

Original article

New *Myloplus* from Essequibo River basin, Guyana, with discussion on the taxonomic status of *Myleus pacu* (Characiformes: Serrasalminidae)

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A new species in the serrasalminid genus *Myloplus* is described from the middle Mazaruni River, Essequibo River basin, Guyana. The new species is similar to *Myleus pacu* and *Myloplus planquettei* in its silver to purplish black coloration and its overall morphology, and has a putative syntopic distribution with those species. The new species is, however, readily distinguishable from the other two by meristic counts of the unpaired fins and by differences in color pattern, primarily in males. Additionally, we provide comments on *Myleus pacu* and other species that have been confounded under that name.

Keywords. Endemic, *Myletes*, Sexually dichromatism, *Species inquirenda*, Taxonomy.

Uma nova espécie de serrasalmídeo do gênero *Myloplus* é descrita do médio rio Mazaruni, bacia do rio Essequibo, Guyana. A nova espécie é similar a *Myleus pacu* e *Myloplus planquettei* pela sua coloração prateada a preto arroxeado e pela morfologia geral do corpo, e por ter suposta distribuição sintópica com essas espécies. No entanto, a nova espécie é prontamente distinguida dessas duas últimas espécies por contagens das nadadeiras não pares, e por diferenças no padrão de coloração, principalmente nos machos. Adicionalmente, fornecemos comentários sobre *Myleus pacu* e outras espécies que têm sido confundidas sob esse nome.

Palavras-chave. Dicromatismo sexual, Endêmico, *Myletes*, *Species inquirenda*, Taxonomia.

Introduction

The diversity of the Serrasalminidae “pacu” genus *Myloplus* Gill, 1896, with 14 currently recognized species, is second only to the most speciose herbivores of the genus *Metynniss* Cope, 1878, which contains 15 named species (Ota *et al.*, 2016; Fricke *et al.*, 2019). *Myloplus* has a broad distribution throughout South America with its greatest diversity in the Amazon basin (Nico *et al.*, 2018). *Myloplus* diversity remains incompletely characterized and has increased modestly in recent years (Andrade *et al.*, 2016a,b, 2018a). Outside the Amazon basin, *Myloplus* is particularly diverse in the coastal drainages of the Guiana Shield, encompassing the Orinoco, Essequibo, and Atlantic flowing river basins of the Guianas, which harbor ten recognized species (Fricke *et al.*, 2019): *Myloplus asterias* (Müller, Troschel, 1844), *Myloplus arnoldi* Ahl, 1936, *Myloplus lobatus* (Valenciennes, 1850), *Myloplus planquettei* Jégu, Keith, Le Bail, 2003, *Myloplus rhomboidalis* (Cuvier, 1818), *Myloplus rubripinnis* (Müller, Troschel, 1844), *Myloplus schomburgkii* (Jardine, 1841),

Myloplus ternetzi (Norman, 1929), *Myloplus torquatus* (Kner, 1858), and *Myloplus tumukumak* Andrade, Jégu, Gama, 2018. Despite this diversity and of relatively detailed historical sampling of their ichthyological diversity (*e.g.*, Eigenmann, 1912; Géry, 1972), tributaries of the Guiana Shield continue to reveal previously undescribed species of *Myloplus*.

In this paper, we report and describe a previously unknown species of *Myloplus* from the Mazaruni River, a tributary of the Essequibo River basin in Guyana. This species was initially identified as *Myleus pacu* (Jardine, 1841) because of its silver to purplish black coloration and its supposedly syntopic distribution with that species. However, this previously unknown species has molariform teeth and premaxillary rows separated by a clear gap characteristic of the genus *Myloplus*, whereas *Myleus* is characterized by two adjacent rows of incisiform teeth in contact with each other (Andrade *et al.*, 2018b). Additionally, we provide some comments on characters distinguishing *Myleus pacu* and other species that have been confounded under that name.

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Material and Methods

Measurements and counts follow Jégu *et al.* (2003) with addition of caudal-peduncle length. Standard length (SL) is expressed in millimeters and all other measurements are expressed as percentage of SL, except for subunits of head, which are expressed as percentage of head length (HL). Counts are given in the description followed by frequency of each count in parentheses; counts observed in the holotype are indicated by an asterisk. Osteological terminology follows Weitzman (1962) with modifications based on Mattox *et al.* (2014). Osteological descriptions, vertebral and supraneural counts were based on radiographed specimens. Vertebrae of the Weberian apparatus are counted as four elements and the compound caudal centra (PU1+U1) as one element.

Institutional abbreviations are as follows: BMNH (Natural History Museum, London), CSBD (Ichthyology Collection of the Centre for the Study of Biological Diversity, University of Guyana, Georgetown), GEA (Laboratório de Ictiologia do Grupo de Ecologia Aquática, UFPA, Belém), INPA (Instituto Nacional de Pesquisas da Amazônia, Manaus), MNHN (Muséum National d'Histoire Naturelle, Paris), NMW (Naturhistorisches Museum Wien, Vienna), ROM (Royal Ontario Museum, Toronto), TAMU (Texas A&M University, College Station), UFGD (Universidade Federal da Grande Dourados, Dourados), UFPA (Universidade Federal do Pará, Belém), UMMZ (University of Michigan Museum of Zoology, Ann Arbor), ZMA (Zoologisch Museum Universiteit van Amsterdam; specimens now at RMNH - Rijksmuseum Museum van Natuurlijke Historie, Leiden), and ZMB (Museum für Naturkunde Berlin, Berlin).

Results

Myloplus taphorni, new species

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Holotype. CSBD F 3611, 143.3 mm SL, Guyana, Mazaruni River at mouth of Kurupung River, 6°12.846'N 60°09.394'W, 21 March 2016, E. Liverpool, D.C. Taphorn, H. López-Fernández, M. Ram, K. Dookram, D. Hemraj, J. Correia.

Paratypes. ROM 101261, 1, 145.7 mm SL, same data of holotype; ROM 101262, 1, 142.4 mm SL, Guyana, Lower Kurupung River, 22 March 2016, E. Liverpool, D.C. Taphorn, H. López-Fernández, M. Ram, K. Dookram, D. Hemraj, J. Correia; UMMZ 251911, 1, 154.9 mm SL, Guyana, Eping Creek, tributary of the Mazaruni River, 6°08.151'N 60°04.470'W, 20 March 2016, E. Liverpool, D.C. Taphorn, H. López-Fernández, M. Ram, K. Dookram, D. Hemraj, J. Correia.

Diagnosis. *Myloplus taphorni* differs from all congeners, except *M. asterias*, *M. levis* (Eigenmann, McAtee, 1907), *M. rubripinnis*, and *M. tumukumak*, by combination of a higher number of branched rays in both dorsal and anal fin (23–25 and 33–34, branched dorsal-fin and anal-fin rays, respectively, vs. 20–21 and 27–29 in *M. arnoldi*, 21–22 and 32–34 in *M. lobatus*, 18–22 and 31–34 in *M. lucienae* Andrade, Ota, Bastos, Jégu, 2016, 18–21 and 32–34 in *M. planquettei*, 21–22 and 30–33 in *M. rhomboidalis*, 20–21 and 30–36 in *M. schomburgkii*, 22–25 and 28–29 in *M. ternetzi*, 24–25 and 30–33 in *M. tiete* (Eigenmann, Norris, 1900), 23–24 and 29–30 in *M. torquatus*, 20–22 and 32–34 in *M. zorroi* Andrade, Jégu, Giarrizzo, 2016). *Myloplus taphorni* differs from *M. asterias* by having a shorter caudal-peduncle length (8.8–9.7% SL vs. 10.2–12.0% SL), and further by possessing anterior and posterior fontanels elongated and about the same size vs. anterior fontanel large, wide and rounded and posterior fontanel minute, narrow and triangle shaped. *Myloplus taphorni* differs from *M. levis* by having a reddish gray (male) or completely hyaline (female) anal fin vs. anal fin with an evident black mark present on the anterodistal portion in both sexes. *Myloplus taphorni* is distinguished from *M. tumukumak*, and additionally from *M. lucienae*, *M. planquettei*, and *M. zorroi* by having more series of scales between the lateral line and the pelvic-fin origin (37–39 vs. 24–29 in *M. tumukumak*, 27–31 in *M. lucienae*, 32–40 in *M. planquettei*, and 36–42 in *M. zorroi*). Additionally, *M. taphorni* differs from *M. arnoldi*, *M. asterias*, *M. lobatus*, *M. lucienae*, *M. rhomboidalis*, *M. rubripinnis*, and *M. torquatus* by having a shorter postorbital distance (24.4–25.7% HL vs. 27.8–32.0% HL in *M. arnoldi*, 27.9–34.2% HL in *M. asterias*, 26.9–32.3% HL in *M. lobatus*, 30.4–36.8% HL in *M. lucienae*, 26.9–32.0% HL in *M. rhomboidalis*, 26.2–32.6% HL in *M. rubripinnis*, and 38.1–38.8% HL in *M. torquatus*).

Description. Morphometric data in Tab. 1. Body deep, rounded to slightly elongated (and see Sexual dimorphism), highest body depth at dorsal-fin origin (Figs. 1a–c). Blunt snout. Big eye. Dorsal profile of head gently concave, predorsal profile and dorsal-fin base slightly convex. Dorsal profile between dorsal-fin base terminus and adipose-fin origin short and straight. Ventral profile of head and body convex. Anal-fin base straight to pronouncedly convex. Caudal peduncle with dorsal and ventral profiles convex.

Upper and lower jaws equal, mouth terminal. Rows of premaxillary teeth separated by an edentulous gap. Five*(4) molariform teeth in outer premaxillary row and 2*(4) in inner row. Dentary with 5*(4) molariform teeth, and pair*(4) of teeth at dentary symphysis. Symphyseal tooth with cutting edge in anterior portion. Maxilla edentulous. First gill arch with 14(1) gill rakers on upper branch, 15(1) rakers on lower branch, and 1(1) raker on intermediate cartilage.

Tab. 1. Morphometric data of *Myloplus taphorni* from Essequibo River basin, Guyana. SD=Standard Deviation.

	Holotype		Paratypes		Mean	SD
	CSBD F 3611	ROM 101261	ROM 101262	UMMZ 251911		
Standard length (mm)	143.3	145.7	142.4	154.9		
<i>Percentages of SL</i>						
Body depth	72.7	72.8	78.9	69.1	73.4	4.1
Head length	26.1	25.4	25.8	25.5	25.7	0.3
Distance from snout to supraoccipital spine	33.0	34.5	33.8	34.2	33.9	0.7
Predorsal length	58.3	59.0	60.9	58.5	59.2	1.2
Dorsal-fin base length	36.5	34.6	36.3	36.2	35.9	0.9
Interdorsal length	9.1	10.1	9.0	9.2	9.4	0.5
Adipose-fin base length	4.6	3.7	4.7	4.2	4.3	0.5
Caudal-peduncle length	9.7	9.2	8.9	8.8	9.2	0.4
Caudal-peduncle depth	10.5	10.0	9.9	9.3	9.9	0.5
Caudal peduncle width	3.3	3.4	3.9	3.6	3.6	0.3
Prepectoral length	29.7	28.4	27.9	28.1	28.5	0.8
Pectoral-fin length	21.7	19.9	21.3	20.3	20.8	0.8
Pelvic-fin origin to anal-fin origin	20.4	22.8	21.2	21.8	21.6	1.0
Pectoral-fin origin to pelvic-fin origin	31.6	32.7	37.6	32.6	33.6	2.7
Prepelvic length	60.6	60.8	65.3	60.2	61.7	2.4
Pelvic-fin length	14.7	14.0	14.1	14.1	14.2	0.3
Preanal length	79.0	80.2	75.0	79.3	78.4	2.3
Anal-fin base length	40.4	38.2	41.4	37.7	39.4	1.8
First anal-fin lobe length	20.8	-	24.1	17.7	20.9	3.2
Second anal-fin lobe length	14.3	-	-	16.2	15.3	1.3
Dorsal-fin lobe length	27.1	25.9	28.4	25.3	26.7	1.4
Dorsal-fin origin to anal-fin origin	75.2	74.4	79.5	72.0	75.3	3.1
Dorsal-fin end to anal-fin origin	55.7	54.0	58.8	51.6	55.0	3.0
Dorsal-fin end to anal-fin end	22.2	21.4	21.7	20.5	21.5	0.7
<i>Percentages of HL</i>						
Snout length	27.9	28.6	28.3	28.9	28.4	0.4
Mouth length	16.9	16.9	14.7	17.3	16.5	1.2
Mouth width	37.3	35.2	36.7	34.9	36.0	1.2
Interorbital width	55.7	59.0	56.9	53.3	56.2	2.4
Head width	64.8	66.0	67.5	64.7	65.8	1.3
Third infraorbital width	12.5	13.1	12.4	11.8	12.5	0.5
Cheek gap width	8.7	9.0	10.0	10.0	9.4	0.7
Fourth infraorbital width	9.5	10.8	10.6	9.3	10.1	0.8
Eye vertical diameter	47.3	46.6	46.7	45.6	46.6	0.7
Postorbital distance	25.7	25.1	24.4	24.6	25.0	0.6

Scales cycloid. Perforated lateral line scales from supracleithrum to edge of hypural plate 63(2) or 65*(2); total perforated scales on lateral line from supracleithrum to base of median caudal-fin rays 67(1), 68(1), 69*(1) or 70(1). Longitudinal scale rows between line and dorsal-fin origin 36(3) or 37*(1); longitudinal scale rows between lateral line and pelvic-fin origin 37(1), 38(1) or 39*(2). Circumpeduncular scale rows 32*(3) or 33(1).

Forward directed spine anterior to dorsal fin. Dorsal-fin base relatively long compared to the short space between dorsal-fin base terminus and adipose-fin origin. Dorsal-fin rays ii*(3) or iii(1), and 23*(2), 24(1) or 25(1). Anal-fin rays iii*(4), and 33*(2) or 34(2). Pectoral-fin rays i*(4), and 12(1), 14(1) or 15*(2). Pelvic-fin rays i,6*(4). Adipose fin tear drop shaped. Caudal fin forked, dorsal and ventral lobes approximately equal in size.

Ventral keel scutes prominent, with large spines. Anterior most spine reaching or surpassing vertical through pectoral-fin origin (Fig. 2). Prepelvic serra with 21(1), 22*(1), 23(1) or 25(1) spines. Postpelvic serra with 5(1), 6*(2) or 7(1) simple spines, and 5*(2) or 6(2) pairs of spines around anus. Total serra with 32(1) 33*(1) or 36(2) spines.

Neurocranium triangular, as long as high (Fig. 2). Fontanel elongated and equal sized. Ascending premaxilla process elongated, massive, and well fused to neurocranium. Dentary short with ventral edge straight. First dorsal-fin pterygiophore inserted between neural spines of vertebrae 10th and 11th(1), or between 9th and 10th(1), 5(1) or 6(1) supraneurals. Nine (1) or 10(1) predorsal vertebrae, 5(2) vertebrae between first anal-fin pterygiophore and last dorsal-fin pterygiophore, 12(2) vertebrae posterior to last dorsal-fin pterygiophore. First dorsal-fin pterygiophore posterior to neural spine of 9th(1) or 10th(1) centrum. First anal-fin pterygiophore posterior to haemal spine of 22nd(2) centrum. Thirty-seven(1) to 38(1) total vertebrae, 21(2) precaudal and 17(1) or 18(1) caudal vertebra (Fig. 2).

Coloration in alcohol. Background coloration yellowish silver (Figs. 1a–c). Flank homogeneously yellowish silver, countershaded (females, Fig. 1c) or with black coloration pattern (males, and see coloration under Sexual dimorphism for details), mainly concentrated on dorsal half of flank (Figs. 1a–b). Eye with well-marked vertical black bar, anterior and posterior portions of sclerotic clear to light yellow. Infraorbital series lacking pigmentation or with very few dark chromatophores on 1st, 2nd and/or 3rd infraorbitals. Opercle silver, anteromedial portion with very few dark chromatophores. Belly silver or light brown. Fins hyaline to light brown with few chromatophores scattered on rays and hyaline membrane between rays. Dorsal fin generally light brown with discrete black pigmentation distally on anterior rays. Adipose light brown to clear or with a very thin brown edge. Anal rays with dark chromatophores along base and extending to middle portion of rays or uniformly light brown. Caudal fin yellow to light brown, distally whitish gray.

Coloration in life. Background coloration silver to purplish silver, especially in males (Fig. 3a); females silver to bluish silver (Fig. 3b). Dorsal portion of head brownish black, ventrally and posterior to eye light silver. Upper portion of 3rd and 4th infraorbital and operculum light olive green. Eye with conspicuous vertical black bar, anterior and posterior portions of sclerotic bright yellow. Flank homogeneous silvery or with evident scattered pattern of black scales, mainly on upper flank. Belly silver or light black and metallic purple. Pectoral, pelvic and adipose hyaline to light yellow. Dorsal, anal and caudal fins yellow-orange to bright or brownish red.

Sexual dimorphism. Males and females are distinguished mainly by differences in coloration. Background coloration of dorsal region of males distinctly brownish red (Figs. 1a–b, 3), ventrally purple to purplish silver with a dark purple, almost black, diffuse band on the ventral-most quarter of the flank. Females are primarily silver with a distinct bluish veneer in life (Figs. 1c, 3). Male flank with a whitish silver medial region above and below the lateral line, bordered by deep black scales, most of which are overlaid with a metallic green sheen; perforated scales and lateral line pigmented black at center. Males also recognized by the presence of elongated middle anal fin rays, forming a lobe with apex centered on 16th branched ray. Females with first anal fin ray clear, longest, decreasing in size towards posterior portion of fin. Males lack stiff hooks on distalmost lepidotrichia of anal-fin rays and filamentous extensions on dorsal-fin rays.

Geographical distribution. *Myloplus taphorni* is currently known only from two tributaries of the middle reaches of the Mazaruni River, Essequibo River basin, Guyana (Fig. 4).

Ecological notes. The species was collected in black water channels (Fig. 5) between 25 and 75 m wide. Water characteristics at the two sites were similar, with temperature between 26.7–29 °C, pH of 5.1, extremely low conductivity between 4–12 µS/m and secchi depth between 65–85 cm. Both sites had bottom consisting of a mixture of sand and coarse gravel, likely a semi-natural substrate transformed at least partially by ongoing or past gold mining activities in the area (see Discussion). Specimens were collected near large rocks or submerged woody debris at depths of 1 m or deeper.

Etymology. The species is named in honor of American ichthyologist Dr. Donald C. Taphorn in recognition of over four decades of continuing contributions to Neotropical ichthyology, his expansive role in training South American ichthyologists (including the authors), and for his participation in the expedition to the middle Mazaruni during which the new *Myloplus* was collected.

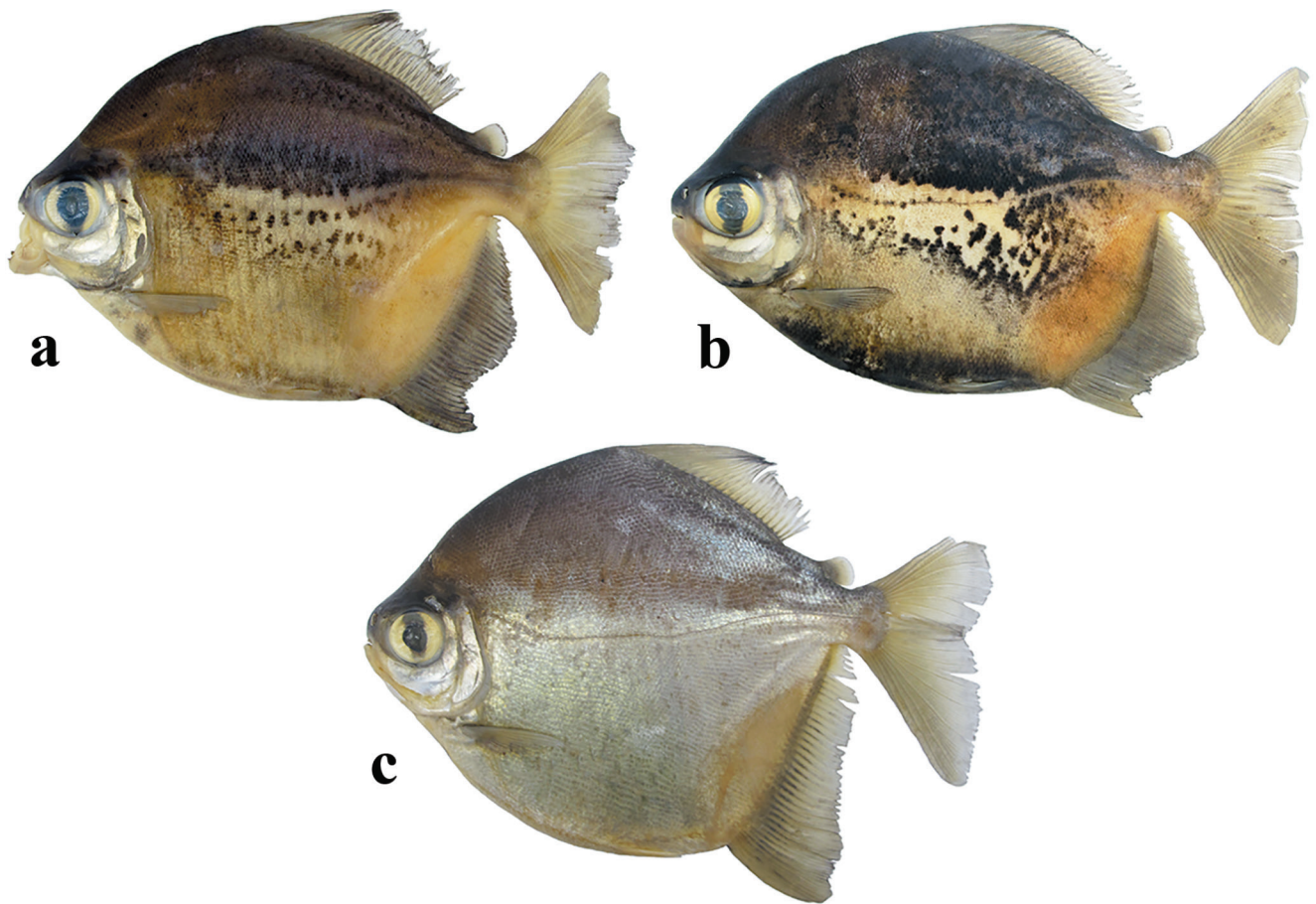


Fig. 1. *Myloplus taphorni*: Guyana, Essequibo Basin. **a.** Holotype, CSBD F 3611, male, 143.3 mm SL; Paratypes, **b.** UMMZ 251911, male, 154.9 mm SL, and **c.** ROM 101262, female, 142.4 mm SL. Photos: MCA.

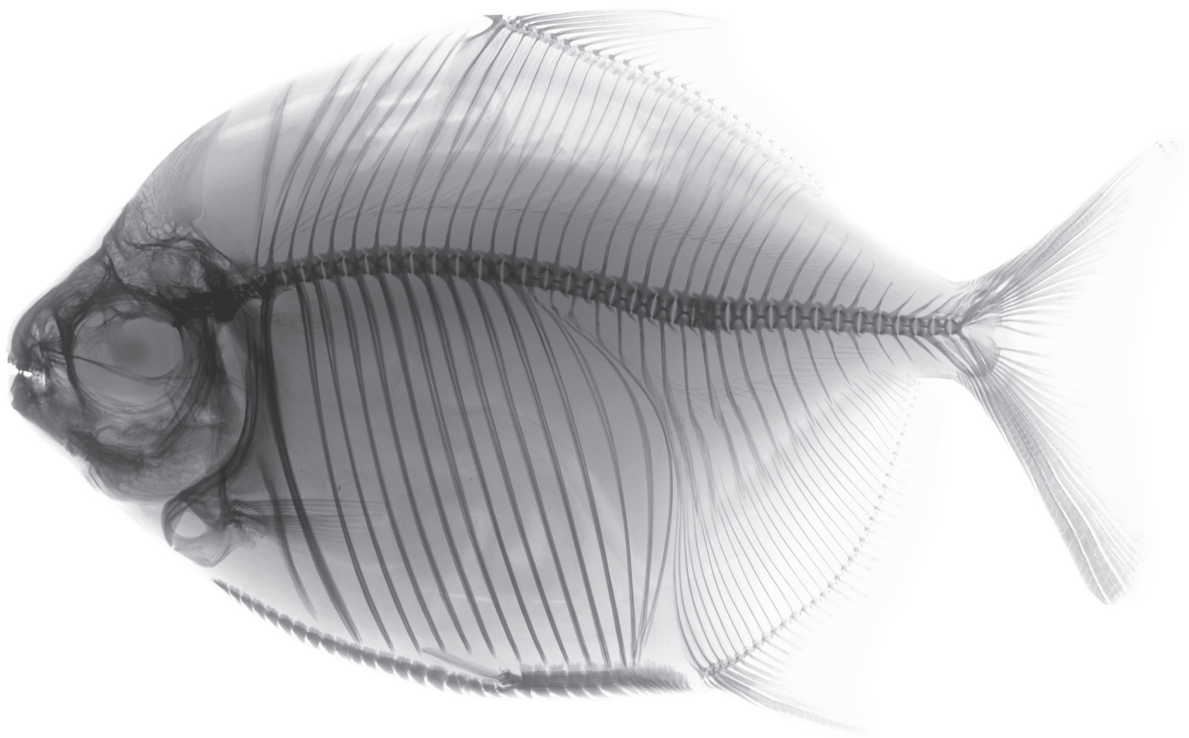


Fig. 2. Radiograph of *Myloplus taphorni*, paratype, UMMZ 251911, male, 154.9 mm SL. Courtesy E. Holm (ROM).

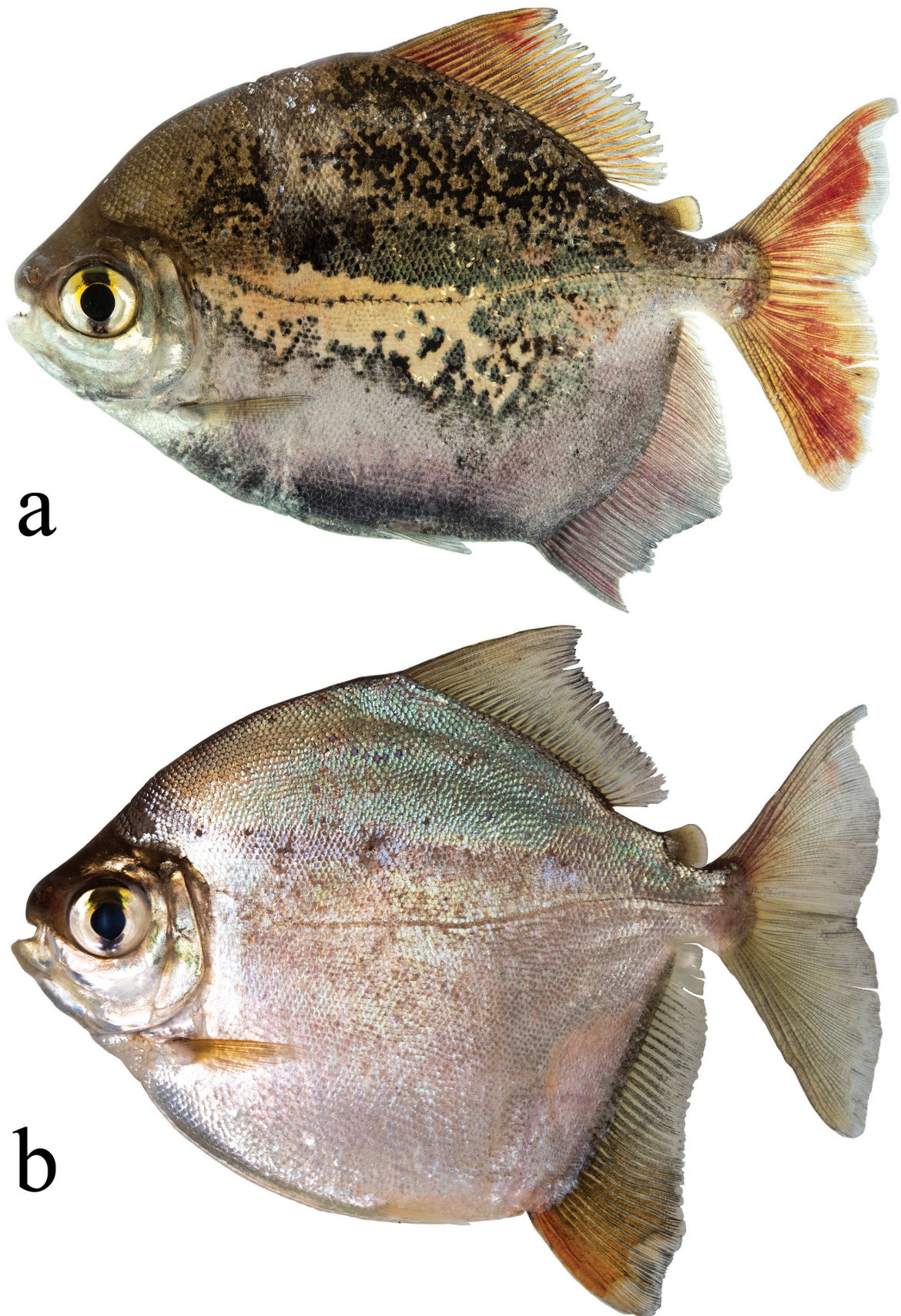


Fig. 3. *Myloplus taphorni* photographed shortly after capture. **a.** Male, paratype, UMMZ 251911, male, 154.9 mm SL, Guyana, Eping creek. **b.** Female, paratype, ROM 101262, 142.4 mm SL, Guyana, Lower Kurupung River. Photos: HLF.

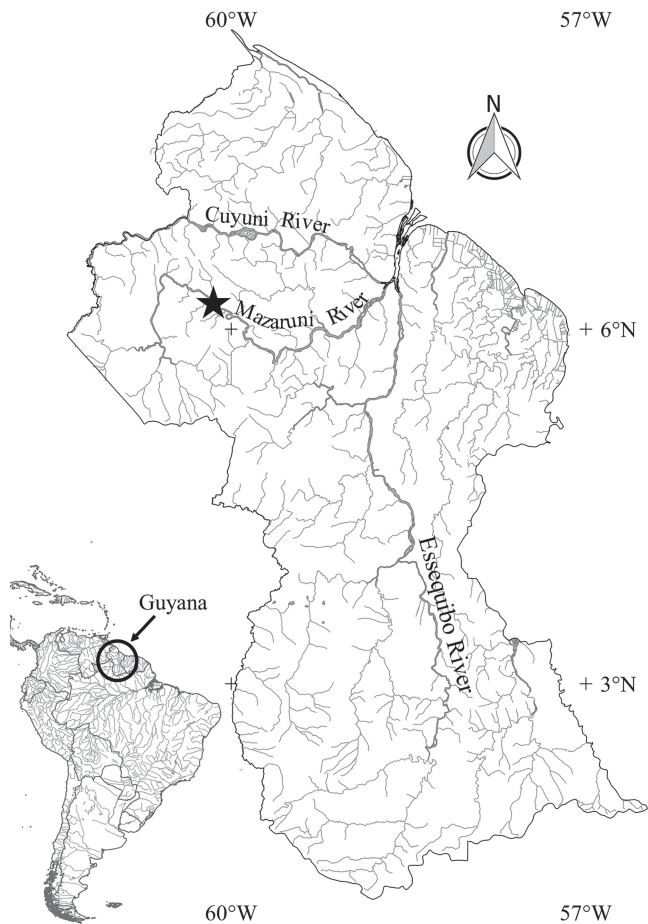


Fig. 4. Distribution map of *Myloplus taphorni* in middle Mazaruni River indicated by the black star.

Discussion

Herbivorous serrasalmids are known to show dimorphic traits; specifically, males are often distinguished by presenting red patches scattered over the flanks, having a dorsal fin with elongated filaments, the branched rays of the anal fin prolonged forming an apex on the middle of the fin, and frequently the presence of stiff hooks on the distalmost anal lepidotrichia (Andrade *et al.*, 2016c; Pastana *et al.*, 2017). Males and females of *Myloplus taphorni* are readily distinguished by the coloration of the males, which consist of striking purplish silver flanks with conspicuous black overtones composed by scales intensely pigmented and often with a metallic green sheen, whereas females are mainly bluish silver without any evident pigmentation or markings (Fig. 3). The presence of evident marks on males of *Myloplus taphorni* is reminiscent of the congeners *M. asterias* and *M. planquettei*, however, the coloration pattern exhibited by males *M. taphorni* is unique in having many scales fully pigmented in black forming a vermiculated pattern around a distinct silvery or yellowish region that may present black spotting on and below the lateral line (Fig. 2). In turn, males of *M. asterias* and *M. planquettei* show some black aureoles

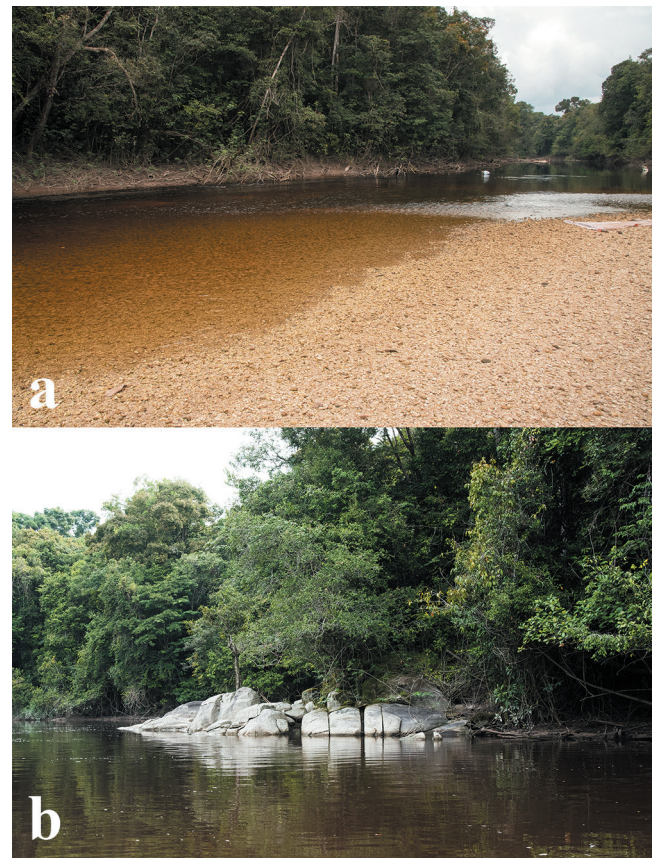


Fig. 5. Collection localities for *Myloplus taphorni*. **a.** Eping Creek; **b.** Type locality, Lower Kurupung River near the mouth. Both streams are tributaries of the middle Mazaruni River, Guyana. Photos: HLF.

or near ocellated spotting with reddish yellow inside or amorphous patches fully blackened and covering most of the flanks. Even though *M. taphorni* shares a general coloration pattern with *M. asterias* and *M. planquettei* and all three species are putatively syntopic, the new species is readily distinguishable on the basis of its coloration, particularly among males, and by meristic counts of the unpaired fins and/or relative length of body subunits. Additionally, *Myloplus taphorni* of both sexes display a conspicuous vertical black band through the eye, which contrasts sharply with a light yellowish sclerotic on the anterior and posterior portions of the eye. In *M. asterias* and *M. planquettei* the sclera is homogeneously pigmented and invariably without a vertical stripe. The vertical band crossing the eye is registered in literature in carnivorous piranhas such as species in the genera *Pygocentrus* Müller, Troschel, 1844 and *Serrasalmus* Lacepède, 1803 (Géry, 1977), and in *Metynnis* and *Catoprion* Müller & Troschel, 1844 (Rafaela P. Ota, 2019, pers. comm.). The coloration of *Myloplus taphorni* probably led to its initial identification as the possibly syntopic *Myleus pacu*. However, coloration in *Myleus pacu* consists of a solid terracotta red background, with males showing brownish black patches scattered on the flanks.

Jardine (1841) described *Myletes pacu* from drawings by Robert H. Schomburgk, who illustrated a pair of specimens from somewhere in the Essequibo River basin, both predominantly red colored with the male presenting some black patches. Jardine (1841) reported the sizes for these two *Myletes pacu*, the male reaching 400 mm and the female about 600 mm in total length, and the presence of 43 total rays in the anal fin for both fish. Eigenmann (1912) redescribed the genus *Myleus*—following the observations of Jardine (1841) on the Schomburgk's drawings—, then suggested *Myletes pacu*, *Myleus setiger* Müller, Troschel, 1844 and *Tometes trilobatus* Valenciennes, 1850 as synonyms of *Myleus pacu*, and diagnosed it as species having a marked ventral keel as juveniles and becoming less evident with growth.

Jégu, Santos (2002) revisited the taxonomic status of *Myleus* based on analyses of type-specimens and examined additional material and illustrations, and considered *Myleus setiger* as a different species from *Myleus pacu*. However, Jégu, Santos (2002) did not examine any specimen as large in length as those reported by Jardine (1841) at about 600 mm for *Myletes pacu*, with the maximum size reached by *Myleus setiger* at about 300 mm SL. Jégu, Santos (2002) redescribed *Myleus setiger*, and further mentioned that the body of *Myletes pacu* in Schomburgk's illustrations is very elongated and that number of rays in the anal fin described by the author is too high for any serrasalmid (43 vs. overall maximum of 38 in specimens of *Myleus setiger*, for example). Therefore, *Myleus setiger* which was in synonymy of *Myleus pacu* since Eigenmann (1912) was revalidated by Jégu, Santos (2002). In turn, Jégu *et al.* (2003) considered *Myleus pacu* as a doubtful species due to the absence of type specimens to support its validity, and the name was listed as *species inquirenda* in the Check list of the freshwater fishes of South and Central America 'CLOFFSCA' (Jégu, 2003).

Myloplus taphorni appears to be an endemic species with a distribution likely limited to the middle reaches of the Mazaruni river basin in Guyana. Examination of a large amount of collections of *Myloplus* in natural history collections with large holdings from Guyana (ROM, ANSP, UMMZ) failed to reveal any specimens beyond the ones included in this paper. The Mazaruni River basin harbors a large proportion of endemic taxa, particularly in its upper section (Alofs *et al.*, 2014). The middle reaches of the river are less explored: previously unidentified species of Cichlidae and Crenuchidae were also encountered in association with the *Myloplus* species described herein, and are in the process of being named (HLF, EAL *et al.*, unpublished data). Unfortunately, the long-term conservation of this fish diversity is far from guaranteed. Nearly the entirety of the Mazaruni basin is extensively mined for gold using placer techniques that move and relocate vast amounts of river channel substrate or riparian soil. Our field observations revealed large-scale reconfiguration of the river consisting of homogenization of the substrate in main channels, a proliferation of "tailings beaches" artificially created by relocation of river substrate, and high turbidity caused by siltation from mining operations.

While most of this large-scale habitat remodeling is centered in the channel of the Mazaruni, tributaries such as the type locality area in the Kurupung River are also affected. Eping Creek, the only other locality where the new species was collected appears to not be mined at this time, but remains of mining equipment and clear reconfiguration of the banks and main channel indicate that mining must have been extensive in the past. More positively, it appears that Eping creek has, to an extent, recovered from some of the mining-related impacts on habitat, particularly in the reduction of suspended solids in the water column. Nevertheless, it is clear that even after mining stopped, the structure of the substrate remained an artificial mixture of sand and "tailings" (evenly sized pebbles and gravel resulting from the mining process) and that a majorly reconfigured channel structure remains in place.

Comparative material examined. *Myloplus arnoldi*: **Brazil**: MNHN 1998-1162, 2, 147.6–154.5 mm SL, Rio Xingu; ZMB 20812, 1 syntype, 43.9 mm SL, Rio Amazonas, Brazil. *Myloplus asterias*: **Guyana**: BMNH 1971.5.10:61-62, 2, 115.3–122.8 mm SL, paralectotypes of *Myletes asterias*, Essequibo River; ROM 101267, 3, 125.8–138.4 mm SL; ROM 101595, 1, 95.8 mm SL; ROM 101756, 6, 78.8–87.5 mm SL; ROM 101828, 1, 85.2 mm SL; ROM 101925, 4, 128.8–144.8 mm SL; ROM 101926, 2, 101.5–104.4 mm SL, Mazaruni River. *Myloplus levis*: **Brazil**: ZUFMS 4413, 1, 115.5 mm SL, Aquidauana, MS, Brazil; ZUFMS 4484, 2, 107.4–117.8 mm SL, Corumbá, MS, Brazil. *Myloplus lobatus*: **Brazil**: BMNH 97.11.26.8, 1, 124.2 mm SL, Rio Capim, Brazil; GEA 1988, 1, 166.7 mm SL, Rio Madeira basin. *Myloplus lucienae*: **Brazil**: INPA 30717, holotype, 130.7 mm SL, Rio Carabinani, Brazil; INPA 52894, 2 paratypes, 122.5–123.4 mm SL, Rio Negro. *Myloplus planquettei*: **French Guyana**: INPA 2260, 1, 119.5 mm SL, Maroni River; INPA 226, 1, 155.3 mm SL, La Mona River. *Myloplus rhomboidalis*: **Brazil**: GEA 1501, 1, 230.1 mm SL, Rio Roosevelt. *Myloplus rubripinnis*: **Guyana**: BMNH 1971.5.10.64, 1, 76.5 mm SL, paralectotype of *Myletes rubripinnis*, Essequibo River. **Suriname**: ZMA 105-565, 2, 168.7–190.6 mm SL, Bassin de la Saramaca; ZMA 120.251, 1, 171.6 mm SL, Lake Brokopondo. *Myloplus ternetzi*: **French Guyana**: BMNH 1926.3.2.531-532, 2 syntypes of *Paramyloplus ternetzi*, 157.1-163.2 mm SL, Approuague River. *Myloplus tiete*: **Brazil**: ZUFMS 2087, 1, 101 mm SL, Campo Grande, MS; ZUFMS 2902, 1, 123 mm SL, Rio Indaiá Grande, MS; ZUFMS 3703, 1, 122 mm SL, Rio Verde, PR, Brazil. *Myloplus torquatus*: **Brazil**: NMW 56449, 1 paralectotype of *Myletes torquatus*, 133 mm SL; NMW 56450, 1 lectotype of *Myletes torquatus*, 122 mm SL, Rio Branco. *Myloplus zorroi*: **Brazil**: INPA 50880, holotype, 326.2 mm SL; INPA 50868, 3 paratypes, 183.8-339.5 mm SL, Rio Aripuanã.

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