman & Vari (1988) and Conway & Moritz (2006) in the case of species that exceed the cut-off size but exhibit paedomorphic features.

Another aspect related to using only size as criterion to compile lists of miniature freshwater fishes is that although new species are discovered and added to revised lists of miniatures, other species reported to exceed the cut-off size limit will have to be excluded. Conway & Moritz (2006) suggested that in the case of African miniature freshwater fishes although there may be a turnover in the taxa included in the list, the overall number of taxa listed would probably remain relatively constant through time. This is clearly not the case for the Neotropical miniature freshwater fish species. Fourteen species were excluded from the previous lists of Weitzman & Vari (1988) and Costa & Le Bail (1999), currently known to exceed 26 mm SL, compared to 118 species that were added to the list, resulting in a markedly increase in the total number of miniatures freshwater fishes currently known for the Neotropical region.

**Fig. 6.** Lake at right bank of rio Urubaxi, near igarapé Tapage, rio Negro, the type locality of *Priocharax nanus*. Photograph by Manoela M. F. Marinho.

After more than 25 years since the publication of Weitzman & Vari's (1988) list of miniature South American freshwater fishes, their statement that "The pace of description of such miniature species has quickened in the last decade and recent collecting efforts in various regions of South America revealed the existence of many interesting miniature species", is still true. In addition, aspects other than body size that may be used as criteria for distinguishing miniatures, such as size at maturity and the presence in miniatures of characters of a reductive nature, remain largely unknown for most species. In that context it would be interesting, for example, to explore which of the many miniature species represent proportional dwarfs and which are the result of developmental truncation (*sensu* Britz & Conway, 2009). Many other aspects of miniature fishes are yet to be explored in future studies of taxonomy, systematics, and developmental biology. We hope that this paper will stimulate further efforts towards the study of miniature Neotropical freshwater fishes.

**Comparative material.** *Priocharax ariel*: **Brazil:** Amazonas, Santa Isabel do Rio Negro, rio Negro basin: MZUSP 39778, 4, 13.5-14.6 mm SL, rio Urubaxi; MZUSP 55099, 8, 12.4-14.2 mm SL, igarapé at São João, near Santa Isabel do Rio Negro; MZUSP 55097, 4 of 6, 12.2-12.7 mm SL, lagoon near Paricatuba; MZUSP 62230, 2 of 4, 15.1-15.2 mm SL, lagoon in island near Paricatuba. **Venezuela:** Territorio Federal Amazonas: MZUSP 36497, 50, 11.8-15.2 mm SL, MZUSP 55142, 12 paratypes, 12.0-14.7 mm SL (5 c&s, 12.0-14.0 mm SL), Caño Manu, tributary of río Casiquiare approximately 250 m upstream from Solano. *Priocharax pygmaeus*: **Colombia:** Departamento Amazonas: MZUSP 36498, 5 paratypes, 10.2-10.7 mm SL, Quebrada Parajito, tributary

of Quebrada Bacada, tributary of Quebrada Matamata, tributary of río Amazonas, northwest of Leticia, about 04º41'S 69º57'W. **Peru:** Loreto, Requena, río Ucayali basin: MZUSP 85644, 1, 16.5 mm SL, small "quebrada", tributary of Quebrada Fierro Caño, *ca.* 4 km North of IIAP (2.7 km east of Jenaro Herrera).

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**Appendix I.** List of Miniature Neotropical freshwater fishes, *sensu* Weitzman & Vari (1988). Orders are organized in systematic sequence according to Wiley & Johnson (2010) and within each order taxa are listed in alphabetical order of less inclusive taxa. Classification of families and subfamilies follows Reis *et al.* (2003) except for the Characidae that follows Mirande (2010) and the use of Eleotridae at the family level (Pezold, 1993). *Priocharax* is included within the Heterocharacinae according to Mattox & Toledo-Piza (2012). SL refers to maximum registered standard length in millimeters, except for cases in which total length is given (indicated by an asterisk). References are those that provide largest registered length. Columns numbered 1 to 3 refer to species included in the list by (1) Weitzman & Vari (1988), (2) Costa & Le Bail (1999) and (3) present study. [#]*Hyphessobrycon* is masculine and it should therefore be *Hyphessobrycon albolineatus* Fernández-Yépez, 1950 rather than *Hyphessobrycon albolineatum* Fernández-Yépez, 1950.

| Taxon | SL | Reference | 1 | 2 | 3 |
|---|---|---|---|---|---|
| **CLUPEIFORMES** | | | | | |
| **Engraulidae** | | | | | |
| *Amazonsprattus scintilla* Roberts, 1984 | 19.5 | Weitzman & Vari, 1988:446 | X | | |
| *Anchoviella manamensis* Cervigón, 1982 | 25.0 | Weitzman & Vari, 1988:446 | X | | |
| **CHARACIFORMES** | | | | | |
| **Characidae** | | | | | |
| **Aphyoditeinae** | | | | | |
| *Axelrodia lindeae* Géry, 1973 | 20.6 | Weitzman & Vari, 1988:446 | X | | |
| *Axelrodia riesei* Géry, 1966 | 16.7 | Weitzman & Vari, 1988:446 | X | | |
| *Axelrodia stigmatias* (Fowler, 1913) | 20.5 | Weitzman & Vari, 1988:446 | X | | |
| *Microschemobrycon elongatus* Géry, 1973 | 25.0 | Weitzman & Vari, 1988:447 | X | | |
| *Microschemobrycon meyburgi* Meinken, 1975 | 22.0 | Lima *et al.*, 2003:145 | | | X |
| *Oxybrycon parvulus* Géry, 1964 | 15.7 | Weitzman & Vari, 1988:447 | X | | |
| *Tyttobrycon dorsimaculatus* Géry, 1973 | 20.5 | Weitzman & Vari, 1988:447 | X | | |
| *Tyttobrycon hamatus* Géry, 1973 | 16.9 | Weitzman & Vari, 1988:447 | X | | |
| *Tyttobrycon marajoara* Marinho, Bastos & Menezes, 2013 | 22.1 | Marinho *et al.*, 2013:740 | | | X |
| *Tyttobrycon spinosus* Géry, 1973 | 20.5 | Weitzman & Vari, 1988:447 | X | | |
| *Tyttobrycon xeruini* Géry, 1973 | 22.6 | Weitzman & Vari, 1988:447 | X | | |
| **Cheirodontinae** | | | | | |
| *Amazonspinther dalmata* Bührnheim, Carvalho, Malabarba & Weitzman, 2008 | 19.6 | Bührnheim *et al.*, 2008:666 | | | X |
| *Cheirodon luelingi* Géry, 1964 | 17.6 | Weitzman & Vari, 1988:446 | X | | |
| *Nanocheirodon insignis* (Steindachner, 1880) | 24.4 | Malabarba, 2003:217 | | | X |
| *Odontostilbe gracilis* (Géry, 1960) | 23.5 | Malabarba, 2003:218 | | | X |
| *Odontostilbe littoris* Géry, 1960 | 18.0 | Malabarba, 2003:218 | | | X |
| *Serrapinnus kriegi* (Schindler, 1937) | 23.6 | Malabarba, 2003:219 | | | X |
| *Spintherobolus broccae* Myers, 1925 | 25.6 | Malabarba, 2003:220 | X | | |
| **Heterocharacinae** | | | | | |
| *Priocharax ariel* Weitzman & Vari, 1987 | 17.1 | Weitzman & Vari, 1988:446 | X | | |
| *Priocharax nanus* Toledo-Piza, Mattox & Britz, 2014 | 15.4 | present paper | | | X |
| *Priocharax pygmaeus* Weitzman & Vari, 1987 | 16.4 | Weitzman & Vari, 1988:446 | X | | |
| **Stevardiinae** | | | | | |
| *Creagrutus maracaiboensis* (Schultz, 1944) | 22.0 | Lima *et al.*, 2003:124 | | | X |
| *Creagrutus nigrostigmatus* Dahl, 1960 | 23.4 | Lima *et al.*, 2003:124 | | | X |
| *Cyanogaster noctivaga* Mattox, Britz, Toledo-Piza & Marinho, 2013 | 17.4 | Mattox *et al.*, 2013:301 | | | X |
| *Iotabrycon praecox* Roberts, 1973 | 21.8 | Weitzman & Vari, 1988:446 | X | | |
| *Pterobrycon landoni* Eigenmann, 1913 | 25.1 | Weitzman, 2003:227 | | | X |
| *Scopaeocharax atopodus* (Böhlke, 1958) | 22.0 | Weitzman & Vari, 1988:446 | X | | |
| *Scopaeocharax rhinodus* (Böhlke, 1958) | 25.0 | Weitzman & Vari, 1988:446 | X | | |
| *Trochilocharax ornatus* Zarske, 2010 | 17.0 | Zarske, 2010:75 | | | X |
| *Tyttocharax cochui* (Ladiges, 1950) | 22.0 | Weitzman & Vari, 1988:446 | X | | |
| *Tyttocharax madeirae* Fowler, 1913 | 17.5 | Weitzman & Vari, 1988:446 | X | | |
| *Tyttocharax metae* Román-Valencia, García-Alzate, Ruiz-C. & Taphorn, 2012 | 15.8 | Román-Valencia *et al.*, 2012:521 | | | X |
| *Tyttocharax tambopatensis* Weitzman & Ortega, 1995 | 15.5 | Costa & Le Bail, 1999:1028 | | X | |
| *Xenurobrycon coracoralinae* Moreira, 2005 | 15.8 | Moreira, 2005:858 | | | X |
| *Xenurobrycon heterodon* Weitzman & Fink, 1985 | 20.1 | Weitzman & Vari, 1988:446 | X | | |
| *Xenurobrycon macropus* Myers & Miranda Ribeiro, 1945 | 19.8 | Weitzman & Vari, 1988:446 | X | | |
| *Xenurobrycon polyancistrus* Weitzman, 1987 | 13.8 | Weitzman, 2003:228 | X | | |
| *Xenurobrycon pteropus* Weitzman & Fink, 1985 | 13.8 | Weitzman & Vari, 1988:446 | X | | |
| **Tetragonopterinae** | | | | | |
| *Hemigrammus aereus* Géry, 1959 | 24.0 | Lima *et al.*, 2003:130 | | | X |
| *Hemigrammus iota* Durbin, 1909 | 21.0 | Weitzman & Vari, 1988:446 | X | | |
| *Hemigrammus luelingi* Géry, 1964 | 25.1 | Lima *et al.*, 2003:132 | | | X |
| *Hemigrammus tridens* Eigenmann, 1907 | 20.0 | Lima *et al.*, 2003:133 | | | X |
| *Hyphessobrycon albolineatus* Fernández-Yépez, 1950 | 25.8 | Lima *et al.*, 2003:134 | | | X |
| *Hyphessobrycon amandae* Géry & Uj, 1986 | 19.5 | Weitzman & Vari, 1988:446 | X | | |
| *Hyphessobrycon arianae* Uj & Géry, 1989 | 24.0 | Lima *et al.*, 2003:134 | | | X |
| *Hyphessobrycon axelrodi* (Travassos, 1959) | 22.0 | Lima *et al.*, 2003:134 | | | X |
| *Hyphessobrycon catableptus* (Durbin, 1909) | 18.0 | Weitzman & Vari, 1988:446 | X | | |
| *Hyphessobrycon ecuadorensis* (Eigenmann, 1915) | 20.5 | Lima *et al.*, 2003:135 | | | X |

| Taxon | SL | Reference | 1 | 2 | 3 |
|---|---|---|---|---|---|
| *Hyphessobrycon elachys* Weitzman, 1985 | 17.9 | Weitzman & Vari, 1988:446 | X | | |
| *Hyphessobrycon gracilior* Géry, 1964 | 21.5 | Weitzman & Vari, 1988:447 | X | | |
| *Hyphessobrycon griemi* Hoedeman, 1957 | 25.7 | Weitzman & Vari, 1988:447 | X | | |
| *Hyphessobrycon haraldschultzi* Travassos, 1960 | 21.0 | Lima *et al.*, 2003:137 | | | X |
| *Hyphessobrycon heteresthes* (Ulrey, 1894) | 17.0 | Lima *et al.*, 2003:137 | | | X |
| *Hyphessobrycon hildae* Fernández-Yépez, 1950 | 18.8 | Lima *et al.*, 2003:137 | | | X |
| *Hyphessobrycon loretoensis* Ladiges, 1938 | 24.0 | Weitzman & Vari, 1988:447 | X | | |
| *Hyphessobrycon minimus* Durbin, 1909 | 21.0 | Weitzman & Vari, 1988:447 | X | | |
| *Hyphessobrycon parvellus* Ellis, 1911 | 21.6 | Lima *et al.*, 2003:139 | | | X |
| *Hyphessobrycon roseus* (Géry, 1960) | 19.3 | Lima *et al.*, 2003:140 | | | X |
| *Hyphessobrycon saizi* Géry, 1964 | 23.0 | Lima *et al.*, 2003:140 | | | X |
| *Hyphessobrycon tenuis* Géry, 1964 | 26.0 | Lima *et al.*, 2003:141 | | | X |
| *Hyphessobrycon tropis* Géry, 1963 | 21.3 | Lima *et al.*, 2003:141 | | | X |
| *Hyphessobrycon tukunai* Géry, 1965 | 20.6 | Weitzman & Vari, 1988:447 | X | | |
| *Paracheirodon innesi* (Myers, 1936) | 22.2 | Weitzman & Vari, 1988:447 | X | | |
| *Paracheirodon simulans* (Géry, 1963) | 20.2 | Lima *et al.*, 2003:153 | X | | |
| **Characidae *incertae sedis*** | | | | | |
| *Bryconella pallidifrons* (Fowler, 1946) | 23.2 | Lima *et al.*, 2003:119 | | | X |
| *Erythrocharax altipinnis* Netto-Ferreira, Birindelli, Sousa, Mariguela & Oliveira, 2013 | 26.2 | Netto-Ferreira *et al.*, 2013b:3 | | | X |
| *Tucanoichthys tucano* Géry & Romer, 1997 | 16.6 | Lima *et al.*, 2003:158 | | | X |
| **Crenuchidae** | | | | | |
| *Ammocryptocharax minutus* Buckup, 1993 | 19.7 | Costa & Le Bail, 1999:1028 | | X | |
| *Characidium bahiense* Almeida, 1971 | 23.3 | Weitzman & Vari, 1988:447 | X | | |
| *Characidium heinianum* Zarske & Géry, 2001 | 25.0 | Netto-Ferreira *et al.*, 2013a:367 | | | X |
| *Characidium mirim* Netto-Ferreira, Birindelli & Buckup, 2013 | 20.2 | Netto-Ferreira *et al.*, 2013a:363 | | | X |
| *Characidium pteroides* Eigenmann, 1909 | 21.1 | Buckup, 2003:90 | | | X |
| *Elachocharax geryi* Weitzman & Kanazawa, 1978 | 19.0 | Buckup, 2003:91 | X | | |
| *Elachocharax junki* (Géry, 1971) | 23.1 | Buckup, 2003:92 | X | | |
| *Elachocharax mitopterus* Weitzman, 1986 | 13.9 | Weitzman & Vari, 1988:447 | X | | |
| *Elachocharax pulcher* Myers, 1927 | 22.1 | Weitzman & Vari, 1988:447 | X | | |
| *Klausewitzia ritae* Géry, 1965 | 25.0 | Weitzman & Vari, 1988:447 | X | | |
| *Microcharacidium eleotrioides* (Géry, 1960) | 21.0 | Weitzman & Vari, 1988:447 | X | | |
| *Microcharacidium geryi* Zarske, 1997 | 24.0 | Buckup, 2003:88 | | | X |
| *Microcharacidium gnomus* Buckup, 1993 | 22.3 | Costa & Le Bail, 1999:1028 | | X | |
| *Microcharacidium weitzmani* Buckup, 1993 | 12.0 | Costa & Le Bail, 1999:1028 | | X | |
| *Odontocharacidium aphanes* (Weitzman & Kanazawa, 1978) | 16.5 | Weitzman & Vari, 1988:447 | X | | |
| **Gasteropelecidae** | | | | | |
| *Carnegiella myersi* Fernández-Yépez, 1950 | 21.5 | Weitzman & Palmer, 2003:101 | | | X |
| *Carnegiella schereri* Fernández-Yépez, 1950 | 26.0 | Weitzman & Palmer, 2003:101 | | | X |
| **Lebiasinidae** | | | | | |
| *Nannostomus anduzei* Fernandez & Weitzman, 1987 | 16.2 | Weitzman & Vari, 1988:446 | X | | |
| *Nannostomus britskii* Weitzman, 1978 | 24.0 | Weitzman & Weitzman, 2003:244 | | | X |
| *Nannostomus minimus* Eigenmann, 1909 | 23.0 | Weitzman & Cobb, 1975:25 | X | | |
| **SILURIFORMES** | | | | | |
| **Aspredinidae** | | | | | |
| *Acanthobunocephalus nicoi* Friel, 1995 | 19.7 | Costa & Le Bail, 1999:1028 | | X | |
| *Hoplomyzon papillatus* Stewart, 1985 | 16.9 | Weitzman & Vari, 1988:448 | X | | |
| *Micromyzon akamai* Friel & Lundberg, 1996 | 15.8 | Costa & Le Bail, 1999:1028 | | X | |
| **Astroblepidae** | | | | | |
| *Astroblepus chimborazoi* (Fowler, 1915) | 25.0 | Schaefer, 2003:313 | | | X |
| **Auchenipteridae** | | | | | |
| *Gelanoglanis nanonocticolus* Soares-Porto, Walsh, Nico & Netto, 1999 | 22.2 | Soares-Porto *et al.*, 1999:66 | | | X |
| *Tatia marthae* Vari & Ferraris, 2013 | 23.1 | Vari & Ferraris, 2013:398 | | | X |
| **Callichthyidae** | | | | | |
| *Aspidoras brunneus* Nijssen & Isbrücker, 1976 | 21.3 | Weitzman & Vari, 1988:448 | X | | |
| *Aspidoras carvalhoi* Nijssen & Isbrücker, 1976 | 25.4 | Weitzman & Vari, 1988:448 | X | | |
| *Corydoras boehlkei* Nijssen & Isbrücker, 1982 | 25.7 | Reis, 2003:295 | | | X |
| *Corydoras cochui* Myers & Weitzman, 1954 | 25.0 | Reis, 2003:296 | | | X |
| *Corydoras gracilis* Nijssen & Isbrücker, 1976 | 23.2 | Weitzman & Vari, 1988:448 | X | | |
| *Corydoras habrosus* Weitzman, 1960 | 20.1 | Weitzman & Vari, 1988:448 | X | | |
| *Corydoras hastatus* Eigenmann & Eigenmann, 1888 | 24.0 | Reis, 2003:298 | X | | |
| *Corydoras pygmaeus* Knaack, 1966 | 23.7 | Weitzman & Vari, 1988:448 | X | | |
| **Cetopsidae** | | | | | |
| *Denticetopsis royeroi* Ferraris, 1996 | 18.0 | Vari & Ferraris Jr., 2003:258 | | | X |
| *Denticetopsis sauli* Ferraris, 1996 | 21.0 | Vari & Ferraris Jr., 2003:258 | | | X |
| **Doradidae** | | | | | |
| *Physopyxis ananas* Sousa & Rapp Py-Daniel, 2005 | 22.0 | Sousa & Rapp Py-Daniel, 2005:631 | | | X |
| *Physopyxis cristata* Sousa & Rapp Py-Daniel, 2005 | 22.7 | Sousa & Rapp Py-Daniel, 2005:633 | | | X |

| Taxon | SL | Reference | 1 | 2 | 3 |
|---|---|---|---|---|---|
| **Heptapteridae** | | | | | |
| *Horiomyzon retropinnatus* Stewart, 1986 | 24.0 | Bockmann & Guazzelli, 2003:413 | X | | |
| **Loricariidae** | | | | | |
| **Hypoptopomatinae** | | | | | |
| *Nannoplecostomus eleonorae* Ribeiro, Lima & Pereira, 2012 | 22.2 | Ribeiro *et al.*, 2012:637 | | | X |
| *Otocinclus tapirape* Britto & Moreira, 2002 | 24.1 | Britto & Moreira, 2002:1064 | | | X |
| *Parotocinclus amazonensis* Garavello, 1977 | 23.0 | Garavello, 1988:125 as *P. aripuanensis* | | | X |
| *Parotocinclus collinsae* Schmidt & Ferraris, 1985 | 25.5 | Ribeiro *et al.*,, 2012:646 | | | X |
| *Parotocinclus halbothi* Lehmann, Lazzarotto & Reis, 2014 | 19.9 | Lehmann *et al.*, 2014:30 | | | X |
| **Pseudopimelodidae** | | | | | |
| *Microglanis zonatus* Eigenmann & Allen, 1942 | 20.0 | Shibatta, 2003:403 | | | X |
| **Scoloplacidae** | | | | | |
| *Scoloplax baileyi* Rocha, Lazzarotto & Rapp Py-Daniel, 2012 | 15.4 | Rocha *et al.*, 2012:674 | | | X |
| *Scoloplax baskini* Rocha, Oliveira & Rapp Py-Daniel, 2008 | 16.1 | Rocha *et al.*, 2008:326 | | | X |
| *Scoloplax dicra* Bailey & Baskin, 1976 | 13.8 | Weitzman & Vari, 1988:448 | X | | |
| *Scoloplax distolothrix* Schaefer, Weitzman & Britski, 1989 | 17.9 | Costa & Le Bail, 1999:1028 | | X | |
| *Scoloplax dolicholophia* Schaefer, Weitzman & Britski, 1989 | 12.0 | Costa & Le Bail, 1999:1028 | | X | |
| *Scoloplax empousa* Schaefer, Weitzman & Britski, 1989 | 19.9 | Costa & Le Bail, 1999:1028 | | X | |
| **Trichomycteridae** | | | | | |
| **Glanapteryginae** | | | | | |
| *Pygidianops cuao* Schaefer, Provenzano, de Pinna & Baskin, 2005 | 18.7 | Schaefer *et al.*, 2005:7 | | | X |
| *Pygidianops eigenmanni* Myers, 1944 | 23.0 | Weitzman & Vari, 1988:447 | X | | |
| *Pygidianops magoi* Schaefer, Provenzano, de Pinna & Baskin, 2005 | 12.6 | Schaefer *et al.*, 2005:7 | | | X |
| *Typhlobelus macromycterus* Costa & Bockmann, 1994 | 21.9 | Costa & Bockmann, 1994:68 | | | X |
| *Typhlobelus guacamaya* Schaefer, Provenzano, de Pinna & Baskin, 2005 | 22.3 | Schaefer *et al.*, 2005:7 | | | X |
| **Sarcoglanidinae** | | | | | |
| *Ammoglanis amapaensis* Mattos, Costa & Gama, 2008 | 17.9 | Mattos *et al.*, 2008:162 | | | X |
| *Ammoglanis diaphanus* Costa, 1994 | 18.7 | Costa & Le Bail, 1999:1028 | | X | |
| *Ammoglanis pulex* de Pinna & Winemiller, 2000 | 14.9 | de Pinna & Wosiacki, 2003:272 | | | X |
| *Malacoglanis gelatinosus* Myers & Weitzman, 1966 | 19.9 | Weitzman & Vari, 1988:448 | X | | |
| *Microcambeva draco* Mattos & Lima, 2010 | 24.6 | Mattos & Lima, 2010:236 | | | X |
| *Sarcoglanis simplex* Myers & Weitzman, 1966 | 21.0 | Weitzman & Vari, 1988:448 | X | | |
| **Stegophilinae** | | | | | |
| *Schultzichthys gracilis* Dahl, 1960 | 26.0 | de Pinna & Wosiacki, 2003:278 | | | X |
| **Trichomycterinae** | | | | | |
| *Trichomycterus anhanga* Dutra, Wosiacki & de Pinna, 2012 | 13.1 | Dutra *et al.*, 2012:229 | | | X |
| *Trichomycterus hasemani* (Eigenmann, 1914) | 18.0 | Weitzman & Vari, 1988:447 | X | | |
| *Trichomycterus santaeritae* (Eigenmann, 1918) | 24.0 | Weitzman & Vari, 1988:447 | X | | |
| *Trichomycterus johnsoni* (Fowler, 1932) | 16.0 | Weitzman & Vari, 1988:447 | X | | |
| **Tridentinae** | | | | | |
| *Miuroglanis platycephalus* Eigenmann & Eigenmann, 1889 | 12.3 | de Pinna & Wosiacki, 2003:276 | X | | |
| *Tridensimilis venezuelae* Schultz, 1944 | 25.0 | de Pinna & Wosiacki, 2003:286 | X | | |
| *Tridentopsis cahuali* Azpelicueta, 1990 | 22.2 | de Pinna & Wosiacki, 2003:286 | | | X |
| *Tridentopsis pearsoni* Myers, 1925 | 23.0 | Weitzman & Vari, 1988:448 | X | | |
| *Tridentopsis tocantinsi* LaMonte, 1939 | 23.0 | Weitzman & Vari, 1988:448 | X | | |
| | | | | | |
| **CYPRINODONTIFORMES** | | | | | |
| **Poeciliidae** | | | | | |
| **Poeciliinae** | | | | | |
| *Cnesterodon raddai* Meyer & Etzel, 2001 | 23.2 | Lucinda, 2003:557 | | | X |
| *Gambusia dominicensis* Regan, 1913 | 25.0 | Lucinda, 2003:559 | | | X |
| *Gambusia marshi* Minckley & Craddock, 1962 | 24.0 | Lucinda, 2003:559 | | | X |
| *Gambusia sexradiata* Hubbs, 1936 | 26.0 | Lucinda, 2003:559 | | | X |
| *Girardinus cubensis* (Eigenmann, 1903) | 26.0 | Lucinda, 2003:561 | | | X |
| *Limia dominicensis* (Valenciennes, 1846) | 26.0 | Lucinda, 2003:563 | | | X |
| *Limia garnieri* Rivas, 1980 | 26.0 | Lucinda, 2003:563 | | | X |
| *Limia heterandria* (Regan, 1913) | 19.5 | Lucinda, 2003:563 | | | X |
| *Limia immaculata* Rivas, 1980 | 21.3 | Lucinda, 2003:563 | | | X |
| *Micropoecilia minima* (Costa & Sarraf, 1997) | 23.6 | Costa & Le Bail, 1999:1028 | | X | |
| *Neoheterandria cana* (Meek & Hildebrand, 1913) | 25* | Lucinda, 2003:564 | | | X |
| *Neoheterandria elegans* Henn, 1916 | 18.0 | Weitzman & Vari, 1988:449 | X | | |
| *Neoheterandria tridentiger* (Garman, 1895) | 25* | Lucinda, 2003:564-565 | | | X |
| *Pamphorichthys araguaiensis* Costa, 1991 | 24.5 | Lucinda, 2003:565 | | | X |
| *Pamphorichthys hasemani* (Henn, 1916) | 13.8 | Lucinda, 2003:565 | | | X |
| *Pamphorichthys hollandi* (Henn, 1916) | 22.4 | Casatti *et al.*, 2006:61 | | | X |
| *Pamphorichthys minor* (Garman, 1895) | 15.0 | Weitzman & Vari, 1988:449 | X | | |
| *Pamphorichthys pertapeh* Figueiredo, 2008 | 20.0 | Figueiredo, 2008:62 | | | X |
| *Pamphorichthys scalpridens* (Garman, 1895) | 24.8 | Lucinda, 2003:565 | | | X |
| *Phallichthys quadripunctatus* Bussing, 1979 | 15.0 | Lucinda, 2003:565 | | | X |

| Taxon | SL | Reference | 1 | 2 | 3 |
|---|---|---|---|---|---|
| *Phallichthys tico* Bussing, 1963 | 25.0 | Lucinda, 2003:565 | | | X |
| *Phalloptychus eigenmanni* Henn, 1916 | 22.8 | Lucinda, 2005:381 | | | X |
| *Phallotorynus dispilos* Lucinda, Rosa & Reis, 2005 | 25.3 | Lucinda *et al.*, 2005:619 | | | X |
| *Phallotorynus psittakos* Lucinda, Rosa & Reis, 2005 | 25.3 | Lucinda *et al.*, 2005:631 | | | X |
| *Phallotorynus victoriae* Oliveros, 1983 | 23.0 | Lucinda *et al.*, 2005:615 | | | X |
| *Poecilia hasemani* (Henn, 1916) | 23.0 | Weitzman & Vari, 1988:449 | X | | |
| *Poecilia parae* Eigenmann, 1894 | 20* | Lucinda, 2003:567, as *P. amazonica* | | | X |
| *Poeciliopsis baenschi* Meyer, Radda, Riehl & Feichtinger, 1986 | 25.0 | Lucinda, 2003:569 | | | X |
| *Priapichthys panamensis* Meek & Hildebrand, 1916 | 25.0 | Lucinda, 2003:572 | | | X |
| *Pseudopoecilia austrocolumbiana* Radda, 1987 | 20.0 | Lucinda, 2003:572 | | | X |
| *Quintana atrizona* Hubbs, 1934 | 25.0 | Lucinda, 2003:572 | | | X |
| *Scolichthys iota* Rosen, 1967 | 25.0 | Lucinda, 2003:572 | | | X |
| *Xiphophorus continens* Rauchenberger, Kallmann & Morizot, 1990 | 25* | Lucinda, 2003:573 | | | X |
| **Protacopodinae** | | | | | |
| *Fluviphylax obscurus* Costa, 1996 | 17.3 | Costa & Le Bail, 1999:1028 | | X | |
| *Fluviphylax palikur* Costa & LeBail, 1999 | 13.9 | Costa & Le Bail, 1999:1028 | | X | |
| *Fluviphylax pygmaeus* (Myers & Carvalho, 1955) | 22.0 | Weitzman & Vari, 1988:448 | X | | |
| *Fluviphylax simplex* Costa, 1996 | 15.5 | Costa & Le Bail, 1999:1028 | | X | |
| *Fluviphylax zonatus* Costa, 1996 | 15.9 | Costa & Le Bail, 1999:1028 | | X | |
| **Rivulidae** | | | | | |
| *Laimosemion jauaperi* Costa & Bragança, 2013 | 18.9 | Costa & Bragança, 2013:94 | | | X |
| *Laimosemion kirovskyi* (Costa, 2004a) | 22.7 | Costa, 2004a:10 | | | X |
| *Laimosemion romeri* (Costa, 2003b) | 21.7 | Costa, 2003b:176 | | | X |
| *Laimosemion uatuman* (Costa, 2004b) | 22.2 | Costa, 2004b:3 | | | X |
| *Laimosemion ubim* Costa & Lazzarotto, 2014 | 18.0 | Costa & Lazzarotto, 2014:371 | | | X |
| *Leptolebias itanhaensis* Costa, 2008 | 21.8 | Costa, 2008:152 | | | X |
| *Leptolebias marmoratus* (Ladiges, 1934) | 23.3 | Costa, 2002:381 | | | X |
| *Melanorivulus egens* (Costa, 2005) | 26.0 | Costa, 2005:80 | | | X |
| *Melanorivulus paracatuensis* (Costa, 2003a) | 23.9 | Costa, 2003a:42 | | | X |
| *Melanorivulus rossoi* (Costa, 2005) | 21.5 | Costa, 2005:75 | | | X |
| *Melanorivulus rutilicaudus* (Costa, 2005) | 22.9 | Costa, 2005:77 | | | X |
| *Notholebias cruzi* (Costa, 1988) | 22.9 | Costa & Le Bail, 1999:1028 | | X | |
| *Notholebias vermiculatus* Costa & Amorim, 2013 | 23.7 | Costa & Amorim, 2013:68 | | | X |
| *Plesiolebias aruana* (Lazara, 1991) | 19.9 | Costa & Le Bail, 1999:1028 | | X | |
| *Plesiolebias glaucopterus* (Costa & Lacerda, 1989) | 24.1 | Costa & Le Bail, 1999:1028 | | X | |
| *Plesiolebias lacerdai* Costa, 1989 | 19.7 | Costa & Le Bail, 1999:1028 | | X | |
| *Simpsonichthys cholopteryx* Costa, Moreira & Lima, 2003 | 23.5 | Costa *et al.*, 2003:142 | | | X |
| *Simpsonichthys nigromaculatus* Costa, 2007 | 25.6 | Costa, 2007:32 | | | X |
| *Simpsonichthys parallelus* Costa, 2000 | 23.5 | Costa *et al.*, 2003:143 | | | X |
| *Spectrolebias costai* (Lazara, 1991) | 19.8 | Costa & Le Bail, 1999:1028 | | X | |
| *Spectrolebias reticulatus* (Costa & Nielsen, 2003) | 20.1 | Costa & Nielsen, 2003:120 | | | X |
| *Spectrolebias semiocellatus* Costa & Nielsen, 1997 | 22.2 | Costa & Le Bail, 1999:1028 | | X | |
| *Stenolebias bellus* Costa, 1995 | 16.5 | Costa & Le Bail, 1999:1028 | | X | |
| *Stenolebias damascenoi* (Costa, 1991) | 24.4 | Costa & Le Bail, 1999:1028 | | X | |
| **GOBIIFORMES** | | | | | |
| **Eleotridae** | | | | | |
| *Leptophilypnion fittkaui* Roberts, 2013 | 9.7 | Roberts, 2013:85 | | | X |
| *Leptophilypnion pusillus* Roberts, 2013 | 9.1 | Roberts, 2013:85 | | | X |
| *Microphilypnus acangaquara* Caires & Figueiredo, 2011 | 18.5 | Caires & Figueiredo, 2011:55 | | | X |
| *Microphilypnus macrostoma* Myers, 1927 | 20.0 | Weitzman & Vari, 1988:449 | X | | |
| *Microphilypnus tapajosensis* Caires, 2013 | 22.7 | Caires, 2013:156 | | | X |
| *Microphilypnus ternetzi* Myers, 1927 | 23.2 | Caires & Figueiredo, 2011:49 | X | | |
| **Gobiidae** | | | | | |
| *Gobiosoma yucatanum* Dawson, 1971 | 26.0 | Kullander, 2003b:661 | | | X |
| **LABRIFORMES** | | | | | |
| **Cichlidae** | | | | | |
| *Apistogramma juruensis* Kullander, 1986 | 24.0 | Kullander, 2003a:614 | | | X |
| *Apistogramma piauiensis* Kullander, 1980 | 23.0 | Kullander, 2003a:615 | | | X |
| *Apistogramma staecki* Koslowski, 1985 | 21.0 | Kullander, 2003a:615 | | | X |

**Appendix II.** Species originally included in the lists of miniature South American freshwater fishes by Weitzman & Vari (1988) and Costa & Le Bail (1999) (in the case of *Stauroglanis gouldingi*) that either exceed 26 mm SL or are not currently considered valid species. Orders are organized in systematic sequence following Wiley & Johnson (2010), and within each order taxa are listed in alphabetical order of less inclusive taxa. Classification of families and subfamilies follows Reis *et al.* (2003) except for the Characidae that follows Mirande (2010), and the use of Eleotridae at the family level (Pezold, 1993).

| Taxon | Justification | Reference |
|---|---|---|
| **CHARACIFORMES** | | |
| **Characidae** | | |
| **Tetragonopterinae** | | |
| *Hyphessobrycon diancistrus* Weitzman, 1977 | Maximum SL: 30 mm | Lima *et al*., 2003:135 |
| *Hyphessobrycon flammeus* Myers, 1924 | Maximum SL: 26.1 mm | Carvalho *et al.*, 2014: 250 |
| *Hyphessobrycon georgettae* Géry, 1961 | Maximum SL: 32 mm | Lima *et al*., 2003:136 |
| *Hyphessobrycon megalopterus* (Eigenmann, 1915) [cited as *Megalamphodus rogoague* by Weitzman & Vari (1988)] | Maximum SL: 36.4 mm | Lima *et al*., 2003:138 |
| *Hyphessobrycon minor* Durbin, 1909 | Maximum SL: 31.2 mm | Lima *et al*., 2003:138 |
| **Lebiasinidae** | | |
| *Nannostomus marginatus* Eigenmann, 1909 | Maximum SL: 35 mm | Weitzman & Weitzman, 2003:245 |
| **SILURIFORMES** | | |
| **Aspredinidae** | | |
| *Dupouyichthys sapito* Schultz, 1944 | Maximum SL: 30 mm | Friel, 2003:263 |
| **Callichthyidae** | | |
| *Aspidoras pauciradiatus* Weitzman & Nijssen, 1970 | Maximum SL: 29 mm | Reis, 2003:292 |
| **Loricariidae** | | |
| **Hypoptopomatinae** | | |
| *Otothyris lophophanes* (Eigenmann & Eigenmann, 1889) [cited as *Microlepidogaster lophophanes* by Weitzman & Vari (1988)] | Maximum SL: 28.2 mm | Ribeiro *et al*., 2012:646 |
| **Trichomycteridae** | | |
| **Sarcoglanidinae** | | |
| *Stauroglanis gouldingi* de Pinna, 1989 | Maximum SL: 27 mm | de Pinna & Wosiacki, 2003:278 |
| **Tridentinae** | | |
| *Tridensimilis brevis* (Eigenmann & Eigenmann, 1889) | Maximum SL: 30 mm | de Pinna & Wosiacki, 2003:286 |
| **Vandeliinae** | | |
| *Paravandellia bertonii* Eigenmann, 1918 | Synonym of *Paravandellia oxyptera* Miranda Ribeiro, 1912 | de Pinna & Wosiacki, 2003:277 |
| *Paravandellia oxyptera* Miranda Ribeiro, 1912 | Maximum SL: 28 mm | de Pinna & Wosiacki, 2003:277 |
| *Paravandellia phaneronema* (Miles, 1943) [cited as *Paravandellia magdalenae* by Weitzman & Vari (1988)] | Maximum SL: 28 mm | de Pinna & Wosiacki, 2003:277 |
| **CYPRINODONTIFORMES** | | |
| **Poeciliidae** | | |
| **Poeciliinae** | | |
| *Phallotorynus jucundus* von Ihering, 1930 | Maximum SL: 29.7 mm | Lucinda *et al*., 2005:618 |
| **GOBIIFORMES** | | |
| **Eleotridae** | | |
| *Microphilypnus amazonicus* Myers, 1927 | Synonym of *Microphilypnus macrostoma* Myers, 1927 | Caires & Figueiredo, 2011:39 |