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NEW DATA ON *METALORICARIA PAUCIDENS* FROM FRENCH GUIANA AND SURINAM (PISCES, SILURIFORMES, LORICARIIDAE)

by

I. J. H. ISBRÜCKER & H. NIJSSEN

Institute of Taxonomic Zoology, University of Amsterdam, P.O. Box 20125, 1000 HC Amsterdam, The Netherlands

ABSTRACT

A large number of previously unrecorded specimens of mailed catfishes of the genus *Metaloricaria* Isbrücker, 1975 (Loricariinae, tribe Harttiini, subtribe Metaloricariina) is compared with the known specimens from French Guiana and Surinam. This results in the recognition of two subspecies, viz., *M. paucidens paucidens* Isbrücker, 1975, from the rivers Oyapock and Maroni (French Guiana, Surinam), and *M. p. nijsseni* (Boeseman, 1976) from the rivers Suriname, Saramacca, Nickerie and Corantijn (Surinam). These subspecies were originally described as two different species, even within two different genera: *Metaloricaria paucidens* Isbrücker, 1975, and *Harttia nijsseni* Boeseman, 1976. Morphometric and meristic data, together with illustrations are given of the two subspecies. Diagnostic characters of *Metaloricaria* are provided, and its position within the Harttiini is indicated.

RÉSUMÉ

Une comparaison a été réalisée entre les exemplaires de poissons-chats cuirassés du genre *Metaloricaria* Isbrücker, 1975 (Loricariinae, tribu Harttiini, subtribu Metaloricariina) déjà connus (de Guyane française et du Surinam), et de nombreux exemplaires pas signalés auparavant. Cette étude conduit à distinguer deux sous-espèces, à savoir: *M. paucidens paucidens* Isbrücker, 1975, des rivières Oyapock et Maroni (Guyane française, Surinam) et *M. p. nijsseni* (Boeseman, 1976), des rivières Suriname, Saramacca, Nickerie et Corantijn (Surinam). Ces sous-espèces avaient été précédemment décrites comme espèces distinctes, et même comme appartenant à des genres distincts: *Metaloricaria paucidens* Isbrücker, 1975 et *Harttia nijsseni* Boeseman, 1976. On présente des données morphométriques et méristiques pour les deux sous-espèces, en même temps qu'une illustration. Des caractères diagnostiques du genre *Metaloricaria* sont fournis, et on indique sa position dans le cadre des Harttiini.

INTRODUCTION

The family Loricariidae Bonaparte, 1831, is presently subdivided into the subfamilies Loricariinae Bonaparte, 1831, Hypostominae Kner, 1853, Ancistrinae Kner, 1853, Hypoptopomatinae Eigenmann & Eigenmann, 1890, Neoplecostominae Regan, 1904, and Lithogeneinae Gosline, 1947.

The former subfamilies Harttiinae Boeseman, 1971, and Acestridiinae Isbrücker & Nijssen, 1974, are considered as tribes of the Loricariinae. The Astroblepidae Bleeker, 1862 (= Argeini Bleeker, 1862, and Cyclopidae Eigenmann, 1910) and Scoloplacidae Bailey & Baskin, 1976 — both previously ranked as subfamilies — are excluded from the family Loricariidae (Isbrücker, 1980: 5 and 130).

The subfamily Loricariinae is subdivided into four tribes:

Loricariini Bonaparte, 1831,
Farlowellini Fowler, 1958,
Harttiini Boeseman, 1971,
Acestridiini Isbrücker & Nijssen, 1974.

Harttiini usually have 12 branched caudal fin rays (rarely 11), whereas the eighteen genera of the Loricariini always have 10 branched caudal fin rays.

The tribe Harttiini is subdivided into two subtribes with the following genera:

(1) Harttiina Boeseman, 1971.
  (a) The *Harttia* genus-group (a depressed body; snout tip naked) comprises:
  Harttia Steindachner, 1876,
  Harttiella Boeseman, 1971,
  Cteniloricaria Isbrücker & Nijssen, in Isbrücker, 1979.
  (b) The *Sturisoma* genus-group (a compressed body; snout tip not naked) comprises:
  Sturisoma Swainson, 1838,
  Lamontichthys P. de Miranda Ribeiro, 1939,

Pterosturisoma Isbrücker & Nijssen, 1978b,
Sturisomatichthys Isbrücker & Nijssen, in Isbrücker, 1979.

(2) Metaloricariina Isbrücker, 1979.
Metaloricaria Isbrücker, 1975.

Metaloricaria was described from 14 specimens of *M. paucidens* (type-species) by Isbrücker (1975). This species is recently recorded from French Guiana by Boeseman (1982, pertaining to 2 specimens). Thirty specimens described as *Harttia nijsseni* by Boeseman (1976) were subsequently assigned to *Metaloricaria* (Isbrücker & Nijssen, 1978a).

Sixty-six previously unrecorded specimens from 16 localities in French Guiana and Surinam were available for this study. All the 112 specimens of *Metaloricaria* now known have been reviewed or examined. The purpose of this paper is to present further descriptive and distributional data. As the result of our comparison we recognize a single species with two subspecies in the genus: *Metaloricaria p. paucidens* from the river Oyapock (= Oiapoque), bordering French Guiana and Brazil, Território do Amapá, and from the river Maroni (=Marowijne), bordering French Guiana and Surinam; the second subspecies is *M. p. nijsseni* which occurs in the rivers Suriname, Saramacca, Nickerie and Corantijn in Surinam (the latter river is the boundary between Surinam and Guyana).

Notes on the genus and species, and illustrations of both subspecies are included for direct comparison. The present publication is part of a series intended to provide information for a revision of the subfamily Loricariinae. The methods of taking measurements and meristic data were defined by Isbrücker & Nijssen (1978a: 180-182).

The material reported upon herein is deposited in the following institutions: British Museum (Natural History), London (BMNH), Institut Royal des Sciences Naturelles de Belgique, Brussels (IRScNB), Instituut voor Taxonomische Zoölogie (Zoölogisch Museum), Amsterdam (ZMA), Muséum National d'Histoire Naturelle, Paris (MNHN), and Rijksmuseum van Natuurlijke Historie, Leyden (RMNH). The specimens collected by Nijssen were assembled during the Biological Brokopondo Research Project (1966/1967), an expedition sponsored by the Netherlands Foundation for the Advancement of Tropical Research (WOTRO) and the University of Amsterdam.

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Metaloricaria Isbrücker, 1975

Metaloricaria Isbrücker, 1975: 2 (original diagnosis; type-species, by original designation and monotypy, *Metaloricaria paucidens* Isbrücker, 1975).

This genus is the only representative of the subtribe Metaloricariina.

Compared to the genera of the subtribe Harttiina (cf. Introduction), *Metaloricaria* has much shorter and more solid teeth, whereas the teeth are less bent near the crown. Moreover, *Metaloricaria* has bilobate crowns with a small outer lobe and a large inner lobe, the outer lobe originating much lower along the tooth than in the Harttiina which possess a strongly bifurcate crown on each tooth, both crown lobes being about equally large (Isbrücker, 1975: 8, fig. 4).

Metaloricaria has a maximum of 26 teeth (Boeseman, 1976: 172, table 5, specimen no. 28, records 27 mandibular teeth in the holotype of *Harttia nijsseni*, which we re-examined); the number of teeth increases with size, from 4 (in specimens of about 57 mm in SL) to 26 (in specimens of about 270-295 mm in SL). The genera of the subtribe Harttiina have at least 40 teeth in each jaw.

Compared to the genera of the Harttiina, *Metaloricaria* is characterized by its premaxillae which do not meet at the symphysis, showing a large gap; furthermore it is distinct by its premaxilla and dentary, which are much shorter in transverse view.

In addition, *Metaloricaria* is distinct by its papillose anterior and lateroventral side of the upper lip (fig. 1), which is conspicuous and broad in comparison with the genera of the Harttiina; its lower lip is longer and broader, whereas the maxillary (= rictal) barbel is distinctly longer (2.0-4.0 in head length in *Metaloricaria* against

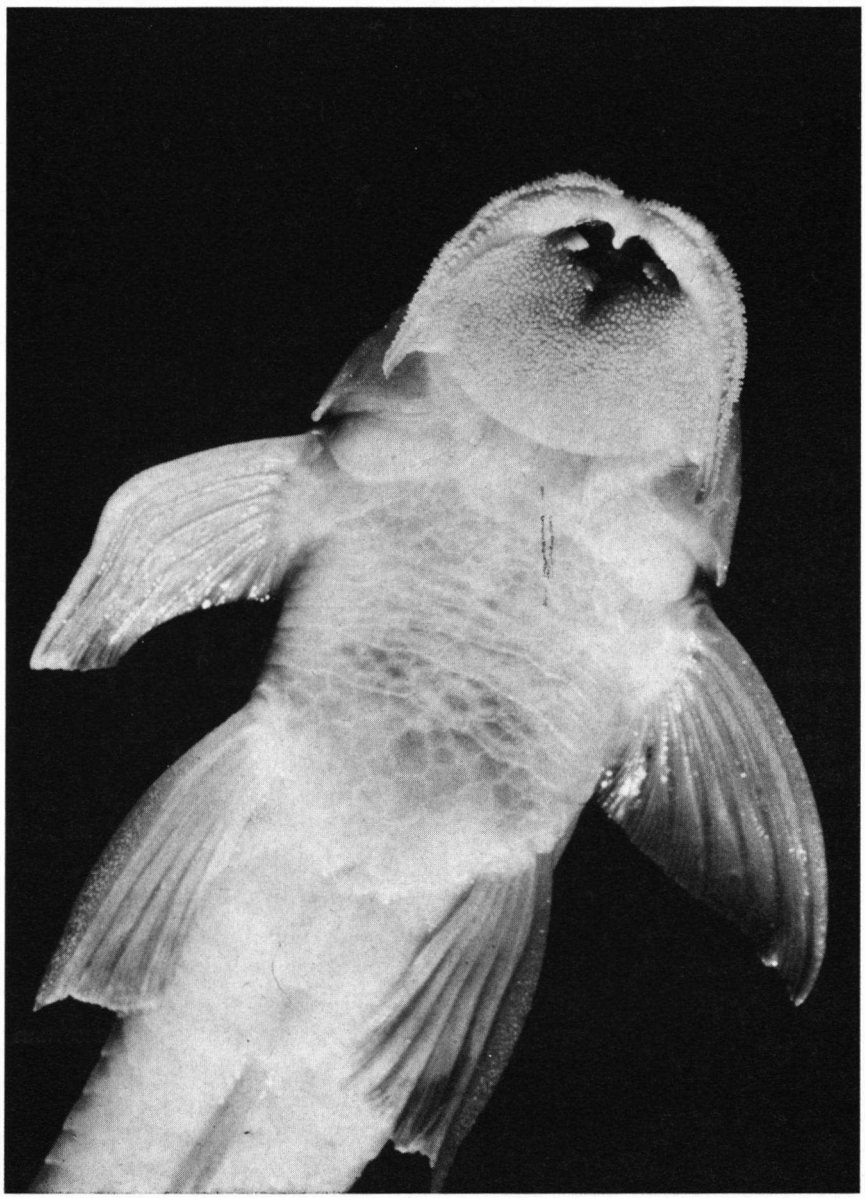

Fig. 1. *Metaloricaria paucidens nijsseni* (Boeseman, 1976), anteroventral view of a specimen in ZMA 106.334, SL 255 mm showing the mouth and lips which are characteristic of the genus (reproduced from Nijssen, 1970: 13).

5.0-10.7 in Harttiina). The posterior margin of the lower lip is convex medially, concave at either side towards the maxillary barbel. Upper and lower lips, together with the maxillary barbels, form a horseshoe-like outline (fig. 1), in contrast to the oval to roundish outline of the lips in the Harttiina; the lip shape of *Metaloricaria* is unique among the Loricariidae. On the surface of the lip inside the buccal cavity (between the outer sides of the premaxilla and dentary) a prominently fleshy, papillose flap is present. The upper oral valve membrane is provided medially with an elongate membranaceous extension, which is several times larger than that in genera of the Harttiina.

Apart from the differences mentioned above, neither morphometric characters, expressed as ratios, nor most of the counts distinguish *Meta-*

loricaria clearly from genera of the Harttiina. However, *Metaloricaria* comprises a larger species (up to 295 mm in SL) than found in any of the related genera. *Cteniloricaria*, with specimens up to 190 mm in SL contains the next to largest species of the tribe.

The morphometric and meristic variation is summarized:

SIZES:

standard length 57.4-295.0 mm;
axial length 63.7-322.2 mm;
total length 65.5-335.6 mm;
smallest mature male 224.0 mm.

RATIOS OF STANDARD LENGTH:

head length 4.2-5.1;
predorsal length 3.2-3.8;
postdorsal length 1.5-1.7;
postanal length 1.8-2.0;
dorsal spine length 4.0-5.8;
length first dorsal fin ray 4.2-5.9;
anal spine length 5.8-8.8;
pectoral fin spine length 4.6-6.4;
pelvic fin spine length 5.3-9.4;
length upper caudal "spine" 5.4-9.6;
length lower caudal "spine" 5.6-10.2.

RATIOS OF HEAD LENGTH:

snout length 1.6-2.0;
length lower lip 3.1-6.2;
thoracic length 1.5-1.8;
abdominal length 1.1-1.5;
maximum orbital diameter 3.7-5.8;
interorbital width 4.6-6.1;
cleithral width 1.0-1.2;
supracleithral width 1.4-1.7;
head width 1.1-1.3;
head depth 2.1-2.9;
body depth at dorsal fin origin 2.0-3.4;
body width at dorsal fin origin 1.3-1.8;
body width at anal fin origin 1.4-2.1;
depth caudal peduncle 9.0-18.7;
width caudal peduncle 6.1-17.7;
length maxillary barbel 2.0-4.0.

COUNTS:

lateral scutes 33-36;
coalescing lateral scutes 20-25;
thoracic scutes 4-8;
premaxillary teeth 4-26;
mandibular teeth 6-26;
dorsal fin rays I, 6, i;
anal fin rays I, 4, i;
pectoral fin rays I, 6;
pelvic fin rays I, 5;
caudal fin rays I, 12, I (of 82 specimens examined, 3 are aberrant, 1 in ZMA 106.335 having I, 9, I, and 2 in ZMA 106.335 & 106.338 having I, 11, I caudal fin rays).

The subsidiary branches of the fin rays all stem from one side of the main (anterior) branch, except for the posterior branch in the dorsal fin rays, which has a single dichotomous distal branching. Especially the third pectoral fin ray is broad (it has 9 subsidiary branches in the largest specimen).

The upper and next to upper branched caudal fin rays are gradually distinctly thicker in larger than in smaller specimens; to a lesser degree this happens with the lower and next to lower branched caudal fin rays as well.

In smaller specimens the caudal fin is forked, the lower lobe slightly or distinctly longer than the upper lobe. The caudal fin, especially the upper lobe, is in larger specimens frequently (more often than not) damaged during life, often either rounded, obliquely truncate, or in various degrees of regeneration. The distal half of the lower caudal fin lobe often has a prominent, dark brown blotch. Caudal triangular scutelets posteriorly with a brown margin in smaller specimens; caudal fin often heavily spotted or with a few ill-defined vertical bars in large specimens.

No pectoral pore could be found.

Eye covered with a narrow dorsal fleshy (erroneously indicated as "skinny" by Isbrücker, 1975: 6) flap of skin, provided with minute, scattered odontodes in some specimens.

Additional characters were described by Isbrücker (1975) and by Boeseman (1976).

Secondary sexual dimorphism (fig. 2). — The illustrated male shows more prominently developed odontodes along the side of the head and on the dorsum of the pectoral fin (spine and first 4 rays) than was known previously (Isbrücker, 1975: 7 and 9, pls. I and III; Boeseman, 1976: 173, pl. 8). The pectoral fin spines of males are thicker than those of females. The largest odontodes along the side of the head in the specimen, detail of which is illustrated in fig. 2 is about 2.8 mm; the specimen figured in fig. 4 has in the same region odontodes up to about 3.8 mm long; the odontodes arise from mucous skin and are difficult to measure accurately.

In males enlarged short odontodes occur on the ventral side of the pelvic fin spine, in an

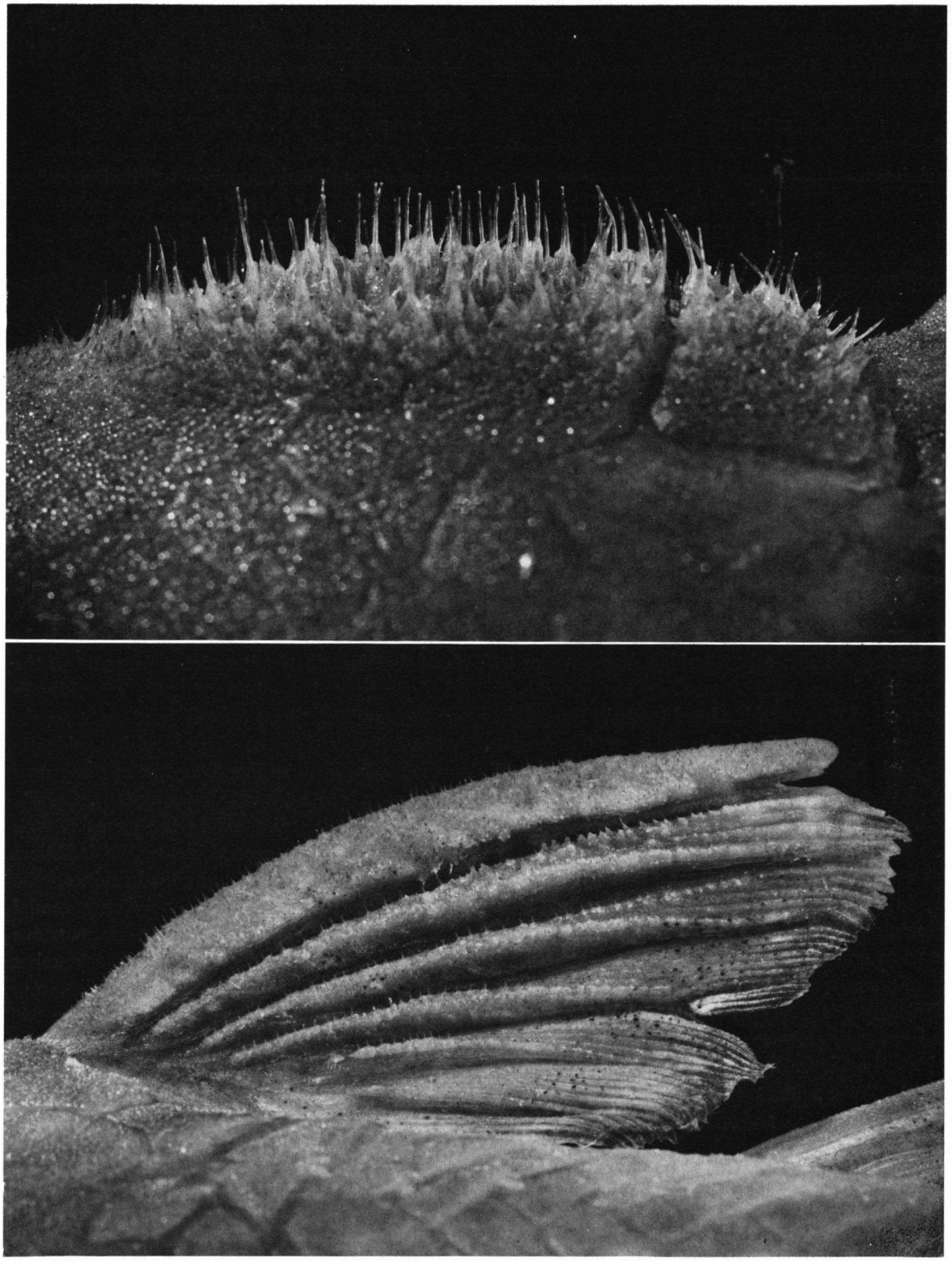

Fig. 2. *Metaloricaria paucidens nijsseni* (Boeseman, 1976), ♂ in ZMA 106.334, SL 256.1 mm, showing secondary sexual dimorphism, viz., enlarged odontodes along the side of the head and on the dorsum of the pectoral fin.

erect position; they are very slender except for the thick, round tip, thus reminiscent in shape of minute pins. The odontodes on the pelvic fin spine are blunter than those in females. In males the inner tooth lobe is somewhat shorter and its distal tip is slightly more rounded than in females and juveniles.

As already indicated above, the smallest recognizable nuptial male is 224 mm in SL. The paratype of *Harttia nijsseni* (ZMA 114.310, ex RMNH 27494, now: *M. p. paucidens*) was listed as specimen number 17 by Boeseman (1976: 172, table 5) and recorded with a SL of 223 mm. It is a mature male, which we measured with a SL of 226 mm. Other mature male paratypes in Boeseman's table 5 are the specimens number 22 (RMNH 27502), 25 (RMNH 27496), 26 (RMNH 27499), and 27 (RMNH 27495), with recorded standard lengths between 239 and 265 mm.

Juvenile. — In the juvenile topotype of *M. p. paucidens* in IRScNB 20029 (SL 57.4 mm), there is a median ridge from the tip of the snout to between the nostrils; a broad ridge runs anterior to the orbital rim, almost reaching the margin of the snout. Dorsum of the head to about the origin of the dorsal fin, and the sides of the caudal peduncle comparatively more coarse than in larger specimens. Abdomen naked except for a few widely scattered minute scutelets covered with odontodes. The thoracic scutes (5/7 in number) are very weakly developed. The tip of the snout in adults is naked, followed ventroposteriorly by a transverse series of well-developed scutelets. These scutelets are absent in this juvenile. Supraorbital margin conspicuously raised. The lips are as in adults except for the presence of relatively smaller and much less papillae. Papillae and fleshy protuberances in the buccal cavity are exactly as in adults. Teeth with a very long oblong, distally rounded inner tip and with a minute, triangular acute outer tip. The specimen is pale, with light brown pigment forming some indistinct spots on the anterior half of the body, and some faint transverse stripes on the dorsum to the sides of the caudal peduncle; there is a small dark spot on the caudal fin base.

Compared to other juveniles (see table II) this smallest specimen examined has the following morphometric ratios and meristic characters worth mentioning: anal fin spine 8.8; pelvic fin spine 9.4; length of lower lip 6.2; maximum orbital diameter 3.7; body depth at dorsal fin origin 3.4; body width at dorsal fin origin 1.8; body width at anal fin origin 2.1; length maxillary barbel 4.0; 4 teeth in each premaxilla; 6/7 mandibular teeth.

Remark. — The jaws and dentition of *Metaloricaria* are reminiscent of the structure usually present in some members of the tribe Loricariini, viz., in two genera of the subtribe Rineloricariina Isbrücker, 1979 (*Rineloricaria* Bleeker, 1862, and *Dasyloricaria* Isbrücker & Nijssen, in Isbrücker, 1979), and in the subtribe Pseudoloricariina Isbrücker, 1981.

Discussion. — *Metaloricaria* was synonymized with *Harttia* by Boeseman (1976: 168, 170). He stated: "In a previous paper (Boeseman, 1971), I omitted any record of several specimens, clearly of a *Harttia*-like aspect, feeling some doubt about their systematic allocation on account of the relatively limited numbers of teeth, especially in young examples. Since then, I have come to the conclusion that these specimens, which evidently represented a new species [*Harttia nijsseni*, now considered *Metaloricaria paucidens nijsseni*], should indeed be allocated to the genus *Harttia* on account of their general shape, the indistinct and rounded lateral longitudinal ridges, the missing orbital notch, the lack of any caudal filaments and, in adults, the still quite numerous teeth found on each half jaw. The smaller number of teeth in juveniles, not unexpected in this group, evidently is of little systematic or phylogenetic importance."

Boeseman (1976: 170) considered that the distinguishing characters of *Metaloricaria paucidens* (viz., the nature of the dentition and the shape and the structure of the lips) "...form a single functional unit with presumably a considerable adaptability and therefore probably without sufficient importance to warrant generic distinction from *Harttia* Steindachner. Especially as many other diagnostic characters also con-

vincingly show a close relationship of *M. paucidens* with my *Harttia surinamensis* (Boeseman, 1971)."

Even when we do not consider the dental and labial characters of *Metaloricaria*, unique among the Harttiini, we fail to understand Boeseman's solution to synonymize this genus with *Harttia*. Previously (1971) he omitted *"Harttia" nijsseni* even from his subfamily Harttiinae (or "comb-toothed" Loricariinae) whilst at that time many specimens were available to him. Boeseman (1971: 9, table 1) included in this subfamily *Harttiella, Harttia, Parasturisoma* "Ribeiro, 1911" = A. de Miranda Ribeiro, 1912 [a junior synonym of *Sturisoma*], and *Sturisoma*, as well as *Farlowella* Eigenmann & Eigenmann, 1889 (the latter is presently assigned to the tribe Farlowellini). Unlike the many species of these genera, *"Harttia" nijsseni* is not "comb-toothed".

Boeseman previously (1971) assigned two Surinam species with an evidently much closer relationship into different genera: *Harttia surinamensis* Boeseman, 1971, and *Parasturisoma maculata* Boeseman, 1971 (the latter was subsequently placed into *Cteniloricaria*). Both *H. surinamensis* and *C. maculata* are less distinct from each other (cf. Boeseman, 1971: 25, key to the Surinam species of Harttiinae) than both are from *Metaloricaria paucidens*. Boeseman's (1976: 173, table 6) comparison of *"Harttia" paucidens, "H." nijsseni,* and *H. surinamensis* is very difficult to read, although the characters "U" and "V" (number of scutes in longitudinal series, and teeth number on half upper/lower jaw, respectively; cf. his fig. 1 on page 154) facilitate a clear distinction. In a recent publication however, Boeseman (1982: 57) correctly listed *Metaloricaria paucidens* from a locality in French Guiana, without comments upon its generic assignment.

Superficially, *Metaloricaria* is reminiscent of some member of the tribe Loricariini rather than of a member of the Harttiini. Like all Harttiini, a few species of Loricariini lack a postorbital notch (e.g., *Loricaria piracicabae* Von Ihering, 1907, *L. prolixa* Isbrücker & Nijssen, 1978a, and *L. lentiginosa* Isbrücker, 1979; cf. also Isbrücker, 1981), although the majority of the members of the Loricariini possess a small to quite prominent postorbital notch. The number of branched caudal fin rays (12 or 11 in Harttiini, 10 in Loricariini) is among the most convincing characters to allocate *Metaloricaria.*

Since Boeseman's description of *H. nijsseni* in 1976, we agreed that *Metaloricaria* contained two distinct species. As a result of the present study, we conclude that only a single species with two subspecies can be recognized.

Metaloricaria paucidens Isbrücker, 1975

Discussion. — The earliest preserved specimen of *Metaloricaria paucidens* was collected by Boeseman on December 28th, 1963 (cf. Boeseman, 1976: 171, in list of material).

The first published record of *Metaloricaria paucidens* is an (at that time) unidentified photograph — after a colour slide made in the field from a freshly preserved specimen — in a popular account of some Surinam freshwater fishes (Nijssen, 1970: 13), with the caption in Dutch: "Zuigbek van harnasmeerval" meaning "Suckmouth of mailed catfish" (here reproduced in fig. 1).

For a review or for a more detailed examination, 112 specimens were at our disposal. On the basis of previously published data (Isbrücker, 1975; Boeseman, 1976), which have been incorporated in this paper, additional specimens from different localities were taken at random for a complete examination. In the course of this, many characters were not taken from all of the specimens, either because of a considerable overlap in ratios and counts or because of the great differences in size (SL) of the specimens in the various samples. A meaningful comparison between local populations of Loricariinae should be based upon specimens of about the same size. Most of our data are given in tables I-III. Several characters tend to differ locally, but we are unable to assess the value of these tendencies. For convenience of comparison, two size groups — one of specimens over 150 mm in SL, the other of specimens under 150 mm — are presented separately (in tables I and II, respectively), arranged according to the different river basins which they occupy. Additional material will be needed to fill the still existing gaps.

TABLE I

Summary of morphometric and of some meristic characters of the two subspecies of *Metaloricaria paucidens* Isbrücker, 1975, specimens over 150 mm in SL, arranged according to river system. Data of 7 specimens from the Oyapock, 7 from the Marowijne, 28 from the Suriname, 3 from the Saramacca, 5 from the Nickerie, 2 from the Sipaliwini, and 3 from the Corantijn river drainages are given, including data published previously. Of some of the specimens, selected characters are given only. Head length through length lower caudal "spine" are ratios of SL, snout length through length maxillary barbel are ratios of head length.

subspecies	*M. p. paucidens*		*M. paucidens nijsseni*				
drainage	Oyapock	Marowijne	Suriname	Saramacca	Nickerie	Sipaliwini	Corantijn
standard length (mm)	158.5-237.0	171.0-270.0	155.0-295.0	231.0-248.0	164.0-266.2	257.0-274.0	180.0-203.0
head length	4.7-5.1	4.6-5.1	4.2-4.7	4.5-4.6	4.7-4.9	4.4-4.6	4.7-4.8
predorsal length	3.4-3.7	3.3-3.8	3.2-3.5	3.3-3.4	3.4-3.7	3.2-3.3	3.4-3.6
postdorsal length	1.5-1.6	1.5-1.6	1.6-1.7	1.6	1.6	1.7	1.6
postanal length	1.8-1.9	1.8-2.0	1.9-2.0	2.0	1.9	2.0	1.9
dorsal spine length	4.0-4.7	4.1-5.0	4.3-5.8	4.2-4.9	<6.0	4.3-5.0	4.4-4.6
length first dorsal fin ray	4.3-4.7	4.2-4.9	4.7-5.7	4.6	5.9	5.3	—
anal spine length	6.9-7.8	6.4-7.2	6.1-7.5	5.9-6.7	7.7	5.8-6.9	6.2-6.4
pectoral fin spine length	4.9-5.2	4.7-6.4	4.6-5.9	5.0-5.1	5.9	4.8-5.6	4.9-5.1
pelvic fin spine length	6.0-6.3	5.8-6.8	5.3-6.2	5.4-5.6	6.2	5.4-5.8	5.6-5.8
length upper caudal "spine"	5.4-<8.1	7.4-7.6	7.4-<9.1	7.5	9.6	<10.1	—
length lower caudal "spine"	6.0-7.4	5.7-8.1	6.7-<8.4	5.6	10.2	6.6	—
snout length	1.6-1.7	1.6-1.8	1.6-1.9	1.6-1.7	1.6	1.7-1.8	1.8
length lower lip	3.1-3.7	3.4-3.8	3.5-4.0	3.8	3.9	3.9	—
thoracic length	1.6-1.8	1.5-1.8	1.7-1.8	1.8	1.6	1.5	—
abdominal length	1.2-1.3	1.1-1.2	1.3-1.4	1.2	1.2	1.4	—
maximum orbital diameter	4.5-5.5	4.4-5.6	4.3-5.8	5.2-5.7	5.4	5.2-5.4	4.9-5.0
interorbital width	5.0-5.3	4.6-5.5	4.7-6.1	5.2-5.4	5.3	5.1-5.4	5.2-5.6
cleithral width	1.0-1.1	1.0-1.1	1.1-1.2	1.1	1.0	1.1	—
supracleithral width	1.4-1.5	1.4-1.5	1.5	1.5	1.4	1.4	—
head width	1.1-1.2	1.1-1.2	1.2	1.1-1.3	1.1	1.1-1.2	1.2
head depth	2.3-2.6	2.3-2.5	2.4-2.6	2.4	2.5	2.1-2.3	2.4
body depth at dorsal fin	2.1-2.5	2.1-2.5	2.2-2.6	2.2-2.4	2.4	2.0-2.1	2.2-2.4
body width at dorsal fin	1.3-1.4	1.3-1.4	1.3-1.4	1.3-1.4	1.3	1.4	1.4
body width at anal fin	1.5-1.6	1.4-1.5	1.5-1.6	1.4-1.5	1.5	1.5	1.5
depth caudal peduncle	12.7-14.2	9.0-13.8	11.4-14.2	11.7-12.8	13.0	13.5-13.7	13.5-14.0
width caudal peduncle	6.6-7.8	6.1-6.6	6.1-7.2	6.1	7.1	7.6	—
length maxillary barbel	2.0-2.5	—	2.4-2.5	—	—	—	—
premaxillary teeth	10-20	11-19	14-26	18-22	21-22	20-26	17
mandibular teeth	11-21	14-19	16-26	13-21	21-23	21-26	19-21

Of the two forms described originally as two different species (*M. paucidens* and *H. nijsseni*), the colour pattern appears to be the easiest and perhaps most reliable character to distinguish them, provided that the specimens are not faded during preservation. The differences in colour pattern proved to be geographically correlated. Moreover, the variability in details of the colour pattern is quite great. Therefore, we assume it is more opportune and more realistic to consider *paucidens* and *nijsseni* distinct subspecies rather than different species.

In addition to certain morphometrical (tables I-II) and meristic (table III) geographical variation, the two subspecies of *Metaloricaria paucidens* are rather easily recognizable by the following differences in colour pattern:

— Dorsum and sides of body and head with many conspicuous dark brown spots; no broad transverse bars posterior to base of last dorsal fin ray (juveniles with about three narrow transverse stripes on dorsum and sides of caudal peduncle) . . . . . *Metaloricaria p. paucidens* Isbrücker, 1975

— Dorsum and sides of body and head with many vague brown spots or without spots; often there are up to five broad transverse brown or blackish bars present posterior to base of last dorsal fin ray (juveniles have a colour pattern which is reminiscent very much of that in juveniles of the nominate subspecies) . . . . . *Metaloricaria p. nijsseni* (Boeseman, 1976)

TABLE II

Summary of morphometric and of some meristic characters of the two subspecies of *Metaloricaria paucidens* Isbrücker, 1975, specimens under 150 mm in SL, arranged according to river system. Data of 4 specimens from the Oyapock, 3 from the Marowijne, 4 from the Suriname, 2 from the Saramacca, 2 from the Nickerie, and 2 from the Corantijn river drainages are given, including data published previously. Presentation of data is the same as in table I.

subspecies	*M. p. paucidens*		*M. paucidens nijsseni*			
drainage	Oyapock	Marowijne	Suriname	Saramacca	Nickerie	Corantijn
standard length (mm)	81.5-144.5	139.5-149.0	98.0-145.0	90.0-128.0	100.9-122.7	115.0-127.0
head length	4.5-5.1	5.0	4.7-4.9	4.7-4.8	4.7-4.8	4.9
predorsal length	3.5-3.7	3.7	3.5-3.6	3.4	3.6	3.6
postdorsal length	1.6	1.6	1.6	1.6	1.6	1.6
postanal length	1.8-1.9	1.8-1.9	1.9	1.9	1.9	1.9
dorsal spine length	4.7-4.9	4.7	4.2-4.7	4.5-4.6	4.6	4.1-4.4
length first dorsal fin ray	4.8-5.2	4.4-5.1	—	—	5.0	—
anal spine length	6.9-7.5	7.4-8.0	6.1-6.6	6.6-6.7	6.6	6.0-6.5
pectoral fin spine length	4.9-5.4	4.9-5.2	4.8-5.0	4.9	5.0	4.7-5.2
pelvic fin spine length	6.5-6.8	6.5-8.5	5.8-6.3	5.9-6.1	6.4	5.8-6.7
length upper caudal "spine"	6.9-8.7	7.5-7.7	—	—	—	—
length lower caudal "spine"	6.3-7.9	6.3-7.7	—	—	<7.6	—
snout length	1.7-1.9	1.8	2.0	2.0	1.9	2.0
length lower lip	3.1-3.5	3.5-5.2	—	—	3.9	—
thoracic length	1.7	1.5-1.6	—	—	1.7	—
abdominal length	1.3-1.5	1.2-1.3	—	—	1.3	—
maximum orbital diameter	4.0-4.4	4.3-4.5	3.9-4.6	3.8-4.4	3.9	4.0-4.2
interorbital width	4.8-5.7	5.0-5.7	5.5-5.9	5.6-5.7	5.7	5.3
cleithral width	1.1-1.2	1.1	—	—	1.1	—
supracleithral width	1.5-1.7	1.5	—	—	1.5	—
head width	1.1-1.2	1.1	1.1-1.2	1.2	1.2	1.2
head depth	2.5-2.9	2.3-2.4	2.5-2.7	2.4-2.5	2.7	2.3-2.4
body depth at dorsal fin	2.5-2.8	2.2-2.4	2.4-2.8	2.6-2.8	2.9	2.5
body width at dorsal fin	1.5-1.6	1.3-1.4	1.3-1.5	1.4	1.4	1.4
body width at anal fin	1.6-1.9	1.5-1.6	1.5-1.7	1.5-1.6	1.6	1.5-1.6
depth caudal peduncle	14.3-18.7	11.5-13.5	13.9-16.9	16.1-17.5	15.4	15.7-17.0
width caudal peduncle	7.5-17.7	7.3-7.7	—	—	7.5	—
length maxillary barbel	2.2-2.9	2.4-3.2	—	—	2.4	—
premaxillary teeth	5-12	9-13	9-12	8-10	8-9	9-12
mandibular teeth	8-15	11-13	11-17	12-13	11	11-14

As noted below (under *Metaloricaria p. nijsseni*), specimens without broad transverse bars and even without prominent colour pattern were encountered in Surinam. In the samples from the rivers Suriname, Saramacca, and Corantijn some of the specimens (RMNH 27495, part of RMNH 27500, and part of RMNH 27494, respectively) differ from other *M. p. nijsseni* (and are therefore only tentatively identified as this subspecies) by the lack of broad bands on the caudal peduncle, and by the possession of a narrow, faint but well-defined transverse line near the posterior margin of each middorsal body scute; these lines are gradually more conspicuous posteriorly.

Metaloricaria paucidens paucidens Isbrücker, 1975

(Figs. 3, 5; tables I-III)

Metaloricaria paucidens Isbrücker, 1975: 2-9, figs. 4a-f, pls. I-III, table 1 (original description; holotype, 13 paratypes; type-locality: "French Guiana, creek at right bank of Ouaqui River, upstream of Saut Bali, Maroni (= Marowijne, Surinam) river system"; paratypes from the type-locality and from French Guiana, Marouini River and Oyapock River: Saut Alicoto and Sikini Creek; comparison with *Harttia surinamensis* Boeseman, 1971 and *Harttia maculata* (Boeseman, 1971)); — Isbrücker & Nijssen, 1978a: 178 (discussion); — Isbrücker, 1979: 88 (listed); — Isbrücker, 1980: 96 (listed); — Nijssen, Van Tuijl & Isbrücker, 1982: 59 (paratype in ZMA 112.741 listed); — Boeseman, 1982: 57 (listed; French Guyana, Saut Gostou).

TABLE III

Frequency of the number of lateral and coalescing scutes of the two subspecies of *Metaloricaria paucidens* Isbrücker, 1975, arranged according to river system. The specimens (number in parentheses) were counted on both sides. Data published previously are included; to the number of lateral scutes given by Boeseman (1976), one is added, because the count given here includes the small triangular scutelet on the caudal fin base.

drainage	lateral scutes				coalescing scutes					
	33	34	35	36	20	21	22	23	24	25
M. p. paucidens										
Oyapock (11)	1	11	7	3	0	0	10	8	3	1
Marowijne (10)	1	18	1	0	1	7	10	2	0	0
M. p. nijsseni										
Suriname (32)	12	47	5	0	25	36	3	0	0	0
Saramacca (5)	1	8	1	0	0	8	2	0	0	0
Nickerie (2)	1	3	0	0	0	2	2	0	0	0
Sipaliwini (2)	0	4	0	0	0	2	2	0	0	0
Corantijn (5)	0	6	4	0	2	2	6	0	0	0

Harttia paucidens; Boeseman, 1976: 170-171, 173-174, table 6 (discussion; comparison with *Harttia nijsseni* Boeseman, 1976 and *Harttia surinamensis* Boeseman, 1971; data after Isbrücker, 1975).

Harttia nijsseni; Boeseman, 1976: 170-174, tables 5-6 (in part; 4 paratypes from Surinam, Tapanahoni River, RMNH 27494); — Nijssen, Van Tuijl & Isbrücker, 1982: 52 (paratype in ZMA 114.310 [ex RMNH 27494] listed).

Material examined. — In addition to the holotype (IRScNB 549), the 13 paratypes (IRScNB 550 through 553, ZMA 112.741), and the 4 paratypes of *Harttia nijsseni* from Tapanahoni River, about 2 km below Paloemeu airstrip (RMNH 27494, three; ZMA 114.310, one, ex RMNH 27494), we have examined the following specimens:

FRENCH GUIANA:

IRScNB 20029 (topotype), SL 57.4 mm, Ouaqui River, right bank tributary of the Tampok, Saut Bali, Maroni basin, coll. J. P. Gosse, 18-XI-1969; — RMNH 28950, two, SL 125-206 mm, Gostou Falls, Maroni basin, coll. P. Planquette, 29-XI-1979 (recorded by Boeseman, 1982: 57).

MNHN 1982-733, SL 222 mm, upper course of Oyapock River, Malipa itu, Yapakani, small creeks near Trois Sauts (02°15'N, 52°53'W), coll. F. d'Aubenton, 28-IX-1976; — ZMA 107.635, SL 223 mm, Saut Panacoupélou (02°43'N, 52°30'W), fall in upper Oyapock River, coll. F. d'Aubenton, 13-X-1976; — MNHN 1982-734, SL 237 mm, Baton Pilon Creek, near its confluence (03°25'N, 52°08'W) with Oyapock River, coll. F. d'Aubenton, 19-X-1976.

SURINAM:

ZMA 106.341, SL 224 mm, district Marowijne, Maka Creek at left bank of Lawa River, 10 km S. of centre of Stoelmans Island, depth 30-120 cm, width 4 m, running water, bottom sand, coll. H. Nijssen, 21-IV-1967.

Remarks. — This subspecies notably differs from *Metaloricaria p. nijsseni* by the presence of profuse dark brown spots scattered on dorsum and sides of body and head (fig. 3); juveniles often have up to three dark brown transverse stripes on the caudal peduncle (cf. Isbrücker, 1975, pl. II).

Most of the morphometric and meristic data are given in tables I-III.

The number of thoracic scutes in 11 specimens from the Oyapock River basin is 6/4 in one specimen, 6 on both sides in four, 6/7 or 7/6 in four, and 7 on both sides in two specimens. In 8 specimens from the Marowijne River basin, there are 6/7 or 7/6 thoracic scutes in four, 7 on both sides in one, 7/8 or 8/7 in two, and 8 on both sides in one specimen.

Metaloricaria paucidens nijsseni (Boeseman, 1976)

(Figs. 1, 2, 4, 5; tables I-III)

Harttia nijsseni Boeseman, 1976: 170-174, pl. 8, tables 5-6 (original description [in part]; holotype, 29 paratypes; type-locality: "Sipaliwini River, south-eastern Surinam"; 1 paratype from the type-locality, paratypes from Surinam: Awaradam (rapids), Gran Rio, upper Suriname River; Zandvallen, ca. 10 km above Avanavero Falls, Kabalebo River, Corantijn River basin; Suriname River near Brokopondo, pools in dry (and in partly or mostly dry) river

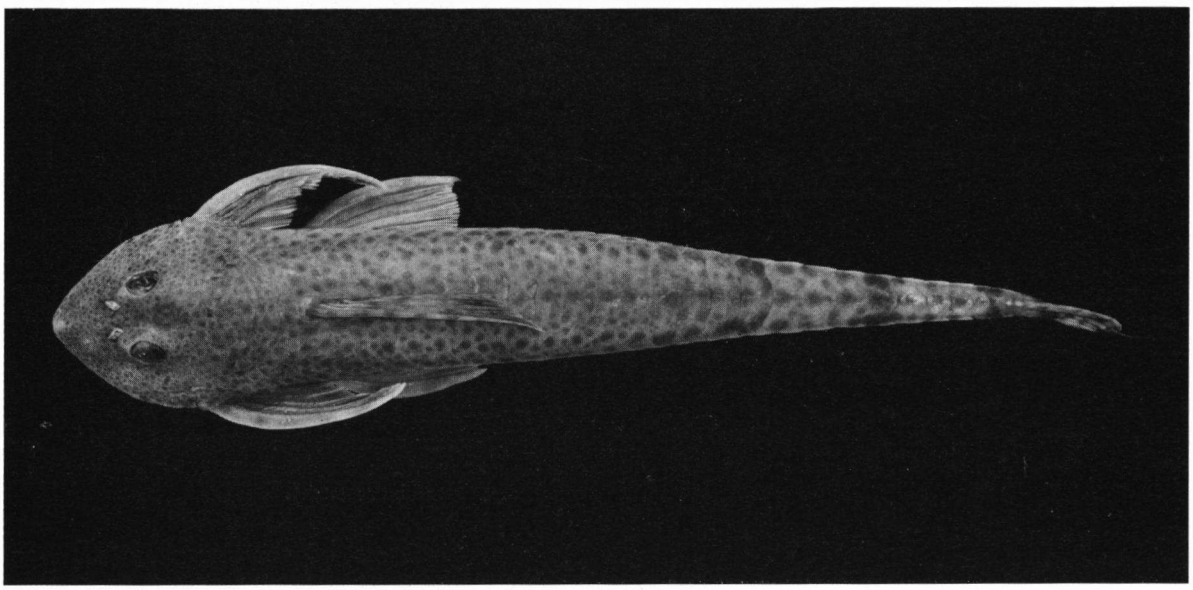

Fig. 3. *Metaloricaria paucidens paucidens* Isbrücker, 1975, paratype in ZMA 112.741, SL 234.5 mm (♂ from Saut Alicoto, upstream of Camopi, Oyapock River basin), showing the colour pattern on the dorsum of the body and head, characteristic of the subspecies.

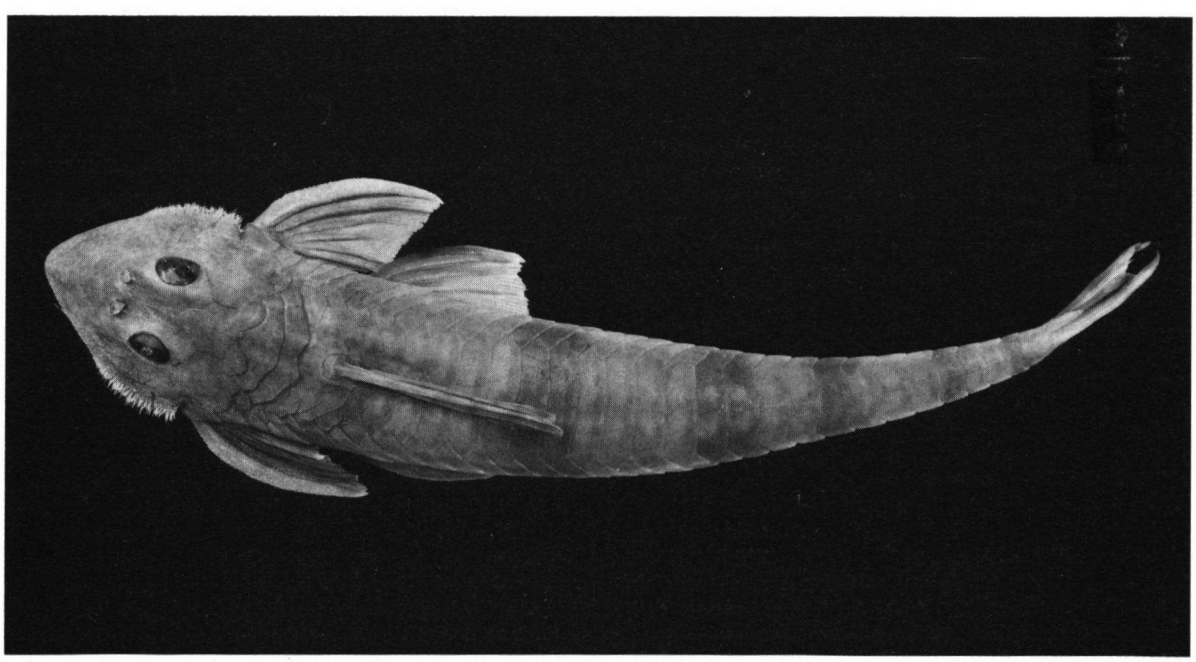

Fig. 4. *Metaloricaria paucidens nijsseni* (Boeseman, 1976), ♂ in ZMA 106.343, SL 245 mm, showing the colour pattern on the dorsum of the body and head, characteristic of the subspecies.

bed (and in shallow parts, subsiding water); pool below Feddiprati rapids, Saramacca River; Kwambaolo Creek, right tributary of Sara Creek above Dam, Suriname River basin; [the paratypes from Tapanahoni River, ca. 2 km downstream Paloemeu airstrip, are *Metaloricaria p. paucidens* Isbrücker, 1975]; comparison with *Harttia paucidens* and *Harttia surinamensis*).

Metaloricaria nijsseni; Isbrücker & Nijssen, 1978a: 178 (discussion); — Isbrücker, 1979: 88 (listed); — Isbrücker, 1980: 96 (listed).

Material examined. — In addition to the holotype (RMNH 27498) and 25 of the 29 paratypes (RMNH 27495 through 27497 and 27499 through 27504), we have examined the following specimens:

SURINAM:

ZMA 106.338, twenty, SL 75.3-169.5 mm, district Brokopondo, Marowijne (= Gran) Creek, 63 km S. of dam at Afobaka, depth 150 cm, running water, bottom sand and leaves, coll. H. Nijssen, 20-X-1966; — ZMA 106.344, two, SL 242-295 mm, largest a ♂, district Brokopondo, Gran Mau Creek at right bank of Gran Rio, 13 km S.W. of Djoemoe Village, depth 50-100 cm, width 5 m, bottom sand and mud, coll. H. Nijssen, 30-I-1967; — ZMA 106.334, seven, 3 ♂♂, SL 237.2-272.5 mm (one deposited in BMNH 1982.4.7:7), 4 of undetermined sex, SL 206-265.3 mm, district Brokopondo, creek at right bank of Gran Rio, 4 km N.E. of N.E. part of Awadam (= Awaradam) Fall, depth 30-150 cm, width 6 m, running water, bottom sand, coll. H. Nijssen, 31-I-1967; — ZMA 106.339, four, SL 112.7-227.9 mm, district Brokopondo, Awara Creek at right bank of Suriname River, 1.5 km S. of Botopasi Village, depth 80-150 cm, width 8 m, running water, bottom sand, coll. H. Nijssen, 18-III-1967; — ZMA 106.336, five, 4 ♂♂, SL 243.8-263.7 mm, 1 of undetermined sex, SL 243.8 mm, district Brokopondo, Parwapa (= Paba) Creek at left bank of Suriname River, 2.5 km N. of Botopasi Village at Foetoenakaba (= Voetoekaba) Village, depth 50-200 cm, width 8 m, running water, bottom sand, coll. H. Nijssen, 20-III-1967; — ZMA 106.343, ♂, SL 245 mm, district Brokopondo, Suriname River, rapid 7.5 km N. of Botopasi Village, coll. H. Nijssen, 27-III-1967; — ZMA 106.346, three, SL 76.2-139.9 mm, district Brokopondo, creek at right bank of Kleine Saramacca River, 11 km E.S.E. of confluence with Saramacca River, depth 30-100 cm, width 4 m, running water, bottom sand and stones, coll. H. Nijssen, 27-II-1967; — ZMA 106.342, SL 236.5 mm, district Brokopondo, Kleine Saramacca River, rapids 14 km E.S.E. of confluence with Saramacca River, depth 100-200 cm, width 80 m, bottom sand, coll. H. Nijssen, 28-II-1967.

ZMA 106.335, four, SL 117.2-162.5 mm, district Nickerie, Stondansie Fall in Nickerie River, width 80 m, bottom sand and rocks, coll. H. Nijssen, 5-IV-1967; — ZMA 106.340, seven, SL 99.1-160 mm, district Nickerie, creek at right bank of Nickerie River, 12 km W.S.W. of Stondansie Fall, depth 50-100 cm, width 7 m, running water, bottom sand, coll. H. Nijssen, 5-IV-1967; — ZMA 106.337, seven, 2 ♂♂, SL 256-266.2 mm, 5 of undetermined sex, SL 100.9-201.5 mm, district Nickerie, rapid in Fallawatra River, 5 km S.W. of Stondansie Fall, width 60 m, bottom sand and rocks, coll. H. Nijssen, 6-IV-1967.

Data of the holotype. — Measurements in mm (followed between parentheses by the usual ratio): ♂, SL 274; axial length 301; total length 315.4; head length 62.8 (4.4); predorsal length 84.4 (3.2); postdorsal length 160.9 (1.7); postanal length 135.5 (2.0); dorsal fin spine length 54.4 (5.0); length first dorsal fin ray 51.9 (5.3); anal fin spine length 39.8 (6.9); pectoral fin spine length 48.9 (5.6); pelvic fin spine length 47.5 (5.8); upper caudal fin "spine" length >27.1 (<10.1); lower caudal fin "spine" length 41.4 (6.6); snout length 37.6 (1.7); length lower lip 16.3 (3.9); thoracic length 41.3 (1.5); abdominal length 46.3 (1.4); maximum orbital diameter 12.1 (5.2); interorbital width 12.2 (5.1); cleithral width 57.3 (1.1); supracleithral width 43.7 (1.4); head width 55.0 (1.1); head depth 30.5 (2.1); body depth at origin of dorsal fin 31.4 (2.0); body width at origin of dorsal fin 46.1 (1.4); body width at origin of anal fin 40.8 (1.5); depth caudal peduncle 4.6 (13.7); width caudal peduncle 8.3 (7.6); lateral scutes 34/34; coalescing scutes 22/22; thoracic scutes 6/6; premaxillary teeth 26/26; mandibular teeth 26/25 (Boeseman recorded 27 mandibular teeth).

Notes. — Most of the morphometric and meristic data are listed in tables I-III.

The number of thoracic scutes in 5 specimens from the Suriname River basin is 6 on both sides in one, 7 on both sides in two, and 8/7 in two specimens. One specimen from the Saramacca River basin has 8/7 thoracic scutes. Two specimens from the Nickerie River basin have 6 thoracic scutes on both sides, like the holotype from the Sipaliwini River (Corantijn River basin).

Specimens with about five broad transverse bands posterior to the last dorsal fin ray occur in the rivers Suriname (fig. 4), Saramacca, Nickerie, and Corantijn. These bands are not always prominent, usually darkest at the sides and in many specimens the bands are very faint on the middorsum of the caudal peduncle. Variation in colour pattern is noted below, according to the different river basins.

Suriname River basin. — In ZMA 106.338, thirteen specimens (121.5-169.5 mm in SL) have usually vague, broad transverse bands; nine of these specimens have numerous small, indistinct brownish dots on the dorsum of the head and snout. Two specimens (102.5-119 mm) are quite pale. Four specimens (75.3-86 mm) have a well-developed colour pattern, with variable brown spots on the dorsum of the body, head and snout; prominent spots behind the base of the last dorsal fin ray at the intervals where in larger specimens the bands are situated. One specimen with imperfect pigmentation.

In ZMA 106.344 broad transverse bands are present; the smaller specimen has indistinct brown spots on the dorsum of the snout.

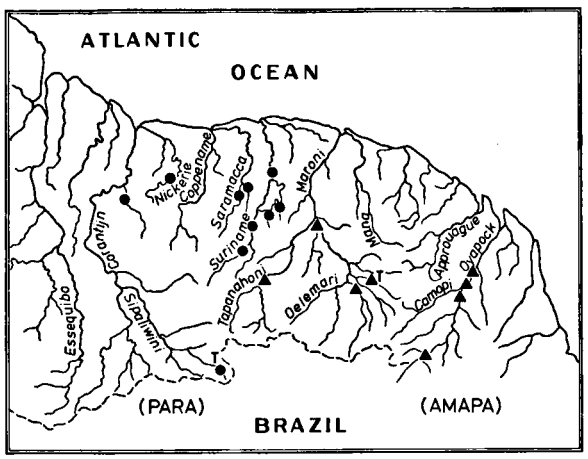

Fig. 5. Map of the Guianas, showing the occurrence of two subspecies of *Metaloricaria paucidens* Isbrücker, 1975: *M. p. paucidens* in the rivers Oyapock and Marowijne (= Maroni) (black triangles), and *M. p. nijsseni* (Boeseman, 1976) in the rivers Suriname, Saramacca, Nickerie, and Corantijn (black spots). T indicates the type-locality.

In ZMA 106.339 the largest specimen has posteriorly broad bands and it has distinct brown spots on the dorsum of the body anterior to the base of the last dorsal fin ray, extending on the dorsum of the head and snout. One specimen (277.7 mm) has the broad bands, no spots. One specimen (129.2 mm) is almost without pigment, except for brown pigment on the caudal fin. One specimen (112.7 mm) has distinct brown spots and rather narrow transverse bands.

All specimens in ZMA 106.336 have broad transverse bands. The male, 243.8 mm, with minute faint brown spots anterior to the base of the last dorsal fin ray, extending on the dorsum of the head and snout; a specimen with the same length has considerably less numerous spots between the base of the last dorsal fin ray, extending anteriorly to the scutes posterior to the supraoccipital process.

The specimens in ZMA 106.334 all have broad transverse bands.

The specimens in RMNH 27501 are pale, the smaller one (223 mm) with spots on the head.

In RMNH 27502 the largest specimen (239 mm) is a male, well-pigmented, with about five broad, transverse bands, spots on the dorsum of the body surrounding and anterior to the dorsal fin base, and on the dorsum of the head. Fins with spots forming lines.

The specimens in RMNH 27503 and 27504 are pale.

The specimen in RMNH 27495 is pale, except for a narrow transverse faint line near the margin of each median dorsal body scute; on about the 10 posterior dorsal scutes (on the caudal peduncle) these lines are gradually darker. A similar colour pattern is present in the two larger specimens in RMNH 27500 (231-248 mm; Saramacca River basin) and in the larger specimens in RMNH 27497 (180-203 mm; Corantijn River basin).

The specimens in RMNH 27499 all have vague transverse broad bands on the caudal peduncle and spots on the head.

Saramacca River basin. — In ZMA 106.346 the specimens are rather pale; transverse bands are present, as well as indistinct brownish spots; the colour pattern of the smallest specimen is reminiscent of the juveniles of *Metaloricaria p. paucidens* and of the four juveniles in ZMA 106.338 (Suriname River basin).

The specimen in ZMA 106.342 has broad transverse bands; faint brown spots on the dorsum of the head and snout.

Nickerie River basin. — In ZMA 106.337 the specimens are well-pigmented, all with more or less broad transverse bands and with dark brown spots from the dorsum of the tip of the snout, in some specimens extending posteriorly to near the caudal fin base. The largest specimen is very dark, obscuring the visibility of spots, although dark transverse bands are well visible. Six specimens with a minute dark brown spot just beyond the supraoccipital process.

ZMA 106.335: bands and spots present; a minute dark brown spot just posterior to the supraoccipital process.

In ZMA 106.340 all except for the largest specimens have a dark brown spot just beyond the supraoccipital process; all have broad transverse bands; spots are present in some specimens, although all but one of the specimens are poorly pigmented.

Sipaliwini River. — The holotype and the topotypical paratype (RMNH 27496) have five vague broad bands on the caudal peduncle and vague spots on the head.

Corantijn River basin. — The five specimens in RMNH 27497 are rather pale (the larger specimens are recorded above, in comparison with specimens from the Suriname River basin). The smaller ones (115 and 127 mm) have five vague broad transverse bands.

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