

A New Distinctively Colored Catfish of the Genus *Pareiorhaphis* (Siluriformes: Loricariidae) from the Rio Piracicaba, Upper Rio Doce Basin, Brazil

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A new species of *Pareiorhaphis* is described from the Ribeirão Caraça, a tributary to the Rio Piracicaba, upper Rio Doce basin in the State of Minas Gerais, eastern Brazil. The new taxon is promptly diagnosed from all other species of *Pareiorhaphis* by having a unique color pattern in both sexes. The color pattern consists of conspicuous dark brown blotches irregularly scattered over a yellowish tan background on head, along the dorsal surface of body and flanks. In addition, the new species can be further distinguished from all congeners except *P. eurycephalus*, *P. nudulus*, and *P. vestigipinnis*, by the absence of an adipose fin. From those species it is distinguished by morphometric traits. The new species is further compared to *P. nasuta* and *P. scutula*, which also occur in the Rio Doce system.

Uma nova espécie de *Pareiorhaphis* é descrita do Ribeirão Caraça, um tributário do Rio Piracicaba, bacia do alto Rio Doce no Estado de Minas Gerais, leste do Brasil. O novo táxon é prontamente diagnosticado de todas as outras espécies de *Pareiorhaphis* por apresentar um padrão único de coloração em ambos os sexos. O padrão de colorido consiste em evidentes manchas castanho-escuras, irregularmente espalhadas sobre um fundo amarelado, presentes na cabeça, ao longo da superfície dorsal do corpo e flancos. Além das diferenças em relação ao padrão de colorido, a nova espécie pode ser distinguida de todos os demais congêneres, exceto *P. eurycephalus*, *P. nudulus* e *P. vestigipinnis*, pela ausência de nadadeira adiposa. Distingue-se das espécies anteriores por dados morfométricos. A nova espécie é ainda comparada com *P. nasuta* e *P. scutula* que também ocorrem na drenagem do Rio Doce.

RECENT ichthyological surveys in the headwaters of tributaries of upper Rio Doce system uncovered, in a short period of time, two new species of the catfish genus *Pareiorhaphis*: *P. nasuta* Pereira, Vieira and Reis (2007), from the Rio Matipó basin; and *P. scutula* Pereira, Vieira and Reis (2010), from the Rio Piracicaba basin. Advances in the taxonomy of *Pareiorhaphis* are mostly due to the studies of the genus undertaken by Pereira and Reis (2002) and Pereira (2005), with nine of its valid species described in the last ten years (Eschmeyer and Fricke, 2011).

The herpetological staff of Museu Nacional/Universidade Federal do Rio de Janeiro captured a few specimens of a loricariid catfish of the Neoplecostominae genus *Pareiorhaphis* in the Serra do Caraça mountains, nested in the Quadrilátero Ferrífero region, Minas Gerais State, and brought to the second author. The specimens lack the diagnostic features of *P. nasuta* or *P. scutula*, the only two species described from Rio Doce basin. Two fish surveys (March and December 2010) in Serra do Caraça resulted in the collection of a large number of specimens in different life stages, including several adult males, of the new species of *Pareiorhaphis*, which is described herein as the third record from the Rio Doce system.

MATERIALS AND METHODS

Measurements and counts were taken as described by Pereira et al. (2007), excluding those inapplicable: pre-adipose length; adipose to caudal fin distance; adipose-fin spine length; number of plates between dorsal and adipose fins; number of plates between adipose and caudal fins; and preadipose azygous plates, due to the absence of adipose fin on the new taxon. Preadipose azygous plates are replaced by

azygous plates (number of all unpaired plates covering the area otherwise occupied by the adipose fin). Dermal plate terminology follows Schaefer (1997). Nomenclature of the raised median unpaired plates posterior to the dorsal fin follows Armbruster et al. (2000). The dorsal flap-like extension of the iris is referred to as the iris operculum following Douglas et al. (2002). Osteological preparations were cleared and counterstained for cartilage and bone (CS) using the method of Taylor and Van Dyke (1985). Institutional abbreviations are as in Sabaj Pérez (2010).

All morphometric features were measured with digital calipers to the nearest 0.1 mm and were made from point to point under a stereomicroscope. Bilaterally paired features were counted on the left side of the body whenever possible. Descriptions of coloration were based on specimens preserved in ethanol. Adult males of *Pareiorhaphis* are herein defined as described by Pereira et al. (2010). In the list of type material, museum abbreviation and catalog number come first, followed by the number and SL range of specimens in that lot, the number and SL range of specimens measured for the morphometric comparisons in parentheses, number of cleared and stained specimens, if any, and their size range, locality, collectors, and date of collection. Abbreviations used are HL (head length) and SL (standard length).

Pareiorhaphis proskynita, new species

Figure 1, Table 1

Holotype.—MNRJ 38561, 83.9 mm SL, male, Brazil, Minas Gerais State, Catas Altas, Rio Doce drainage, Ribeirão Caraça at locality of Taboões, Reserva Particular do Patrimônio

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Fig. 1. *Pareiorhaphis proskynita*, MNRJ 38561, holotype, 83.9 mm SL, male, Brazil, Minas Gerais, Catas Altas, Rio Doce drainage, Ribeirão Caraça at Taboões R.P.P.N. Santuário do Caraça, Serra do Caraça, tributary to Rio Piracicaba, 20°04'54"S, 43°30'20"W.

Natural (R.P.P.N.) Santuário do Caraça, Serra do Caraça, tributary to Rio Piracicaba, 20°04'54"S, 43°30'20"W, M. Britto, F. Pupo, R. R. Pinto, and M. W. Cardoso, 17 March 2010.

Paratypes.—All from Brazil, Minas Gerais, Catas Altas, Rio Doce drainage, R.P.P.N. Santuário do Caraça, Serra do Caraça, tributary to Rio Piracicaba. MCP 46317, 12, 42.7–88.8 mm SL

(11, 51.7–88.8 mm SL); MNRJ 36770, 12, 51.5–89.7 mm SL (11, 51.5–89.7 mm SL), 1 CS, 82.6 mm SL; collected with holotype. MNRJ 36762, 6, 20.3–61.3 mm SL (4, 55.8–61.3 mm SL), 1 CS, 61.3 mm SL, same locality as the holotype, M. Britto and F. Pupo, 15 March 2010. MCP 46318, 20, 45.6–87.9 mm SL (4, 74.9–87.9 mm SL), 1 CS, 69.2 mm SL; MNRJ 38278, 12, 44.3–88.7 mm SL (2, 78.3–88.7 mm SL); same locality as the

Table 1. Morphometric and Meristic Data of *Pareiorhaphis proskynita*. Values are given as percent of standard length or head length. SD = standard deviation, *n* = number of specimens, H = holotype.

	Types					
	H	<i>n</i>	Low	High	Mean	SD
Standard length (mm)	83.9	38	51.5	89.7	70.0	
Percent of standard length						
Head length	36.2	38	34.6	37.9	36.0	0.80
Predorsal length	45.7	38	42.9	48.1	45.2	1.17
Postdorsal length	37.7	38	35.9	40.9	38.8	1.27
Preal length	68.1	38	64.2	69.6	67.0	1.27
Dorsal-fin spine length	22.5	37	21.5	24.8	23.1	0.77
Anal-fin unbranched ray length	17.3	37	14.3	19.5	17.2	0.98
Pectoral-fin spine length	13.9	38	13.9	18.4	16.0	1.12
Pelvic-fin unbranched ray length	20.7	38	18.8	22.6	20.8	0.96
Upper principal caudal-fin ray	22.0	37	21.2	27.8	24.1	1.49
Lower principal caudal-fin ray	23.0	38	22.6	28.5	25.5	1.57
Trunk length	16.3	38	14.9	17.9	16.0	0.72
Abdominal length	23.6	37	21.3	27.7	24.1	1.13
Cleithral width	28.4	38	27.0	29.9	28.3	0.67
Body depth at dorsal-fin origin	19.8	38	17.5	22.4	20.0	1.16
Body width at dorsal-fin origin	20.4	38	18.5	24.0	21.2	1.58
Body width at anal-fin origin	13.3	37	10.6	15.6	13.6	0.95
Caudal peduncle length	31.8	38	30.5	34.8	32.6	0.97
Caudal peduncle depth	9.2	38	7.6	9.8	9.0	0.48
Caudal peduncle width	4.6	38	3.6	6.0	4.8	0.57
Percent of head length						
Snout length	67.8	37	64.0	71.1	66.6	1.70
Orbital diameter	11.3	38	10.3	13.7	12.0	0.92
Interorbital width	27.2	38	26.3	29.6	28.0	0.85
Head depth	49.8	38	47.1	57.3	51.6	2.54
Mandibular ramus	22.3	38	20.1	23.5	21.9	0.72
Meristics						
Premaxillary teeth	50/52	38	44	74	56.2	6.34
Dentary teeth	43/50	38	43	73	53.5	5.78
Plates in median lateral series	29	32	26	30	27.9	0.92
Plates at dorsal-fin base	6	38	6	7	6.2	0.39
Plates at anal-fin base	3	38	3	4	3.2	0.41
Plates between anal and caudal fins	11	38	10	12	11.2	0.54
Azygous plates	4	33	2	5	3.6	0.90

holotype, M. Britto, J. Gomes, D. Baeta, and A. C. Lourenço, 29 November 2010. MNRJ 38279, 28, 44.4–89.4 mm SL (5, 65.5–89.4 mm SL) same locality as the holotype, M. Britto and J. Gomes, 30 November 2010.

Non-type material.—All from Brazil, Minas Gerais, Catas Altas, Rio Doce drainage, R.P.P.N. Santuário do Caraça, Serra do Caraça, tributary to Rio Piracicaba. MNRJ 38485, 8, 33.6–95.9 mm SL, Ribeirão Caraça at bridge on road to administration R.P.P.N. Santuário do Caraça, 20°05'34"S, 43°29'24"W, M. Britto and J. Gomes, 29 November 2010. MNRJ 38486, 14, 34.2–59.6 mm SL, Córrego Canjerana (Banho do Belchior), 20°06'52"S, 43°29'28"W, M. Britto and J. Gomes, 28 November 2010.

Diagnosis.—*Pareiorhaphis proskynita* is uniquely diagnosed among all members of the genus *Pareiorhaphis* in having a color pattern composed of large and conspicuous dark brown blotches irregularly scattered over a yellowish tan

background on head, along the dorsal surface of body and flanks (vs. mostly plain gray, or with small distinct black dots, or with three to five irregular and diffuse dark saddles over a gray or dark brown, sometimes light brown ground color), and by having a shallow depression at posterior unpaired plates covering the area otherwise occupied by the adipose fin (vs. depression absent). In addition, the new species can be distinguished from all congeners except, *P. nudulus*, *P. eurycephalus*, and *P. vestigipinnis* by the usual absence of the adipose fin. From *P. nudulus*, *P. eurycephalus*, and *P. vestigipinnis* it is distinguished by having a shorter pectoral-fin spine (13.9–18.4 vs. 19.3–24.2, 20.0–24.7, and 18.2–21.4% SL, respectively).

Description.—Morphometric and meristic data in Table 1. Overall view of body in Fig. 1. Small to medium-sized loricariid with standard length of measured specimens 51.5–89.7 mm SL. Body elongate and moderately depressed, progressively tapering from cleithrum to end of caudal

peduncle. Dorsal profile of body gently convex, rising from snout tip to origin of dorsal fin and then descending to end of caudal peduncle except for shallow depression at posterior unpaired plates covering area otherwise occupied by adipose fin. Greatest body depth at dorsal-fin origin. Least body depth at shallowest part of caudal peduncle. Trunk and caudal peduncle mostly oval in cross-section, slightly flattened ventrally and more compressed caudally. Lateral-line canal in median series complete, pored tube visible from compound pterotic to caudal-fin base. Ventral profile almost straight between snout tip and pelvic girdle, slightly elevating posteriorly along anal-fin base, almost straight along caudal peduncle. Dorsal surface of body covered by plates except for narrow naked area around dorsal-fin base. Abdomen entirely devoid of plates. First anal-fin pterygiophore covered by skin. Lower surface of head, portion from pelvic-fin insertions to anal-fin origin, and portion around anal fin completely naked.

Head broad and moderately depressed. Anterior profile of head slightly triangular to roundish in dorsal view; females and juveniles more rounded. Interorbital space straight or slightly concave. Three weakly elevated ridges between orbits and snout tip. Outer ridges from middle of snout to upper margins of orbits slightly prominent. In adult males, ridges ornamented with many short hypertrophied odontodes. Snout gently convex in lateral profile; snout tip with small ovoid area of naked skin. Adult males with well-developed soft fleshy lobes extending along lateral portion of head. Soft fleshy area ornamented with few, short hypertrophied odontodes, approximately perpendicular to body axis. Eye small, dorsolaterally placed; orbit diameter 10.3–13.7% of HL. Iris operculum absent or very small. Nares ovoid, slightly longer than wide, positioned closer to anterior margin of orbit than to snout tip.

Oral disk roughly circular. Lips well developed, occupying almost wholly ventral surface of head. Upper lip narrow, covered with small rounded papillae. Lower lip wide and long but not reaching pectoral girdle. Lower lip densely covered by minute papillae. Papillae surrounded by small naked areas, decreasing in size toward edge. Posterior edge slightly fringed. Maxillary barbel short and united basally to lip by membrane, tip distally free. Both premaxillae and dentaries forming shallow arc with overall angle just slightly less than 180°, with mesial ends slightly curved inward. Teeth slender, asymmetrically bifid, medial cusp slightly curved inward and rounded. Lateral cusp small and pointed, usually reaching half length of medial cusp.

Dorsal-fin origin on vertical line through pelvic-fin origin. Dorsal fin short, depressed tip not reaching first median unpaired plate of postdorsal ridge. Nuchal plate and dorsal-fin spinelet exposed, not covered by skin. Dorsal-fin spinelet transversely oval-shaped, slightly wider than base of dorsal-fin spine; dorsal-fin locking mechanism non-functional. Dorsal-fin ray moderately flexible, followed by seven branched rays. Adipose fin absent, replaced by series of two to five small median unpaired plates forming low postdorsal ridge on otherwise adipose-fin area. Pectoral fin moderate in size, with curved and flattened unbranched ray, covered by minute odontodes in immature males and females. Adult males with first thickened pectoral-fin spine bearing straight and short hypertrophied odontodes on its entire surface; dorsal surface with discrete dermal flap along its entire length. Six branched rays, first and second as long as spine. Subsequent branched rays decrease gradually in

size. Posterior margin of pectoral fin straight to slightly round, overlapping pelvic-fin origin when adpressed. Pelvic fin with one unbranched and five branched rays, not reaching anal-fin origin when adpressed. Pelvic-fin spine depressed, covered with minute odontodes ventrally and laterally; dermal flap on its dorsal surface present and well developed, extending to ray tip; more prominent in adult males. Pelvic-fin flap distinctly higher close to fin base. Anal fin long with one unbranched and five branched rays; reaching end of postdorsal ridge level when adpressed in adult males. Caudal fin forked or slightly concave; ventral lobe slightly longer than dorsal lobe; 14 branched rays. Upper caudal-fin lobe with four and lower lobe with two to four plate-like procurrent rays, posteriormost elongate. Odontodes on principal and procurrent rays small and irregularly arranged.

Color in alcohol.—Ground color of trunk and head yellowish tan; lips pale yellow. Dorsum and flanks irregularly spotted with conspicuous, irregularly scattered, dark brown blotches from snout tip to caudal peduncle. Head blotches roughly in two patterns: elongate and narrow, located posterior to eyes, from snout tip to nares, and on opercle; and small and rounded spots, more scattered, and located between nares and eyes, on supraoccipital region and opercle. Both blotches coalescent in some specimens.

Trunk blotches irregularly shaped and variable in size. Five to seven irregular, oblique markings along sides of body. Posteriormost markings coalescent dorsally to its counterpart in some specimens. Small, rounded blotches variably scattered around elongate blotches; somewhat larger on caudal peduncle. Postdorsal region with large, irregular blotches along midline.

Dorsal-fin rays with four to six irregular series of dark brown spots on pale yellow background and caudal-fin rays with four or five dark spots forming irregular transverse bands on yellowish brown background. Dorsal-fin spine slightly darker than rays. Skin at base of dorsal fin dark brown. Ground color of anal-fin rays yellowish white. Two or three irregular diffuse rows of dark brown spots on anal-fin rays, not including first unbranched ray. Ground color of caudal-fin rays pale yellow. Caudal-fin base with irregular dark brown blotch. Caudal fin with three irregular series of small, dark brown blotches restricted to rays and forming poorly defined arched bands. Pectoral- and pelvic-fin rays also spotted with small dark brown blotches, not forming clear bands. Pectoral- and pelvic-fin rays yellowish tan with pale brown blotches on ventral surface. Interradial membrane of all fins hyaline or pale white.

Adult males with yellowish white fleshy skin on margin of head (cheeks), snout, and pectoral-fin spines, bearing yellow to orange hypertrophied odontodes with red tips. Small red-tip odontodes on dorsal-fin spine, first anal- and pelvic-fin rays, and procurrent and principal caudal-fin unbranched rays.

Color in life.—Color pattern of living specimens similar to preserved specimens, but blotches more conspicuous and black to slightly bright dark green. Some pale specimens show more conspicuous scattered melanophores on dorsal surface of head, and reddish pale coloration on all fins and regions of fleshy skin.

Sexual dimorphism.—Presumed adult males of *Pareiorhaphis proskynita* are easily recognized by the presence of hypertrophied odontodes and well-developed soft fleshy lobes along

the lateral portion of head. The holotype of *Pareiorhaphis proskynita* is an adult male, exhibiting narrow soft fleshy lobes extending along the entire lateral margins of head (Fig. 1). This soft area is ornamented with short hypertrophied odontodes inserted approximately at right angle with the longitudinal body axis, smaller odontodes usually entirely hidden by fleshy lobes. Odontodes are present in females and juveniles, but are not as extensively developed as in males, while soft fleshy area is absent in females. Besides, adult males of *Pareiorhaphis proskynita* also have the unbranched pectoral-fin ray slightly thickened from base to approximately three-fourths of its length, with distal portion soft and with short hypertrophied odontodes on outer and ventral surfaces. Also, unbranched pelvic-fin ray with developed dermal flap on dorsal surface, extending to ray tip, is distinctly higher close to fin base in comparison to adult females and juveniles. Adult males of the new species have a conical urogenital papilla behind the tubular anus, which is not present in females. Specimens of *Pareiorhaphis proskynita* smaller than 45 mm SL show no clear sexual dimorphism.

Habitat and natural history notes.—The new species is known from Córrego Canjerana (Banho do Belchior), Córrego Cascatinha, and Córrego Barragem, tributaries of the upper portion of Ribeirão Caraça; it was also collected in Ribeirão Caraça main course. The headwaters of Ribeirão Caraça are located in the southern foothills of Serra do Espinhaço mountains, in the Serra do Caraça, nested in the Quadrilátero Ferrífero region, characterized by its iron-ore coal-beds. The Ribeirão Caraça joins the Rio Conceição and flows into the Rio Santa Barbara, which empties in the Rio Piracicaba, one of the main tributaries of the Rio Doce. The new species was collected in an altitude range between 1175–1279 m a.s.l. The highest point in the Serra do Caraça is the Pico do Sol (2072 m a.s.l.; Dutra et al., 2002).

The tributaries of Ribeirão Caraça are all blackwater rivers. The water is translucent and fast flowing, characterized by rapids and stretches with backwater pools. The bottom is formed by very large rocks sparsely covered by iron-ore pebbles and gravel. A thin layer of periphyton and green algae covers the rocks. The pH varies from 4.5 (main course of Ribeirão Caraça) to 5.5 (Banho do Belchior), and the conductivity varies from 4 to 9 $\mu\text{S}/\text{cm}$. The type locality of *Pareiorhaphis proskynita*, Taboões, and the Córrego Canjerana (Banho do Belchior) are characterized by waters running inside forested areas or at least inside a gallery forest, with large amounts of riparian vegetation. In other localities, the streams run in open areas with riparian vegetation characterized by shrubs and grasses. The new species was collected in medium-sized streams, relatively shallow (0.5 to 1.5 m deep). Small specimens and juveniles were sampled in stretches of relative-slow water currents, associated with loose stones and pebbles deposits. In Banho do Belchior, small specimens were often collected together with tadpoles of *Bokermannohyla* aff. *circumdata*, *B. nanuzae*, *Hylodes uai*, *Phasmahyla jandaia*, and *Scinax machadoi* (A. C. C. Lourenço and D. Baeta, pers. comm.); the anurofauna in Serra do Caraça is especially abundant and diversified (J. P. Pombal, Jr., A. C. C. Lourenço, and D. Baeta, pers. comm.). In contrast, adult males and other larger individuals were sampled in fast-flowing stretches, often associated with rocky clefts.

The stomach contents of two specimens (39.1–82.6 mm SL) were composed mainly of filamentous algae; mud pellets and

unidentified insects fragments were also observed. Other species collected along with *Pareiorhaphis proskynita* at the sampled localities are *Oligosarcus* sp. and *Hoplias* cf. *malabaricus*, both collected in stretches of slow-water pools.

Pareiorhaphis proskynita is restricted to the upper portion of Ribeirão Caraça in altitudes higher than 1000 m a.s.l. Sampling efforts below this altitude revealed more abundant and diversified ichthyofauna, and distinct water parameters. Collections in Córrego do Engenho, which empties in Ribeirão Caraça at 750 m a.s.l., and in Ribeirão Caraça itself (at 727 m a.s.l.) included *Astyanax* gr. *scabripinnis*, *Australoheros* sp., *Characidium* sp., *Gymnotus* gr. *carapo*, *Harttia* sp., *Hasemannia* sp., *Knodus* sp., *Phalloceros* sp., *Serrapinnus heterodon* (Eigenmann), and *Trichomycterus* sp. The pH varies from 6.0 to 6.8, and the conductivity varies from 7 to 10 $\mu\text{S}/\text{cm}$. Samples in Rio Conceição (between 742–793 m a.s.l., pH 7.3, conductivity 18 $\mu\text{S}/\text{cm}$) additionally revealed *Bryconamericus* sp., *Geophagus* gr. *brasiliensis*, *Neoplecostomus* sp., and *Pareiorhaphis scutula*, collected in transparent and fast flowing waters, always associated with small to medium, loose rocks and gravel.

Distribution.—*Pareiorhaphis proskynita* is known from the upper portion of the Ribeirão Caraça, tributary to Rio Piracicaba (Fig. 2, circle). All specimens were collected above 1100 m, and within the limits of the R.P.P.N. Santuário do Caraça, Catas Altas, Minas Gerais State, Brazil.

Comments.—*Pareiorhaphis proskynita* differs from most of the remaining congeners by the absence of adipose fin that is replaced by a series of two to five small, median unpaired plates forming a low postdorsal ridge. However, six specimens of *P. proskynita* (MNRJ 38485, 4 ex. and MNRJ 38486, 2 ex.) possess an adipose fin. Five of these non-type specimens are between 33.0 and 47.3 mm SL and one is 78.5 mm SL. However, the remaining type series of *P. proskynita* consists of 91 specimens including adult males, females, and juveniles ranging 20.3–89.4 mm SL, and the adipose fin is always absent. The condition observed in these few specimens can indicate variation in this feature; however, due to small size of most of them, these specimens were considered non-types, although otherwise indistinguishable from the type series.

Etymology.—The species name *proskynita* is from the Greek *proskynitís* (Προσκυνητής), which means “pilgrim,” in allusion to the pilgrimage activity associated with The Santuário do Caraça (“Caraça’s Sanctuary”), originally founded by Brother Lourenço in the 1770s as a resting place for those travelers in search of an alternative to the madness of the mining activities of that century through spiritual redemption, and which is now a Reserva Particular do Patrimônio Natural (“Natural Patrimony Particular Reserve”), preserving an area of more than 100 km², nested in a region of intense mining activity. A noun.

DISCUSSION

The new taxon shows all the diagnostic features of *Pareiorhaphis* (see Sexual dimorphism) as proposed by Pereira et al. (2007).

Two species of *Pareiorhaphis* were reported previously from the Rio Doce basin: *Pareiorhaphis nasuta* and *P. scutula* (Pereira et al., 2007, 2010). With the recognition that *Pareiorhaphis proskynita* is distinct, the genus *Pareiorhaphis*

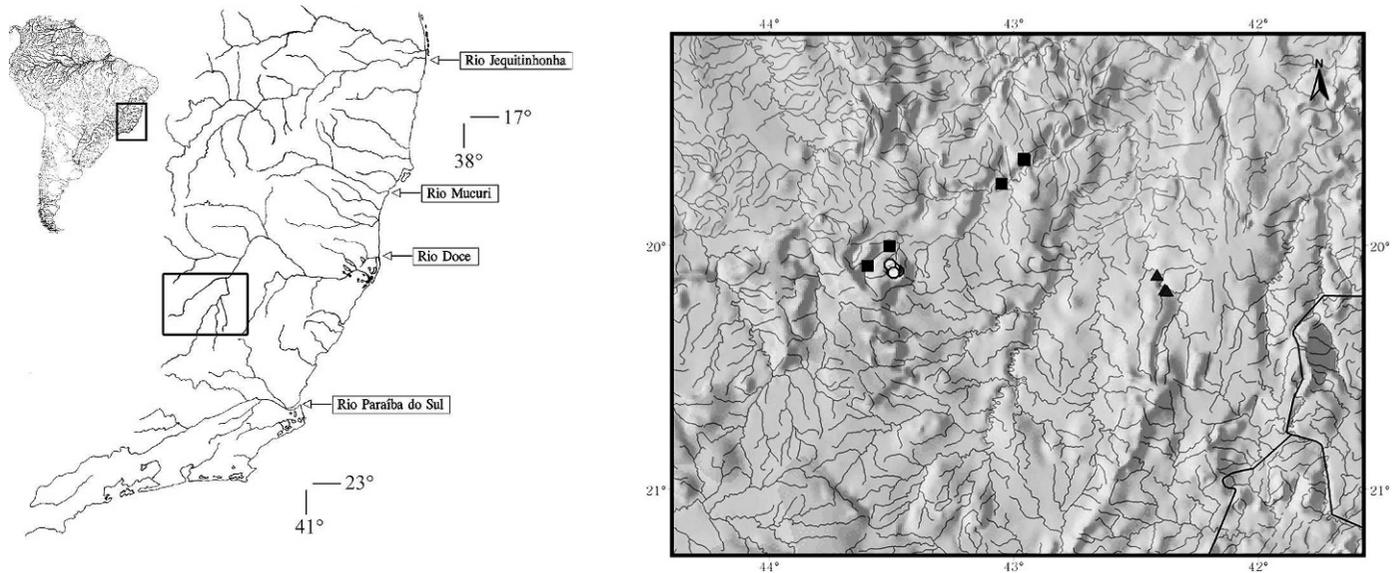


Fig. 2. Geographic distribution of species of *Pareiorhaphis* in eastern Brazil. *Pareiorhaphis proskynita* (circle), *P. scutula* (square), and *P. nasuta* (triangle). One symbol may represent more than one lot or locality.

now contains three species in the Rio Doce basin. The distinctive features of the new species relative to all other species of *Pareiorhaphis* is the unique color pattern of body in both sexes. Color pattern consists of conspicuous dark brown blotches irregularly scattered over the yellowish tan background on head and body. In addition to the feature above, *P. proskynita* also can be distinguished from all other species of *Pareiorhaphis*, except *P. nudulus*, *P. eurycephalus*, and *P. vestigipinnis*, by the absence of adipose fin that is replaced by a series of two to five small median, unpaired plates forming a low postdorsal ridge covering the area otherwise occupied by the adipose fin. Furthermore, some differences exist in the adipose fin among the three species. While *Pareiorhaphis eurycephalus*, which may or may not have an adipose fin, in *P. nudulus* and *P. vestigipinnis* the adipose fin is always absent, but *P. proskynita* is distinguished from the previous species by having the shallow depression at posterior unpaired plates.

Replacement of the adipose fin by a low postdorsal ridge formed by unpaired plates is shared by other loricariid genera. According to Armbruster et al. (2000), *Lipopterichthys* and *Leptoancistrus* have a postdorsal ridge between the dorsal fin and the dorsal caudal-fin ray formed by median unpaired plates, and lack an adipose fin. This feature was also observed in other genera, including *Corymbophanes*, *Pareiorhina*, and some species of the genus *Ancistrus*, *A. jataiensis*, *A. reisi*, *A. tombador*, *A. verecundus*, and *A. parecis* (Fisch-Muller et al., 2005a, 2005b). In each of these species of *Ancistrus* the adipose fin is replaced by a series of two to six small median, unpaired plates forming a low postdorsal ridge covering the area otherwise occupied by the adipose fin. *Lipopterichthys*, *Leptoancistrus*, and all above-cited species of *Ancistrus* have evertible cheek plates and are thus distinguished from all species of *Pareiorhaphis*. From *Corymbophanes* and *Pareiorhina*, the new species is distinguished by having a relatively short postdorsal ridge formed by two to five median unpaired plates, vs. 13–17 in *Corymbophanes* (Armbruster et al., 2000) and 10–13 in *Pareiorhina carrancas* (Bockmann and Ribeiro, 2003).

Finally, the new species is further distinguished from all other congeners by having a shallow depression at

posterior unpaired plates covering the area occupied by the adipose fin (see Fig. 1; vs. depression absent in all remaining species of *Pareiorhaphis*). Shallow depressions on the caudal peduncle are also reported in delturines, especially in representatives of the genus *Hemipsilichthys*, which is somewhat similar to *Pareiorhaphis* in a general external view. *Hemipsilichthys gobio* and *H. papillatus* from the Rio Paraíba do Sul and *H. nimius* from the Rio Perequê-Açu share this feature. However, *Pareiorhaphis proskynita* is promptly diagnosed from the species of *Hemipsilichthys* by several features in addition to the color pattern, such as lack of adipose fin (vs. adipose fin present in all delturine species), teeth asymmetrically bifid with small lateral cusp in both dentary and premaxilla (vs. teeth with cusps approximately equal in size), and upper lip bearing small rounded or oval shaped papillae arranged in transverse rows (vs. papillae in upper lip fused to form four or five transverse, elongate skin folds; Pereira et al., 2000:fig. 3).

The discovery of *P. proskynita* in the upper Rio Doce drainage in a relatively short period after the description of *P. nasuta* and *P. scutula* suggests this basin as a region of potential undescribed diversity in the genus *Pareiorhaphis* and deserves more survey efforts in its headwaters.

MATERIAL EXAMINED

All from Brazil (in addition to that listed in Pereira and Reis, 2002).

Delturus brevis: MCP 26927, 3 paratypes, 1 CS, 86.5–146.7 mm SL, Minas Gerais, Rubelita, Rio Jequitinhonha drainage, Rio Salinas near Rubelita.

Hemipsilichthys nimius: MCP 33049, holotype, 105.1 mm SL, Rio de Janeiro, Parati, Rio Perequê-Açu drainage, Rio Carrasquinho below Cachoeira do Tobogã, Penha, ca. 7.5 km west of highway BR101, on road from Parati to Cunha; MCP 31990, 11 paratypes, 45.7–98.1 mm SL, collected with the holotype; MCP 30671, 10 paratypes, 1 CS, 35.9–102.2 mm SL, same locality as holotype.

Isbrueckerichthys calvus: MCP 40208, 2 paratypes, 72.5–86.2 mm SL, Paraná, Apucarana, Rio Tibagi drainage, Córrego Juruba.

Isbrueckerichthys epakmos: MZUSP 79804, holotype, 103.1 mm SL, São Paulo, Tapiraí, Rio Ribeira de Iguape drainage, Rio Verde at Piúva, on road to Rio Verde; MCP 28276, 63 paratypes, 1 CS, 39.5–83.3 mm SL, São Paulo, Tapiraí, Rio Coruja, tributary to Rio Juquiá, on road from Tapiraí to Juquiá near Cachoeira do Chá.

Isbrueckerichthys saxicola: MCP 40209, 2 paratypes, 59.7–84.7 mm SL, Paraná, Londrina, Rio Tibagi drainage, Ribeirão Jacutinga.

Kronichthys subteres: MCP 20150, 32, 38.1–76.8 mm SL, São Paulo, Iporanga, Rio Ribeira de Iguape drainage, Córrego Areias, ca. 1 km SE from Bairro da Serra.

Neoplecostomus microps: MCP 18031, 4, 1 CS, 79.5 mm SL, São Paulo, Piquete, Rio Paraíba do Sul drainage, Rio Piquete at Vila Esperança; MCP 20069, 4, 47.1–89.3 mm SL, São Paulo, Piquete, Rio Paraíba do Sul drainage, Ribeirão Benfica at Benfica, ca. 1 km of Piquete; MCP 20071, 13, 45.1–98.3 mm SL, São Paulo, Silveiras, Rio Paraíba do Sul drainage, Ribeirão Macacos at Bairro dos Macacos.

Pareiorhaphis cameroni: MCP 17276, 16, 1 CS, 46.0–92.5 mm SL, Santa Catarina, Águas Mornas, Rio Teresópolis, tributary to Rio Cubatão.

Pareiorhaphis eurycephalus: MCP 19778, holotype, 62.3 mm SL, Santa Catarina, Urubici, Rio Uruguai drainage, creek tributary of Rio Canoas East of vila São José, on road to Serra do Corvo Branco; MCP 22341, 29, 5 CS, 14.2–58.3 mm SL, Rio Urubici on bridge at south of Urubici.

Pareiorhaphis nasuta: MCP 41764, holotype, 78.6 mm SL, Minas Gerais, Abre Campo, District of Granada, Rio Doce drainage, Ribeirão Areia Branca, tributary to Rio Matipó; MCP 37176, 12 paratypes, 2 CS, 25.1–78.6 mm SL, collected with the holotype.

Pareiorhaphis nudulus: MCP 20278, holotype, 33.6 mm SL, Santa Catarina, Nova Veneza, Rio Araranguá drainage, Rio Jordão at Jordão Alto; MCP 10436, 126 paratypes, 11 CS, 12.9–32.4 mm SL, collected with the holotype.

Pareiorhaphis parmula: MCP 35826, holotype, 93.3 mm SL, Paraná, Lapa, Rio Iguazu drainage, Rio dos Patos, tributary to Rio da Várzea on road PR-427 from Lapa to Campo Tenente; MCP 35827, 61 paratypes, 2 CS, 45.7–94.5 mm SL, collected with the holotype.

Pareiorhaphis scutula: MCP 44046, holotype, 84.7 mm SL, Minas Gerais, Nova Era, Rio Doce drainage, Córrego Prainha, tributary to Rio Piracicaba; AMNH 249486, 2, 45.3–55.9 mm SL; ANSP 189490, 2, 47.9–59.5 mm SL; MCP 44045, 15, 21.3–67.6 mm SL; MNRJ 33986, 2, 47.2–53.2 mm SL; UFRGS 10820, 2, 53.0–53.7 mm SL; all collected with the holotype; MCP 37182, 29 paratypes, 2 CS, 28.2–84.7 mm SL, Nova Era, Córrego Prainha on road to Cachoeira da Fumaça; MNRJ 38452, 6, 26.3–75.5 mm SL, Catas Altas, Rio Conceição on road to Córrego do Sitio mine; MNRJ 38474, 12, 32.3–60.1 mm SL, Catas Altas, Rio Conceição.

Pareiorhaphis vestigipinnis: MCP 14344, holotype, 97.5 mm SL, Santa Catarina, Lages, Rio Uruguai drainage, creek tributary of

Rio Caveiras at Paineal, on the road from São Joaquim to Lages; MCP 14345, 22 paratypes, 1 CS, 59.6–91.1 mm SL; MCP 14346, 56 paratypes, 2 CS, 22.7–60.0 mm SL, all collected with the holotype.

Pareiorhina carrancas: LIRP 2280, 2 paratypes, 1 CS, 35.8–36.9 mm SL, Minas Gerais, Carrancas, Rio Grande drainage, Córrego Debaixo da Serra.

Pareiorhina rudolphi: MCP 18052, 24, 1 CS, 30.4–49.3 mm SL, São Paulo, Piquete, Rio Paraíba do Sul drainage, creek tributary of Rio Piquete at Benfica.

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