Neotropical Ichthyology

Original article

https://doi.org/10.1590/1982-0224-2021-0164

urn:lsid:zoobank.org:pub:8CE078EE-B953-4D91-B208-CEAA445EEBFC

New species of driftwood catfish of *Tatia* (Siluriformes: Auchenipteridae) from rio Tapajós, Brazil

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A new species of *Tatia* is described from rio Tapajós, upstream of the rapids of São Luiz do Tapajós, Pará State, Brazil. The new species is identified and diagnosed from its congeners through morphological characteristics such as the absence of an adipose fin, which is shared with *T. akroa* and *T. britskii*; the composition of the cranial roof elements; the color pattern consisting of dorsolateral dark dots formed by both dermal and epidermal pigments; as well as several morphometric measures. The new species is a Centromochlinae fish that feeds on insects on the surface of the water at night and it is probably endemic to rio Tapajós basin.

Keywords: Amazonia, Biodiversity, Centromochlinae, Freshwater fishes, Taxonomy.

Submitted December 1, 2021
Accepted March 25, 2022
by Marcelo Britto
Epub June 03, 2022

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Online version ISSN 1982-0224
Print version ISSN 1679-6225

Neotrop. Ichthyol.
vol. 20, no. 2, Maringá 2022

Official Journal of the Sociedade Brasileira de Ictiologia

Uma nova espécie de *Tatia* é descrita do rio Tapajós, à montante das corredeiras de São Luiz do Tapajós, Estado do Pará, Brasil. A nova espécie é identificada e diagnosticada das congêneres por características morfológicas, tal como a ausência de nadadeira adiposa, compartilhada com *T. akroa* e *T. britskii*; a composição dos elementos do teto craniano; o padrão de colorido, consistindo em pequenas pintas escuras dorsolaterais formadas por pigmentos dérmicos e epidérmicos; assim como por várias características morfométricas. A espécie nova é um peixe Centromochlinae que se alimenta de insetos na superfície da água durante a noite e provavelmente é endêmica da bacia do rio Tapajós.

Palavras-chave: Amazônia, Biodiversidade, Centromochlinae, Peixes de água doce, Taxonomia.

INTRODUCTION

Tatia Miranda Ribeiro, 1911 is the most species-rich genus in Centromochlinae with 27 valid species of small to medium-sized auchenipterid catfishes that commonly are no more than 200 mm in standard length. Its representatives are widely distributed throughout most of the cis-Andean River basins in South America, *i.e.*, the Orinoco, Amazon, São Francisco, and upper Paraná rivers, along with coastal rivers in the north of the continent between the mouths of the Orinoco and Amazon rivers (Sarmento-Soares, Martins-Pinheiro, 2020; Souza *et al.*, 2020; Fricke *et al.*, 2021).

The taxonomy of *Tatia*, as well as that of Auchenipteridae, has changed substantially over the past two decades as studies of phylogenetic relationships among the species of Centromochlinae have been addressed (*e.g.*, Calegari *et al.*, 2019; Sarmento-Soares, Martins-Pinheiro, 2020). According to Sarmento-Soares, Martins-Pinheiro (2020), *Tatia* is a monophyletic group of auchenipterid catfish that is diagnosed by three autapomorphic and two non-exclusive features: anterior basibranchial cartilage narrow; coracoid process small, shorter than the pectoral-fin base; inclinator anales muscle in mature males that allow anal fin rotational movement to a transverse position; slit-like urogenital opening in females (shared with several Auchenipteridae); and modified anal-fin rays in mature males with the third unbranched and first branched rays converging to a pointed tip (shared with *Gelanoglanis nanonocticolus* Soares-Porto, Walsh, Nico & Netto, 1999).

Four species of *Tatia* are currently known to inhabit the rio Tapajós basin: *T. brunnea* Mees, 1974, *T. intermedia* (Steindachner, 1877), *T. meridionalis* (Sarmento-Soares, Cabeceira, Carvalho, Zuanon & Akama, 2013), and *T. nigra* Sarmento-Soares & Martins-Pinheiro, 2008 (Sarmento-Soares *et al.*, 2013; Silva-Oliveira *et al.*, 2016; Sarmento-Soares, Martins-Pinheiro, 2020). Specimens of a previously unknown species of *Tatia*, which is described herein, were collected during recent ichthyofaunal surveys undertaken throughout the rio Tapajós.

MATERIAL AND METHODS

Counts and measurements were taken from the left side of the specimens whenever possible, according to Sarmento-Soares, Martins-Pinheiro (2008). Standard length (SL) is expressed in mm and all other measurements are expressed as percentages of the SL, except for the subunits of the head, which are expressed as percentages of head length (HL). Straight-line measurements were taken with precision of 0.1 mm from digital photographs of specimens captured under a Zeiss Stemi 2000 stereomicroscope, using the software ZEN 2.6 (blue edition). Counts of fin rays were obtained from alcohol preserved and cleared and stained specimens.

Fin ray counts include anteriormost spine (capital Roman numeral) or unbranched ray (lower case Roman numeral) and all subsequent branched rays (Arabic numeral). The two posteriormost dorsal and anal-fin rays articulating with the last pterygiophore of each fin were counted as separate rays. Caudal-fin ray counts included all principal rays (*i.e.*, all inner branched rays and the first unbranched ray of the dorsal and ventral lobes, also referred to as the outer principal rays).

Osteological preparations were cleared and stained (CS) for cartilage and bone using the method of Taylor, Van Dyke (1985). Osteological terminology follows Lundberg, Baskin (1969) and Sarmento-Soares, Martins-Pinheiro (2020). Vertebral, rib, and procurrent caudal-fin rays counts were taken from CS specimens. Vertebral counts follow Vari, Ferraris (2013), including the five elements incorporated into the Weberian complex as separated elements plus one terminal element associated with the hypural complex. Images of structural details were captured using a digital camera coupled in a stereomicroscope.

Institutional abbreviations follow Sabaj (2020). In the list of comparative material examined, the museum abbreviation and catalog number are followed by the total number of specimens in the lot, the range of the standard length, an indication of CS specimens, and abbreviated collection data.

RESULTS

Tatia luisae, new species

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(Figs. 1–3; Tab. 1)

Holotype. UFOPA-I 1363, 25.4 mm SL, Brazil, Pará State, Itaituba, Pimental Community, rio Tapajós, 04°33'22.3"S 56°17'56.1"W, 11 Sep 2021, A. Conceição, M. Barbosa, D. Melo & J. Araújo.

Paratypes. Brazil, Pará State, Itaituba: INPA 59670, 20, 20.9–36.0 mm SL, Buburé Community, rio Tapajós, 04°36'57.5"S 56°19'29.9"W, 23 Nov 2021, A. Conceição, M. Lima, D. Melo & J. Araújo. MCP 54773, 20, 16.8–30.1 mm SL, Pimental Community, rio Tapajós, 04°33'22.3"S 56°17'56.1"W, 11 Sep 2021, A. Conceição, M. Barbosa,

D. Melo & J. Araújo. INPA 59669, 20, 18.9–28.3 mm SL, Pimental Community, rio Tapajós, 04°33'22.3"S 56°17'56.1"W, 11 Sep 2021, A. Conceição, M. Barbosa, D. Melo & J. Araújo. UFOPA-I 1358, 77, 4 CS, 15.4–24.8 mm SL, Pimental Community, rio Tapajós, 04°33'22.3"S 56°17'56.1"W, 19 Nov 2020, C. Silva-Oliveira & M. Barbosa. UFOPA-I 1359, 1, 22.5 mm SL, Penedo Community, rio Tapajós, 05°31'26.7"S 57°06'18.2"W, 10 Sep 2021, A. Conceição, M. Barbosa, D. Melo & J. Araújo. UFOPA-I 1360, 23.3 mm SL, Buburé Community, rio Tapajós, 04°36'57.5"S 56°19'29.9''W, 9 Sep 2021, A. Conceição, M. Barbosa, D. Melo & J. Araújo. UFOPA-I 1361, 48, 3 CS, 15.7–33.1 mm SL, Pimental Community, rio Tapajós, 04°33'22.3"S 56°17'56.1"W, 11 Sep 2021, A. Conceição, M. Barbosa, D. Melo & J. Araújo. UFOPA-I 1362, 8, 22.5–43.3 mm SL, Buburé Community, rio Tapajós, 04°36'57.5"S 56°19'29.9"W, 23 Nov 2021, A. Conceição, M. Lima, D. Melo & J. Araújo.

Diagnosis. *Tatia luisae* differs from all species of *Tatia* and *Centromochlus*, except *T. akroa* Souza, Sarmento-Soares, Canto & Ribeiro, 2020 and *T. britskii* Sarmento-Soares & Birindelli, 2015, by the absence (*vs*. present) of adipose fin. *Tatia luisae* differs from *T. akroa* by the dorsal-fin spine length (16.4–24.3% SL, mean 19.6 *vs*. 12.3–17.3% SL, mean, 14.7), head depth (56.4–71.9% HL, mean 66.3 *vs*. 40.6–57.6% HL, mean 47.2), interorbital distance (34.7–45.0% HL, mean 4.0 *vs*. 46.1–57.9% HL, mean 50.2), and posterior internarial distance (22.1–30.2% HL, mean 25.7 *vs*. 30.0–38.2% HL, mean 33.3). *Tatia luisae* differs from *T. britskii* by the body depth (17.8–24.6% SL, mean 22.6 *vs*. 14.6–17.1% SL, mean 16.2), dorsal-fin spine length (16.3–24.3% SL, mean 19.7 *vs*. 13.3–15.6% SL, mean 14.3), head depth (56.4–71.9% HL, mean 66.3 *vs*. 46.3–52.7% HL, mean 49.5), anterior internarial distance (14.6–24.2% HL, mean 21.9 *vs*. 29.2–33.0% HL, mean 31.2), and posterior internarial distance (22.1–30.2% HL, mean 25.7 *vs*. 31.5–34.7% HL, mean 33.5). *Tatia luisae* further differs from *T. aulopygia* (Kner, 1857), *T. altae* (Fowler, 1945), *T. brunnea*, *T. caudosignata* DoNascimiento, Albornoz-Garzón & García-Melo, 2019, *T. dunni* (Fowler, 1945), *T. ferrarisi* (Birindelli, Sarmento-Soares & Lima, 2015), *T. galaxias* Mees, 1974, *T. gyrina* (Eigenmann & Allen, 1942), *T. intermedia*, *T. jacaratia* Pavanelli & Bifi, 2009, *T. meesi* Sarmento-Soares & Martins Pinheiro, 2008, *T. meridionalis*, *T. neivai* (Ihering, 1930), *T. perugiae* (Steindachner, 1882), *T. punctata* Mees, 1974, *T. reticulata* Mees, 1974 and *T. strigata* Soares-Porto, 1995 by dotted color pattern on sides of body (*vs*. mottled, spotted or reticulated on flanks). Differs from *T. aulopygia*, *T. boemia* Koch & Reis, 1996, *T. brunnea*, *T. caxiuanensis* Sarmento-Soares & Martins-Pinheiro, 2008, *T. caudosignata*, *T. dunni*, *T. galaxias*, *T. gyrina*, *T. intermedia*, *T. jaracatia*, *T. meesi*, *T. neivai*, *T. nigra*, and *T. strigata* by the absence (*vs*. presence) of anterior nuchal plate.

Description. Morphometric data in Tab. 1. Small size species, largest specimen examined 43.3 mm SL. Body elongate; depth of trunk proportionally greater than its width. Head slightly depressed anteriorly, progressively more elevated posteriorly. Profile of head longer than broad in dorsal view, slightly convex from snout tip to pectoral-fin insertion. In lateral view, dorsal profile of body from dorsal-fin base to caudal fin slightly to distinctly convex. Ventral profile of head and abdomen approximately straight. Greatest body width at postorbital region. Ventral profile of body gently concave between pelvic-fin base and caudal-fin origin. Greatest body depth at dorsal-fin

FIGURE 1 | Holotype of *Tatia luisae* in lateral, dorsal, and ventral views, UFOPA-I 1363, 25.4 mm SL, rio Tapajós, Municipality of Itaituba, Pará State, Brazil.

origin. Trunk from pectoral-fin base to caudal peduncle gradually compressed. Lateral line extending onto caudal-fin base, midlateral, nearly straight, with superficial tubular ossicles directed posteroventrally. Head covered by integument thick, obscuring bones of cranial roof; adipose eyelid weakly developed. Snout short, less than half head length; anterior margin rounded. Eye on anterior half of head; laterally placed and oriented equally visible in dorsal and ventral view. Mouth wide, terminal. Posteriormost mouth corner extending slightly behind vertical through anterior orbital margin. Upper and lower lips thin, weakly developed; upper lip extended posterolaterally, fleshy rictal fold well developed; snout margin approximately rounded in dorsal view; anterior nostril tubular, anteriorly oriented, located on anterior border of snout; posterior nostril somewhat

larger, rounded, anteriorly oriented, limited anteriorly by small skin flap; transverse distance between anterior nostrils slightly smaller than distance between posterior ones. Maxillary barbel elongate, reaching approximately vertical through middle of dorsal fin or slightly beyond; adpressed maxillary barbel fits in groove ventrally to orbit, from dorsal portion of rictal fold extending ventrolaterally to operculum; mental barbels short, tips not reaching pectoral-fin base; mental barbels inserted anterior to vertical through posterior margin of eyes. Inner mental barbel about two-thirds length of outer mental. Posterior process of cleithrum moderately long, reaching or extending slightly beyond vertical through origin of dorsal-fin spine. Coracoid process small, shorter than pectoral fin base.

TABLE 1 | Morphometric data of *Tatia luisae*. Range includes the holotype. SD = Standard deviation.

	Holotype	n	Range	Mean	DS
Standard length (mm)	25.4	27	17.4–43.3	26.7	-
Percents of standard length					
Body depth	21.1	27	17.8–24.6	22.6	1.5
Body width	21.2	27	18.5–21.9	20.1	0.8
Caudal peduncle dept	11.9	26	10.7–14.4	12.8	0.8
Caudal peduncle length	17.6	26	17.3–25.3	21.0	1.9
Predorsal length	30.6	27	25.7–36.0	32.9	2.0
Preanal length	68.8	27	68.8–79.2	75.3	2.3
Prepelvic length	54.1	26	54.1–63.6	59.4	2.0
Dorsal origin to pectoral origin	19.8	27	17.4–23.0	20.8	1.3
Dorsal origin to pelvic origin	32.4	27	32.7–39.1	35.5	1.8
Pectoral origin to pelvic origin	32.9	26	32.9–42.5	37.0	2.2
Prepectoral length	23.6	27	22.5–29.9	25.6	2.0
Dorsal-fin base length	11.5	27	10.4–15.5	12.8	1.3
Anal-fin base length	5.8	26	5.8–9.4	7.8	0.8
Dorsal-fin spine length	16.3	24	16.3–24.3	19.7	1.9
Pectoral-fin spine length	19.2	27	18.0–26.4	22.5	2.0
Humeral spine lenght	15.8	27	14.0–19.7	17.0	1.3
Longest pelvic fin ray	9.9	26	9.7–13.6	11.9	1.1
Maxillary barbel length	33.2	27	29.3–45.9	37.0	4.0
Outer mental barbel length	10.8	22	7.2–13.5	10.7	1.5
Inner mental barbel length	6.2	26	4.8–11.5	7.5	1.9
Head length	27.4	27	25.2–35.9	30.5	2.2
Percents of head length					
Head width	61.3	27	57.8–73.2	66.8	4.1
Head depth	57.8	27	56.4–71.9	66.3	4.0
Interorbital distance	39.7	27	34.7–45.0	40.0	3.2
Left internarial width	13.3	27	9.1–13.6	11.7	1.2
Anterior internarial distance	21.7	27	14.6–24.2	21.9	1.9
Posterior internarial distance	24.0	27	22.1–30.2	25.7	1.9
Snout length	26.3	27	25.3–37.3	31.8	3.0
Eye diameter	15.7	27	9.9–15.7	12.1	1.3
Mouth width	33.4	26	30.1–45.1	36.6	3.5

Dorsal fin II,5; originated slightly posterior to vertical through terminus of pectoral-fin base; spinelet triangular anteriorly, covered by thin layer of skin; dorsal-fin spine straight, strong, pungent, shorter than first branched ray, with filamentous tip; anterior margin of dorsal-fin spine with 13–16 denticulations, posterior margin with 2–5 serrations on distal portion (n = 20); first branched ray longest, subsequent rays decreasing gradually in length; last dorsal-fin ray approximately half length of first branched ray; distal margin of dorsal fin rounded.

Adipose fin absent. Pectoral fin I,5; pectoral spine, rigid, pungent; its anterior margin with 17–21 serrations; posterior margin with 10–16 serrations (n = 20); pectoral-fin spine denticulations becoming progressively more prominent distally. First branched ray longest, subsequent rays decreasing in length; posterior margin of pectoral fin obliquely truncate. Pelvic fin i,5; its origin at or slightly posterior to middle of body; second branched ray longest, subsequent rays decreasing in length; posterior pelvic-fin margin rounded. Anal fin iii–iv,6; its origin approximately on last third of standard length, posterior to vertical through tip of pelvic-fin rays; last ray unbranched and first branched rays longest; distal margin rounded. Caudal fin i,15,i; deeply forked; dorsal and ventral caudal-fin lobes equal in length; outer principal rays unbranched, seven branched rays on dorsal lobe and eight branched rays on ventral lobe; 12–14 upper procurrent, 12–14 lower procurrent rays (n = 4).

Anterior nuchal plate absent; anterior margin of middle nuchal plate sutured to parieto-supraoccipital. Middle nuchal plate wide, with deeply concave lateral margins; posterior nuchal plate short, projected laterally, with prominent tip (Fig. 2). Mesethmoid longer than broad, lateral margin concave; mesethmoid cornua slender distally. Nasal ossified as tubular bone situated between mesethmoid cornua and lateral ethmoid, free from mesethmoid. Lateral ethmoid not participating in dorsal face of cephalic shield. Anterior cranial fontanel narrow and elongate, located from mesethmoid to midpoint of medial margins of frontals; posterior fontanel absent. Maxilla slightly elongated. Jaws of equal sizes; premaxilla and dentary slender, each with four or five rows of robust conical teeth.

Hyomandibula broad, sutured to both quadrate and metapterygoid. Metapterygoid as wide lamina, joined to quadrate via suture (Fig. 3). Quadrate trapezoidal, with broad base, sutured to preopercle, hyomandibula and metapterygoid; long preopercle ventral margins sutured to both quadrate and hyomandibula; suprapreopercle present as long canal bone; preopercular canal exiting on anterior portion of pterotic. Opercle laminate, ornamented with shallow ridges, and broadly subtriangular (Fig. 3).

Infraorbital 1 with ventro-lateral process restricted to anterior border of eye, followed by canal-like bones, in incomplete infraorbital series. Lateral line approximately straight, inconspicuous, with ossified canal bones only anteriorly, unbranched and ending at caudal-fin base. Branchiostegal membrane broadly united to isthmus. Total vertebrae 33–34; ribs 7–10, becoming progressively smaller in size posteriorly.

Color in alcohol. Background color light brown to light cream, dorsally darker. Mid-dorsal and dorsolateral portions of body densely covered with dark chromatophores. Dorsolateral dots formed by both dermal and epidermal pigments. Dark coloration on body extending ventrally over lateral area above lateral midline, becoming sparse ventrally. Dark pigmentation on caudal peduncle extending along entire lateral area. Dorsal surface of head with dark pigmentation, except for broad

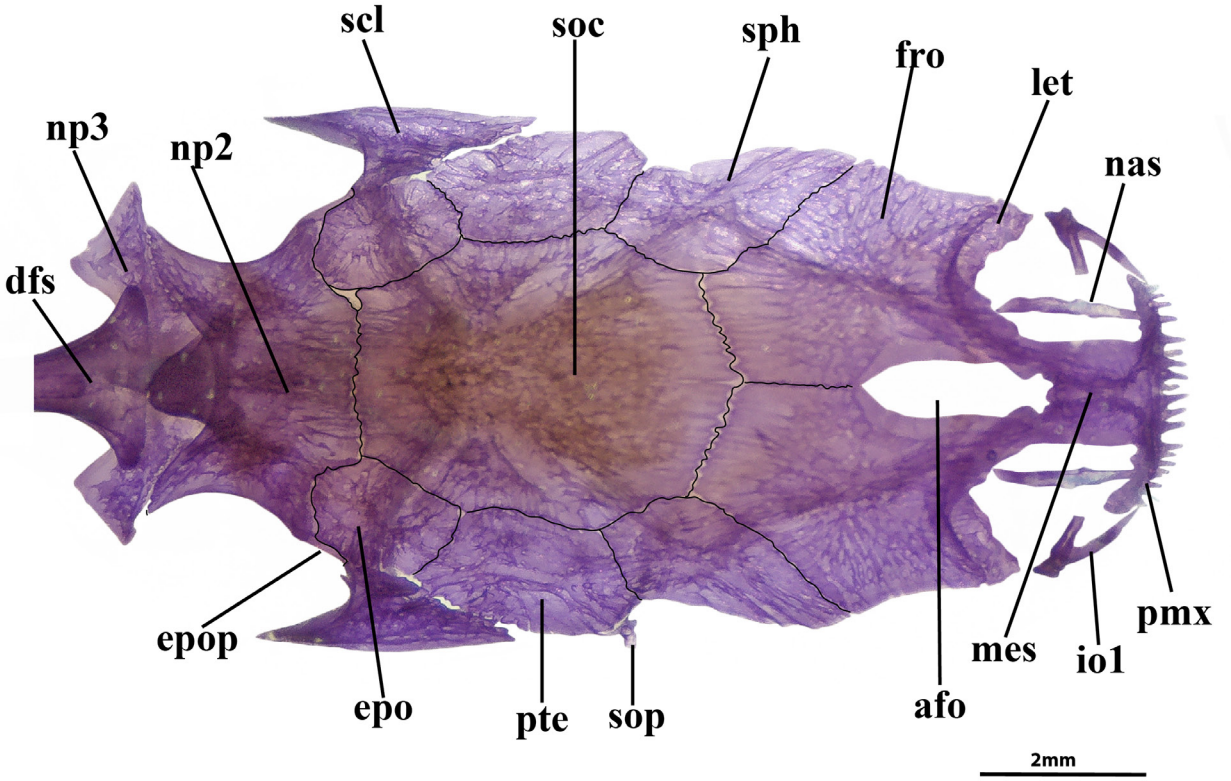

FIGURE 2 | Neurocranium of *Tatia luisae*, UFOPA-I 1358, 23.5 mm SL, paratype. Dorsal view. Abbreviations: dfs, dorsal fin spine; epo, epiotic; epop, epiotic process; afo, anterior cranial fontanel; fro, frontal; io1, first infraorbital; let, lateral ethmoid; mes, mesethmoid; nas, nasal; np2, middle nuchal plate; np3, posterior nuchal plate; pmx, premaxilla; scl, posttemporo-supracleitrum; pet, pterotic; soc, parieto-supraoccipital; sph, sphenotic; spo, suprapreopercle.

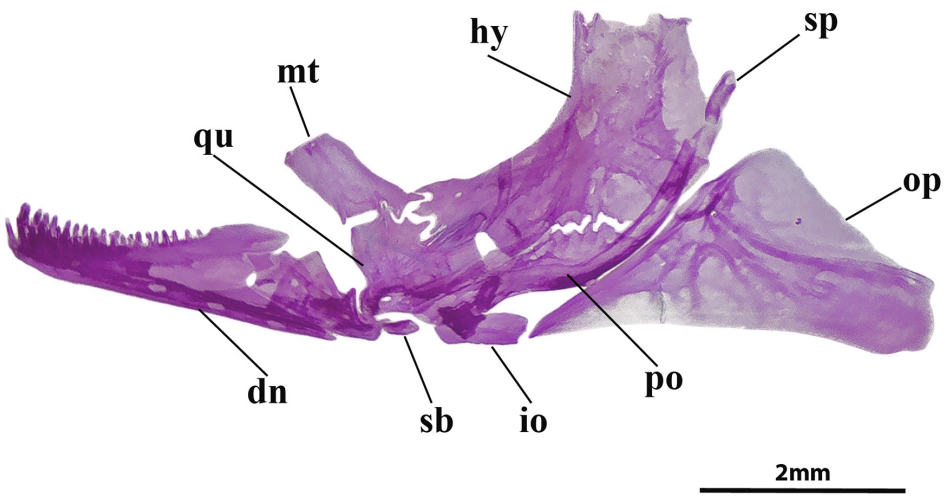

FIGURE 3 | Lateral view of left suspensorium of *Tatia luisae*, UFOPA-I 1358, 23.5 mm SL, paratype. Abbreviations: dn, dentary; hy, hyomandibula; io, interopercle; mt, metapterygoid; op, opercle; po, preopercle; qu, quadrate; sb, subpreopercle; sp, suprapreopercle.

unpigmented areas in postorbital region, over cranial fontanel, and at anterior margin of snout; cranial shield surface densely covered with dark chromatophores extending laterally to eyes and opercle. Lateral surface of head with scattered pigmentation on opercle and sometimes branchiostegal membrane. Maxillary barbel white to light yellow with scattered chromatophores on basal portion. Mental barbels white to light yellow, lacking dark pigmentation. Dorsal fin with dark spot in proximal region; remainder of fin unpigmented. Caudal-fin base with scattered dark chromatophores, becoming completely hyaline distally. Pectoral, pelvic, and anal fins completely hyaline (Fig. 1).

Color in life. Ground color light gray to light cream, with dark chromatophores on head and dorsolateral region, more concentrated on mid-dorsal portion. Dorsolateral dots formed by both dermal and epidermal pigments. Dark coloration on body extending ventrally over lateral area above lateral line, becoming sparse ventrally on anterior and posterior positions of trunk; dark pigmentation on caudal peduncle extending along all lateral area. Dorsal surface of head densely pigmented, except postorbital region, over cranial fontanel, and at anterior margin of snout; dark chromatophores extending laterally to eyes and opercle. Lateral surface of head with scattered pigmentation on opercle and infraorbital portion. Maxillary barbel white with scattered chromatophores on basal portion. Mental barbels white, lacking dark pigmentation. Dorsal fin with dark spot in proximal region; remainder of fin unpigmented. Caudal-fin base with scattered dark chromatophores; completely hyaline distally. Pectoral, pelvic, and anal fins similar to preserved specimens (Fig. 4).

Sexual dimorphism. In one nuptial and five males with partially modified anal fin for insemination (Fig. 5). Proximal radials connected to each other in modified anal fin of adult males. All proximal radials closely together, not fused, sutures visible. Least unbranched and first branched anal-fin rays closely together to form a structure of support for the intromittent organ. Urogenital opening at base of anal fin as simple pore at the distal tip of a tubular structure bound by integument. Deferent duct externally visible as a genital papilla. Female and immature males have anal-fin proximal radials and rays separate and anal fin obliquely oriented, with distal tip rounded (Fig. 4). Female with slit-like urogenital opening.

FIGURE 4 | Live specimen of *Tatia luisae*, UFOPA-I 1361, 25.3 mm SL, paratype.

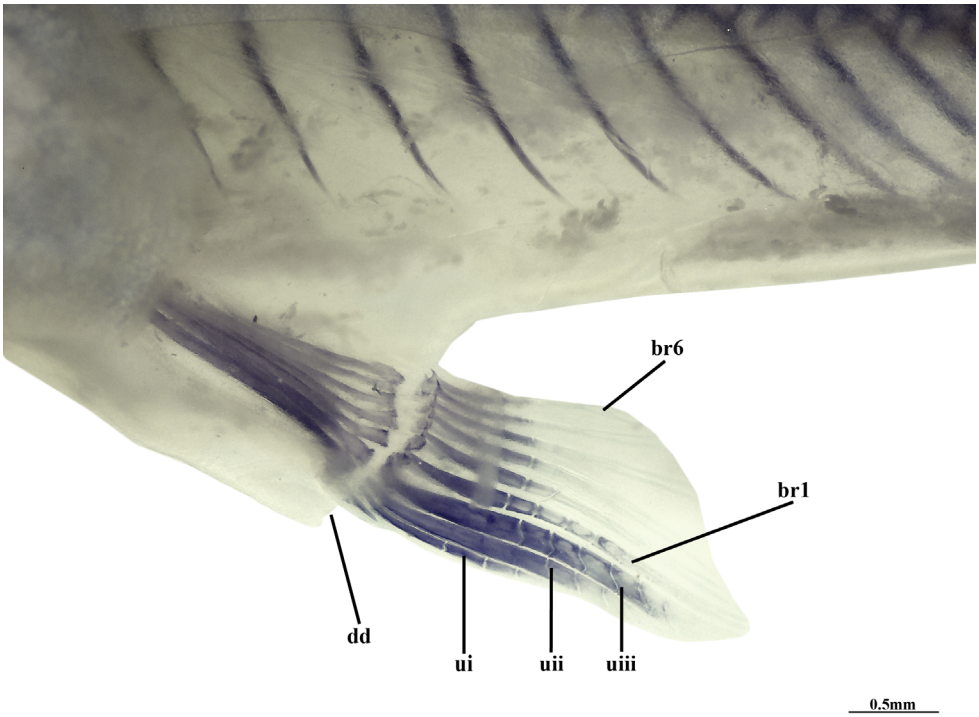

FIGURE 5 | Male anal fin of *Tatia luisae* partially modified for insemination. UFOPA-I 1361, 26.8 mm SL, paratype. Right side in lateral view. Abbreviations: br1, first branched ray; br6, sixth branched ray; dd, deferent duct; ui, first unbranched ray; uii, second unbranched ray; uiii, third unbranched ray.

Geographical distribution. *Tatia luisae* is currently known only from the middle rio Tapajós, upstream of the rapids of São Luiz do Tapajós, at Itaituba Municipality (Fig. 6).

Etymology. The specific epithet *luisae* is in honor to the Brazilian ichthyologist Luisa M. Sarmento-Soares, in recognition of her many contributions to the systematics of Neotropical catfishes of the subfamily Centromochlinae. A noun in the singular genitive case.

Ecological notes. Similar to many auchenipterids, *Tatia luisae* appears to be an active night feeder. *Tatia luisae* specimens were observed and collected during the night while they were swimming just below the water surface. Six dissected specimens (UFOPA-I 1358 and 1361) were found to have fed on insects, especially those that fall onto the water surface such as Ephemeroptera. The stretch where the specimens were collected is characterized by moderate to fast-flowing clear waters, substrate composed predominantly of sand and rocks, neutral waters (pH 7.2), water oxygenation >70%, and water surface temperature at around 32°C. This stretch of the rio Tapajós has suffered substantial anthropogenic pressure in recent years, *e.g.*, it has received a large volume of tailings from mining activities, mainly from the Crepori and Jamanxim rivers, which has drastically altered some of its water characteristics, especially its transparency.

Conservation status. *Tatia luisae* is known only from three localities corresponding to an Extent of Occurrence (EOO) of approximately 2,500 km^2. However, individuals of *T. luisae* were abundant near the Pimental rapids and Buburé Community. Additionally, continuing population decline was not observed, as well as area of occupancy, quality of

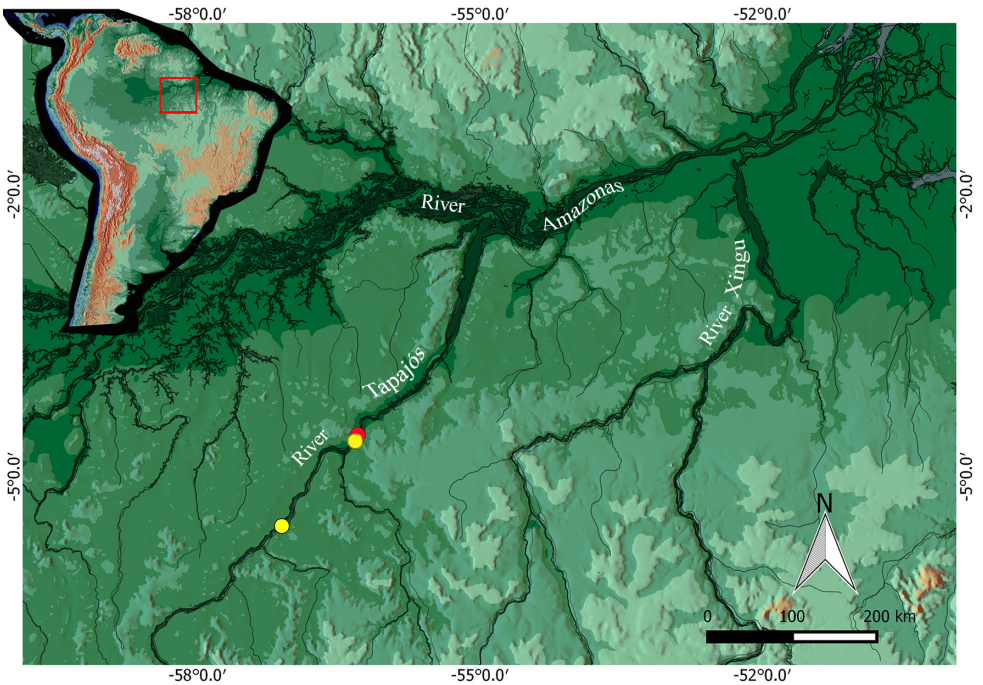

FIGURE 6 | Map indicating the known distribution of *Tatia luisae* in the rio Tapajós, Municipality of Itaituba, Pará State, Brazil. Red circle represents type locality.

habitat, and number of locations or subpopulations. Therefore, *T. luisae* can be classified as Least Concern (LC) according to the International Union for Conservation of Nature (IUCN) categories and criteria (IUCN Standards and Petitions Committee, 2022).

DISCUSSION

Tatia luisae exhibits the five features proposed by Sarmento-Soares, Martins-Pinheiro (2020) that define the genus *Tatia*: narrow anterior basibranchial cartilage, a coracoid process that is shorter than the pectoral-fin base, a slit-like urogenital opening in females, inclinator anales that allow anal fin rotational movement to a transverse position, and modified anal-fin rays with the third unbranched and first branched rays converging to a pointed tip. The last two character-states are shared with other Centromochlinae species.

Tatia is classified in three clades that are informally named A, B, and C (Sarmento-Soares, Martins-Pinheiro, 2020). *Tatia luisae* shares with *T. concolor*, *T. bockmanni*, *T. britskii*, *T. punctata*, *T. simplex*, and *T. marthae* the single exclusive characteristic supporting the monophyly of clade C (*i.e.*, the sixth and/or seventh branched anal-fin rays being rudimentary in mature males). Among these congeners, *T. luisae* shares with *T. bockmanni*, *T. britskii*, and *T. simplex* a dorsal-fin spine with small blunt serrations on the posterior margin. However, unlike these species, the lateral surface of the dorsal-fin spine of *T. luisae* has shallow ridges or grooves.

Along with *Tatia akroa* and *T. britskii*, *T. luisae* is the third member of the genera to lack

an adipose fin. Additionally, *T. simplex* is recognized by an adipose fin that is extremely reduced in size (Souza *et al*., 2020). Although few studies have been conducted on the adipose fin, evidence suggests that it has multiple origins in teleost fishes (Stewart *et al*., 2014); thus, great effort and skill are required to determine its origin and evolutionary history. Understanding the function of the adipose fin is equally complex. For example, Temple, Reimchen (2008) found that the absence of the adipose fin was frequently associated with environments that did not flow, whereas species with adipose fins were more likely to inhabit fast-flowing waters. Although an adipose fin is typically present in most catfish species living in fast-flowing waters, including those from Auchenipteridae, this association is not strictly valid for Siluriformes (Silva-Junior *et al*., 2020). *Tatia luisae* was collected from a fast-flowing environment above the rapids of São Luís do Tapajós. Despite the absence of the adipose fin among centromochlins being poorly understood, in auchenipterins this absence has been interpreted as a derived character state (Calegari *et al*., 2019; Sarmento-Soares, Martins-Pinheiro, 2020).

Knowledge of the diversity of *Tatia* in the rio Tapajós basin is beginning to develop (see Sarmento-Soares, Martins-Pinheiro, 2008: fig. 6). Following the review of the genus by Sarmento-Soares, Martins-Pinheiro (2008), taxonomic studies with descriptions of new centromochlins have improved our knowledge of the diversity of the group in the basin; this is especially the case in the upper Tapajós river basin, where collection efforts have been increasingly concentrated over recent years (*e.g*., Sarmento-Soares *et al*., 2013; Calegari *et al*., 2014; Vari, Calegari, 2014). Our description of *T. luisae* contributes further to our understanding of the fish fauna of the rio Tapajós basin, where the new species is apparently exclusively found.

Comparative material examined. *Centromochlus existimatus*: **Brazil**. INPA 40662, 6, 46.5–59.0 mm SL, rio Xingu. *Centromochlus heckelii*: **Brazil**. MZUSP 8336, 2 CS, 53.4–62.0 mm SL, rio Tapajós. *Centromochlus macracanthus*: **Brazil**. MZUSP 30605, 2, paratypes, 65.7–71.8 mm SL, rio Negro. *Centromochlus schultzi*: **Brazil**. MNRJ 12139, 38, 1 CS, 85.0–108.9 mm SL, rio Tocantins. *Centromochlus carolae*: **Guyana**. ANSP 175836, 9, 22.3–30.5 mm SL; USNM 401511, 1, paratype, x-rayed, 31.9 mm SL, Cuyuni River. *Centromochlus melanoleucus*: **Brazil**. MZUSP 8535, 6, 1 CS, 46.9–76.5 mm SL, rio Tapajós; MZUSP 30585, 6, 1CS, 35.0–48.4 mm SL, rio Tapajós. *Centromochlus musaicus*: **Venezuela**. ANSP 160656, 1, 57.0 mm SL, Río Sipapo; MZUSP 9347, 1, 29.4 mm SL, rio Uraricoera. *Centromochlus orca*: **Brazil**. INPA 35086, 14, 1 CS, 40.5–56.8 mm SL, rio Nhamundá. *Tatia akroa*: **Brazil**. UFOPA-I 671, holotype, 38.4 mm SL. UFOPA-I 670, 1, paratype, CS, 34.26 mm SL, rio Tocantins. *Tatia altae*: **Colombia**. USNM 121965, 1, 35.5 mm SL, Río Orteguazo. *Tatia bockmanni*: **Brazil**. MZUSP 82351, 8, paratypes, 1 CS, 29.4–35.8 mm SL, rio Preto. *Tatia britskii*: **Brazil**. MZUSP 43251, 2, paratypes, 1 CS, 33.5–36.3 mm SL, rio Paraná. MNRJ 41787, 2, paratypes, 36.0–38.6 mm SL. *Tatia concolor*: **Suriname**. ZMA 106210, holotype, 33.4 mm SL, x-rayed, Coppename River; ZMA 106209, 2, paratypes, x-rayed, 29.0–30.6 mm SL, Coppename River. *Tatia ferrarisi*: **Brazil**. MNRJ 41924, 1, paratype, 57.6 mm SL; MZUSP 115352, 2, paratypes, 1 CS, 50.4–68.1 mm SL, rio Tocantins. *Tatia marthae*: **Venezuela**. ANSP 146201, holotype, x-rayed, 23.1 mm SL, Río Cusimi; ANSP 199070, 1, paratype, x-rayed, 19.0 mm SL, Río Cusimi. *Tatia meridionalis*: **Brazil**. INPA 37897, 2, paratypes, CS, 29.7–39.2 mm SL, rio Roquete; MNRJ 40702, 3, paratypes, 32.6–38.3 mm SL, rio Roquete. *Tatia perugiae*: **Ecuador**. ANSP 130611, 14, 30.1–45 mm SL, Río Aguarico. *Tatia punctata*: **Brazil**. MNRJ 9417, 2, 32.7–60.8 mm SL, rio Xingu; RMNH.PIS 26494, 2, paratypes, Rx, 33.3–43.2 mm SL, rio Paru.

Tatia reticulata: **Brazil**. INPA 35394, 6, 18.3–28.8 mm SL, rio Purus. Colombia. ANSP 128797, 4, 30.7–34.2 mm SL, Río Meta. *Tatia romani*: **Venezuela**. MCNG 14896, 18, 29.0 mm SL, rio San Jose, Guanare. RMNH.PIS 30491, 3, x-rayed, paratypes, 27.1–31.3 mm SL, Monagas, Maturin. *Tatia simplex*: **Brazil**. INPA 18475, 1, 19.9 mm SL, rio Tocantins; MZUSP 44071, 2, 26.0–49.3 mm SL, 1 CS, rio Tocantins; MZUSP 44074, 1, 26.5 mm SL, rio Tocantins.

ACKNOWLEDGMENTS

We thank Carlos Lucena, Lúcia R. Py-Daniel, and Renildo de Oliveira for curatorial assistance. The authors are grateful to Manoel Barbosa, Marcos Lima, David Melo, and Josué Araújo (UFOPA) for their help and assistance during field work. Support for this project was provided by the Instituto de Conservação Ambiental The Nature Conservancy do Brasil (Águas Tapajós Project, Cooperation BR FY20 104) and Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq, process 436763/2018-4). CSO is funded by the Conselho Nacional de Desenvolvimento Científico e Tecntológico (CNPq, process 317781/2021–9).

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ETHICAL STATEMENT

Not applicable.

COMPETING INTERESTS

The authors declare no competing interests.

HOW TO CITE THIS ARTICLE

- **Ribeiro FRV, Silva-Oliveira C, Silva AC, Canto ALC**. New species of driftwood catfish of *Tatia* (Siluriformes: Auchenipteridae) from rio Tapajós, Brazil. Neotrop Ichthyol. 2022; 20(2):e210164. https://doi.org/10.1590/1982-0224-2021-0164

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