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A New Species of Armored Catfish (Loricariidae: Hypoptopomatinae) Syntopic and Superficially Similar to *Parotocinclus collinsae*, from the Potaro River Basin, Guyana

Pablo Lehmann A.[1], Nathan K. Lujan[2], and Roberto E. Reis[3]

***Parotocinclus hardmani*, new species, is described as a new hypoptopomatine from tributaries of the Potaro River, Essequibo River basin, Potaro-Siparuni, Guyana. The new species is distinguished from congeners in northeastern and southeastern coastal rivers of Brazil by having the canal cheek plate elongated posteriorly on the ventral surface of the head and in contact with the cleithrum. It is diagnosed from species of *Parotocinclus* from the Amazon, Orinoco, and Guianas watersheds by uniquely having a conspicuously elongated, conical urogenital papilla which is twice the size of the anal tube and 3–4 times larger than in congeners, by having the central abdominal area mostly devoid of plates, by mature males lacking a dermal flap on the dorsal surface of the first pelvic-fin ray, and, except for *P. halbothi*, by having a rudimentary adipose fin adnate to the dorsal plates, without a membrane. The new species is believed to form a clade with *P. collinsae* and *P. halbothi*, with which it shares accessory teeth on both premaxilla and dentary, the odontodes on the first pelvic-fin ray aligned with the main ray axis, not bent and pointing mesially, the lack of a triangular dark spot at the anterior base of the dorsal fin, and the lack of a Y-shaped light mark from the snout tip to each nostril.**

THE genus *Parotocinclus* is widely distributed across cis-Andean South America, and has been demonstrated to be composed of two geographically isolated and morphologically distinct species groups (Lehmann and Reis, 2012; Lehmann et al., 2014, 2015). Species living in coastal drainages of the Brazilian Shield from Santa Catarina State of Brazil, in the south, to Piauí State, in the north, compose a possibly non-monophyletic, phenotypically variable group of species where the canal cheek plate on the ventral surface of the head is rounded and not expanded posteriorly to contact the pectoral girdle. The species inhabiting the Amazon, Orinoco, and the coastal drainages of the Guianas, on the other hand, form a clade diagnosed by the canal cheek plate on the ventral surface of the head being posteriorly elongated and contacting the cleithrum. Species in this clade are small (maximum standard length 31 mm), usually have a long, pointed snout, are sharply barred with dark colors, and often have a dark, triangular spot at the dorsal-fin origin and a Y-shaped mark on the snout. This clade includes *Parotocinclus amazonensis* (lower Amazon basin), *P. aripuanensis* (Aripuanã River basin), *P. britskii* (Guyana, Suriname, eastern Venezuela, and Roraima State, Brazil), *P. collinsae* (Essequibo River, Guyana), *P. eppleyi* (upper Orinoco River basin), *P. halbothi* (Trombetas River, Brazil and Marowijne River, Suriname), *P. kwarup* (upper Xingu River), *P. longirostris* (central Amazon basin, Brazil), *P. polyochrus* (Casiquiare, Venezuela), *P. variola* (western Amazon basin, Colombia), and *P. yaka* (Tiquié River, upper Rio Negro basin).

In the present paper, an additional species of *Parotocinclus* belonging to the latter clade, which is clearly distinct but syntopic with and superficially similar to *P. collinsae*, is described from tributaries to the Potaro River, Essequibo River basin, in Potaro-Siparuni, Guyana.

MATERIALS AND METHODS

Microphotographs were prepared in a stereomicroscope with a multi-focus photographic system. A CT scan of one specimen (ROM 91423) of the new species was generated at the Microscopy and Imaging Facility at AMNH using a GE v|tome|x s240 dual tube 240/180kV system (General Electric, Fairfield, CT, USA). The specimen was scanned at 9.91 μm resolution on the 180 kV nano tube using a beam energy of 100 kV and 135 μa with a diamond target. Projections were collected for 500 ms, averaged four times to improve signal-to-noise, and reconstructed using Phoenix datos|x (General Electric, Wunstorf, Germany). Data were edited and animated using VGStudio Max 3.3.4 (Volume Graphics, Heidelberg, Germany).

Measurements were taken as point-to-point linear distances with digital calipers under a dissecting microscope on the left side of individuals, and recorded to the nearest 0.1 mm, following mainly Boeseman (1968) and Schaefer (1997). Standard length (SL) is expressed in millimeters while all other measurements are given as percents of SL or head length (HL). Identification and counts of dermal plates follow the serial homology scheme proposed by Schaefer (1997). Dermal plates and vertebral centra were counted from cleared and stained (CS) specimens. Specimens were cleared and stained for inspection of bones and cartilages following Taylor and Van Dyke (1985). Vertebral counts include the five centra modified into the Weberian Apparatus and the compound caudal centrum (PU1+U1) counted as one element. In the description, counts of the holotype are presented in parentheses following the range of all type specimens. In the list of examined material, museum abbreviation and catalog number come first, followed by the number and SL range of specimens in that lot, the

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Fig. 1. Holotype of *Parotocinclus hardmani*, CSBD F3618, 22.8 mm SL, female, Kuribrong River at Grass Shoals Rapids, Potaro-Siparuni, Guyana.

number and SL range of specimens measured for the morphometric comparisons, in parentheses, if different, and locality. Fish collections providing specimens for this study are identified using acronyms from Sabaj (2020). Conservation status of the new species was assessed following the categories and criteria of the International Union for Conservation of Nature (IUCN Standards and Petitions Subcommittee, 2019). Comparative material examined is listed in Lehmann and Reis (2012, 2021) and Lehmann et al. (2014, 2015, 2018) in addition to that listed below.

***Parotocinclus hardmani*, new species**
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Figure 1, Supplemental Movie

Holotype.—CSBD F3618 (formerly AUM 62850), 22.8 mm SL, female, Kuribrong River at Grass Shoals Rapids, Potaro-Siparuni, Guyana, 5°28′44.7″N, 59°31′54.4″W, J. Armbruster, D. Werneke, E. Liverpool, D. Fernandes, and D. Taphorn, 12 March 2014.

Paratypes.—AUM 62850, 78, 14.9–25.1 mm SL (8 measured 21.6–24.3 mm SL), CSBD F3619, 10, 17.8–24.2 mm SL, MCP 54588, 17, 19.2–24.9 mm SL + 3 CS, 21.2–22.2 mm SL (9 measured 20.3–23.8 mm SL), ROM 110801, 10, 18.3–23.5 mm SL, UMMZ 252792, 10, 18.6–23.8 mm SL, collected with the holotype; AUM 62879, 33, 10.0–24.6 mm SL, Kuribrong River at Ram Sheep Rapids, Potaro-Siparuni, Guyana, 5°26′32.5″N, 59°30′07.2″W, J. Armbruster, D. Werneke, E. Liverpool, D. Fernandes, and D. Taphorn, 13 March 2014; AUM 62895, 26, 14.8–24.6 mm SL, Grass Falls Creek (Kiwikparu Creek), just upstream from mouth of Kuribrong River, Potaro-Siparuni, Guyana, 5°24′23.4″N, 59°32′01″W, J. Armbruster, D. Werneke, E. Liverpool, D. Fernandes, and D. Taphorn, 13 March 2014; INHS 49522, 5, 14.6–22.0 mm SL + 1 CS, Potaro River at Amatuk Cataract, Essequibo drainage, Potaro-Siparuni, Guyana, 5°18′13.5″N, 59°18′40.2″W, L. Page, M. Sabaj, J. Armbruster, M. Hardman, J. Knouft, and W. Prince, 25 October 1998; INHS 49555, 2, 19.1–22.8 mm SL + 1 CS, INHS 49556, 1, 23.5 mm SL, Potaro River at Waratuk Cataract, Essequibo drainage, Potaro-Siparuni, Guyana, 5°15′31.9″N, 59°24′01.0″W, L. Page, M. Sabaj, J. Armbruster, M. Hardman, J. Knouft, and W. Prince, 26 October 1998; ROM 111040, 49, 12.6–23.4 mm SL, creek entering Kuribrong River at upper Grass Falls, at lowermost series of rapids near mouth, Essequibo drainage, Potaro-Siparuni, Guyana, 5°24′26.55″N, 59°31′57.05″W, D. Abraham, C. Benjamen, D. Stoby, D. Gordon, and N. Lujan, 29 October 2011; ROM 91423, 17, 15.2–23.7 mm SL, Mikobe Creek, approx. 0.5 km upstream from mouth, at rapids beyond first rapid blocking upstream boat entry, Essequibo drainage, Potaro-Siparuni, Guyana, 5°24′50.25″N, 59°28′12.91″W, D. Abraham, C. Benjamen, D. Stoby, D. Gordon, and N. Lujan, 29–30 October 2011.

Diagnosis.—*Parotocinclus hardmani* is distinguished from its congeners from coastal drainages of the Brazilian Shield (*P. adamanteus*, *P. arandai*, *P. bahiensis*, *P. bidentatus*, *P. cabessadecuia*, *P. cearensis*, *P. cesarpintoi*, *P. cristatus*, *P. doceanus*, *P. fluminense*, *P. haroldoi*, *P. jacumirim*, *P. jequi*, *P. jimi*, *P. jumbo*, *P. maculicauda*, *P. minutus*, *P. muriaensis*, *P. nandae*, *P. planicauda*, *P. prata*, *P. robustus*, *P. seridoensis*, *P. spilosoma*, and *P. spilurus*) in having the canal cheek plate elongated posteriorly on the ventral surface of the head and contacting the cleithrum (Fig. 2; vs. canal plate rounded, not elongated posteriorly and not contacting the pectoral girdle). *Parotocinclus hardmani* is distinguished from all other congeners from the Amazon, Orinoco, and the Guianas by uniquely having a conspicuously elongated, conical urogenital papilla which is twice the size of the anal tube and 3–4 times larger than in congeners (Fig. 3), by having the central abdominal area mostly devoid of plates (Fig. 1; vs. central abdomen fully covered with dermal plates, Fig. 4), by males lacking a dermal flap on the dorsal surface of the first pelvic-fin ray (vs. males with well-developed dermal flap), and, except for *P. halbothi*, by the rudimentary adipose fin, which is adnate to the dorsal plates (vs. normally developed adipose fin). The new species is also distinguished from *P. amazonensis*, *P. aripuanensis*, *P. britski*, *P. dani*, *P. eppleyi*, *P. kwarup*, *P. longirostris*, *P. pentakelis*, *P. polyochrus*, *P. variola*, and *P. yaka* by having unicuspid accessory teeth on both the premaxilla and dentary (vs. accessory teeth absent). The new species is further distinguished from *P. collinsae* and *P. halbothi* by the very small accessory teeth (Fig. 5; vs. well-developed, conspicuous accessory teeth in former species). It also differs from *P. eppleyi*, *P. longirostris*, and *P. polyochrus* by lacking a Y-shaped light marking dorsally on the head, from the posterodorsal margin of orbit to posterior parieto-supraoccipital tip (Fig. 1; vs. Y-shaped light markings present on dorsum of head; see fig. 3a, b in Lehmann et al., 2018). *Parotocinclus hardmani* differs from *P. dani* and *P. pentakelis* by having an adipose-fin spine adnate to the dorsum (vs. adipose fin absent), and from other congeners in having fewer oral teeth: 18–22 premaxillary and 16–19 dentary teeth (vs. 20–30 and 18–30, respectively, in *P. britskii*, 25–33 and 24–32 in *P. collinsae*, 28–34 and 27–33 in *P. kwarup*, 28–36 and 27–31 in *P. longirostris*, 36–51 and 33–39 in *P. variola*, and 34–39 and 31–41 in *P. yaka*). Additionally, *P. hardmani* further differs from *P. collinsae*, the most similar and geographically sympatric species, by the morphometric proportions marked in boldface in Table 1.

Fig. 2. *Parotocinclus hardmani*, ROM 91423, CT scan of head in dorsal, lateral, and ventral views. Note typical snout shape, canal cheek plate extended posteriorly and contacting pectoral girdle, and absence of central abdominal plates. Scale bar = 1 mm.

Description.—Proportional measurements in Table 1. Dorsal profile of head straight to slightly concave from snout tip to

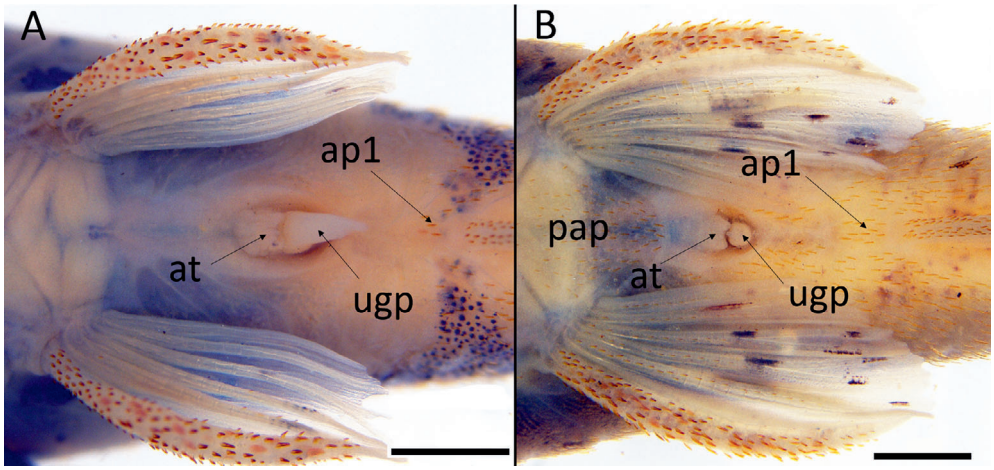

Fig. 3. Pelvic region of *Parotocinclus*. (A) *P. hardmani*, MCP 54588, 20.4 mm SL; and (B) *P. collinsae*, AUM 62851, 21.7 mm SL. ap1, exposed portion of first anal-fin pterygiophore; at, anal tube; pap, preanal plate; ugp, urogenital papilla. Scale bar = 1 mm.

Fig. 4. *Parotocinclus collinsae*, AMNH 55433, holotype, 23.9 mm SL, male, creek tributary to Takutu River, about 2 miles from Mazarahally Takutu lumber camp in Takutu Mountains, Essequibo River drainage, Cuyuni-Mazaruni, Guyana.

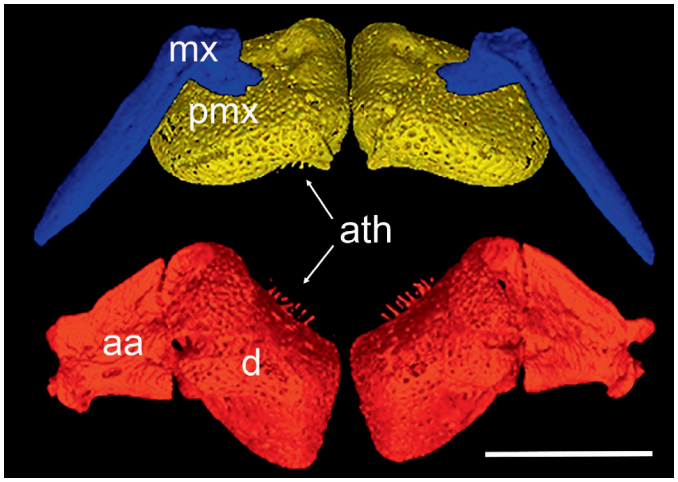

Fig. 5. *Parotocinclus hardmani*, ROM 91423, CT scan of the jaw bones in dorsal view; aa, anguloarticular; ath, accessory teeth; d, dentary; mx, maxilla; pmx, pramaxilla. Scale bar = 1 mm.

posterior border of rostral plate, convex from that point to parieto-supraoccipital tip and straight to slightly concave from that point to origin of dorsal fin. Dorsal profile of body mostly straight from dorsal-fin origin to insertion of caudal fin. Trunk horizontally ovoid to roundly triangular and caudal peduncle rounded to ovoid in cross section, slightly flattened ventrally and compressed caudally. Body progressively narrowing posteriorly from cleithrum, more so behind dorsal fin.

Head straight to slightly convex between orbits; dorsal margin of orbit slightly elevated. Snout elongated, depressed, its anterior margin rounded in dorsal view, with small depression anterior of naris. Eye comparatively small, positioned dorsolaterally, with small to inconspicuous iris operculum. Posterior tip of parieto-supraoccipital without patch of enlarged odontodes. Slightly enlarged odontodes on snout border, especially on rostral and postrostral plates and on lower surface of pectoral and pelvic spines; enlarged odontodes curved and posteriorly oriented. Odontodes on head and trunk otherwise of uniform size and distribution. Canal cheek plate bent and elongated posteroventrally, contacting cleithrum. Lips rounded, narrow, covered with minute papillae; papillae decreasing in size towards lip margin. Lip margin with uniformly distributed papillae forming delicate fringe. Maxillary barbel short; mostly adnate to lower lip with small free distal portion. Teeth moderately slender, bifid. Larger, medial cusp blade-like and slightly rounded, not elongated. Smaller, lateral cusp minute and pointed. Premaxillary teeth 18–22 (21); dentary teeth 16–19 (18); accessory teeth minute on both dentary and premaxilla.

Body entirely covered by dermal plates except for ventral surface of head around lips, central abdomen between lateral abdominal plates, and area around anus. Lateral plates arranged in five longitudinal series on trunk. Dorsal plate series complete, beginning at origin of dorsal fin, with 18–20 plates; mid-dorsal series incomplete, with 6–7 plates; middle series incomplete, with 1–2 ossified tubes, 2–3 plates with canal, a gap with 3–5 missing plates, and 15–18 plates.

Table 1. Morphometrics of holotype (H) and paratypes ($n = 18$) of *Parotocinclus hardmani* and *P. collinsae* ($n = 11$) as percents of standard length or head length. Range includes the holotype (H). SD = standard deviation. Variables in boldface distinguish the two species.

	P. hardmani					*P. collinsae*				
Measurement	H	Min	Max	Mean	SD	H	Min	Max	Mean	SD
Standard length (mm)	22.8	20.3	24.3	22.6	—	23.7	17.9	24.3	21.8	—
Percent of standard length										
Body depth	15.4	13.8	16.6	15.2	0.84	16.4	16.0	18.1	16.8	0.74
Predorsal distance	50.1	50.1	53.7	51.9	1.09	51.7	49.7	54.0	51.6	1.24
Prepelvic distance	48.8	48.0	51.0	49.6	0.87	48.4	45.4	51.3	48.0	1.66
Preanal distance	67.9	66.2	70.4	68.6	1.31	69.7	66.8	70.5	68.5	1.24
Preadipose distance	80.7	77.9	82.4	80.7	1.26	82.2	81.0	83.5	82.6	0.74
Dorsal-fin spine length	18.9	16.4	19.7	18.6	0.82	19.7	17.8	26.0	20.4	2.18
Anal-fin unbranched ray length	15.5	12.6	15.8	14.1	0.89	12.5	10.9	15.6	13.6	1.37
Adipose-fin spine length	4.6	**3.4**	**5.4**	**4.5**	0.59	5.6	**5.5**	**7.7**	**6.5**	0.84
Pectoral-fin spine length	24.6	22.9	26.9	25.2	0.97	24.8	22.9	27.6	24.9	1.38
Pectoral-fin spine depth	1.6	1.1	2.1	1.4	0.20	1.8	1.6	2.1	1.8	0.13
Caudal peduncle depth	8.8	**8.2**	**9.1**	**8.7**	0.30	9.5	**9.4**	**10.6**	**9.8**	1.35
Dorsal-adipose fin distance	16.0	16.0	18.5	17.3	0.57	17.3	17.3	19.7	18.9	0.87
Dorsal-fin base length	11.5	11.3	13.5	12.3	0.73	12.4	10.2	13.0	11.9	0.80
Lower caudal-fin principal ray	23.9	19.0	27.7	24.0	1.94	26.4	21.7	26.7	24.4	1.71
Cleithral width	22.8	**21.8**	**23.8**	**22.7**	0.58	26.8	**25.5**	**28.4**	**26.9**	0.86
Head length	40.1	38.1	42.8	40.7	1.47	40.0	38.1	43.3	41.0	1.69
Percent of head length										
Head depth	38.2	35.3	39.1	37.8	1.16	42.2	37.6	43.8	41.3	1.88
Interorbital distance	24.1	21.9	25.0	23.8	0.81	28.9	23.2	29.5	27.8	1.82
Orbital horizontal diameter	12.8	11.1	14.4	13.2	1.13	12.9	10.4	13.9	12.6	0.95
Snout length	59.1	56.0	60.6	58.7	1.38	58.1	51.7	58.4	56.7	1.83
Internarial distance	6.8	5.6	7.8	6.7	0.64	9.6	5.8	9.6	7.6	1.49
Tooth count										
Premaxilla	21	**18**	**22**	**20.3**	1.37	33	**25**	**33**	**28.6**	2.73
Dentary	18	**16**	**19**	**17.5**	1.01	32	**24**	**32**	**26.5**	2.70

Lateral line either uninterrupted with 22–24 pored plates or with 6–7 anterior plates bearing canal followed by two unperforated plates, then 14 posterior plates bearing canal, and 1–2 terminal plates without canal. Mid-ventral series incomplete with 15–16 plates; series terminating below adipose fin. Ventral series complete and continuous from pelvic-fin origin to caudal-fin base, with 17–18 plates. Predorsal plates forming two transverse rows anterior to nuchal plate. Single preadipose azygous plate. Coracoid completely exposed ventrally; cleithrum mostly exposed but with small area covered by skin medially; arrector fossa open medially. Lateral abdominal plates 5–7 (6/5); plates transversely elongate, clearly arranged in line between coracoid and pelvic-fin origin. Middle abdominal plates absent, except for few (2–5) minute platelets embedded in skin at midline, sometimes bearing one or few odontodes, variably present in some individuals. Preanal plate usually absent, embedded odontodes attached to fragile preanal plate in few specimens. First anal-fin pterygiophore exposed in front of anal fin as small, plate-like bone supporting odontodes. Total vertebrae 27, in one dissected specimen.

Dorsal-fin rays I, 7; spine slightly arched. Dorsal-fin origin at or slightly posterior to vertical through pelvic-fin origin. Dorsal-fin spinelet present, plate-like, roundly triangular dorsally and slightly V-shaped. Spinelet articulated to first dorsal-fin pterygiophore and dorsal-fin spine locking mechanism functional. Adipose fin rudimentary and undeveloped, spine adnate to dorsal plates without membrane. Pectoral-fin rays I, 6. Large spine slightly arched; tip of adpressed spine reaching between middle and distal third of pelvic fin. Pectoral-fin axillary slit present, with large slanted opening ventral to tip of posterior process of cleithrum. Pelvic-fin rays i, 5, fin short, with tip of adpressed fin almost reaching or reaching to anal-fin origin in both males and females. Adult males without fleshy flap along posterodorsal margin of thickened first pelvic-fin ray typical of other species. Odontodes on ventral surface of thickened first pelvic-fin ray oriented distally along main ray axis and not bent mesially. Anal-fin rays i, 5. Caudal-fin rays i, 14, i, with lower unbranched ray slightly longer than upper.

Color in alcohol.—Dorsal portions of head and trunk dark to reddish brown, light brown laterally, and cream to pale yellow ventrally (Fig. 1). Dorsal surface of snout and head with darker chromatophores between plates and bones, creating reticulated aspect. Dark pigmentation also concentrated around pores of head sensory lateral system. Posterior portion of parieto-supraoccipital and predorsal region lighter than surrounding areas, but not forming Y-shaped mark. Trunk with four conspicuous dark brown bars, extending transversely from dorsal midline to ventral surface, narrowing ventrally. First bar at dorsal-fin origin weak. Second bar immediately posterior to dorsal-fin base and almost reaching to anal-fin origin. Third bar immediately after and sometimes merged with second, forming very wide bar reaching adipose spine. Fourth bar immediately anterior to caudal fin and sometimes divided into two narrow bars, last at caudal-fin base. Ventral surface mostly unpigmented, but small dark spots sometimes on cheeks, lateral abdominal plates, and caudal peduncle crossed by 3–4 dark bars continuing ventrally from lateral dark color. One small dark spot on lateral portion of lip, dorsal to base of maxillary barbel. Tooth cusps and odontodes, especially on ventral surface, reddish orange. Fins with transverse, conspicuous brown bands formed by concentration of chromatophores on rays; bands more numerous on leading rays; membranes mostly hyaline. Dorsal-fin spine with 3–4 dark brown spots; branched rays with 1–2 dark bands, especially in distal half. Pectoral-fin spine with 3–4 dark spots, branched rays with 1–2 irregular dark bands. Pelvic fin with one irregular dark band. Anal fin with 1–2 dark bands. Adipose fin with one dark spot at anterior portion of spine. Caudal fin with dark transverse band at base and 3–4 conspicuous irregular dark brown bands.

Sexual dimorphism.—Males have a conspicuous urogenital papilla, which is twice the size of the anal tube (Fig. 3) and is absent in females. The typical sexual dimorphism of males having a skin fold on the pelvic-fin unbranched ray is absent in this species.

Distribution and habitat.—*Parotocinclus hardmani* is currently known from seven localities in tributaries to the Potaro River below the Guiana Shield escarpment, Potaro-Siparuni (Region 8), Guyana (Fig. 6). All seven collecting sites are relatively large forest creeks or rivers, with moderately tanic, fast-flowing water. All specimens of *P. hardmani* were collected at or near waterfalls or rapids, usually among stones in structured bottom.

Etymology.—*Parotocinclus hardmani* is named in honor of Michael Hardman, former technician at the Center for Biodiversity, Illinois Natural History Survey, Champaign, Illinois, USA, who collected specimens in 1998 and first recognized the species as undescribed.

Conservation assessment.—The extinction risk of *Parotocinclus hardmani* is assessed as low despite the limited knowledge of its geographic distribution. The species is so far known from seven localities in the Potaro River basin, with an Extension of Occurrence (EOO) calculated by the convex polygon of those localities of 187 square kilometers. The area maintains a heavy rain forest cover; however, logging and gold mining are common throughout the area, comprising the only known threat to the species. For this reason and for the inferred more widespread presence in the Potaro basin, *P. hardmani* is tentatively categorized as Least Concern (LC) according to the International Union for Conservation of Nature (IUCN) categories and criteria (IUCN Standards and Petitions Subcommittee, 2019). Additional fish inventories should be conducted throughout the Potaro and neighboring drainages in order reveal the real geographic distribution of this species.

Remarks.—*Parotocinclus hardmani* is distinguished from all congeners from the Amazon, Orinoco, and the Guianas by having a conspicuous genital papilla 3–4 times larger than other species, and by males lacking a dorsal skin flap on the first pelvic-fin ray. The behavior associated with such a large urogenital papilla is currently unknown, and aquarium information would be valuable to shed light on this question. It might be associated, however, with the lack of the dorsal skin flap on the pelvic fin of males, which may also play a role in the spawning process.

The new species is sympatric with and remarkably similar to *P. collinsae* (compare Figs. 1 and 4). Both species were collected syntopically in three out of seven collecting

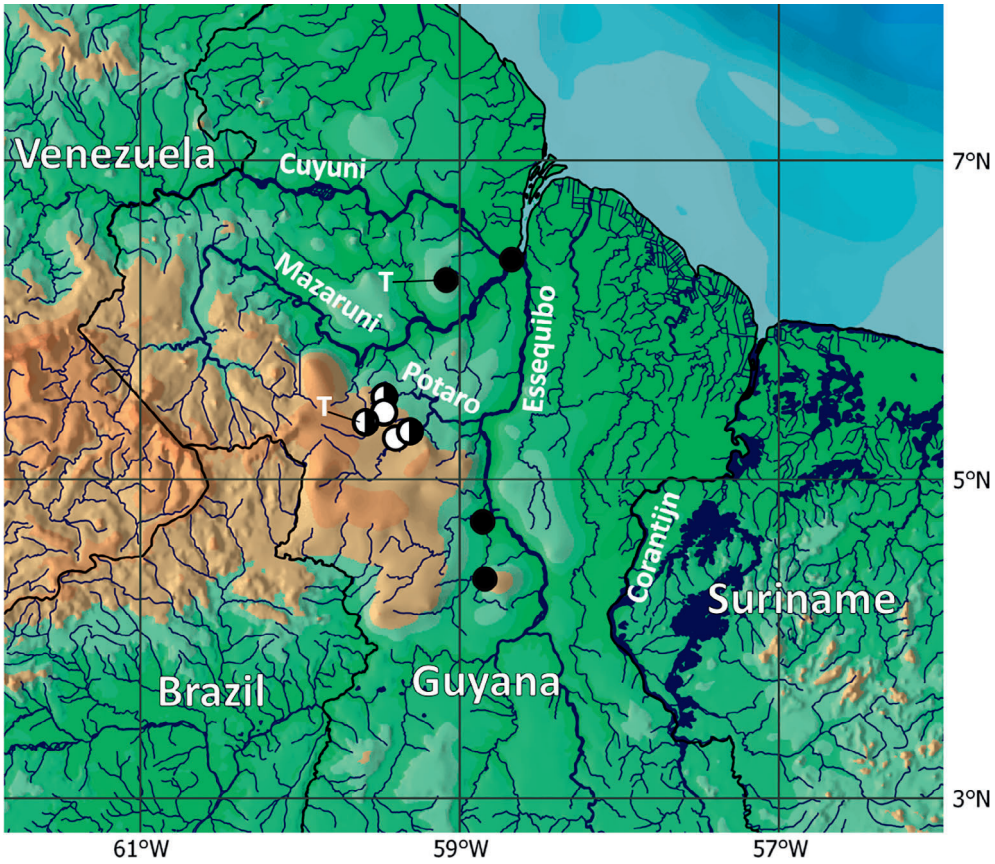

Fig. 6. Drainage map centered on Guyana showing the localities of *Parotocinclus hardmani* (white circle) and examined specimens of *P. collinsae* (black circle). Black and white circles indicate syntopy of the species. T indicates type-locality; each symbol may represent more than one lot or locality.

localities and probably form mixed schools. Nevertheless, both species are easily distinguished by at least six morphological characters: (1) the large urogenital papilla that distinguishes *P. hardmani* from all other hypoptopomatines; (2) the lack of a dorsal skin flap on the first pelvic-fin ray of males; (3) the lack or almost lack of middle abdominal plates between the lateral abdominal ones; (4) the rudimentary adipose fin, where the spine is adhered to the dorsal plates and there is no fin membrane; (5) the more robust and less numerous oral teeth; and (6) the fewer and very small accessory premaxillary and dentary teeth.

Despite these striking differences, *P. hardmani* and *P. collinsae* probably form a monophyletic group with *P. halbothi*. The three species are unique among all hypoptopomatins in having the odontodes in the first pelvic-fin ray aligned with the main ray axis, and not bent and pointing mesially, which probably represents a synapomorphy for the tribe. In addition to their primitively arranged pelvic-fin odontodes, the three species share the presence of accessory teeth in both the premaxilla and dentary, and the lack of two other typical features common to all other Amazon, Orinoco, and Guianan species of *Parotocinclus*, a triangular dark spot at the anterior base of the dorsal fin and a Y-shaped light mark from the snout tip diverging into each nostril. Among these three species, *P. hardmani* and *P. halbothi* share a rudimentary and undeveloped adipose fin, where the spine is adnate to the surrounding dorsal plates and there is no fin membrane, and probably represent sister species. Another pair of sister species of loricariid catfishes share the same disjoint distribution in the coastal rivers of the Guianas, including the Essequibo basin, and the Trombetas River drainage in Brazil, a Guianas Shield, northern tributary of the Amazon, as recently demonstrated by Londoño-Burbano et al. (2021) for *Cteniloricaria platystoma* and *C. napova*. The same river capture events mentioned by those authors may possibly be responsible for the divergence between *P. hardmani* and *P. halbothi*.

MATERIAL EXAMINED

Lots marked with an asterisk are syntopic with paratypes of *Parotocinclus hardmani*.

Parotocinclus collinsae: AMNH 55433, holotype, creek tributary to Takutu River, about 2 miles from Mazarahally Takutu lumber camp in Takutu Mountains, Essequibo River drainage, Cuyuni-Mazaruni, Guyana, approx. 6°15′N, 59°5′W; AMNH 55434, 2 of 4 paratypes, same locality as holotype; ANSP 175923, 2 CS, blackwater creek 5 minutes downstream from Burro Burro campsite, Potaro-Siparuni, Guyana, 4°43′58″N, 58°51′18″W; ANSP 175927, 1, creek crossing Kurupukari-Surama River road ca. 3 miles from Kurupukari field station, Siparuni VIII-2, Potaro-Siparuni, Guyana, 4°22′29″N, 58°50′30″W; AUM 28118*, 7 + 2 CS, Potaro River at Amatuk Cataract and beach just below cataract, Potaro-Siparuni, Guyana, 5°18′14″N, 59°18′40″W; AUM 35577, 10 + 1 CS, ANSP 179140, 7, MCP 34710, 3, Whitewater Creek, small blackwater creek tributary to Mazaruni River, Essequibo River drainage, 6.8 km SW of Bartica, Cuyuni-Mazaruni, Guyana, 6°22′41″N, 58°40′25″W; AUM 62851*, 13 of 25, Kuribrong River at Grass Shoals Rapids, Potaro-Siparuni, Guyana, 5°28′44.7″N, 59°31′54.4″W; AUM 62880*, 1, Kuribrong River at Ram Sheep Rapids, Potaro-Siparuni, Guyana, 5°26′32.5″N, 59°30′07.2″W; AUM 62896*, 3, Grass Falls Creek (Kiwikparu

Creek), just upstream mouth of Kuribrong River, Potaro-Siparuni, Guyana, 5°24′23.4″N, 59°32′01″W.

DATA ACCESSIBILITY

Supplemental material is available at https://www.ichthyologyandherpetology.org/i2021065. Unless an alternative copyright or statement noting that a figure is reprinted from a previous source is noted in a figure caption, the published images and illustrations in this article are licensed by the American Society of Ichthyologists and Herpetologists for use if the use includes a citation to the original source (American Society of Ichthyologists and Herpetologists, the DOI of the *Ichthyology & Herpetology* article, and any individual image credits listed in the figure caption) in accordance with the Creative Commons Attribution CC BY License. ZooBank publication urn:lsid:zoobank.org:pub:3022947F-DFA1-42FE-9E65-C1891DDA085C.

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