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The identity of the South American catfish *Loricaria cataphracta* Linnaeus, 1758, with redescriptions of the original type specimens of four other nominal *Loricaria* species (Pisces, Siluriformes, Loricariidae)

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ABSTRACT

This article contains figures and descriptions of *Loricaria cataphracta* Linnaeus, 1758, *sensu stricto* (neotype), *Loricaria cirrhosa* Bloch & Schneider, 1801 [identical with *L. cataphracta*] (lectotype and paralectotype), *Loricaria flagellaris* (Gronovius, 1854) (holotype), *Loricaria carinata* de Castelnau, 1855 (holotype), and *Loricaria lata* Eigenmann & Eigenmann, 1889, *sensu stricto* (lectotype and paralectotypes, in part). Another part of the paralectotype series of *Loricaria lata* represents another species, described but not named below, which eventually may prove not to belong to the genus *Loricaria*. The ultimate status of *L. flagellaris* and of *L. carinata* remains uncertain, there being too few additional data. In addition to *L. cirrhosa*, *L. setifera* Lacépède, 1803, *L. setigera* Valenciennes, 1836, and *L. dura* Bleeker, 1862 [ex-Linnaeus, 1754], are accepted as synonyms of *L. cataphracta*.

INTRODUCTION

The genus *Loricaria* is in need of a critical revision and the same statement can be made for its type species, *L. cataphracta*. The original diagnosis of *Loricaria cataphracta* by Linnaeus in 1758 consisted of three elements, viz., of "*Loricaria dura*" Linnaeus, 1754, "*Plecostomus* no. 68" Gronovius, 1754, and as a variety—separated from the first two parts of the original diagnosis by a β —"*Plecostomus* no. 69" Gronovius, 1754. The first "revisor" of Linnaeus' 1758 diagnosis of *Loricaria cataphracta* was Bloch, who in 1794 described the species *sensu stricto* from specimens. He listed "*Loricaria dura*" and "*Plecostomus* no. 69" in the synonymy of *Loricaria cataphracta*. "*Plecostomus* no. 68" was listed in the synonymy of Bloch's new species *Loricaria maculata*.

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The first account of *Loricaria cataphracta*, *sensu stricto* was given by Linnaeus in 1754 under the name "*Loricaria dura*". The first part of Linnaeus' 1758 diagnosis contained a reference to his 1754 description, and some meristic data (a fin formula). In fact, these data are the original description of *Loricaria cataphracta*, *sensu stricto*. This is not much information by which to recognize a species. It has been the description and figure of "*Loricaria dura*" Linnaeus, 1754, that has led all subsequent authors except Gronovius (ed. Gray), 1854, to the identification of the fish they called *Loricaria cataphracta*. It is of interest to note that Gronovius died August 8th, 1777 (cf. Wheeler, 1958: 190), leaving the manuscript that was published and edited by Gray in 1854. Gronovius correctly revised the composition of Linnaeus' *Loricaria cataphracta*. Gronovius' concept of *L. cataphracta*, *sensu stricto*, however, contradicts that of Bloch, 1794, who correctly selected the name *cataphracta* for one of the biological species involved with Linnaeus' composite species. In practice, we must follow Bloch's decision in this complicated case, as I have recently demonstrated (Isbrücker, 1971b). There are no difficulties in the determination of *Loricaria cataphracta*, *sensu stricto* (= "*Loricaria dura*" Linnaeus, 1754 = *Loricaria cataphracta*; Bloch, 1794) if the sole 'original' (1758) diagnosis in the form of a fin formula is accepted as representing the original description of that species in its restricted sense. The fact that Gronovius' "*Plecostomus* no. 68" [= *Loricaria maculata* since 1794, and *Loricariichthys maculatus* since 1862] was included as a syntypical part of the Linnaean diagnosis, whereas "*Plecostomus* no. 69" [considered to be identical to *Loricaria cataphracta*, *sensu* Bloch, 1794, by almost all authors] was expressly not, might confuse modern readers.

Information additional to Linnaeus' 1758 fin formula is found in Linnaeus' 1754 description and figure (fig. 1 of the present paper) of "*Loricaria dura*". The specimen on which Linnaeus based his description was later lost (Günther, 1864; Lönnberg, 1896; Holm, 1957), which is confirmed by Dr. A. Holm (April 29, 1970, *in litt.*: "... the type material of *Loricaria cataphracta* L. is obviously lost. It is present in the catalogue of 1828 ("finns i kat." [Holm, 1957: 45]) written by Thunberg [reference not seen by me], but already Lönnberg 1897 (Bih. K. Vet. Akad. Handl. 22(IV), p. 44) mentions it as lost ("Saknas" = be lacking [Holm, 1957: 45])." In view of the nomenclatural difficulty in this group and of the fact that the type material is lost I propose to designate a neotype under Article 75 of the International Code of Zoological Nomenclature (1964: 81). The specific name *Loricaria cataphracta* has been used for one or maybe more species occurring in various river systems in South America. I have chosen as the neotype a recently preserved specimen from Surinam and not one of the still extant type specimens of *Loricaria cirrhosa* Bloch & Schneider, 1801, for the exact local origin of these specimens is unknown. Part of Valenciennes's (in Cuvier & Valenciennes, 1840: 459—466) material came from Surinam; he was the second author, after Linnaeus (1758), to describe the species from actual material and the first who recorded localities.

In 1858, Bleeker listed the name *Loricaria cataphracta*, but in later works

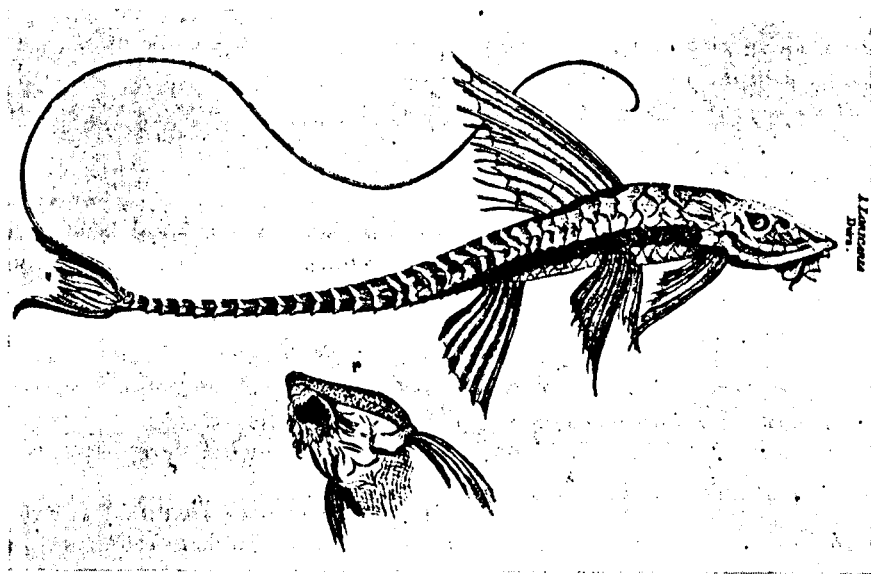


FIG. 1. *Loricaria cataphracta*. Reproduction of Linnaeus' (1754) figure of "*Loricaria dura*".

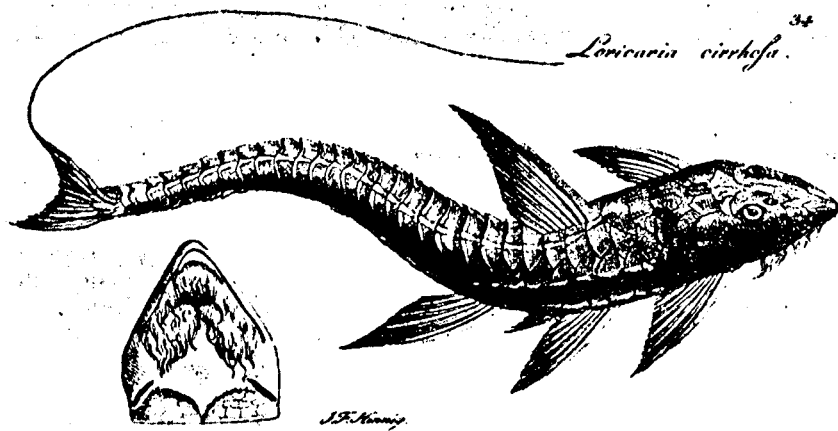


FIG. 2. *Loricaria cataphracta*. Reproduction of Bloch & Schneider's (1801) figure of "*Loricaria cirrhosa*".

he recorded the same species as *Loricaria dura*. This action is, according to the *Code of Nomenclature*, to be regarded as if it was the proposal of a new name, with the Linnaean specimen as the holotype, but with Bleeker as the 'original' (post-1758) author. Bleeker's extensive 1864 description of *Loricaria dura* was also partly based on Surinam specimens although without detailed locality (his other material was said to come from "Mejico" (= Mexico) but the genus *Loricaria* has not subsequently been reported in Mexico). There seems to be good reason for choosing a neotype from Surinam, and there is every likelihood that Linnaeus' specimen came from coastal Surinam.

Boeseman (1968: 10) also explains his reasons for believing *Hypostomus plecostomus* (Linnaeus, 1758), to originate from Surinam; the same reasons can apply to *Loricaria cataphracta*. Cf. also Boeseman, 1968: 32, footnote.

In Surinam *Loricaria cataphracta* is known only from the Marowijne and the Suriname river systems. A specimen from the Marowijne River population has been designated the neotype.

Gronovius' "*Plecostomus* no. 69" has invariably been identified as *Loricaria cataphracta* Linnaeus, 1758, as *Loricaria dura* Bleeker, 1862 [ex Linnaeus, 1754], or as *Plecostomus flagellaris* Gronovius, 1854. This latter name was employed by Gronovius (ed. Gray), 1854, only, so as to provide a binominal for "*Plecostomus* no. 69" of 1754. Gronovius (1854: 158) also used the specific name *cataphracta* combined with *Plecostomus*, to name the "*Plecostomus* no. 68" of 1754; this species has, however, not much in common with *Loricaria cataphracta*, *sensu stricto*.

The specimen on which Gronovius based his extensive 1754 description of "*Plecostomus* no. 69" is still extant (in British Museum (Natural History), London; BMNH 1853.11.12.195—196, dorsal and ventral part of one specimen). Recently, Wheeler (1958: 214), while redescribing this specimen under the caption *Loricaria ? cataphracta*, remarked: "The measurements given in 1754 agree perfectly with those made on the specimen, except that part of the caudal filament is missing. The description in this work [Gronovius'], was referred to by Linnaeus under *Loricaria cataphracta* and is the sole reference under his variety B; it must be regarded as the type of this variety. Neither Regan (1904) nor Günther (1864) apparently recognized that this was one of the types of the species. I am doubtful if the specimen does belong to this species (of authors), but it is to be hoped that any future revision of these fishes will take this specimen and its resulting problem, into consideration."

More recently, Boeseman (1968: 5) stated: "I re-examined the still extant type specimen of Gronovius' no. 69 (BM 1853.11.12.195—6), and found that Valenciennes was evidently correct when identifying it with *Loricaria cataphracta* Linnaeus, in spite of different suggestions expressed by Wheeler (1958: 214)." In fact, Valenciennes (in Cuvier & Valenciennes, 1840: 446) wrote: "C'est le véritable *loricaria cataphracta* de Linné [i.e., agreeing with Valenciennes' specimens], comme il est aisé de s'en convaincre par la figure qu'il en donne dans le *Musée d'Adolphe-Frédéric*, pl. XXIX, figure

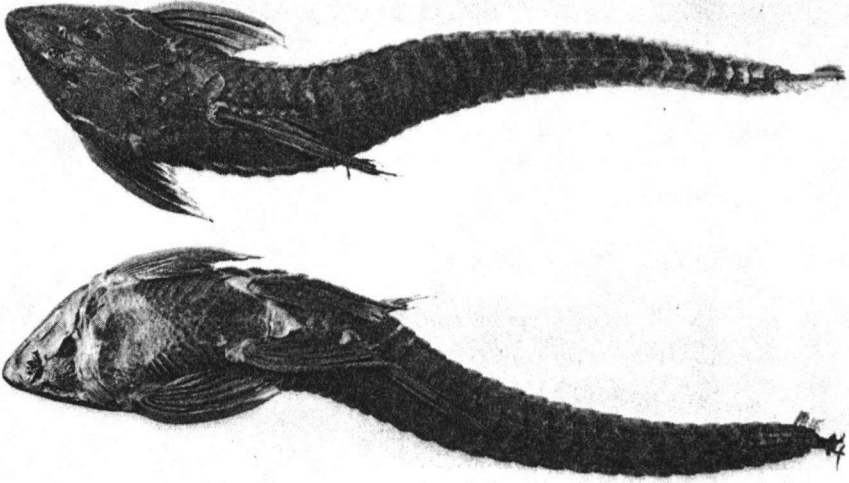


FIG. 3. *Loricaria cataphracta*. Lectotype (ZMB 3160) of "*Loricaria cirrhosa*" in dorsal (above) and ventral (below) view.

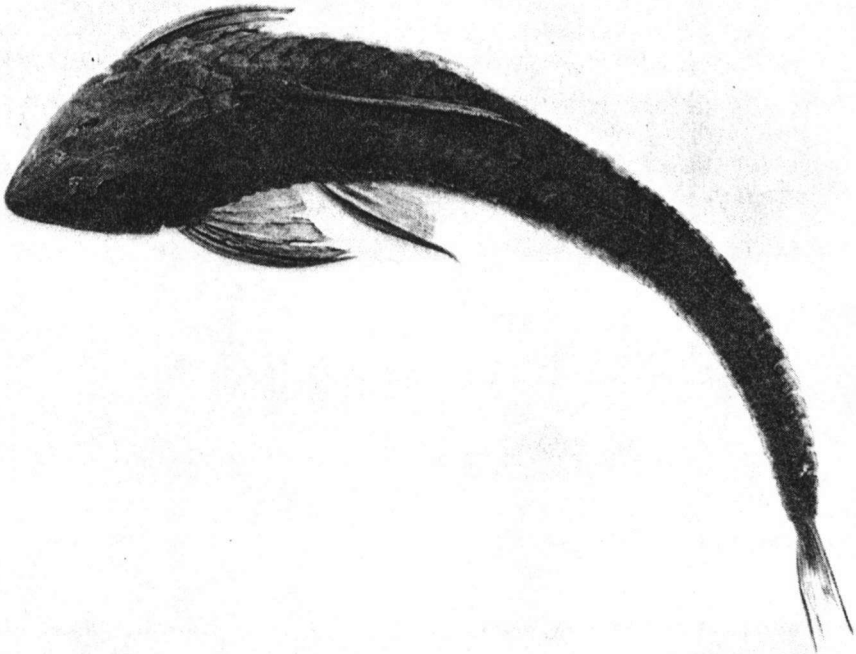


FIG. 4. *Loricaria cataphracta*. Neotype (ZMA 109.616), in dorsal view.

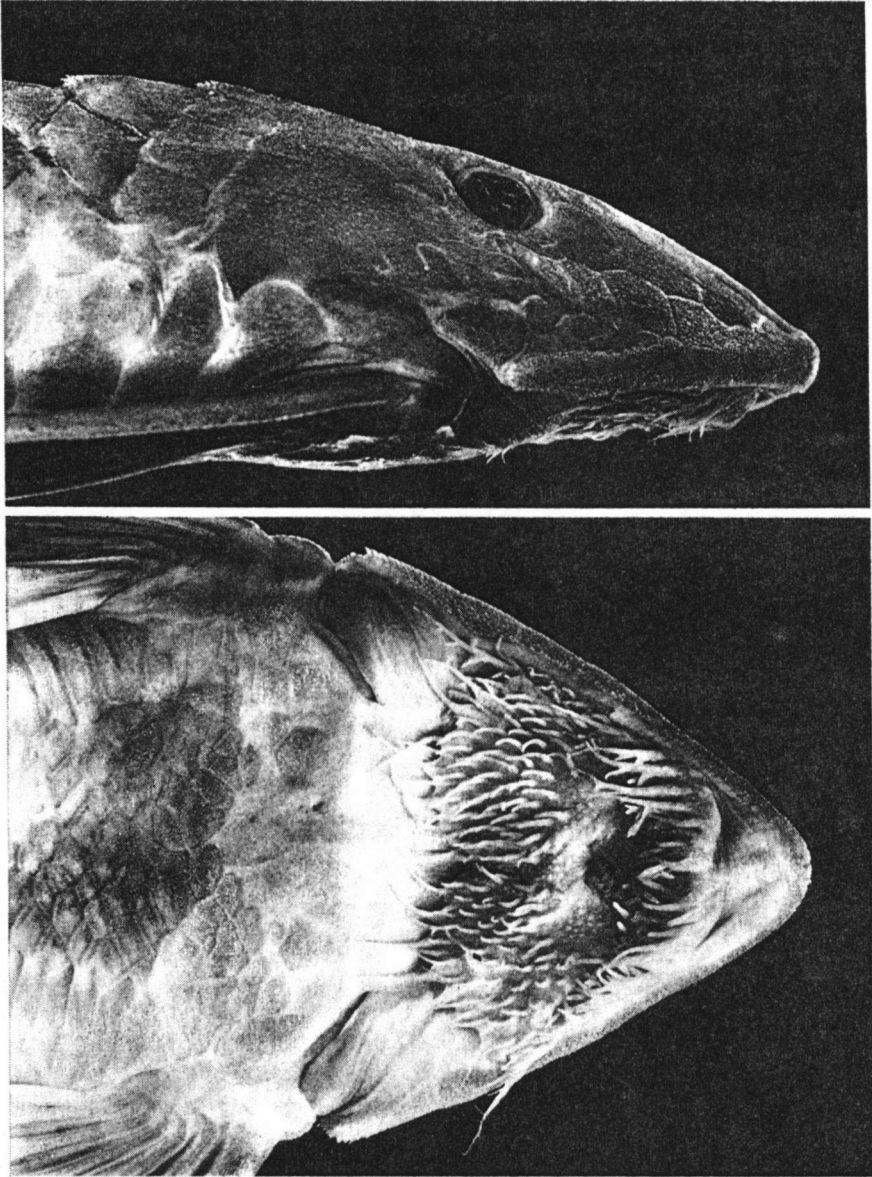


FIG. 5. *Loricaria cataphracta*. Neotype (ZMA 109.616), lateral (above) and ventral (below) view of head.

excellente, où seulement le barbillon latéral est trop court; mais Linné l'a confondu à tort avec une espèce de Gronovius (*Mus.* no. 68, pl. II), dont nous parlerons plus loin; tandis qu'il en sépare le no. 69, qui est bien de l'espèce actuelle, ou de celle qui va suivre". The species that was described subsequently is *Loricaria vetula* Valenciennes, 1840.

The generic name *Plecostomus* was first used in binominal form by Gronovius (ed. Gray) in 1854, and is a junior objective synonym of *Hypostomus* Lacépède, 1803 — see Boeseman, 1968. However, Gronovius' *Plecostomus* included several species which today are not regarded as congeneric, amongst these is *Plecostomus flagellaris* which is a *Loricaria*. Since I concur with Wheeler's suggestion that it might be not identical to *Loricaria cataphracta*, *sensu stricto*, the Gronovius specimen is called here *Loricaria flagellaris*. Gronovius did not mention the geographic origin of his specimen. The fact that he mentioned Surinam as the locality for "*Plecostomus* no. 68" might be an indication that *Loricaria flagellaris* also came from that country (see also Wheeler, 1958: 202). I must admit that *Loricaria flagellaris* resembles *Loricaria cataphracta* very much, but the only known specimen of the former possesses one character that is not found in the latter, viz., the existence of a row of more prominent denticles along the ventral snout profile.

In 1794, Bloch described without locality data and used the binomen *Loricaria cataphracta* for an unknown number of specimens (two of which still exist; his remark on : 78 : "Ich habe einige geöffnet, . . ." and the fact that the lectotype and paralectotype of *Loricaria cirrhosa* I studied are not damaged in the ventral area indicates that the original lot contained at least four specimens). Later, Bloch ed. Schneider (1801: xxxii, and: 125) again used the name *L. cataphracta*, but from their diagnosis, and in particular from the accompanying references it is evident that they were not using Linnaeus' name *Loricaria cataphracta* in its present sense. According to Bleeker (1864: 11—13) their specimens were referable to *Ancistrus temmincki* (Valenciennes, 1840).

Bloch ed. Schneider (1801: xxxii) summarized genera, species, varieties, and authors in the index. They state for *Loricaria*: "*Species.* 1. *Plecostomus* L. 2. *Cataphracta*. *Plecostomus* Gronovii et Sebae. 3. *Cirrhosa* L. *Varietas.* *Maculata* Bl.". The *specific name* "*Cirrhosa*" is used here for the first time, but they credit the *species* to Linnaeus. So *Loricaria cirrhosa* is in fact a new name for *Loricaria cataphracta* Linnaeus, 1758, *sensu* Bloch, 1794. But opposite to *Loricaria cataphracta*; Bloch & Schneider, 1801 (= *Ancistrus temmincki*), the diagnosis of *Loricaria cirrhosa* by Bloch & Schneider (1801) must be regarded as the description of a new species, and Bloch's 1794 material of *Loricaria cataphracta* became type series of *Loricaria cirrhosa*. Dr. C. Karrer (*in litt.*, May 26, 1970) wrote: "Da ich an einem Katalog der BLOCHschen Sammlung arbeite, bat mir Herr Prof. Deckert, Ihnen die gewünschte *Loricaria cirrhosa* zu senden. BLOCH haben 2 Exemplare vorgelegen, die er als *L. cataphracta* L. 1794, XI, p. 76 beschrieben und auf Tafel 375, fig. 3, 4 abgebildet hat. Diese beide Exemplare hat Schneider dann

(ob nach Notizen von BLOCH, weiß ich nicht) *L. cirrhosa* genannt. Ein Holotypus ist nicht bezeichnet, sicher handelt es sich um das größere Stück". Consequently, the largest extant specimen is here selected as the lectotype. The unusual representation of the fishes under consideration by Bloch & Schneider was commented upon by Valenciennes (in Cuvier & Valenciennes, 1840: 467, under the description of their *Loricaria maculata* Bloch, 1794) as: "Dans son Système posthume Bloch a encore mêlé autrement la synonymie de ces deux espèces: il a un *loricaria cataphracta* tout différent du véritable, le *plecostomus* no. 167 du *Museum* de Gronovius et la figure 12 de la planche XXIX de Seba, qui est notre *hypostomus cirrhosus* ou le *Hyp. Temminckii*; ensuite, il fait du véritable *Lor. cataphracta* de Linné une espèce qu'il nomme *Lor. cirrhosa*, et à laquelle il ajoute le *Lor. maculata* actuel comme synonyme. C'est une confusion que nous espérons maintenant avoir débrouillée".

Lacépède (1803: 140, and 141—143) originally described *Loricaria setifera* from "l'Amérique méridionale". As he listed *Loricaria cataphracta* Linnaeus — "ed. Gmel." — in synonymy additional to his quite extensive description, it seems that he only intended to rename Linnaeus' fish Lacépède's nominal *Loricaria setifera* was quoted and misspelled by Cuvier (1817: 211; 1829: 301; 1836: 253) in a footnote as [*Loricaria*] "*Setigera*, Lacép.".

Valenciennes (1836, pl. 100), in the atlas belonging to Cuvier's 1836 work, gave the legend of plate 100 in the following words: "Genre LORICAIRE. *Loricaria*. Fig. 2. La Loricaire sétigère. *Loricaria setigera*. Nob. Montrant le corps couvert de plaques ou de boucliers osseux et carénés. L'espèce est remarquable par le long filet qu'elle porte à la caudale. — Des eaux douces de l'Amérique. Fig. 2a. La tête, vue par dessous, pour montrer les lèvres larges et frangées qui entourent la bouche. (D'après nature)."

As already stated above, Lacépède's *Loricaria setifera* apparently was no more than a new name for *L. cataphracta* Linnaeus, 1758, *sensu stricto*, as was *L. cirrhosa* Bloch & Schneider. It is possible that Valenciennes was simply using Cuvier's misspelling (1836: 253). On the other hand, I think Valenciennes' *Loricaria setigera* may have been intended as the name for a supposed new species, though this name has never since been used as a senior synonym; moreover, Valenciennes used "nob." after so many names he did not propose that I wonder. Even Valenciennes himself, in Cuvier & Valenciennes, 1840, ignores both *L. setifera* and *L. setigera* while summarizing the knowledge of the genus *Loricaria*. Mrs. Dr. Bauchot (*in litt.*, July 18, 1970) informs me that the Muséum National d'Histoire Naturelle at Paris does not possess any specimen that can be regarded as the type of *L. setifera* Lacépède, 1803, neither one of *L. setigera* Valenciennes, 1836. I follow those authors who already regarded these two specific names as synonyms of *L. cataphracta* and think there is no need to designate a neotype for each, for there is little danger of instability in nomenclature in these cases.

The next of the nominal species under consideration, *Loricaria carinata*, was described by de Castelnau in 1855. He had only the single holotype, which is redescribed and figured in this paper. It is not surprising that in literature subsequent to the de Castelnau's publication of *L. carinata* there exist

quite a bit of confusion on the identity of this nominal species. There are authors who regard it identical to *Loricaria cataphracta*, and there are authors who consider it identical to *Loricaria lata*. A critical comparison of *Loricaria cataphracta* populations throughout its distributional area has to be made before one is able to estimate the validity of *Loricaria carinata* as well as that of *L. lata*, *sensu stricto*.

Loricaria lata was described in 1889 by Eigenmann & Eigenmann from eleven syntypes from Goyaz, Brazil. I have seen nine syntypes and found that these represent two species. By selection of the lectotype, *Loricaria lata* remains closely related to the *L. cataphracta*-group (a group that remains to be defined), while the other species differs in several characters. Although I am unable to identify *Loricaria lata*, *sensu lato*, with any of the 'known' species within the subfamily Loricariinae, I prefer to leave it unnamed until more perfect material with good locality data becomes available.

MEASUREMENTS

In the description of the specimens and in table I, the *axial length* equals the standard length plus the length of the middle caudal fin rays or the membrane between them; the *head length* is from the tip of the snout to the end of the occipital process; the *head width* is taken at the opercle, just before the pectoral fin spine insertion; the *head depth* is taken at the end of the occipital process; the *snout length* is from the tip of the snout to the anterior border of the orbital rim; the *thoracic length* is taken between the spine insertions of the pectoral and pelvic fins; and the *abdominal length* is taken between the spine insertions of the pelvic and anal fins. All other measurements are self-explanatory. The measurements were taken directly.

Loricaria Linnaeus, 1758

Loricaria Linnaeus, 1758: 307—308 (type species, by monotypy, *Loricaria cataphracta* Linnaeus, 1758, composite nominal species, restricted by Bloch, 1794: 76—79).

Fusiloricaria Fowler, 1940: 247 (type species, by monotypy, *Loricaria (Fusiloricaria) clavipinna* Fowler, 1940; proposed as a subgenus of *Loricaria* Linnaeus, 1758).

Loricaria is characterized by the possession of bilobed or simple teeth in both jaws, those in the upper jaws twice as large as those in the lower jaws (fig. 12), and is, to use Eigenmann's (1912: 243) expression, readily distinguished from the other Loricariids by its tentacled lips (fig. 5). The dorsal caudal 'spine' (a simple ray) forms a filament, much longer than the standard length. The head is more or less triangular in frontal view, the snout pointed, eyes moderate in size, and the pelvic spines are longer and thicker than the pelvic rays. The character on which Fowler distinguished his subgenus *Fusiloricaria*, the terminally greatly expanded pectoral spines in his *Loricaria (Fusiloricaria) clavipinna* (based on the single holotype from the Ucayali River basin, Contamana, Peru (ANSP 68665)) is, to a lesser degree though, found in my material of *L. cataphracta*, too, and could be explained better as a secondary sexual dimorphism, or maybe as an adult character in general, rather than being of phylogenetic significance.

Loricaria cataphracta Linnaeus, 1758
(figs. 1—6, 12 c-h, table I)

"*Loricaria dura*" Linnaeus, 1754: 79—80, pl. 29 (pre-1758, and therefore nomenclaturally invalid; description).

"*Plecostomus corpore aculeato*..." Seba, 1758: 88, pl. 29 fig. 14 (non-binominal, and therefore nomenclaturally invalid; description).

Loricaria cataphracta Linnaeus, 1758: 307 (original diagnosis, in part; reference to and fin formula of "*Loricaria dura*" Linnaeus, 1754 [pre-Linnaean]; type locality: "...in America meridionali"; neotype in Instituut voor Taxonomische Zoölogie (Zoölogisch Museum), Amsterdam, ZMA 109.616). — Bonnaterre, 1788: 157—158, pl. 65 fig. 259 [not 250] (after Linnaeus). — Linnaeus, 1789 (ed. Gmelin): 1363 (same as Linnaeus, 1758). — Bloch, 1794: 76—79, pl. 375 figs. 3—4 (description; discussion). — Cuvier, 1817: 211 (name only, in footnote). — Bleeker, 1858: 331 (name only, listed). — Holm, 1957: 45 (statement of lacking type material).

Loricario cataphracta; Cuvier, 1829: 301; 1836: 253 (name only, in footnote; misspelling).

Loracaria cataphracta; Fowler, 1940: 286 (listed; misspelling).

Loricaria cirrhosa Bloch & Schneider, 1801: 125, pl. 34 (original description; new name for *Loricaria cataphracta* Linnaeus, 1758; based on specimens described as *L. cataphracta* by Bloch in 1794; type locality: "...in America meridionali..."; lectotype in Zoologisches Museum an der Humboldt-Universität zu Berlin, ZMB 3160).

Loricaria cirrhora; Cuvier, 1829: 301; 1836: 253 (name only, in footnote; misspelling).

Loricaria setifera Lacépède, 1803: 140 and 141 (original description; new name for *Loricaria cataphracta* of several authors, including Linnaeus, 1758; apparently not based on actual specimens).

Loricaria setigera; Cuvier, 1817: 211; 1829: 301; 1836: 253 (name only, in footnote; misspelling).

Loricaria setigera Valenciennes, 1836, pl. 100 figs. 2—2a (description; locality: "Des eaux douces de l'Amérique"; [disposal of specimens unknown; see introduction above]).

Loricaria dura Bleeker, 1862 [ex-Linnaeus, 1754]: 3 (name only, to be regarded as a *nomen novum*; the holotype of Bleeker's *dura* is the specimen described by Linnaeus in 1754, which is lost). — Bleeker, 1863: 80 (name only; listed as type species of *Loricaria* Linnaeus [1754]). — Bleeker, 1864: 18—20 (description; discussion; localities: "Surinama" and "Mejico").

Loricaria cataphracta has been recorded from many South American localities by various authors, for example by Valenciennes, in Cuvier & Valenciennes, 1840: 459—466 (Surinam, Cayenne), Müller & Troschel, in Schomburgk, 1848: 631 (Rupununi), Kner, 1854: 77—79, pl. 1 fig. 2a (Cujaba, Guaporé), Günther, 1864: 255 (Surinam, northern Brazil), Peters, 1877: 471 (Venezuela, Calabozo), Cope, 1878: 681 (Peru, Marañon), Steindachner, 1882: 80 (Canelos, Iles de l'Ecuador), Eigenmann & Eigenmann, 1889: 36 (Vigia, Sao Conçallo, Cameta, Manaos, Para, Rio Negro, Coary, Villa Bella, Gurupa, Rio Preto, Tajapurú, Porto do Moz, Teffé, Marañon, Ucayale, Obidos), Pellegrin, 1899a: 158 (Apuré), and 1899b: 406 (Manaos), Regan, 1904: 291 (R. Amazon, Guiana), Eigenmann, 1910: 415 (Amazons, Guiana, Paraguay), and 1912: 243—244 (British Guiana, Mud-flats, Demerara, Crab Falls), Starks, 1913: 36 (Pará), Eigenmann & Allen, 1942: 208 (Rio Huallaga, Iquitos, Gosulimacocha, Rio Paranapura, all in Peru), van der Stigchel, 1946: 170—172, and 1947: 170—172 (partly based on specimens of *Loricaria dura* Bleeker; Surinam, Surinam-Brazil, South America), Puyo, 1949: 107

(French Guiana, Tonate, région de Kourou, rivière du tour de l'île, Kaw et l'Approuage), Ovchynnyk, 1968: 258 (Canelos on Rio Bobonaza, tributary of Rio Pastaza [based on Steindachner, 1882], Rio Anzu, at Puerto Napo, tributary of Rio Napo, Prov. Napo-Pastaza; Rio Bogota, tributary of Rio Tulubi, tributary of Rio Santiago, Prov. Esmeraldas), Mago Leccia, 1970: 85 (Venezuela). Because of the confusion which still exists between *L. carinata* and *L. lata*, it seems better to await a re-examination of all recorded material, before these records can be placed safely in the list of references.

Type locality, by present restriction: Surinam: district Marowijne, mouth of Marowijne River near Galibi (05°45' N, 54°00' W), in fresh water (due to the rainy season during the collecting period).

Specimens examined. — ZMA 109.616, *neotype* (by present designation), sex unknown, but probably a ♀, 290.0 mm standard length, from the type locality, coll. H. Nijssen (Brokopondo Research 1966/1967¹) and W. Vervoort, 1/2 June 1966 (# HN 22). — ZMA 110.722, *topotype*, sex unknown, but probably a ♂, 270.0 mm standard length, same data as ZMA 109.616. — ZMA 106.230, 8 *topotypes*, same data as ZMA 109.616. — ZMA 106.231, 1 *topotype*, Surinam: district Marowijne, Marowijne River near Mopikondre (= Maria's Hoop), 30 km South of Albina, 05°30' N, 54°15' W, seine in sandy bay, coll. H. Nijssen (Brokopondo Research 1966/1967), 17 June, 1966 (# HN 30). — ZMA 106.232, 1 specimen, Surinam: district Brokopondo, Suriname River system, little tributary at right bank of Sara Creek, 31 km South of the village Dam, depth 40 cm, running water, sand, poison, coll. H. Nijssen (Brokopondo Research 1966/1967), 12 October, 1966 (# HN 74). — ZMA 106.233, 7 specimens, Surinam: district Brokopondo, Suriname River system, Sara Creek, 27 km South of the village Dam, depth 150 cm, running water, loam, sand, stones, wood, poison, coll. H. Nijssen (Brokopondo Research 1966/1967), 14 October, 1966, (# HN 76). — ZMA 106.234, 8 specimens, Surinam: district Brokopondo, Suriname River system, Marowijne (= Gran) Creek, 63 km South of Afobaka's dam, 3 km South of bank of 'Prof. Dr. Ir. W. J. van Blommestein Lake' (= Brokopondo Lake), depth 150 cm, running water, sand, dead wood, leaves, poison, coll. H. Nijssen (Brokopondo Research 1966/1967), 20 October, 1966 (# HN 79). — ZMB 3160, *lectotype* (by present designation) of *Loricaria cirrhosa* Bloch & Schneider, 1801, 276.0 mm standard length, South America, collected by or in the collection of M. E. Bloch, end of 18th century. — ZMB 22223, *paralectotype* of *Loricaria cirrhosa*, 143.0 mm standard length, same data as ZMB 3160.

Description (for actual measurements see table I). — Morphometric and meristic data based on the *neotype* (ZMA 109.616), a *topotype* (ZMA 110.722), the *lectotype* (ZMB 3160) and *paralectotype* (ZMB 22223) of

¹) The Brokopondo Research Project, biological investigations in the 'Prof. Dr. Ir. W. J. van Blommestein Lake' (= Brokopondo Lake) in the Suriname River (8 km South of Brokopondo), Surinam, sponsored by the Netherlands Foundation for the Advancement of Tropical Research (WOTRO).

"*Loricaria cirrhosa*", respectively: standard length 290.0, 270.0, 276.0, 143.0 mm; predorsal length 3.2, 3.2, 3.4, 3.5 in standard length; head length 4.7, 4.7, 5.0, 4.9 in standard length; head width 6.0, 6.4, 6.5, 7.2 in standard length, 1.3, 1.4, 1.3, 1.5 in head length; head depth 9.3, 10.8, 10.2, 13.6 in standard length, 2.0, 2.3, 2.0, 2.8 in head length; snout length 8.6, 8.8, 9.0, 9.9 in standard length, 1.8, 1.9, 1.8, 2.0 in head length; orbital diameter 7.0, 6.4, 6.3, 4.8 in head length; interorbital width 4.3, 4.8, 4.7, 5.3 in head length; internasal width 5.9, 5.8, 6.8, 6.4 in head length; dorsal spine length 4.4, 4.1, 4.1, — (broken) in standard length; length first dorsal ray 4.3, 4.2, 4.2, 4.6 in standard length, 0.9, 0.9, 0.8, 0.9 in head length; length last dorsal ray 8.7, 12.2, — (broken), 10.8 in standard length, 1.9, 2.6, —, 2.2 in head length; length dorsal fin base 8.7, 9.1, 9.3, 10.5 in standard length, 1.9, 2.0, 1.8, 2.1 in head length; anal spine length 4.9, — (broken), 5.1, 5.1 in standard length, 1.0, —, 1.1, 1.1 in head length; pectoral spine length 5.2, 4.8, 4.8, 5.6 in standard length, 1.1, 1.0, 0.9, 1.1 in head length; pelvic spine length 4.7, 5.0, 4.4, 5.0 in standard length, 1.0, 1.1, 0.9, 1.0 in head length; length lower principal caudal 'spine' (unbranched ray) 6.3, 6.3, — (broken), — (broken) in standard length, 1.4, 1.3, —, — in head length; cleithral width 5.8, 6.0, 5.9, 6.8 in standard length, 1.3, 1.3, 1.2, 1.4 in head length; supra-cleithral width 7.5, 8.2, 7.5, 9.4 in standard length, 1.6, 1.8, 1.5, 1.9 in head length; thoracic length 7.3, 7.2, 6.7, 6.8 in standard length, 1.6, 1.5, 1.3, 1.4 in head length; abdominal length 6.8, 6.1, 7.0, 7.4 in standard length, 1.4, 1.3, 1.4, 1.5 in head length; post-anal peduncular length 2.0, 1.9, 1.8, 1.8 in standard length; depth caudal peduncle 12.7, 14.5, 12.2, 15.3 in head length; width caudal peduncle 5.0, 5.0, 5.1, 6.7 in head length; distance between anus and anal fin origin 11.9, 11.0, 13.3, 13.0 in standard length, 2.5, 2.4, 2.6, 2.6 in head length; longest barbel of upper lip 9.4, 10.7 — (damaged), — (damaged) in standard length, 2.0, 2.3, —, — in head length; greatest axial length of lower lip 3.9, 3.8, 5.5, — (damaged) in head length; barbels of lower lip from 31.1, 41.4, 36.2, — (damaged) to 9.9, 11.6, 7.8, — in head length.

Body scutes in longitudinal lateral series 34, 34, 34, 36, last scute on caudal peduncle. Scutes between dorsal spine and caudal fin 26, 28, 27, 27. Scutes between anal fin origin and caudal fin 23, 23, 24, 24. Postoccipital scutes 2 in all four specimens, predorsal shield not included. Between anus and anal fin origin 3 pairs of scutes in all four specimens. 9, 8, 8, 8 Oblong scutes on thorax between last pectoral fin ray and pelvic spine. Dorsal fin I.6 in all four specimens, last ray split to its base. Anal fin I,4 in all four specimens, last ray split to its base. Pectoral fin I.6, pelvic fin I.5, and principal caudal fin rays (the dorsalmost and ventralmost one unbranched) I.10.I in all four specimens.

There are no structural differences between the lips of males, females, and juveniles. The neotype has the lips in perfect condition (fig. 5), whereas the others have them partly folded. Rictal barbels with over 30 subbarbels of various lengths, long barbel partly uniting upper and lower lips. Upper lip with numerous barbels, some of them with one or more subbarbels. Lower lip

broad and slightly notched in the middle. Many short thin barbels distributed over the surface of the lower lip and many longer barbels along the margin (fig. 5). Teeth (fig. 12c-h) in both jaws; those in the upper jaw long and slender, generally bilobed (probably due to abrasion, in the neotype the smaller lobe seems to have disappeared in some teeth); number of teeth in the upper jaw right/left 3/3, 2/3, 3/2, 4/3. Teeth in the lower jaw bilobed, shorter and less slender than those in the upper jaw, anterior lobe larger; number of teeth in the lower jaw right/left 6/8, 9/6, 7/8, 6/7. Some of the teeth removed for examination.

Eye large, oval in shape, pupil covered by a conspicuous flap originating from the iris. Shallow orbital notch present. The distribution of ridges of larger denticles than those covering all external ossifications and fin spines and rays is essentially the same as described for *Pseudohemiodon* (*Planiloricaria*) *cryptodon* (cf. Isbrücker, 1971a¹), but in *Loricaria cataphracta* these denticles are comparatively larger and heavier, particularly on the occipital region and along the dorsal fin base. Along the lateral body scutes, two distinct rows of denticles converge posteriorly and run parallel along the last (left/right) 17/16, 15/15, 17/17, 14/14 scutes. Due to their long preservation, the larger denticles of the lectotype and paralectotype of "*L. cirrhosa*" have largely disappeared; small pits, however, indicate their original presence.

There are some inconspicuous sensory canals on the head and one lateral line sensory canal on each of the lateral body scutes, between the two ridges of denticles. Snout naked ventrally, except for the margin, which is covered by scutes. Irregular structure of clearly visible platelets covers head and snout dorsally. Belly almost entirely covered by more or less irregularly arranged platelets between the right and left row of oblong ventral scutes. The latter may sometimes look a little irregular, some scutes being the result of the fusion of two or more parts.

Colour (in alcohol). — Ground colour of the neotype yellowish grey; some indistinct brownish grey markings on pectoral fin and on the end of rays and spine of lower caudal fin lobe.

Loricaria flagellaris (Gronovius, ed. Gray, 1854)
(figs. 7, 12a-b, table I)

"*Plecostomus* no. 69" Gronovius, 1754: 26—27 (description; no locality given). — Gronovius, 1756: 16 (diagnosis).

Loricaria cataphracta; Linnaeus, 1758 [non Linnaeus, 1758, *sensu stricto*]: 308 (diagnosis of 'variant' β , based on "*Plecostomus* no. 69" Gronovius, 1754). — Günther, 1864: 255 (in part; Gronovius' specimen listed). — Boeseman, 1968: 5 (identification of Gronovius' specimen).

Loricaria ? cataphracta; Wheeler, 1958 [non Linnaeus, 1758]: 214—215, pl. 28 fig. 1 (redescription of Gronovius' specimen; discussion).

"*Plecostomus* no. 392" Gronovius, 1763: 127 (diagnosis; based on "*Plecostomus* no. 69" Gronovius, 1754).

¹) This paper was not issued before February 2nd, 1971, contrary to the date given (1970).

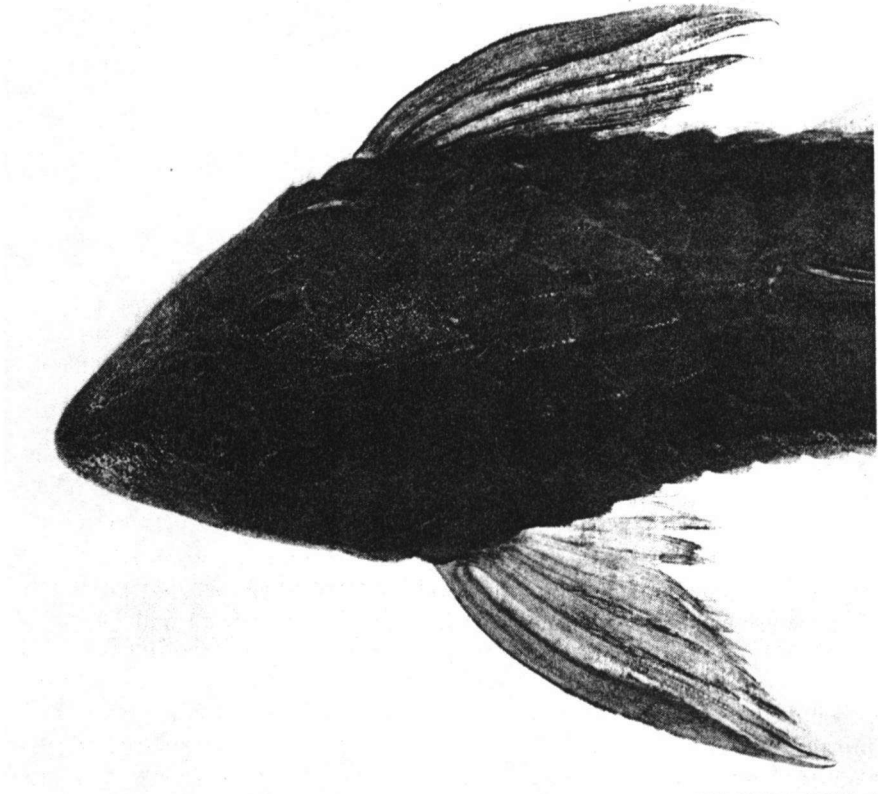


FIG. 6. *Loricaria cataphracta*. Topotype (ZMA 110.722), dorsal view of head and pectoral fins.

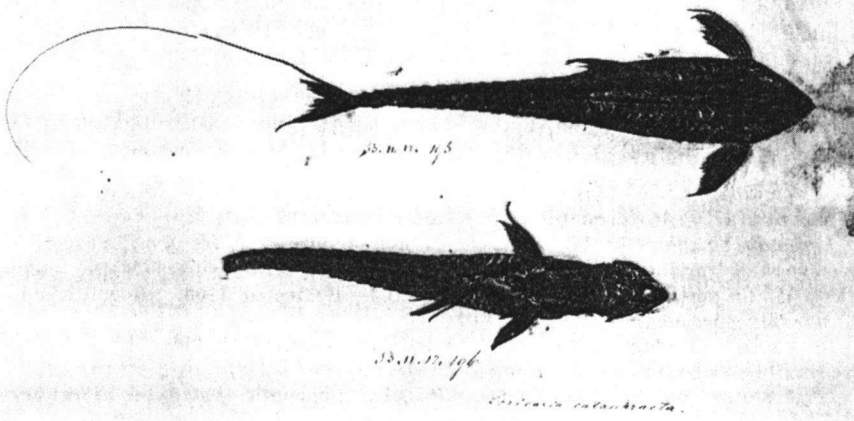


FIG. 7. *Loricaria flagellaris*. Holotype (BMNH 1853.11.12.195—196); dorsal and ventral view of the skin. Courtesy of British Museum (Natural History), London, via Mr. A. C. Wheeler.

Plecostomus flagellaris Gronovius (ed. Gray), 1854: 158 (original diagnosis; based on "*Plecostomus* no. 69" Gronovius, 1754; holotype in British Museum (Natural History), London, BMNH 1853.11.12.195—196, upper and lower surface).

"*Plecostomus* s. *Loricaria loricaria*" [ex-Meuschen, sp. nov., 1781]; Whitley, 1929: 305 (listed; based on "*Plecostomus* no. 392" Gronovius, 1763 [Whitley's reference not seen]).

Type locality: South America (not stated by Gronovius).

Specimen examined. — BMNH 1853.11.12.195—196, *holotype*, upper and lower skin surface, dry, Gronovius collection, exact date and locality unknown.

Description (for actual measurements see table I). — Morphometric and meristic data based on the holotype: standard length 181.9 mm; predorsal length 3.4 in standard length; head length 5.1 in standard length; head width 5.7 in standard length, 1.1 in head length; head depth impossible to measure; snout length 9.6 in standard length, 1.9 in head length; orbital diameter 5.7 in head length; interorbital width 5.4 in head length; internasal width 8.2 in head length; dorsal spine length 3.9 in standard length; length first dorsal ray 3.9 in standard length, 0.8 in head length; length last dorsal ray 10.0 in standard length, 2.0 in head length; length dorsal fin base 9.7 in standard length, 1.9 in head length; anal spine length 6.7 in standard length, 1.3 in head length; pectoral spine length 5.7 in standard length, 1.1 in head length; pelvic spine length 6.2 in standard length, 1.2 in head length; length lower principal caudal 'spine' (unbranched ray) 5.4 in standard length, 1.1 in head length; cleithral width 5.4 in standard length, 1.1 in head length; supra-cleithral width 7.4 in standard length, 1.5 in head length; thoracic length impossible to measure; abdominal length 7.5 in standard length, 1.5 in head length; post-anal peduncular length 1.9 in standard length; depth caudal peduncle impossible to measure; width caudal peduncle 6.3 in head length; distance between anus and anal fin origin 12.7 in standard length, 2.5 in head length; barbels and lips impossible to measure.

Body scutes in longitudinal lateral series 34, last scute on caudal peduncle. Scutes between dorsal spine and caudal fin 26. Scutes between anal fin origin and caudal fin 22. Postoccipital scutes 2, predorsal shield not included. Between anus and anal fin origin 3 pairs of scutes. 9 or 8 oblong scutes on thorax between last pectoral fin ray and pelvic spine. Fin spine and counts exactly as in *L. cataphracta*. Lips and barbels very damaged. Still, the fragments show agreement with the structures found in *L. cataphracta*. Teeth structure as in *L. cataphracta*; number of teeth in the upper jaw right/left 4/4, number of teeth in the lower jaw 6/4. The snout margin with larger denticles than found elsewhere on the body. This seems to be the only character by which this specimen is separated from *L. cataphracta*. Otherwise the development of external ossifications and denticles agree with that species.

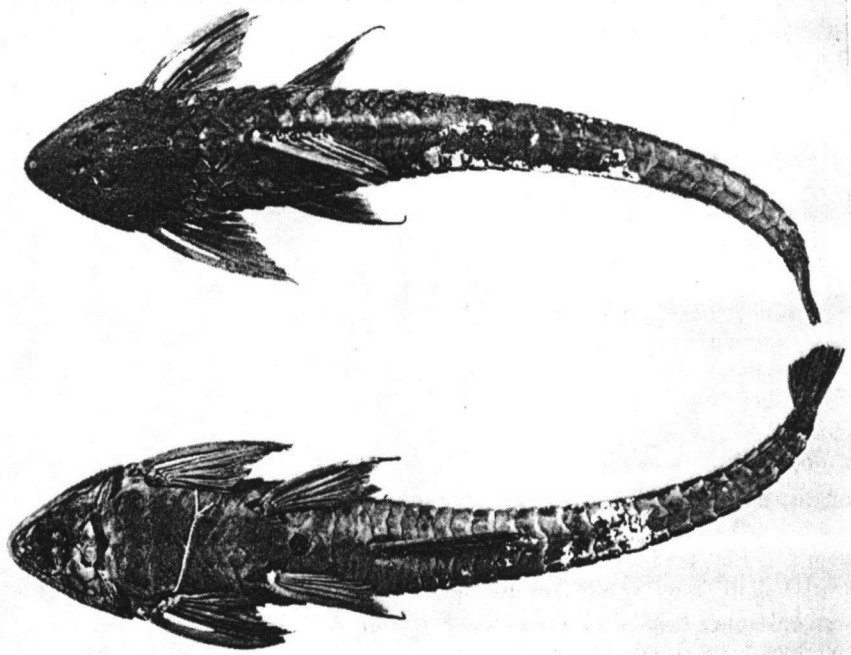


FIG. 8. *Loricaria carinata*. Holotype (MNHN A. 9562), in dorsal (above) and ventral (below) view.

***Loricaria carinata* de Castelnau, 1855**
(figs. 8, 12i-j, table I)

Loricaria carinata de Castelnau, 1855: 46, pl. 23 fig. 3 (original description; type locality: "De la rivière des Amazones"; holotype in Muséum National d'Histoire Naturelle, Paris, MNHN A. 9562). — Kner, 1858: 349 (reference to the original description; discussion). — Regan, 1904: 292 (in part; description composite; listed in subgenus *Loricaria* in key on: 274).

The appreciation of nominal *Loricaria carinata* by authors is quite complicated. Günther (1864: 255) and Eigenmann & Eigenmann (1889: 36) listed it as a synonym of *L. cataphracta*. Bleeker (1864: 19) was of the same opinion about the identity of *L. carinata* by listing it as a synonym of *L. dura* (= *L. cataphracta*). Regan (1904) was the first author subsequent to de Castelnau's description to recognize *L. carinata* as a valid species. He had re-examined the holotype, and among other material, he had a syntype of *Loricaria lata* at hand. From this, he concluded that *L. lata* was identical with *L. carinata*. Since Regan, nobody has re-examined the type material of these two nominal species, and therefore it is difficult to construct a list of references, without having seen the material recorded either as *L. carinata* or as *L. lata*.

Specimen examined. — MNHN A. 9562, holotype, sex unknown, but

probably a ♂, 227.0 mm standard length, Brazil, State unknown, Rio Amazonas, coll. F. de Castelnau, exact date and locality unknown.

Description (for actual measurements see table I). — Morphometric and meristic data based on the holotype: standard length 227.0 mm; predorsal length 3.4 in standard length; head length 4.7 in standard length; head width 5.7 in standard length, 1.2 in head length; head depth 10.3 in standard length, 2.2 in head length; snout length 8.6 in standard length, 1.8 in head length; orbital diameter 7.0 in head length; interorbital width 4.5 in head length; internasal width 8.5 in head length; dorsal spine length < 7.4 in standard length; length first dorsal ray < 7.4 in standard length, < 1.6 in head length; length last dorsal ray 10.5 in standard length, 2.2 in head length; length dorsal fin base 10.3 in standard length, 2.2 in head length; anal spine length < 6.2 in standard length, < 1.3 in head length; pectoral spine length < 5.3 in standard length, < 1.1 in head length; pelvic spine length 5.2 in standard length, 1.1 in head length; length lower principal caudal 'spine' (unbranched ray) impossible to measure; cleithral width 5.5 in standard length, 1.2 in head length; supra-cleithral width 7.7 in standard length, 1.6 in head length; thoracic length 7.7 in standard length, 1.6 in head length; abdominal length 6.8 in standard length, 1.5 in head length; post-anal peduncular length 1.9 in standard length; depth caudal peduncle 13.0 in head length; width caudal peduncle 7.3 in head length; distance between anus and anal fin origin 14.2 in standard length, 3.0 in head length; lips and barbels very damaged, impossible to measure.

Body scutes in longitudinal lateral series 35 on the left side, 34 on the right side, last scute on caudal peduncle. Scutes between dorsal spine and caudal fin 28. Scutes between anal fin origin and caudal fin 24. Postoccipital scutes 2, predorsal shield not included. Between anus and anal fin origin 3 pairs of scutes. There are 9 oblong scutes on thorax between last pectoral fin ray and pelvic spine on the left side, and 8 on the right side. Fin spine and ray counts as in *L. cataphracta*; the caudal fin is very damaged. Little has remained from the lips. The still extant parts of the upper lip are fringed. Four teeth in the left upper jaw; 2 in the right upper jaw, from which one is simple and not erected; 8 teeth in the left lower jaw; 5 in the right lower jaw. Most of the softer parts have disappeared because the specimen is badly preserved. The development of external ossifications and denticles agrees with that found in *L. cataphracta*. Along the lateral body scutes, two distinct rows of denticles converge posteriorly and run parallel along the last (left/right) 15/15 scutes.

***Loricaria lata* Eigenmann & Eigenmann, 1889**
(figs. 9—10, 12k-m, table I)

Loricaria lata Eigenmann & Eigenmann, 1889: 36—37 (original description, composite; in part; type locality: "Goyaz"; lectotype in Museum of Comparative Zoology, Cambridge, MCZ 46721).

Loricaria carinata; Regan, 1904 [non de Castelnau, 1855]: 292 (in part; *L. lata* considered identical after examination of a syntype).

characters	A	B	C	cataphraata	cataphraata	cataphraata	D	E	flagellaria	oartnata	F	G	H	I	J	K	L	M	N
standard length	290.0	270.0	276.0	143.0	181.9	227.0	267.0	198.0	254.8	218.3	"212.0"	104.3	102.9	108.4					
axial length	311.5	290.0	--	±152.0	196.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
predorsal length	90.0	84.0	80.4	40.9	53.1	67.5	86.2	60.0	81.4	69.4	72.0	34.9	34.8	36.8					
head length	62.3	58.0	54.7	29.0	35.9	48.2	59.0	41.3	55.0	46.8	49.7	24.8	24.6	25.8					
head width	48.1	42.5	42.3	19.8	32.0	40.1	49.0	34.3	46.1	40.3	41.0	20.3	19.1	20.9					
head depth	31.2	25.0	27.0	10.5	--	22.1	25.0	15.2	21.1	19.9	18.3	10.2	10.1	10.5					
snout length	33.8	30.8	30.5	14.5	18.9	26.4	34.0	22.2	30.8	26.1	27.8	14.2	13.7	14.7					
orbital diameter	8.9	9.0	8.7	6.0	6.3	6.0	8.0	6.2	7.5	6.3	6.2	3.9	3.5	4.3					
interorbital width	14.5	12.0	11.6	5.5	6.6	10.7	11.5	8.2	10.6	8.6	9.3	5.2	4.7	5.4					
internasal width	10.6	10.0	8.0	4.5	4.4	5.7	7.7	6.1	7.9	7.3	7.2	4.2	4.6	4.8					
dorsal spine length	>65.6	>66.6	>68.0	--	>47.0	>30.5	>37.6	--	>50.2	>44.2	53.9	>15.6	18.9	22.1					
length first dorsal ray	67.9	>64.5	>66.0	31.0	>47.0	>30.5	>51.2	--	--	--	48.5	>17.6	18.3	17.1					
length last dorsal ray	33.1	22.2	--	13.3	±18.2	21.7	>26.5	20.3	--	--	20.5	>10.0	5.7	9.4					
dorsal fin base	33.4	29.6	29.7	13.6	18.8	22.0	30.0	22.0	29.2	25.6	25.7	10.6	10.5	11.3					
anal spine length	56.9	52.5	56.6	--	27.1	>36.6	46.0	35.8	44.7	35.3	42.2	19.4	18.8	18.3					
pectoral spine length	55.8	56.2	57.6	25.7	31.7	>42.5	55.4	39.5	55.1	42.3	49.2	22.7	21.8	24.4					
pelvic spine length	62.0	54.4	62.1	28.5	>29.3	43.2	49.9	35.5	50.5	41.4	43.9	24.2	22.6	25.2					
lower caudal spine length	46.1	43.0	--	--	33.6	--	--	--	--	--	--	--	--	--					
cleithral width	49.9	44.9	46.5	21.1	34.0	41.2	50.5	35.6	47.7	41.6	43.7	21.1	20.1	21.9					
supra-cleithral width	38.5	32.8	37.0	15.3	24.6	29.5	36.6	24.5	33.3	34.4	29.9	15.4	14.5	15.4					
thoracic length	39.7	37.8	41.5	20.9	--	29.3	43.0	35.0	43.0	40.4	43.0	15.4	15.4	15.7					
abdominal length	43.0	44.3	39.5	19.2	24.1	33.1	44.5	30.0	41.7	37.9	37.4	19.8	20.1	19.9					
post-anal peduncular length	147.6	141.8	149.5	78.0	±95.0	±122.0	129.0	99.5	120.8	99.3	83.0	47.8	47.7	49.2					
depth caudal peduncle	4.9	4.0	4.5	1.9	--	3.7	4.6	2.7	4.2	3.4	5.4	1.7	1.6	1.8					
width caudal peduncle	12.5	11.6	11.8	4.3	5.7	6.6	11.5	7.5	10.0	8.2	--	--	3.2	3.0					
anus to anal fin origin	24.4	24.5	20.7	11.0	14.3	±16.0	27.2	17.6	±26.8	23.1	24.9	11.8	--	--					
length barbel upper lip	31.0	25.2	--	--	--	--	27.9	17.4	--	--	--	--	8.8	--					
axial length lower lip	15.8	15.2	9.9	--	--	--	9.0	7.4	--	--	--	--	6.1	5.5					
lengths barbels lower lip	2.0-6.3	1.4-5.0	±1.5-7.0	--	--	--	small	small	--	--	--	small	small	--					

TABLE I. Actual measurements in millimeters to the nearest tenth, from the specimens described in this paper. Total length and length upper caudal spine are not included, because none of the specimens is found in these respects; a loose caudal filament was found measuring 300 mm (ZMA 106.230). A — ZMA 109.616, B — ZMA 110.722, C — ZMB 3160, D — ZMB 22223, E — BMNH 1853.11.12.195—196, F — MNHN A. 9562, G — MCZ 46721, H-K — MCZ 8123, L-N — MCZ 46722.

As already stated under the chapter on *L. carinata*, Regan (1904) was followed by all authors with regard to the synonymy of *L. lata* with that species.

Specimens examined. — MCZ 46721, *lectotype* (by present designation), sex unknown, but probably a ♂, 267.0 mm standard length, Brazil, Goyaz, coll. Senhor Honorio, exact date and locality unknown. — MCZ 8123, 4 *paralectotypes*, 198.0 to 254.8 mm standard length, same data as MCZ 46721. — BMNH 1889.11.14.64, 1 *paralectotype*, 155.4 mm standard length, same data as MCZ 46721.

Description (for actual measurements see table I). — Morphometric and meristic data based on the lectotype and three of the paralectotypes of MCZ 8123 (the fourth specimen is deformed in the caudal region), respectively: standard length 267.0, 198.0, 254.8, 218.3 mm; predorsal length 3.1, 3.3, 3.1, 3.2 in standard length; head length 4.5, 4.8, 4.6, 4.7 in standard length; head width 5.4, 5.8, 5.5, 5.4 in standard length, 1.2, 1.2, 1.2, 1.2 in head length; head depth 10.7, 13.0, 12.1, 11.0 in standard length, 2.4, 2.7, 2.6, 2.4 in head length; snout length 7.8, 8.9, 8.3, 8.4 in standard length, 1.7, 1.9, 1.8, 1.8 in head length; orbital diameter 7.4, 6.7, 7.3, 6.9 in head length; inter-orbital width 5.1, 5.0, 5.2, 5.5 in head length; internasal width 7.7, 6.8, 7.0, 6.4 in head length; dorsal spine length 7.1, —.— (broken), 5.1, 4.9 in standard length; length first dorsal ray 5.2, —.—, —.—, —.— (broken in three specimens) in standard length, 1.2 in head length for the lectotype; length last dorsal ray 10.1, 9.8, —.—, —.— (broken in two specimens) in standard length, 2.2, 2.0 in head length for the lectotype and 'first' paralectotype; length dorsal fin base 8.9, 9.0, 8.7, 8.5 in standard length, 2.0, 1.9, 1.9, 1.8 in head length; anal spine length 5.8, 5.5, 5.7, 6.2 in standard length, 1.3, 1.2, 1.2, 1.3 in head length; pectoral spine length 4.8, 5.0, 4.6, 5.2 in standard length, 1.1, 1.0, 1.0, 1.1 in head length; pelvic spine length 5.4, 5.6, 5.0, 5.3 in standard length, 1.2, 1.2, 1.1, 1.1 in head length; length lower principal caudal 'spine' (unbranched ray) damaged in all four specimens; cleithral width 5.3, 5.6, 5.4, 5.3 in standard length, 1.2, 1.2, 1.2, 1.1 in head length; supra-cleithral width 7.3, 8.1, 7.6, 6.4 in standard length, 1.6, 1.7, 1.7, 1.4 in head length; thoracic length 6.2, 5.7, 5.9, 5.4 in standard length, 1.4, 1.2, 1.3, 1.2 in head length; abdominal length 6.0, 6.6, 6.1, 5.8 in standard length, 1.3, 1.4, 1.3, 1.2 in head length; post-anal peduncular length 2.1, 2.0, 2.1, 2.2 in standard length; depth caudal peduncle 12.8, 15.3, 13.1, 13.8 in head length; width caudal peduncle 5.1, 5.5, 5.5, 5.7 in head length; distance between anus and anal fin origin 9.8, 11.2, 9.5, 9.5 in standard length, 2.2, 2.3, 2.1, 2.0 in head length; longest barbel of upper lip 9.6, 11.4, —.—, —.— (damaged in two specimens) in standard length, 2.1, 2.4 in head length; greatest axial length of lower lip 6.6, 5.6, —.—, —.— (damaged in two specimens) in head length. The further condition of the lips and barbels do not allow to take accurate measurements.

Body scutes in longitudinal lateral series 34, 34, 35, 35, last scute on caudal peduncle. Scutes between dorsal spine and caudal fin 27, 26, 27, 27. Scutes between anal fin origin and caudal fin 23, 23, 23, 23. Postoccipital scutes 2

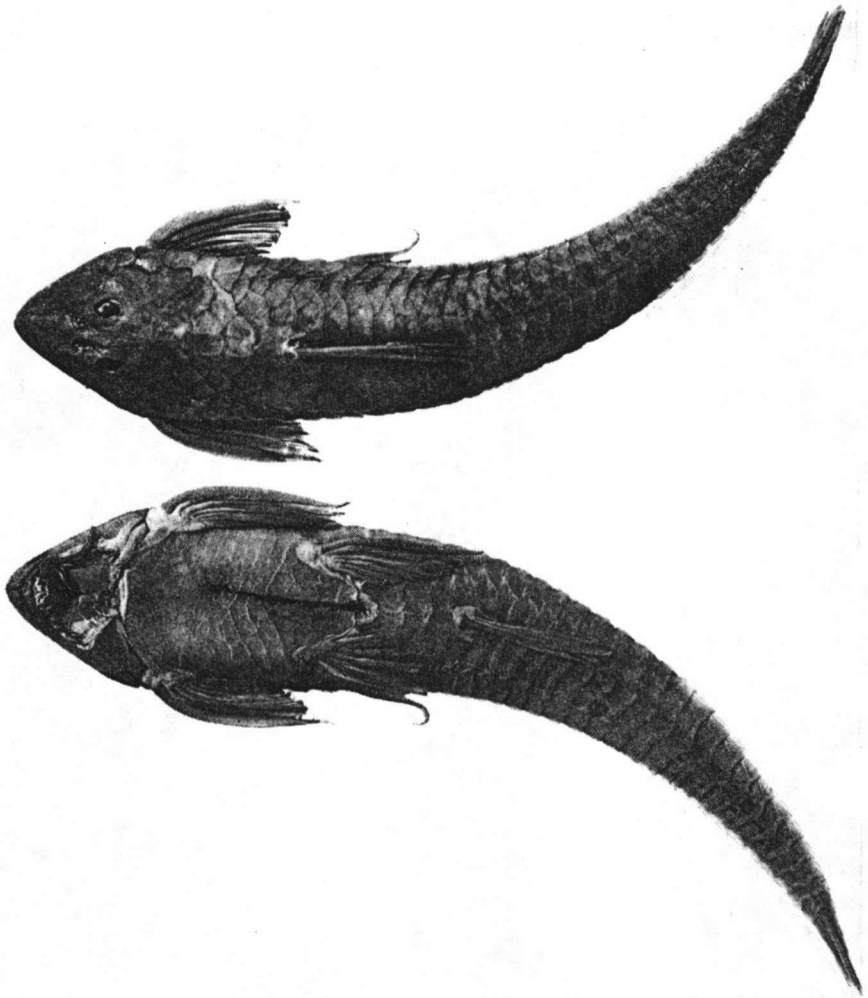


FIG. 9. *Loricaria lata*. Lectotype (MCZ 46721), in dorsal (above) and ventral (below) view.

in all four specimens, predorsal shield not included. Between anus and anal fin origin 3 pairs of scutes in all four specimens. There are (on the left and right side, respectively) 8/7, 7/9, 7/8, 8/7 oblong scutes on thorax between last pectoral fin ray and pelvic spine. Fin spine and ray counts exactly as in *L. cataphracta*. Because of the less perfect condition of the lips it is difficult to describe them in detail, but I think it sufficient to state that they resemble those of *L. cataphracta* very closely. Number of teeth in the upper jaw (left/right) 3/4, 3/4, 0/0, 2/4. Number of teeth in the lower jaw (left/right) 7/6, 5/7, 4/0, 9/7. Along the lateral body scutes, two distinct rows of

denticles converge posteriorly and run parallel along the last (left/right) 19/19, 18/18, 20/21, 21/22 scutes.

Sometimes the sensory canals are bifurcated. The development of external ossifications and denticles agrees greatly with that found in *L. cataphracta*. In *L. lata* there is, in addition, a small patch of large denticles along the margin of the operculum (fig. 10).

Colour (in alcohol). — Ground colour yellowish. Dorsal region light brown. Dorsal fin and pectoral fins evenly brown. Pelvic fins with inconspicuous brownish dots.

(?) *Loricaria* species incerta sedis
(figs. 11, 12n-o, table I)

Loricaria lata; Eigenmann & Eigenmann, 1889 [non *L. lata* Eigenmann & Eigenmann, 1889, *sensu stricto*]: 36–37 (in original description, composite; in part; locality “Goyaz”).

Specimens examined. — MCZ 46722, 3 *paralectotypes* of *Loricaria lata* Eigenmann & Eigenmann, 1889, *sensu lato*, 102.9 to 108.4 mm standard length, Brazil, Goyaz, coll. Senhor Honorio, exact data and locality unknown.

Description (for actual measurements see table I). — Morphometric and meristic data based on the three specimens listed above: standard length 104.3, 102.9, 108.4 mm; predorsal length 3.0, 3.0, 2.9 in standard length; head length 4.2, 4.2, 4.2 in standard length; head width 5.1, 5.4, 5.2 in standard length, 1.2, 1.3, 1.3 in head length; head depth 10.2, 10.2, 10.3 in standard length, 2.4, 2.4, 2.5 in head length; snout length 7.4, 7.5, 7.4 in standard length, 1.7, 1.8, 1.8 in head length; orbital diameter 6.4, 7.0, 6.0 in head length; interorbital width 4.8, 5.2, 4.8 in head length; internasal width 5.9, 5.3, 5.4 in head length; dorsal spine length 6.7, 5.4, 4.9 in standard length; length first dorsal ray 5.9, 5.6, 6.3 in standard length, 1.4, 1.3, 1.5 in head length; length last dorsal ray 10.4, 18.0, 11.6 in standard length, 2.5, 4.3, 2.7 in head length; length dorsal fin base 9.9, 9.8, 9.6 in standard length, 2.3, 2.3, 2.3 in head length; anal spine length 5.4, 5.5, 5.6 in standard length, 1.3, 1.3, 1.3 in head length; pectoral spine length 4.6, 4.7, 4.4 in standard length, 1.1, 1.1, 1.1 in head length; pelvic spine length 4.3, 4.6, 4.3 in standard length, 1.0, 1.1, 1.0 in head length; length lower principal caudal ‘spine’ (unbranched ray) broken in all three specimens; cleithral width 4.9, 5.1, 5.0 in standard length, 1.2, 1.2, 1.2 in head length; supra-cleithral width 6.8, 7.1, 7.0 in standard length, 1.6, 1.7, 1.7 in head length; thoracic length 6.8, 7.8, 6.9 in standard length, 1.6, 1.9, 1.6 in head length; abdominal length 5.3, 5.1, 5.4 in standard length, 1.3, 1.2, 1.3 in head length; post-anal peduncular length 2.2, 2.2, 2.2 in standard length; depth caudal peduncle 14.6, 15.4, 13.0 in head length; width caudal peduncle 7.7, 8.2, 9.2 in head length; distance between anus and anal fin origin 8.8, —, — (damaged in two latter specimens) in standard length, 2.1 in head length; longest barbel of upper lip 11.9, —, — (damaged in latter two specimens) in standard



FIG. 10. *Loricaria lata*. Lectotype (MCZ 46721), lateral view of head.

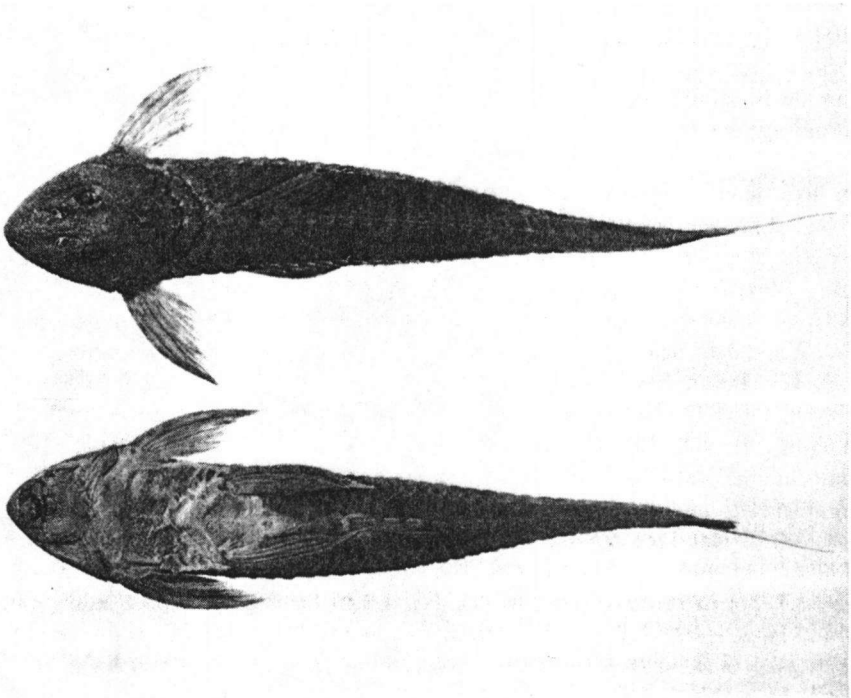


FIG. 11. (?) *Loricaria* species incerta sedis. Paralectotype (MCZ 46722) of *Loricaria lata*, *sensu lato*, in dorsal (above) and ventral (below) view.

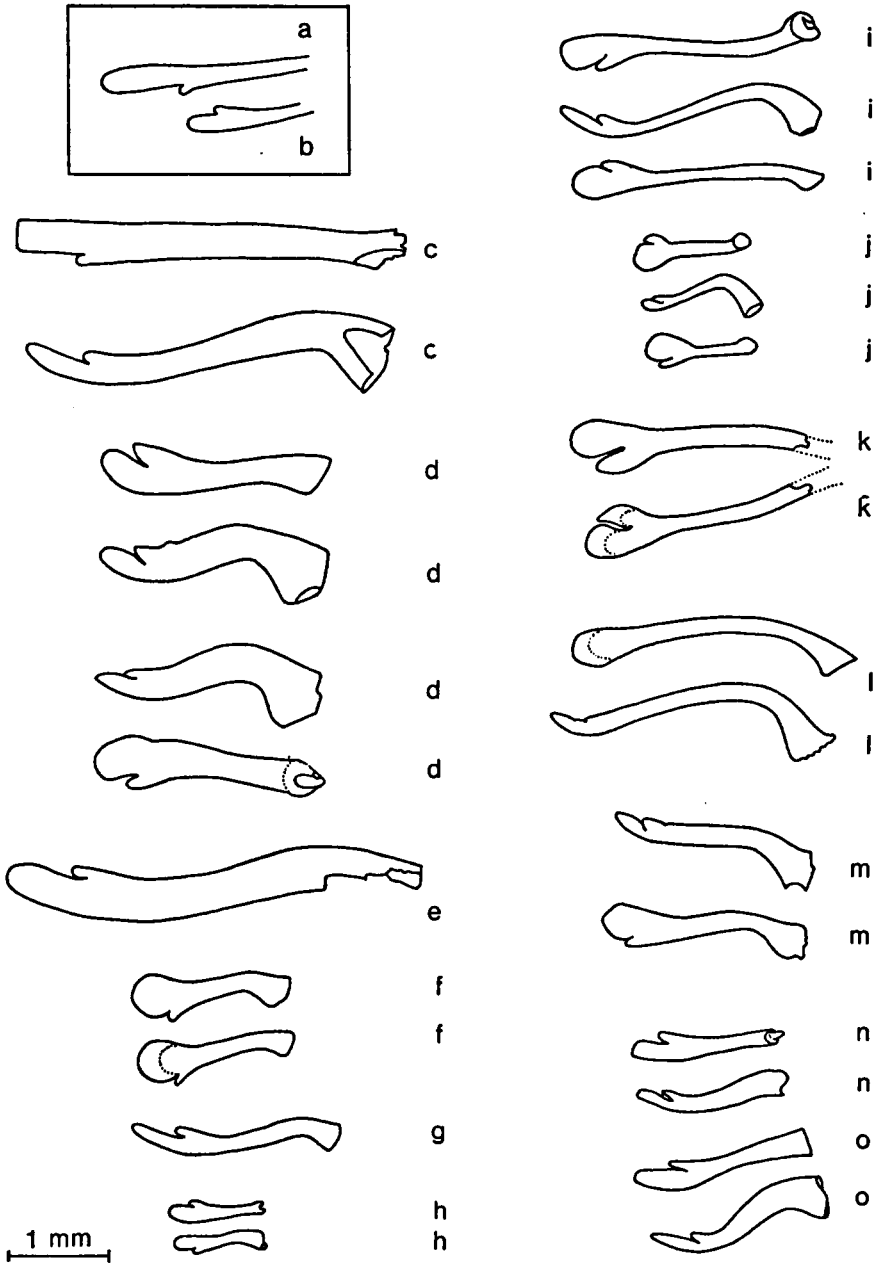


FIG. 12. *Loricaria*. Profiles of the teeth from: a- upper, and b-lower jaw of *L. flagellaris*, holotype (not exactly to scale, from a hand sketch); c- upper, and d-lower jaw of *L. cataphracta*, neotype; e- upper, and f- lower jaw of "*L. cirrhosa*", lectotype; g- upper, and h- lower jaw of "*L. cirrhosa*", paralectotype; i- upper, and j- lower jaw of *L. carinata*, holotype; k- and l- upper, and m- lower jaw of *L. lata*, lectotype; n- upper, and o- lower jaw of "(?) *Loricaria* species incerta sedis". Each letter represents a single tooth.

length, 2.8 in head length; greatest axial length of lower lip 4.1, 4.5, 3.4 in head length; barbels of lower lip very small.

Body scutes in longitudinal lateral series 32, 32, 31, last scute on caudal peduncle. Scutes between dorsal spine and caudal fin 26, 26, 25. Scutes between anal fin origin and caudal fin 21, 21, 21. Post-occipital scutes 2 in all three specimens, predorsal shield not included. Between anus and anal fin 3 pairs of scutes in all three specimens. There are 6/5, 6/7, 6/6 (left/right) oblong scutes on thorax between last pectoral fin ray and pelvic spine. Fin spine and ray counts are exactly as those in *L. cataphracta*.

The three specimens at hand do not show structural differences between the lips. Upper lip with numerous barbels of various lengths. Lower lip surface with numerous papillae, which are rather long towards the buccal cavity, decreasing in size towards the margin. Along the margin there are numerous short barbels. In the buccal cavity, at either side between the upper and lower jaws, there is a fleshy, barbel-like flap, as long as or a little longer than the longest tooth. The lips are not in a perfect condition. Teeth in both jaws; in the upper jaw there are (right/left) 4/4, 2/3, 5/5 teeth, in the lower jaw 4/4, 4/4, 4/4.

Eye large, oval in shape, pupil covered by a conspicuous flap, rounded ventrally, originating from the iris. Shallow orbital notch present. A small, but conspicuous concentration of denticles at the end of the occipital process in two of the specimens. The dorsal surface of head and snout granular, more so than in *L. cataphracta* and allied species. Irregular structure of platelets covers head and snout dorsally. Belly almost entirely naked, without platelets; there is a number of very small patches of denticles in the skin, irregularly arranged, more numerous anteriorly. Along the lateral body scutes, two distinct rows of denticles converge posteriorly and run parallel along the last (left/right) 18/18, 19/21, 21/19 scutes.

Sensory canals present on head and between converging rows of denticles, the latter sometimes bifurcated.

Colour (in alcohol). — Ground colour tan. There are traces of about six transverse, dorsolateral bands. Four spots on pectoral spine, and few on pectoral rays. Three spots on pelvic fin spine, four on anal fin spine. Pigmentation brown. The colour of this species was described by Eigenmann & Eigenmann (1889: 37; 1890: 385) as: "... young [of supposed *L. lata*] with five cross bars which are most prominent on the sides; all the fins more or less spotted; upper lip and barbel dotted."

DISCUSSION

Loricaria flagellaris differs slightly from *Loricaria cataphracta*. It is possible, that this is due to the manner of preservation of the holotype of *L. flagellaris*. Apart from differences in head width, dorsal spine length, anal spine length, pelvic spine length, cleithral width, interorbital width, and internasal width, *L. flagellaris* has a lower number of scutes between anal fin origin and caudal fin (22 in *L. flagellaris* against 23—24 in *L. cata-*

phracta). The main character by which the single known specimen of *L. flagellaris* is distinguished from *L. cataphracta* is the possession of rather heavy denticles along the snout margin. Examination of larger numbers of *L. cataphracta* in future may or may not prove that a difference on specific level exists.

Loricaria carinata differs only slightly from *L. cataphracta* in morphometric and meristic data, and again these differences might be the result of the state of preservation of the holotype of the former species. Morphometric differences are found in head width, interorbital width, internasal width, length dorsal fin base, cleithral width, thoracic length, depth caudal peduncle, width caudal peduncle, and in distance between anus and anal fin origin. The type locality of *L. carinata* should be restricted, if possible, so that freshly preserved specimens can be compared with *L. cataphracta*. Nothing is known of the structure of the lips in *L. carinata*.

Loricaria lata closely resembles *L. cataphracta*. *L. lata* differs from the latter species by the possession of prominent denticles along the margin of the operculum. Moreover, there are differences in head length, head width, dorsal spine length, length of the first dorsal ray, anal spine length, and in distance between anus and anal fin origin. The type locality of *L. lata* should be restricted.

The doubtful "*Loricaria*" species incerta sedis described above differs from the others mentioned in this paper in eight morphometrical aspects: predorsal length, head length, snout length, cleithral width, supra-cleithral width, abdominal length, width caudal peduncle, and in distance between anus and anal fin origin. I am of the opinion that it is more closely related to e.g. *Loricaria evansii* Boulenger, 1892 (of which I examined the holotype, BMNH 1892.4.20.29, from "River Jangada", state of Mato Grosso, Brazil), than to the species of the *L. cataphracta* group.

Loricaria cirrhosa Perugia, 1897, is preoccupied by *Loricaria cirrhosa* Bloch & Schneider, 1801, and is not identical with *Loricaria cataphracta* Linnaeus, 1758. With the present lack of thorough knowledge of the systematics within the family Loricariidae, I feel that there might be some valid argument against renaming a homonymous nomenclatural item. *Loricaria cirrhosa* Perugia, 1897, closely resembles my "*Loricaria*" species incerta sedis described above, and might prove to be identical with it.

Recently (Isbrücker, 1971b: 12, 16), I proposed the terms paraneotype and alloneotype for specimens belonging to a sample from which a neotype is chosen. Since apparently few taxonomists agree with my philosophy of the neotype concept, I decided to delete these new terms in the manuscript of the present paper.

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