THE SOUTH AMERICAN NEMATOGNATHI OF THE MUSEUMS AT LEIDEN AND AMSTERDAM

by

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The collections of the South American Nematognathi in the Rijksmuseum van Natuurlijke Historie at Leiden, referred to in this publication as "Museum Leiden", and of those in the Zoölogisch Museum at Amsterdam, referred to as "Museum Amsterdam", consist of valuable material, which for a very important part has not been studied yet.

I feel very much obliged to Prof. Dr. H. Boschma who allowed me to start with the study of the Leiden collections and whom I offer here my sincere thanks. At the same time I want to express my gratitude towards Prof. Dr. L. F. de Beaufort, who has been so kind to place the collection of the Zoological Museum at Amsterdam at my disposal. Furthermore I am greatly indebted to Dr. F. P. Koumans at Leiden for his assistance and advice to solve the various problems which I met during my study.

The material dealt with here comes from a large number of collections of different collectors, from various areas of South America, it consists of 125 species, belonging to 14 families of the order Nematognathi. Contrary to the original expectations no adequate number of specimens from Surinam could be obtained to get a sufficient opinion about the occurrence of the various species, and, if possible, also about their distribution in this tropical American part of the Netherlands. On the whole the collections from Surinam were limited to the generally known species only. *Pygidium gracilior* Eigenm., hitherto not known from Surinam, forms an exception in this respect. Out of the 125 species described in the present paper only 41 originate from Surinam. At the beginning of Bleeker's (1864) investigations of the Nematognathi in the collections of the Museum Leiden and the Museum Amsterdam, there were 23 species from Surinam. During his work, however, he increased this number with 21 species. The additions of 7 newly founded species by Bleeker must be cancelled, because of their

being synonyms of already classified ones. In Bleeker's time therefore 37 species from Surinam were present in the collections. This number since has been increased with 4 species, which means that an important task for investigators is still to be accomplished. From the literature I could collect the particulars of 50 species from Surinam, 35 from French Guiana and 48 from Demerara. The expedition to British Guiana, led by Prof. Dr. C. H. Eigenmann (1912), collected 76 species of Nematognathi. I must, however, draw attention to the fact that among the stated totals the species mentioned therein are partially different from those referred to above. As Surinam belongs to the same geographical area as those above mentioned, the presence of the same species as in the said regions may, to a certain extent, be expected.

It is a matter of fact that a more intensive way of collecting than at present was possible would yield a great number of species of Nematognathi from Surinam, which until now have not yet been recorded for the country.

When in the statements of the studied species nothing is said about the preservation, they are preserved in alcohol. Stuffed specimens are specially mentioned.

The names of the localities are given as written on the labels and checked according to Stieler's Atlas. In cases, where these names wanted correction or where in any way they were liable to comment, it is to be found in the description of the specimens.

Finally I wish to thank Mr. P. van 't Zelfde for the figures of the new species.

Various species of the order Nematognathi have already drawn attention of investigators of the South American fauna. There are figures and more or less good descriptions by the pre-Linnean authors Marcgravius (1648), Willoughby (1686), Gronow (1754) and Seba (1758). In a very limited number of cases is it possible, with their plates and descriptions, to find out with which of the now known species those can be identified. The figure of the Bagre de Rio of Marcgravius (1648), for instance, represents *Rhamdia quelen* (Quoy & Gaimard), and the animal named by this author Bagre without any doubt is *Pimelodus clarias* (Bloch); the Clipbagre probably is *Franciscodoras marmoratus* (Reinhardt), whereas the Tamoata undoubtedly is *Callichthys callichthys* (L.). I have every reason to state this on account of certain typical characters of the figures. The descriptions are totally unadequate.

Willoughby (1686) copied these figures and descriptions unaltered.

Gronow (1754) came forward with an important improvement by giving detailed and accurate descriptions, in some cases even with measurements. The figures themselves are more accurate. Moreover, he classified forms with corresponding characters in separate genera.

Seba (1758) gives very accurate figures; his descriptions, however, although rather detailed, are incomplete. Under the names Mysti, Barbeau or Barbu he brings together all the forms that have barbels, so, besides the Nematognathi, this group includes some fishes of other groups too. He divides them into two classes:

I. Cauda bifurcata et appendice cutacea in extremo dorso.

II. Mysti cauda in extremo vel aequali, vel levissime bifida, quorum alii appendice dorsali gaudent alii carent.

Linnaeus (1758, 1766) included in the order Pisces Abdominales under the genera *Silurus* and *Loricaria* all forms of the group known to him. Bloch (1794) separated from the genus *Silurus* a genus *Platystus;* so he consequently had 3 genera, viz., *Silurus, Platystus* and *Cataphractus* = *Callichthys* L.

Lacépède (1803) classified 15 genera, of which 8 were of South American origin, viz., the genera *Silurus, Pimelodus, Doras, Cataphractus* = *Callichthys, Ageneiosus, Loricaria, Hypostomus* = *Plecostomus,* and *Corydoras.*

Mitchill (1814), Von Humbolt (1806), Lichtenstein (1829), Jenyns (1842), Temminck (1845), Müller & Troschel (1845), Schomburgk (1848), Kner (1853, 1858), Castelnau (1855) and Günther (1864) united all forms of the group known to them, in the family Siluridae.

Agassiz (1829) did so too, though he already stipulated that the characters of some genera had the value of family characters. As a consequence he created a separate family Goniodontidae. It was Bleeker who introduced important modifications in the systematics of the group by creating the order Siluri, which in 1858 he divided into 4 families, the number of which in 1863 he augmented to 6, viz., Loricarioidei, Callichthyoidei, Siluroidei, Aspredinoidei, Chacoidei and Heterobranchoidei.

Gill (1870) replaced the name of the order Siluri by Nematognathi, of which Cope (1870) gave the following definition: "Praecoracoid arch present. No coronoid or symplectic bones. Parietals and supraoccipital confluent, four anterior vertebrae coössified, and with ossicula auditus. No mesopterygium. Basis cranii and pterotic bone simple, third superior pharyngeal bone wanting, or small and resting on the fourth, second directed backward. One or two pairs of basal branchihyals, two pairs of

branchihyals. Suboperculum wanting, premaxillary forming mouth-border above. Interclavicles present." Cope divided the order into 3 families.

Gill (1872) changed this division altogether and introduced 11 families.

Eigenmann & Eigenmann (1890 b) added to these 11 families that of the Diplomystidae. Eight out of these families occur in tropical America only. Four of them are subdivided into a number of subfamilies. This classification by Eigenmann & Eigenmann (1890 b) was considered as being to a certain extent provisionally; although in Eigenmann's later publications he adhered to this system. In 1925 he promoted all subfamilies, with the exception of the Loricariidae, to families without any further explanation. It is true, indeed, that the value of the characters, which led to the classification of subfamilies is of sufficient importance to warrant a division of the Nematognathi into 16 families, 14 of which are represented in the collections described in the present paper.

The key to the 14 families, of which specimens are described in the present paper, gives the explanation why the chosen division is the most logical. The important morphological and anatomical differences between the Ariidae, Callophysidae, Pimelodidae, Auchenipteridae, Ageneiosidae and Doradidae render it impossible to include these as subfamilies in the family Siluridae.

When I started to divide the family Doradidae into genera I followed the thoroughly altered system given by Eigenmann (1925), which strongly differs from that given by Eigenmann & Eigenmann (1890 b) and that used by Eigenmann (1906 and 1912). The division into genera according to this system is based on a number of anatomical characteristics, viz., the exaggerated development of the parapophyses of the fourth vertebra, associated with the peculiar air-bladder and Weberian apparatus. This system in almost all respects runs parallel with that of Bleeker (1863 b), whose system is totally founded on morphological characteristics. From Eigenmann's use of anatomical characters one may notice at once that the old division can be considered to be exact. Eigenmann has even added a number of new genera. I could increase the number of species of the genus *Megalodoras* with a new one, which I named *Megalodoras paucisquamatus* nov. spec., on account of the small number of scutes in the lateral series. The foregoing plainly shows how essential a minute comparison of the anatomical characters is to confirm the results of the morphological analysis. It is to be regretted that I could not do a thorough research in more genera because the limited number of specimens of each species did not justify the loss connected with anatomical analysis.

Under the circumstances I have tried to define the limitations of the

species as accurately as possible by availing myself of the data of a number of essential coefficients. When it could be stated that the limits of the characteristics of a species agreed with all the characteristics of those of a related species I felt justified to unite the species.

Thus I came to the conclusion that the following species are synonyms:

Aspredo aspredo (L.) and *Aspredo sicuephorus* Cuv. & Val.;

Platystacus cotylephorus (Bloch) and *Aspredo nematophorus* Bleeker;

Bunocephalus verrucosus (Bloch) and *Bunocephalus gronovii* Bleeker;

Felichthys marinus (Mitchill) and *Pimelodus filamentosus* Bleeker and *Galeichthys bahiensis* Castelnau;

Hexanematichthys rugispinis (Cuv. & Val.) and *Arius dieperinki* Bleeker and *Tachisurus* (*Hexanematichthys*) *rugispinis phrygiatus* Eigenm. & Eigenm.;

Rhamdia quelen (Quoy & Gaimard) and *Rhamdia sebae* (Cuv. & Val.), *Pimelodus holomelas* Günther, *Rhamdia sebae kneri* (Steind.) and *Rhamdia sebae martyi* Güntert;

Amblydoras hancocki (Cuv. & Val.) and *Amblydoras truncatus* Bleeker;

Pterygoplichthys multiradiatus (Hancock) and *Pterygoplichthys lituratus* (Kner), *Pterygoplichthys etentaculatum* (Spix), *Pterygoplichthys pardalis* (Castelnau) and *Pterygoplichthys jeanesianus* (Cope);

Otocinclus affinus Steind. and *Otocinclus vestitus* Cope;

Loricaria lima Kner and *Hemiloricaria caracassensis* Bleeker.

I am convinced that this list is far from being complete, but for more complete results the study of the type-material is absolutely necessary.

In the collections described the following holotypes are present: *Platystacus nematophorus* Bleeker, *Netuma dubia* Bleeker, *Hexanematichthys hymenorrhinus* Bleeker, *Hexanematichthys surinamensis* Bleeker, *Megalodoras paucisquamatus* nov. spec., *Corydoras raymundi* Steind., *Hemipsilichthys cameroni* Steind., *Hypostomus serratus* Cuv. & Val., *Hemiloricaria caracassensis* Bleeker; moreover there are paratypes of: *Netuma dubia* Bleeker, *Pseudopimelodus albomarginatus* Eigenm., *Chasmocranus longior* Eigenm.,*Pimelodella megalops* Eigenm., *Doras affinis* Kner, *Leptodoras linnelli* Eigenm., *Auchenipterus brevior* Eigenm., *Lithoxus lithoides* Eigenm., *Loricaria griseus* Eigenm.

The type-material which I had at my disposal I used, either to prove the necessity of uniting a number of species, or to justify, in some cases, the right of their existence. As to the literature I was in a rather awkward position, because books and papers concerning this subject are very scarce in the Dutch libraries, so I could not consult many of the South American publications. I made special use of the excellent publications by Eigenmann

& Eigenmann (1890 a and 1890 b) and by Eigenmann (1906, 1912, 1919-1920 and 1925). The publications by Kner (1854 a, 1854 b, 1855, 1857, 1858) and by Steindachner (1875 a, b, c, 1876 a, b, 1879 a, b, c, 1881-1883, 1906, 1910 b, 1915 a, b, c, 1917 a, b) are out of date, and their accuracy is hardly sufficient for a comparative analysis. Ribeiro's monograph (1911) on the material in the Museum at Rio de Janeiro gives many obsolete names; many statements ought to be seriously checked, and, if possible, corrected. The publications by Bleeker (1858, 1863 b, 1864), especially the latter, containing the description of the specimens seen by Bleeker in the collections of the Museums at Leiden and at Amsterdam, enabled me to investigate the specimens as far as they were still there and to check his results. I could ascertain many errors in the descriptions as well as in the measurements.

By comparing the results obtained by the investigators named above, I found rather large deviations, so that I considered it my duty to give a description of the material as I found it in the collections of the Museums at Leiden and at Amsterdam myself. Afterwards I compared my results with those of others. In some cases my statements, figures and measurements ran parallel with those obtained by other investigators, in others they differed to a great extent. I therefore conscientiously limited myself to give accurate descriptions of the specimens at my disposal, and made remarks here and there as to why and where my results differ, as far as regards the characteristics and proportions, from those of the literature. To draw conclusions from those differences in many cases was impossible because I had not the material described by others at my disposal and as a consequence could not ascertain the proportions in order to obtain comparable statements.

The measurements of the specimens, or of their various parts, always were taken in the same manner, so that the proportions always were arrived at in a similar manner, whereby a comparison of the data always is possible without a chance of confusion.

The length of the specimens was measured from the point of the snout either to the points of the lobes of the caudal fin (when the caudal was forked), or to the tip of the longest centre rays of the caudal fin (when the caudal was rounded).

When, in the case of a forked caudal fin, the length of each of the lobes was different, the length was measured to both of the ends of the lobes, and the averages of the two measurements was taken. As the length of the caudal fin, within the species, varies considerably, the measurement in this way is of little value for a base of further calculations. Therefore the

"standard length" was used, i. e., the length from the tip of the snout to the base of the caudal fin.

An impression of the shape of the body was obtained by using the following proportions:

1, depth of body to standard length;

2, depth of caudal peduncle to standard length;

3, largest width of body to standard length;

4, length of head to standard length;

5, distance between tip of snout and base of dorsal spine to standard length.

The shape of the head was determined by the following proportions:

1, largest width of head to length of head;

2, when the snout was not pointed, moreover width at the rictus to length of head;

3, largest height of head to length of head;

4, diameter of eye to length of head;

5, diameter of eye to length of snout (= distance of anterior edge of eye to tangent at point of snout);

6, diameter of eye to interorbital (= distance between upper edges of eyes measured across the head);

7, in special cases, when the under edge of the eye lies under the level of the mouth, the proportions were moreover determined by the factor diameter of eye to interocular distance (= distance between the under edges of the eyes measured underneath the head).

The data concerning the fins were fixed by the proportions of the length of their bases to the standard length and by their mutual situation.

The first ray of the dorsal fin and the pectoral fins has, as a morphological characteristic, a positive and a negative meaning. In the Nematognathi this first ray is transformed into a spine, furnished to a higher or lesser degree with hooks, thorns or sawteeth, as typical specific characters. It is, however, an essential family character when the first finray is not spine-like.

The colour and the colour-design of the described specimens are of little systematical value. The specimens were preserved in alcohol during a long time. Yet I recorded the colours as I found them, although for the greater part they are no longer in accordance with those of the living fish. From the designs, if still noticeable, I learned that they vary considerably with age, sex, and locality. When I found, in a few special cases, in the literature a description of the colour of the living fish, I mentioned this with the name of the author and of the locality of the specimen concerned.

Key to the 14 families of the South American Nematognathi dealt with in the present paper

The families Diplomystidae and Astroblepidae are not mentioned, because I had no specimens to investigate, moreover, the descriptions by others have not sufficiently convinced me to accept their existence without research.

a. Body naked. Mouth terminal or sub-terminal.
  b. Operculum small, gill-opening reduced to a slit in front of the pectorals. No adipose fin. Dorsal fin short. Pectorals with a strong spine.
    c. Tail long, with a median dorsal fold. The distance from the vent to the tip of the snout less than half the distance between the vent and the base of the caudal. Neural spines of the coalesced vertebrae forming a ridge from the occipital to the dorsal. Anal fin long, 50-60 rays. Aspredinidae
    cc. Tail short, vent nearly equidistant from the tip of the snout and the base of the caudal. Anal fin short, 6-9 rays. Bunocephalidae
  bb. Operculum well-developed, gill-opening usually wide. Maxillary small.
    d. Airbladder well-developed, simple or divided into sections by transverse constrictions. The bladder lies free in the abdominal cavity.
      e. Dorsal fin over the abdominal portion of the vertebral column. Anal fin not very long, its origin far behind the vertical from the last ray of the dorsal fin.
        f. Gill-membranes free from the isthmus.
          g. Nares approximate, the posterior with a valve. Ariidae
          gg. Nares remote, barbels six.
            h. Teeth incisor-like, in two series in the upper jaw and in a single series in the lower jaw. The first dorsal and pectoral rays are not spine-like. Adipose fin long. Callophysidae
            hh. Teeth villiform, in bands in both jaws. Teeth on the vomer, when present, in small patches. Pimelodidae
        ff. Gill-membranes united and joined to the isthmus. Nares remote, without barbels. Maxillary barbels present.
          i. Maxillary and mental barbels present. Auchenipteridae
          ii. Very short maxillary barbels only. Ageneiosidae.
      ee. Dorsal fin over the caudal portion of the vertebral column, anal fin very long, nearly as long as the tail, at any rate its origin far in advance of the vertical from the first dorsal ray. Dorsal and pectoral without spines. Adipose minute. Eyes very small, directed upwards and outwards. Helogeneidae
    dd. Airbladder double, divided into two small sections, one on either side of the coalesced vertebrae.
      j. A small adipose present. Dorsal fin over the anal. The anal fin is very long, $^2/_3$ of the standard length, with 34 or more rays. Eye lateral, partly below the level of the angle of the mouth. Hypophthalmidae
      jj. Without adipose fin.
        k. Dorsal fin entirely in front of the ventrals. A narrow band of conical teeth on each side. Eye almost entirely concealed under the skin. Cetopsidae
        kk. Dorsal fin situated over or behind the ventrals. The dorsal and pectoral fins without spines. Nares remote, the anterior with a barbel. Two maxillary barbels. Opercle and interopercle generally erectile. Pygidiidae
aa. Body with one series of bony plates along the sides, each plate with a more or less strong median backwards directed spine. Doradidae
aaa. Body with a double series of bony plates, which meet along the middle of the

sides, and which are not developed in specimens with a length less than one centimeter. Callichthyidae

aaaa. Body more or less completely covered with several series of bony plates. Sometimes the lower surface of the body is partly naked. Mouth inferior, provided with a broad disk-like lip. Adipose fin, when present, with a spine and a thin membrane. Anal fin short. Loricariidae

ASPREDINIDAE

Aspredinoidei Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 117.
Aspredinia Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 266.
Aspredinidae Gill, Arrangement of the Families of Fishes, 1872, p. 19.

Body naked. Mouth subterminal. Opercle minute, a mere vestige. Neural spines of the coalesced vertebrae forming a ridge from the occipital to the dorsal. Caudal vertebrae greatly compressed, their neural spines expanded. Gill-openings reduced to a slit in front of the pectorals. Air-bladder well-developed. No adipose fin. Teeth villiform. Nares remote. Dorsal short, over the ventrals. Pectoral with a strong spine. Tail long with a median dorsal fold. Anal long, 50-60.

Chamaigenes Eigenmann

Chamaigenes Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 380 (name only).

Type: *Aspredo filamentosus* Cuv. & Val.

Head without prominent hooks on the ethmoid, but the nasals with a hook, which is partially concealed. Maxillary barbels each with a complementary barbel at its base. A single pair of mental barbels. From the angle of the mouth a series of marginal tentacles on the lower side of the head and the breast to beyond the base of the pectorals.

Chamaigenes filamentosus (Cuv. & Val.)

Aspredo filamentosus Cuvier & Valenciennes, Hist. Nat. Poiss. 15, 1840, p. 324, pl. 450 (Cayenne);—Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 270 (Demerara);—Eigenmann & Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 26 (name only).

Platystacus filamentosus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 50 (name only);—Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 24 (name only).

Chamaigenes filamentosus Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 380 (name only); — Mem. Carn. Mus., 5, 1912, p. 121 (Georgetown).

Museum Amsterdam:

Georgetown market, British Guiana Exp., 1908, Eigenmann, 1 ex., exact length unknown.

Some characters as length, standard length and the correct number of anal rays cannot be given because the posterior part of the tail is broken off.

Body and tail long and slender, head broad and greatly depressed. Depth

of the head half its width. Its width 1½ in its length to the tip of the occipital process, and nearly equal to the distance between the tip of the snout and the upper angle of the gill-opening. From the base of the long narrow occipital process two prominent ridges run forward, forming the supra-orbital edges meeting on the tip of the snout. The ridges enclose a fontanel which is divided in two parts by a long bridge.

Eye small, about 5 in the snout, 14 in the head, 4 in the interorbital.

Width of the mouth 3 in the maximum width of the head. Maxillary barbel reaching the gill-opening, adnate, with a small barbel at its base opposite the corner of the mouth; a series of marginal tentacles on the lower side of the head and the breast to beyond the base of the pectoral. A pair of post-mental barbels in the middle; no mental barbels.

The dorsal fin has an extremely elongate first ray, the length of which 1¾ in the distance from its base to the tip of the snout; its last ray adnate for half its length. The humeral process triangularly pointed, a round pectoral pore near its tip. Pectoral spine reaching the base of the ventrals, with strong hooks on its inner margin, increasing in size towards the tip; and small hooks on the outer margin at right angles to the spine.

Chocolate coloured, without blotches, lower surface plain. Anterior part of the anal hyaline; ventrals dusky, other fins blackish.

D. I/4.

Aspredinichthys Bleeker

Aspredinichthys Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 118 (*tibicen*).
Type: *Aspredo tibicen* (Temminck), Cuvier & Valenciennes, Hist. Nat. Poiss. 15, 1840, p. 325 (Surinam).

Readily distinguished by the four nasal spines and the marginal tentacles on the lower surface of the head and on the breast.

Aspredinichthys tibicen (Temminck)

Aspredo tibicen (Temminck), Cucier & Valenciennes, Hist. Nat. Poiss. 15, 1840, p. 325 (Surinam); — Müller & Troschel, in Schomburgk, Reisen 3, 1848, p. 630 (Coast of Guiana); — Günther, Cat. Fish. Brit. Mus. 5, 1864, p. 270 (British Guiana); — Eigenmann & Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 26 (Surinam, British Guiana, Caruca, Rio Muria).

Platystacus tibicen Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 50;—idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 24 (Caruca, Rio Muria);—Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 386 (Rio Muria, Estado de Para, Br. Guiana).

Aspredinichthys tibicen Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 118;—Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 381 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 122 (Georgetown market).

Museum Leiden:

No. 3111, Surinam, Dieperink, 1 ad. ♀, 201 mm.
No. 3112, Surinam, Dipering, 1 juv., 153 mm.
No. 10275, Berbice river, Young, 1 ad. ♀, 218 mm; 1 ad. ♂, 220 mm.

Museum Amsterdam:

Georgetown market, British Guiana Exp., 1908, Eigenmann, 1 ♂, 145 mm; 2 ♀♀, 130 and 132 mm.
South America, 1 ♀, 170 mm.

Eigenmann gives this species as the most abundant of the banjomans in British Guiana. In the Leiden collection there are only 4 specimens, 2 collected by Mr. Dieperink in Surinam, a female and a young one and 2 from British Guiana, a male and a female collected by Mr. Young. There are no specimens of this species in the collections of Mr. Van Heurn and Mr. Cossee, taken partly from the town market of Paramaribo. Probably this species is not so abundant in Surinam.

Head somewhat elongate, subconical, 4¾ in standard length. Interorbital width 4-4½ in the distance between tip of snout and base of pectoral. Mouth narrow, snout little projecting, teeth fine and long, the intermaxillary band continuous. Maxillary barbels reaching to the gill-openings in the adult specimen, to the middle between snout and gill-opening in the young; an accessory barbel on the anterior margin of the maxillary barbel. Lower surface of the head and breast with 2 series of barbels on each side to about the base of the pectoral. A pair of mental barbels nearly equidistant from each other as well as from the mouth, not reaching the postmental barbels, which are nearly twice as far apart; lower surface of the head warty.

Eye rather large, 2 in interorbital, 15-22 in the head, 2½-3½ in the snout.

Coracoid processes diverging backwards, their length about 1-1½ in the distance between their bases. Humeral process co-extensive with the coracoid process, the pectoral pore, which is round, immediately below its termination.

Distance from dorsal fin to tip of snout 3½-4 in the standard length; first dorsal ray produced in a filament, which is much longer than the distance between its base and the tip of the snout in the male, but only $^2/_3$ of this distance in the female. Last dorsal ray adnate. Outer caudal rays slightly produced. Anal 58, last ray adnate. Pectoral spine flat, curved upwards and backwards, its posterior margin with a series of teeth which grow longer and stronger towards the tip, its anterior margin with weaker teeth; its tip reaching beyond the base of the ventral fin.

Colour slaty, marked with dark blotches. Ventrals and anterior part of anal hyaline, other fins black.

D. I/4. P. I/7. V. I/5. A. 58.

Aspredo Bleeker

Aspredo (ex Linnaeus, Mus. Adolphi Fred., 1754, p. 73) Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 117 (*batrachus*).

Type: *Aspredo batrachus* Gronow = *Aspredo aspredo* Linn.

Distinguished by the absence of marginal tentacles on the lower surface of the head and on the breast and by having a basal barblet on the maxillary. Snout without hooks.

Aspredo aspredo (L.)

Silurus aspredo Linnaeus, Syst. Nat., ed. 10, 1758, p. 304; ed. 12, 1766, p. 502.—Bonnaterre, Tabl. Encycl. Ichth., 1788, p. 150;—Lacépède, Hist. Nat. Poiss., 5, 1803, p. 78.

Platystacus aspredo Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 50 (Para, Arary);—idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 23 (Para, Arary);—Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 385 (copied).

Aspredo aspredo Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 26 (Guiana, Rio Para, Lake Arary);—idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 380 (name only);—idem, Mem. Carn. Mus., 5, 1912, p. 123 (copied);—Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 225 (Brazil, Surinam).

Platystacus laevis Bloch, Ausl. Fische, 8, 1794, p. 58;—Bloch & Schneider, Syst. Ichth., 1801, p. 373 (Amer. merid.).

Aspredo laevis Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 320 (Guiana); — Müller & Troschel, in Schomburgk, Reisen, 3, 1848, p. 630 (Waini).

Aspredo batrachus (ex Linnaeus, Mus. Adolphi Fred., 1754, p. 73) Gronow, Cat. Fish., ed. Gray, 1854, p. 137;—Bleeker, Silures de Suriname, 1864, p. 93 (Surinam);—Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 268, part. (Brit. Guiana, Cayenne, Surinam).

Aspredo sicuephorus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 326 (Mana);—Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 269 (copied);—Eigenmann, Proc. U. S. Nat. Mus., 14, 1891, p. 26 (French Guiana);—idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 380 (name only);—idem, Mem. Carn. Mus., 5, 1912, p. 124, pl. I fig. 1 (Georgetown).

Platystacus sicuephorus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), pl. 2, 1889, p. 50 (Curaca, Rio Muria);—idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 24 (Curaca, Rio Muria).

Museum Leiden:

No. 3010, Surinam, Dieperink, 1 ♀, 338 mm.
No. 3108, Surinam, Dieperink, 1 ♂, 278 mm.
No. 3109, Surinam, Dieprink, 2 ♀ ♀, 350 and 325 mm.
No. 3110, Surinam, Dieperink, 1 ♀, 302 mm.
No. 4744, South America, 1 ♂, 215 mm.
No. 6917, Surinam, Bleeker, 3 ex., 84, 110 and 192 mm.
No. 10726, Berbice river, Young, 4 ex., 213, 260, 315 and 335 mm.
No. 14797, Surinam, Mus. Cambridge, Mass., 1 ♀, 320 mm.
No. 17247, Surinam, Van Heurn, 1 ex., 326 mm.
No. 17248, Paramaribo, Van Heurn, 1 ex., 315 mm.
No. 17249, Paramaribo, Van Heurn, 1 ♀, 424 mm.

Museum Amsterdam:

Georgetown market, British Guiana Exp., 1908, Eigenmann, 1 ♀, 310 mm.
South America, 3 ♂ ♂, 180, 255 and 265 mm.

Body slender, largest width before the pectoral fins $5^1/_2$—6 in standard length. Head greatly depressed, spatulate, its length to the tip of the occipital process ± 4 in the head, interorbital $3^1/_2$ in the distance from base of pectoral to tip of snout. Mouth broad, half the width of the head, the snout projecting for its entire length, Each jaw with two patches of small villiform teeth, separated in the middle. Maxillary barbels reaching to the base of the pectorals, an accessory barbel in front, the maxillary barbel adnate. Mental barbels placed near the lip, extending to the postmentals which are equal in length to the interorbital.

Coracoid processes slightly diverging backwards, their length equal to the space between them. Pectoral pore minute, at the extremity of the coracoid process. Humeral process a little longer.

Distance from dorsal to tip of snout $3^3/_4$ in the standard length; first ray of dorsal more or less prolonged. Pectoral spine heavy, slightly curved, with strong teeth on the inner and outer margins; those on the inner margin almost straight, those on the outer margin pointed towards the tip of the spine.

Colour uniform light brown to purplish brown, ventral surface plain light. Anal and caudal fins dark, dorsal dusky.

D. 5. A. 53-57.

In his descripion of *sicuephorus* (1912b, p. 124) Eigenmann says: "I have also examined the specimens of the Leiden Museum and the British Museum. It is very probable that *aspredo* and *sicuephorus* are identical."

The characteristic difference between *aspredo* and *sicuephorus* is given in the length of the head, which in *aspredo* is more than 4 and in *sicuephorus* 4 or less in the standard length. In all the 20 specimens out of the Leiden collection, this proportion is about 4. It is remarkable that Eigenmann (1912b, p. 124) in his description of *sicuephorus* mentions: "Distance from snout to predorsal plate 4 in the length to tip or to base of caudal". He gives for *aspredo* A. 51-55 and for *sicuephorus* 54-57. In the specimens of the Leiden collection the anal is varying from 53 to 57. The specimens of the Leiden collection, seen by Eigenmann, are all *aspredo* with the head a little more than 4 in the standard length and the anal with 56-57 rays. In the specimen of *sicuephorus* of 310 mm in Museum Amsterdam, the distance from snout to predorsal plate is 76 mm, thus more than 4 in the length with caudal, the anal has 55 rays. Günther gives the differences between *batrachus* (= *aspredo*) and *sicuephorus* as: "*batrachus* head less than 4 and *sicuephorus* more than 4 in the length with the caudal." My conclusion is that *aspredo* and *sicuephorus* are identical, and the latter is a synonym of *aspredo*.

Platystacus Bloch

Platystacus Bloch, Ausl. Fische, 8, 1794, p. 52; Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 118.

Type: *Platystacus cotylephorus* Bloch.

Sternal and abdominal region without tentacles; maxillary barbel simple, without tributary barbels at its base; snout without spines.

Platystacus cotylephorus Bloch

Platystacus cotylephorus Bloch, Ausl. Fische 8, 1794, p. 54, pl. 372; — Bloch & Schneider, Syst. Icht., 1801, p. 372; — Bleeker, Silures de Suriname, 1864, p. 95 (Surinam); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 50 (Vigia, Para, Tajapuru); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 21 (Vigia, Para, Tajapuru); — Eigenmann, Proc. U.S. Nat. Mus., 4, 1891, p. 26 (Surinam, Rio Para); — idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 300 (name only). — idem, Mem. Carn. Mus., 5, 1912, p. 125 (copied); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 384, pl. 53 fig. 2 (without locality); — Fowler, Proc. Nat. Sc. Phil., 1915, p. 225 (Surinam).

Silurus cotylephorus Lacépède, Hist. Nat. Poiss., 5, 1803, p. 78.

Aspredo cotylephorus, Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 269 (Surinam).

Silurus hexadactylus, Lacépède, Hist. Nat. Poiss., 5, 1803, p. 82.

Aspredo sex-cirrhis Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 441.

Aspredo spectrum Gronow, Cat. Fish., ed. Gray, 1854, p. 137.

Platystacus nematophorus Bleeker, Silures de Suriname, 1864, p. 96, pl. I fig. 1 (Surinam); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 50 (name only); — Occ. Pap. Cal. Acad. Sc. vol. 1, 1890, p. 23 (name only).

Aspredo nematophorus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 270 (copied).

Museum Leiden:

No. 3106, Guiana, Ancien cabinet, 1 ex., 242 mm.
No. 3107, Surinam, Dieperink, 1 ex., 193 mm.
No. 10724, Berbice river, Young, 1 ex., 248 mm.
No. 11052, Surinam, Van Heurn, 3 ex., 192, 215 and 223 mm.
No. 17256, Surinam, Bolten, 5 ex., 94, 117, 220, 283 and 284 mm.
No. 17258, Paramaribo, Van Heurn, 1 ex., 265 mm.
No. 3105, Surinam, 1 ex., 177 mm., type of *Aspredo nematophorus* Bleeker.

Head greatly depressed, narrowed forwards, greatest width before the base of the pectoral fin, $5^3/_4$ in the standard length, the interorbital width 4 in the distance from the tip of the snout to the base of the pectoral. Length of the head 6-9 in the standard length. Width of the mouth equals the interorbital plus the orbits. Villiform teeth in the intermaxillaries in two patches; in the lower jaw wider patches with similar teeth. Maxillary barbels reaching to the gill-openings. Mental barbels not reaching to the base of the postmentals, which are as long as the width of the mouth.

Distanue from dorsal fin to tip of snout $3^1/_2$ in the standard length. First dorsal ray scarcely prolonged. Caudal emarginate, outermost rays prolonged; with four rows of papillae on the sides. Length of the coracoid processes $1\,1/4$ in the distance between their bases. Humeral process nearly

co-extensive with the coracoid processes. Pectoral pore below the tip of the humeral process.

Colour dark brown with lighter blotches. There is one specimen in the collection, which has the dorsal surface of the head plain light brown, a second with the whole caudal peduncle in this colour, whereas a third has the whole body coloured in this way.

D. I/4. P. I/7. A. 53.

The specimens mentioned above, except those which have the head 9 in the standard length, are all females, showing appendages serving to attach the eggs on the belly during the spawning time.

Platystacus nematophorus Bleeker, the type of which, the only specimen, is in the Leiden collection, is closely allied to *P. cotylephorus*. The length of the head to the gill-opening 9 in the standard length, which is also to be observed in some specimens of *cotylephorus*. The first dorsal ray is produced into a filament; this is undoubtedly a character of the male. The differences in the other characters all can be accepted as sexual differences. The specimen of *nematophorus* of Bleeker is a male of *cotylephorus*.

BUNOCEPHALIDAE

Bunocephalidae Eigenmann & Eigenmann, Amer. Naturalist, 1888, p. 647; — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 12.

Bunocephalinae Eigenmann, Mem. Carn. Mus., 5, 1912, p. 125.

Bunocephalidae Eigenmann, Trans. Amer. Phil. Soc., n.s., 22, 1925, p. 281.

Gill-opening reduced to a slit in front of the pectoral fin. Tail short. The vent is nearly equidistant from the tip of the snout and the base of the caudal. Teeth villiform, in bands on the jaws, no teeth on the vomer. Anal fin short, 6-9.

Bunocephalus Kner

Bunocephalus Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 95; — Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 118 (*verrucosus*).

Type: *Platystacus verrucosus* Bloch.

Tail short; dorsal well developed. Barbels 6, head depressed, without prominent knobs.

Bunocephalus verrucosus (Bloch)

Platystacus verrucosus Bloch, Ausl. Fische, 11, 1795, p. 63, pl. 373 fig. 3.

Silurus verrucosus Bloch & Schneider, Syst. Ichthyol., 1801, p. 379.

Aspredo verrucosus Cuvier & Valenciennes, Hist. Nat. Poiss. 15, 1840, p. 328.

Bunocephalus verrucosus Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 96 (Barra do Rio Negro); — Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 118; — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 266 (copied); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 48 (Serpa); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1,

1890, p. 16 (Serpa). — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 26 (Amazon); — idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 380 (name only).

Aspredo verrucosa Gronow, Cat. Fish., ed. Gray, 1854, p. 137.

Bunocephalus gronovii Bleeker, Ichth. Arch. Ind. Prodr., I, 1858, p. 329 (based on Gronow, Mus. Ichth., 2, 1756, p. 5, pl. 5 fig. 3); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 266 (Demerara); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 48 (name only); — idem, Occ. Pap. Cal. Acad. Sc. vol. 1, 1890, p. 17 (name only); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 26 (mouth of Rio Negro, Guiana); — idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 380 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 126 (copied).

Museum Leiden:

No. 14788, Serpa, Brazil, from Museum Cambridge, Mass., 1 ex., 112 mm.

Tail short, quadrangular, deeper than wide; body not greatly depressed. Head depressed, its greatest depth about half its width and 1½ in the space between tip of snout and base of pectoral. The length of the head 5 in the standard length, the greatest width 3½ in the standard length. Nuchal plate broad, its width at the base 3½ in its length, a transverse ridge at its base, turning abruptly backwards and exteriorly upwards; another transverse ridge in front of and connected with the former by a median ridge.

Eye very small, interorbital width greater than the length of the snout. Maxillary barbels reaching beyond origin of pectorals, mental barbels reaching to the postmentals, which are about as long as the width of the interorbital.

Teeth in two patches in each jaw.

Dorsal fin well developed, with 5 rays, the last of which is adnate. Distance from dorsal fin to tip of snout 2½ in the standard length. Coracoid processes not prominent. Humeral processes extending beyond the tip of the coracoid process and reaching to the middle of the pectoral spine. No prominent tentacles on the head. A slit-like pectoral pore. Pectoral spine slightly curved, its margin with recurved hooks, the largest towards the tip. Ventrals nearly equidistant from the tip of the snout and the base of the caudal. Anal with 6 rays. Caudal 4 in the standard length. Skin covered all over with warts.

Colour dark brown spotted with lighter brown. Belly lighter freckled with dark spots. All the fins dark brown, the rays with small transparent spots.

D. 5. A. 6. P. I/5.

When we compare the description given above with that given by Bleeker (1858, p. 329), of *Bunocephalus gronovii*, based on Gronow (1756, pl. 5 fig. 3) and the description by Günther (1864, p. 266), based on a specimen of 102 mm from Demerara, collected by Hancock, we arrive at the following conclusions:

1. The figure of *Aspredo verrucosa* (= *gronovii*) does not show the necessary particulars to create a new speces.

2. The description of *Bunocephalus gronovii* Bleeker by Günther, if complete, proves that *gronovii* and *verrucosus* are synonyms.

ARIIDAE

Tachisurinae Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sci., I, 1890, p. 29.
Ariidae Eigenmann, Transact. Amer. Phil. Soc., vol. 22, 1925, p. 281.

Gill-membranes free from the isthmus. Nares approximate, the posterior with a valve.

Felichthys Swainson

Breviceps Swainson, Class. Fish. Amph. and Rept., I, 1838, p. 328 (*bagre*).
Felichthys Swainson, Class. Fish. Amph. and Rept., 2, 1839, p. 305, substitute for *Breviceps* Swainson, preoccupied (*bagre*).
Ailurichthys Baird & Girard, Proc. Acad. Nat. Sc. Phil., 1854, p. 26 (*marinus*).
Aelurichthys Gill, Proc. Acad. Nat. Sc. Phil., 1863, p. 172, emendation.
Mystus Gronow, Cat. Fish., ed. Gray, 1854, p. 165 (*carolinensis*) (name preoccupied).
Pimelodus Bleeker, Silures de Suriname, 1864, p. 65 (*bagre*), not *Pimelodus* of Lacépède, as restricted by Gill.

Type: *Silurus bagre* L.

Nostrils close together, separated by a valve; lower jaw with only two barbels, band-like; dorsal and pectoral spines prolonged in filaments.

Felichthys marinus (Mitchill)

Silurus bagre (not of Linnaeus) Bloch, Ausl. Fische, 8, 1794, p. 27, pl. 365 (preoccupied); — Bloch & Schneider, Syst. Ichthyol., 1801, p. 377.
Silurus marinus Mitchill, Trans. Lit. and Phil. Soc. N. Y., vol. 1, 1814, p. 433.
Galeichthys marinus De Kay, Nat. Hist. New York, Zool., 4, 1842, p. 178, pl. 37 fig. 118 (New York?).
Ailurichthys marinus Baird & Girard, Proc. Acad. Nat. Sc. Phil., 1854, p. 26 (without locality); — Girard, U. S. & Mexico Boundary, 2, 1859, p. 31, pl. 14 (Indianola, Texas); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 148 (Rio de Janeiro, Para, Bay of Balady, Mobile Bay, Pernambuco, Victoria); — Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 36 (same localities).
Aelurichthys marinus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 178 (North America); — Goode, Proc. U.S. Nat. Mus., 2, 1879, p. 119 (St Johns River, Florida); — Steindachner, Denkschr. Akad. Wiss. Wien, 41, 1879, p. 10 (Orinoco near Ciudad Bolivar); — Jordan & Gilbert, Proc. U.S. Nat. Mus., 5, 1883, p. 246 (abundant from Pensacola, Florida, to Galveston, Texas); — idem, loc. cit., p. 584 (Charleston, S. C.); — Jordan, Proc. U.S. Nat. Mus., 6, 1883, p. 106 (Key West, Florida); — Jordan & Gilbert, Synopsis Fish. N. Am., 1883, p. 111 (Cape Cod to Mexico); — Jordan, Cat. Fish. N. Am., 1885, p. 16 (name only); — idem, Proc. U.S. Nat. Mus., 9, 1886, p. 26 (Beaufort, N. C.).
Felichthys marinus Gill, Proc. U.S. Nat. Mus., 13, 1891, p. 354 (without locality); — Jordan & Evermann, Bull. U.S. Nat. Mus., 47, I, 1896, p. 118 (Cape Cod to Texas); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, p. 351, pl. 51 fig. 2 (without locality); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 381

(name only); — idem, Mem. Carn. Mus., 5, 1912, p. 134 (Georgetown market); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 203 (Harvey Cedars, Great Egg Harbor, Corson's Inlet, Nicaragua, Wounta Haulover, Sea Isle City, New Jersey).

Felichthys filamentosus Swainson, Fishes, 2, 1839, p. 305 (based on Bloch, plate 365).

Pimelodus filamentosus Bleeker, Silures de Suriname, 1864, p. 67 (Surinam).

Galeichthys bahiensis Castelnau, Anim. Amer. Sud, 1855, p. 37, pl. XVIII fig. 1 (Bahia).

Galeichthys blochii Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 44 (Bahia).

Aelurichthys longispinis Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 178 (Mexico, South America); — Jordan, Proc. U.S. Nat. Mus., 1886, p. 559 (name only).

Galeichthys parrae Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 33 (New York, Charleston, New Orleans, Rio de Janeiro); — Castelnau, Anim. Amer. Sud. Poiss. 1855, p. 37 (Bahia); — Hyrtl, Denkschr. Akad. Wiss. Wien, 16, 1859, p. 17.

Silurus felis Linnaeus, Syst. Nat., ed. 12, 1766, p. 503 (Carolina).

Arius felis Jordan & Gilbert, Bull. U.S. Nat. Mus., 16, 1882, p. 110 (without locality).

Aelurichthys felis Günther, Proc. Linn. Soc. London, 1898-1899, p. 30 (type of *Silurus felis* L. from the collection of Linnaeus).

Galeichthys felis Fowler, Proc. Acad. Nat. Sc. Phil., 67, 1915, p. 203 (Bayport and Big Pine Key, Florida).

Felichthys felis Jordan & Evermann, Bull. U.S. Nat. Mus., 47, 4, 1900, p. 3196 (without locality); — Metzelaar, Over tropisch Atlantische Visschen, 1919, p. 13 (Trinidad); — Gudger, Zoologica, N. Y., 2, 1924, p. 138 (Beaufort).

Museum Leiden:

No. 3011, Ind. Occid., Schomburgk, from Museum Hamburg, 1847, 1 ex., 297 mm.
No. 3005, from Museum Paris, 1 ex., 393 mm.
No. 8418, coast of Venezuela, 1904, P. Buitendijk, 1 ex., 271 mm.

Museum Amsterdam:

Trinidad, De Weger, 1 ex., 393 mm.

Body rather robust, caudal peduncle slender, the greatest width less than the depth.

Head short and broad, somewhat compressed, 4 in the standard length. Its greatest width nearly equal to its length. The depth at the tip of the occipital process equal to the greatest width. Profile from the base of the occipital process to the base of the dorsal steep. The base of the occipital process nearly equal to the length; the process articulating with the dorsal plate, roof shaped, granular, covered with thin skin, like the post-orbital portion of the head, which has some granules here and there.

Fontanel reaching a line between the posterior margins of the eyes, continued as a groove to the base of the occipital process. Along the sides of the head, above the eyes and on the snout many pores.

Eye 1 in snout, 3 in interorbital, 5 in head.

Maxillary barbels reaching to the base of the ventrals, broad, band-like. Mental barbels 2. Upper jaw slightly longer than lower one; intermaxillary band of teeth narrowed in the middle. Vomerine patches separate, but

united with the palatine patches, forming on each side a row of three ovate patches. Gill membranes united and narrowly joined to the isthmus.

Dorsal spine nearly equal to the length of the head, continued in a filament which reaches the base of the caudal. Distance from dorsal to tip of snout 3 in the standard length. Distance from dorsal to adipose 3 in the standard length. Caudal deeply forked. Base of anal 6 in the standard length. Ventrals just half way tip of snout and base of caudal, their length $1^1/_2$ in the length of the head. Pectoral spine equal to the length of the head, the filament reaching as far as the origin of the anal.

Colour bluish above, silvery below. Dorsal, pectorals, ventrals and anal covered with dark dots.

D. I/7. P. I/12. A. 19—20.

I do not understand at all why Eigenmann (1912, p. 132) describes as *Felichthys bahiensis* (Castelnau) specimen no. 3001 of the Leiden collection, which as well as no. 3005, was labelled as *Pimelodus filamentosus* Bleeker. Eigenmann & Eigenmann (1890, p. 36) already regard this name as a synonym of *Ailurichthys marinus* = *Felichtys marinus*, whereas later (1912, p. 134) Eigenmann does not mention this. *Galeichthys bahiensis* Castelnau is no doubt a synonym of *Felichthys marinus* (Mitchill). The specimens nos. 3001 and 3005 are classified by Bleeker as *Pimelodus filamentosus* spec. nov. with the character: anal 26. This statement, however, is wrong, because no. 3001 has 20, 3005, 19 rays in the anal, which proves that they belong to the species *marinus*.

Felichthys bagre (L.)

Silurus bagre Linnaeus, Syst. Nat., ed. 12, I, 1766, p. 505; ed. 13, 1788, p. 1360; — Bloch, Ausl. Fische, 8, 1794, p. 27, pl. 365 (America).

Pimelodus bagre Lacépède, Hist. Nat. Poiss., 5, 1803, p. 93, 98 (Brazil); — Bleeker, Silures de Suriname, 1864, p. 66 (Surinam).

Aelurichthys bagre Jordan, Proc. U.S. Nat. Mus., 9, 1886, p. 559 (name only).

Ailurichthys bagre Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 148 (Sao Matheos, Santos, Para, Curuca, Bahia, Pernambuco, British Guiana); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 33 (same localities).

Felichthys bagre Gill, Proc. U.S. Nat. Mus. 13, 1891, p. 354 (without locality); — Jordan & Evermann, Bull. U.S. Nat. Mus, 47, I, 1896, p. 116 (without locality); — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 133 (British Guiana); — Metzelaar, Over tropisch Atlantische Visschen, 1919, p. 13, fig. 6 (Georgetown); — Borodin, Amer. Mus. Nov., 271, 1927, p. 1 (without locality).

Galeichthys gronovii Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 30 (Guiana, Maracaibo, Mana, Cayenne, Bahia); — Müller & Troschel in Schomburgk, Reisen, 3, 1848, p. 628 (Waini, Barima); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 392 (Cajutuba, Para).

Aelurichthys gronovii Günther, Cat. Fish. Brit. Mus. 5, 1864, p. 178 (Demerara, West Indies).

Galeichthys eidouxii Cuvier & Valenciennes, Hist. Nat. Poiss. 15, 1840, p. 32 (Guayaquil).
Aelurichthys eydouxii Jordan, Proc. U.S. Nat. Mus., 7, 1884, p. 40 (note on type).
Bagrus macronemus Ranzani, Nov. Comm. Acad. Sc. Inst. Bonon., 5, 1842, p. 334, pl. 28 fig. 1, 2 (Brazil).
Mystus carolinensis Gronow, Cat. Fish., ed. Gray, 1854, p. 156.
Pimelodus longifilis, "Mus. Lugd. Bat." (fide Bleeker).

Museum Leiden:

No. 3002, Surinam, Dieperink, 1 ex., 444 mm.
No. 8413, Demerara river, P. Buitendijk, 1904, 1 ex.
No. 15460, Bahia, from Smithsonian Institution, 1880/81, 1 ex.
No. 17236, Surinam river, 29-V-1911, Van Heurn, 5 ex., 240, 281, 291, 335 and 375 mm.

Museum Amsterdam:

Georgetown, De Weger, 1 ex., 410 mm.

Body compressed, elongate, greatest width less than greatest depth. Head depressed, short and broad, its width $1^1/_7$ in its length, its length $4^2/_5$—$4^7/_8$ in the standard length. The depth at the base of the occipital process $1^1/_4$—$1^1/_3$ in the length of the head. Profile not very steep, the anterior part nearly flat. Occipital process nearly twice as broad at the base as at the tip. The tip is notched and articulates with the dorsal plate. The interorbital is flat, the fontanel wide, extends a little behind the eye, and is continued as a groove to the base of the occipital process. Entire upper and anterior part of the head covered with a thick, very porous skin.

Eye 1—2 in the snout, $1^1/_3$—$1^3/_5$ in the interorbital, 3-4 in the interocular and 4½—6 in the length of the head.

The maxillary barbels reach beyond the base of the origin of the anal, in young specimens beyond the half of this base. Mental barbels hardly reaching to the gill-opening. The barbels very broad and flat. Upper jaw slightly projecting, teeth villiform. The intermaxillary band narrowing in the middle, becoming twice as deep at the sides and tapering posteriorly to a point. The teeth in the vomer in two separate elliptical patches, in young specimens the patches are very close together. The palatine teeth in a similar patch on either side, but much longer than the vomerine patches and contiguous to them. Gill-membranes united and narrowly joined to the isthmus. Gill-rakers not very long, 2+6.

Distance from dorsal fin to tip of snout $3^4/_5$—4 in the standard length, the spine toothed in front, 1—1½ in the length of the head, the second ray much longer, equal to the length of the head or longer. The filament of the spine reaching the base of the caudal or beyond. The distance between the dorsal and the adipose 2½—$2^5/_8$ in the standard length. Caudal deeply forked, the upper lobe a little longer, nearly 3½ in the standard length.

Base of anal 4 in the standard length, the highest ray 2—$2^1/_3$ in its base. The distance between the base of the ventrals and the tip of the snout $1^2/_7$ in the space between the base of the ventrals and that of the caudal.

The pectoral spine $1^1/_5$—$1^3/_{10}$ in the length of the head, the filament reaching to the posterior end of the anal base.

Colour bronze above, white below. The fins more or less covered with dark dots. The tips of the fins dark. Adult specimens have the sides and parts of the belly covered with the same dots.

D. I/7. A. 32.

Felichthys panamensis (Gill)

Aelurichthys panamensis Gill, Proc. Acad. Nat. Sc. Phil., 1863, p. 172 (West Coast of Central America); — Günther, Fishes of Centr. Amer., 1866, p. 393 and 476 (Panama); — Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 14, pl. II figs. 1-4 (Altata, Panama, Magdalena Bay); — Jordan & Gilbert, Bull. U.S. Fish Comm., 1882, p. 37 (Panama); — idem, Proc. U.S. Nat. Mus., 1882, p. 622 (Panama); — Jordan, Proc. U.S. Nat. Mus., 1885, p. 365 (name only); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 148 (Panama).

Ailurichthys panamensis Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc. vol. 1, 1890, p. 31 (West Coast of Central America and Mexico).

Aelurichthys nuchalis Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 179 (Pacific Coast, Panama); — idem, Fish. Centr. Amer., 1866, p. 393 and 476, pl. 81 fig. 2 (Panama).

Museum Leiden:

No. 17296, Guayaquil river, Ecuador, 28-VII-1930, Van den Boogert, 1 ex., 285 mm.

Body rather robust, the depth under the dorsal spine somewhat greater than the width. Head short, its depth at the base of the occipital process scarcely equal to its greatest width, $1^1/_3$ in the length of the head. Head 4 in the standard length. Fontanel narrow, continued as a groove to the base of the very broad occipital process, shaped like a shamrock, obtusely bent in the middle.

Eye large, 1½ in the snout, 3 in the interorbital and 4¾ in the length of the head.

Maxillary barbels reaching beyond the base of the ventrals to half the length of the fins. Mental barbels reaching to the gill-opening. Jaws nearly subequal, the upper slightly longer. Teeth in the intermaxillary in two lanceolate patches, meeting in the middle. The vomerine teeth in an elliptical band narrowed in the middle; the palatine teeth in a lanceolate much narrower patch at each side, but contiguous to the vomerine patches. Gill-membranes joined, free from the isthmus.

Distance from dorsal fin to tip of snout $3^1/_7$ in the standard length. The spine is not produced into a filament. The second ray is the longest of the fin. The spinous portion of the first ray $1^3/_8$ in the length of the head. Its

outer margin with hooks. The greatest height of the fin $1^1/_{11}$ in the length of the head. Adipose fin short, higher than long, its distance from the dorsal 2½ in the standard length. Caudal deeply forked, $3^1/_3$ in the standard length. Anal with 25 rays (Eigenmann gives 28—30). Highest ray 2 in the head. Ventrals inserted vertically posterior of the dorsal. Their tips reaching the anal. The length of the spinous portion 1¾ in the length of the head. Pectoral spine produced into a filament nearly reaching the posterior end of the base of the anal. The spine which is roughened on the basal portion of the anterior margin and serrated on its upper part, $1^1/_9$ in the length of the head.

Colour steel-blue above, silvery at the sides and whitish below, the lower part of the sides and the fins with dark dots.

D. I/7. A. 25.

Genidens Castelnau

Genidens Castelnau, Anim. Nouv. Amer. Sud, Poiss. 1855, p. 33 (*cuvieri* = *genidens*).

Type: *Bagrus genidens* Cuv. & Val.

Head covered with skin, the surface of the head partly granular. Occipital process triangular, strongly keeled. Fontanel extending beyond the eye and continued as a groove to near the base of the occipital process. The palatine teeth in small patches resting on thick fleshy cushions.

Genidens genidens (Cuv. & Val.)

Bagrus genidens Cuvier & Valenciennes, Hist. Nat. Poiss., 14, 1839, p. 452, pl. 419 (Rio de Janeiro).

Genidens genidens Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 148 (Porto Alegre, Santos, Rio Janeiro, Rio Sao Matheos, Rio Grande do Sul); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 38 (same localities); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 26 (La Plata, Araguay); — H. v. Ihering, Os peixes d'agua doce do Rio Grande do Sul, 1897, p. 10 (Rio Grande do Sul); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 381 (name only); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 350, pl. 51 fig. 1 (without locality).

Genidens cuvieri Castelnau, Anim. Nouv. Amer. Sud, Poiss., 1855, p. 34 (La Plata and tributaries); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 175 (Brazil); — Kner, Novara, Fisch., 1869, p. 312, pl. 12 fig. 3-3a (Rio Janeiro); — Hensel, Wiegm. Arch., I, 1870, p. 71 (Guahyba and tributaries); — Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 89 (Guahyba, Rio Janeiro, Rio S. Matheos, Porto Seguro, Santos).

Genidens granulosus Castelnau, Anim. nouv. Amer. Sud, Poiss., 1855, p. 34, pl. XVI fig. 1 (Rio Araguay, Prov. of Goyaz, Brazil).

? Laukidi Schomburgk, Fish. Brit. Guiana, part I, 1843, p. 176 (in part.).

Rhamdia laukidi Bleeker, Nederl. Tijdschr. Dierk. I, 1863, p. 208 (name only).

Museum Leiden:

No. 14768, Rio de Janeiro, Thayer Exp., from Museum Cambridge, Mass., 1 ex., 261 mm.

Museum Amsterdam:

Santos, 26-I-1925, Capt. Noordraven, S. S. Drechterland, 1 ex., ♀, 235 mm.

Width behind the head slightly greater than the depth. Postorbital portion of the head arched, snout decurving, interorbital flat. Head 4 in the standard length. Fontanel continued as a narrow groove from the posterior nares to near the base of the occipital process. The occipital process rather wide, its width 2 in its length, strongly keeled, reaching the narrow saddle-shaped dorsal plate. Skin on the top of the head very thin. The surface of the bones granular. Snout and sides of the head with vermiculating mucous canals.

Eye elliptical, the longitudinal axis inclined, 1½ in the snout, 5 in the head and 1½ in the interorbital.

Lips thick, upper jaw projected. There is an intermaxillary band of teeth, which at both ends shows a small triangular patch of teeth, which is contiguous to the intermaxillary band, and forms a backward projecting angle. Palatine teeth in two patches, each placed on a fleshy cushion on the sides of the strongly arched palate. Mandibulary teeth in five irregular series in a band nearly equal to the intermaxillary band, broadly interrupted in front, the teeth disappearing with age. Barbels six, maxillary barbels reaching the edge of the opercle, mental and postmental barbels inserted in a line parallel with the edge of the mandible; short. Gill-membranes united and joined to the isthmus, leaving a narrow free margin. Gill-rakers 5 + 9.

Distance from dorsal spine to tip of snout 2¾ in the standard length, dorsal spine stout, the anterior margin granular on its basal half, the upper half with recurved notches. Height of the dorsal spine 1¾ in the length of the head. Distance from adipose to dorsal $3^1/_2$ in the standard length, the adipose very short. Caudal deeply forked, the upper lobe narrower and longer. Anal emarginate. Ventrals 2 in the length of the head. Pectoral 1¾ in the length of the head, spine stout, depressed, as high as the dorsal spine, outer margin roughened, with recurved hooks near the tip, inner margin with saw-teeth.

Colour blue-black, sides silvery with bluish and purplish reflexions. Belly white. Fins dark.

D. I/7. A. 17.

In the specimen from Santos the fleshy cushions on the palate are very thick and movable.

Netuma Bleeker

Netuma Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 90; — idem, Ichthyol. Arch. Ind. Prodr., Siluri, I, 1858, p. 30 (*nasuta*).

Bagrus netuma Cuvier & Valenciennes, Hist. Nat. Poiss., 14, 1839, p. 438 = *Bagrus laevigatus* Cuvier & Valenciennes, loc. cit. p. 439.

Type: *Netuma nasuta* Bleeker.

Occipital process widest at its base, scarcely keeled in the young. Fontanel long, continued as a groove. Posterior nasal openings not connected by a membrane. Teeth villiform. Patches of teeth on the palate confluent with the vomerine patches, which are separated from each other.

Netuma barbus (Lacépède)

Pimelodus barbus Lacépède, Hist. Nat. Poiss., 5, 1803, p. 94 and 106.

Galeichthys barbus Jordan, Proc. U.S. Nat. Mus., 1886, p. 559 (name only).

Tachisurus barbus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 142 (Campos, Rio Doce, Rio Grande do Sul); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 76 (same localities); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 27 (Montevideo); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 343 (Guahyba, Rio Grande do Sul, Rio Parahyba, Rio Doce, Araguay); — idem, Rev. Mus. Paulista, 10, 1918, p. 733 (Rio Tieté, Santos, Caraguatatuba, Rio Juqueriquere, Carbe).

Netuma barbus Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1906, p. 381 (name only); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 206 (Rio Janeiro).

Pimelodus commersonii Lacépède, Hist. Nat. Poiss., 5, 1803, p. 95 and 108, pl. 3 fig. 1 (without locality).

Bagrus commersonii Valenciennes, in d'Orbigny, Voy. Amer. Merid., Poiss., Atlas, 2, 1847, pl. 3 fig. 1; — Cuvier & Valenciennes, Hist. Nat. Poiss., 14, 1839, p. 449 (Montevideo, Rio de Janeiro); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 386 (Rio de Janeiro).

Arius commersonii Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 143 (Bahia); — Hensel, Wiegm. Arch., I, 1870, p. 69 (Guahyba and larger tributaries); — Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 85 (Bay of Rio de Janeiro, Rio Grande do Sul, Rio Parahyba near Campos, Rio Doce, Santos); — Perugia, Ann. Mus. Civ. de Genova, 10, 1892, p. 633; — Ihering, Os peixes d'agua doce do Rio Grande do Sul, Ann. Estado Rio Grande do Sul, 1898, p.10.

Bagrus barbatus Quoy & Gaimard, Voy. Uranie, Zool., 1824, p. 230, pl. 49 figs. 1 and 2 (without locality).

Pimelodus versicolor Castelnau, Anim. Amer. Sud, Poiss., 1855, p. 35, pl. 16 fig. 3 (Rio Araguay, Goyaz).

Museum Leiden:

No. 15461, Brazil, from Museum Rio de Janeiro, 1 ex., 313 mm.

Body rather slender, little deeper than wide, the caudal peduncle compressed. Head large, somewhat depressed, 4 in the standard length, its width $1^1/_3$ in its length, width at the corner of the mouth 2, its depth $1\frac{1}{2}$ in the length of the head. Interorbital flattish, with obscure ridges. Top of head coarsely granular, the granules in series along the fontanel and towards the eye. The interorbital, the snout and the opercles smooth. The occipital process with the granules in series running from a point in the centre of the base, sharply keeled, half as broad as long.

Fontanel $3\frac{1}{2}$ times as long as the diameter of the eye, its centre across the middle of the eyes continued as a groove to the base of the occipital process.

Eye 2 in snout, $5^1/_3$ in head and $2^2/_3$ in the interorbital.

Maxillary barbels reaching beyond the gill-openings, but scarcely reaching the base of the pectoral. Mental barbels halfway to the gill-openings, postmentals scarcely reaching beyond them. Snout blunt, upper jaw little produced. Teeth villiform, intermaxillary band emarginate on the sides. Teeth in vomer and palate in 3 patches on each side, vomerine patches subtriangular, separated from each other, but contiguous to the patches on the palatine. Gill-membranes touching each other obtuse-angularly, forming a fold across the isthmus. Gill-rakers 6 + 10.

Distance from dorsal to tip of snout $2^5/_6$ in the standard length. Dorsal and pectoral spine granular in front, but serrated near the top, on the sides striate; at the back the dorsal and pectoral spines are serrated, but the dorsal with short and fine teeth, which appear as little spines. The dorsal spine 1½ in the head, the pectoral $1^1/_3$. Space between dorsal and adipose 3 in the total length. Base of adipose equal to that of dorsal. Caudal deeply forked. Upper lobe longer, falcate, 3½ in the total length.

Colour dark above, silvery on the sides, white below, tip of all fins dusky.

D. I/7. A. 19.

Sciadeichthys Bleeker

Sciades Müller & Troschel, Horae Ichthyol., 3, 1849, p. 8 (***emphysetus*** and ***pictus***).

Sciadeichthys Bleeker, Ichthyol. Arch. Ind. Prodr., I, 1858, p. 62 and 66 (***emphysetus***).

Not *Sciadeichthys* Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 99.

Type: ***Bagrus emphysetus*** Müller & Troschel.

This genus is distinguished from other South American Nematognathi by the approximate nares, the enlarged dorsal plate, the backwards projecting angle of the palatine patches of teeth, and the absence of an internarial membrane in the adult specimens. The young specimens of *Sciadeichthys proöps* often have a slit or incipient membrane between the posterior nares (Eigenmann).

Sciadeichthys proöps (Cuv. & Val.)

Bagrus proöps, Cuvier & Valenciennes, Hist. Nat. Poiss., 14, 1839, p. 457 (Antilles, Guiana, Surinam, Porto Rico); — Müller & Troschel, in Schomburgk, Reisen, 3, 1848, p. 627 (Waini & Barima); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 386 (without locality).

Arius proöps Günther, Cat. Fish. Brit. Mus. 5, 1864, p. 148 (copied).

Netuma proöps Bleeker, Ichthyol. Arch. Ind. Prodr., I, 1858, p. 67; — idem, Silures de Suriname, 1864, p. 62, pl. 7 fig. 2 (Surinam).

Galeichthys proöps Jordan, Proc. U. S. Nat. Mus., 9, 1886, p. 559 (name only).

Tachisurus proöps Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 141 (Pernambuco); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 57 (Pernambuco).

Sciadeichthys proöps Jordan & Evermann, Bull. U. S. Nat. Mus., 47, I, 1896, p. 123 (without locality); — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 136, pl. V fig. 2, pl. VI figs. 1-3 (Georgetown market).

Museum Leiden:

No. 3053, Surinam, Dieperink, 1 ex., 298 mm.
No. 11062, Surinam river, Van Heurn, 1 ex., 300 mm.

Museum Amsterdam:

Georgetown market, British Guiana Exp., 1908, Eigenmann, 1 ex., 300 mm.

Body slender and elongate, broader than deep. Head depressed, its length 4—$4^1/_3$ in the standard length, its width $1^1/_3$ in its length, its width at the mouth 2 and its depth also 2 in the length of the head. Anterior part of the head flat above; top of the head, humeral process and dorsal plate granular, the granules arranged in series along the fontanel. Occipital process mucronate, broader than long, dorsal plate large, butterfly-shaped. Fontanel 1½ times as long as the eye, continued as a shallow groove.

Jaws subequal, teeth villiform, the intermaxillary band very wide; teeth on the roof of the mouth in six contiguous patches. Gill-membranes meeting in an angle, forming a broad fold across the isthmus. Pectoral large, vertical series of pores along the lateral sides.

Distance from dorsal spine to tip of snout 2¾ in the standard length; the dorsal spine granular in front, striate on the sides, serrate behind; its length 1¼ in the length of the head. Space between dorsal and adipose $2^4/_5$ in the length, the posterior margin of the adipose free. Caudal deeply forked, its upper lobe longer. Anal emarginate, as high as long, the length 2 in the length of the head. Ventrals nearly as long as the anal. Pectoral spine rough or granular in front, serrate behind, its length $1^1/_5$ in the length of the head.

Colour bluish gray above, white below, sides silvery, maxillary barbels dark, the mental barbels white; fins all more or less dotted with brown.

D. I/7. A. 18.

Sciadeichthys parkeri (Traill)

Silurus parkeri Traill, Mem. Wern. Soc., 6, 1832, p. 377, pl. 6 fig. 1 (muddy water of rivers of Guiana); — Schomburgk, Fish. Brit. Guiana, I, 1843, p. 188 (Guiana).

Arius parkeri Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 156 (copied).

Galeichthys parkeri Jordan, Proc. U. S. Nat. Mus., 9, 1865, p. 559 (name only).

Tachisurus parkeri Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 141 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 65 (name only).

Selenaspis parkeri Jordan & Evermann, Bull. U. S. Nat. Mus., 47, I, 1896, p. 123 (without locality).

Arius quadriscutis Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 83 (Cayenne, Mana); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 389 (Para).

Netuma quadriscutis Bleeker, Silures de Suriname, 1864, p. 59, pl. 8 and pl. 13 fig. 2 (Surinam).

Sciadeichthys parkeri Eigenmann, Mem. Carn. Mus., 5, 1912, p. 136 (Georgetown market).

Museum Leiden:

No. 3049, Cayenne, from Museum Paris, 1 ex., 264 mm.
No. 3050, Surinam, Dieperink, 1 ex., 298 mm.
No. 11061, road off Nickerie, 1911, Van Heurn, 1 ex., 383 mm.
No. 16049, Brazil, 1 ex., 230 mm.
No. 17317, West Indies, 1 ex., 225 mm.

Museum Amsterdam:

Georgetown market, British Guiana Exp., 1908, 1 ex., 270 mm.

Body stout, the greatest width equal to the greatest depth. The head somewhat depressed, the depth $1^1/_9$—$1^1/_3$ in the width, which goes $1^1/_2$—$1^2/_3$ in the length of the head; the width at the mouth 2—$2^2/_5$ in the length. The length of the head 3—$3^1/_5$ in the standard length. Top of head granular, the opercles smooth. The eye $1^2/_3$—$2^2/_3$ in the snout, 7½—11 in the head and 2½—4½ in the interorbital. Dorsal plate enlarged, emarginate in front, receiving the point of the occipital process, partly covered with a thick skin on the sides.

Maxillary barbels reaching the base of the pectorals, postmentals to the gill-openings. Teeth in both jaws conical, those on the palate and the vomer finely granular, the patches united and nearly covering the roof of the mouth, except a narrow space in the middle. Gill-membranes forming a broad marginal flap across the isthmus.

Distance from dorsal spine to tip of snout 3 in the standard length. The dorsal spine $1^1/_5$—$1^1/_2$ in the length of the head, granular in front, serrate behind. Distance from adipose to dorsal 4½—5 in the standard length, the base of the adipose as long as that of the dorsal, the dorsal fin twice as long as high, adnate. Caudal forked, the upper lobe longer, 4½—5 in the standard length. Anal fin as high as long, 1¾—$2^1/_5$ in the length of the head. Ventrals broad, reaching to the base of the anal. Pectoral spine stout, serrate on both margins, the sides striate, $1^1/_2$—$1^5/_7$ in the length of the head. The humeral process with radiating lines of granules.

Colour greyish above, white below. Yellow when alive (Van Heurn).

D. I/7. A. 15. V. I/5. P. I/10.

Selenaspis Bleeker

Selenaspis Bleeker, Ichthyol. Arch. Ind. Prodr., I, 1858, p. 62 (*herzbergii*).
Leptarius Gill, Acad. Nat. Sc. Phil., 1863, p. 170 (*dowii*).

Type: *Silurus herzbergii* Bloch.

Distinguished from *Sciadeichthys* by the internarial membrane. "This character is scarcely of generic importance, especially since in the young

of *Sciadeichthys proöps,* a slit or incipient membrane is often present between the posterior nares." (Eigenmann, 1912, p. 139).

Selenaspis herzbergii (Bloch)

Silurus herzbergii Bloch, Ausl. Fische, 8, 1794, p. 33, pl. 367 (Surinam); — Bloch & Schneider, Syst. Ichthyol., 1801, p. 383 (Surinam).

Bagrus herzbergii Cuvier & Valenciennes, Hist. Nat. Poiss., 14, 1839, p. 453 (Mana, Cayenne); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 386 (Para).

Selenaspis herzbergii Bleeker, Ichthyol. Ind. Prodr., I, 1858, p. 63 (without locality); — Jordan & Evermann, Bull. U. S. Nat. Mus., 47, I, 1896, p. 125 (without locality); — Eigenmann & Bean, Proc. U. S. Nat. Mus., 31, 1907, p. 659 (Amazon); — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 139, pl. 7 fig. 1 (Georgetown market, Mahaica); — Fowler, Proc. Ac. Nat. Sc. Phil., 1915, p. 203 (Dutch Guiana) and p. 529 (Trinidad).

Arius herzbergii Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 144 (British Guiana, Demerara); — Vaillant, Nouv. Arch. Mus. Hist. Nat. (4), vol. 2, 1900, p. 124 (Mahury, French Guiana); — Regan, Proc. Zool. Soc. London, 1906, I, p. 386 (Trinidad).

Netuma herzbergii Bleeker, Silures de Suriname, 1864, p. 61, pl. 9 and pl. 13 fig. 3 (Surinam).

Galeichthys herzbergii Jordan, Proc. U. S. Nat. Mus., 9, 1886, p. 559 (name only).

Tachisurus herzbergii Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 141 (Para, Curuca, Bahia); — Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 59 (Para, Curuca, Bahia); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 27 (Para).

Pimelodus argenteus Lacépède, Hist. Nat. Poiss., 5, 1801, p. 94 and 102.

Bagrus pemecus Cuvier & Valenciennes, Hist. Nat. Poiss., 14, 1839, p. 456 (Cayenne).

Bagrus mesops Cuvier & Valenciennes, Hist. Nat. Poiss., 14, 1839, p. 456 (without locality); — Müller & Troschel, in Schomburgk, Reisen, 3, 1848, p. 627 (Waini, Barima); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 384, pl. 1 fig. 2 (Para).

Arius mesops Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 145 (copied).

Galeichthys mesops Jordan, Proc. U. S. Nat. Mus., 9, 1886, p. 559 (name only).

Tachisurus mesops Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 141 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 57 (name only).

Sciadeichthys mesops Jordan & Evermann, Bull. U.S. Nat. Mus., 47, I, 1896, p. 123 (without locality).

Bagrus coelestinus Müller & Troschel, in Schomburgk, Reisen, 3, 1848, p. 627 (Waini, Barima); — idem, Horae Ichthyol., 3, 1849, p. 7 (Guiana).

Hexanematichthys hymenorrhinus Bleeker, Versl. en Med. Akad. Wetensch. Amsterdam, 14, 1862, p. 377 (Surinam); — idem, Silures de Suriname, 1864, p. 57, pl. 11 fig. 2, pl. 13 fig. 4 (Surinam).

Netuma dubia Bleeker, Versl. en Med. Akad. Wetensch. Amsterdam, 14, 1862, p. 382 (Surinam); — idem, Silures de Suriname, 1864, p. 63, pl. 15 fig. 2, pl. 13 fig. 5 (Surinam).

Arius dubius Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 144 (copied).

Galeichthys dubius Jordan, Proc. U. S. Nat. Mus., 9, 1886, p. 559 (name only).

Tachisurus dubius Eigenmann & Eigenmann, Proc. Cal. Acad. Sc., (2), vol. 1, 1888, p. 141 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 69 (name only).

Museum Leiden:

No. 3042, Surinam, Dieperink, 1 ex., 250 mm.

No. 3051, Surinam, Dieperink, 1 ex., 171 mm, holotype of *Netuma dubia* Blkr.

No. 3052, Surinam, Dieperink, 1 ex., 131 mm, paratype of *Netuma dubia* Blkr.

No. 3056, Guatemala, 1852, Deby, 1 ex., 212 mm, holotype of *Hexanematichthys hymenorrhinus* Blkr.

No. 3092, Surinam, Dieperink, 1 ex., 340 mm.
No. 8403, Paramariba, Buitendijk, 1 ex., 310 mm.
No. 17263, Surinam, Bolten, 61 ex., 80-132 mm.
No. 17318, Paramaribo, 1911, Van Heurn, 5 ex., 128, 145, 165, 216, 228 mm.
No. 17319, Paramaribo, 1911, Van Heurn, 2 ex.
No. 17320, Surinam, 1910, Bolten, 1 ex.

Museum Amsterdam:

Georgetown market, British Guiana Exp., 1908, Eigenmann, 1 ex., 235 mm.

Body elongate, the width 1¼ times as great as the depth. Width of the head $1^1/_3$—$1^2/_3$ in the length of the head, at the angle of the mouth about 2; depth $1^1/_2$—2 in its length. Length of the head $2^9/_{10}$—$3^3/_5$ in the standard length. Humeral process, dorsal plate, top of head as far as between the eyes granular. Occipital process wider than long, scarcely keeled. Fontanel not continued behind the eyes, and without backwards projecting groove. Posterior nostrils connected by a membrane.

Eye $4^3/_5$—8 in the head, $1^1/_6$—$2^3/_{10}$ in the snout, $1^1/_3$—$2^1/_2$ in the interorbital.

Barbels flat, maxillary barbels reaching to the ventrals in the young specimens, in the older ones to the middle of the pectorals. Mental barbels to the gill-openings, postmentals to the base of the pectoral. Teeth villiform, forming an intermaxillary and a mandibulary band. The palatine and vomerine teeth in patches which are about equal in size and shape in the young. When older the palatine patches are more distinctly developed and a separate patch behind the palatine is formed. But there are some specimens among the great number I have seen in the Leiden collection, in which the palatine teeth remained juvenile, e.g., no. 3056, a specimen of 212 mm, which is the type of the *Hexanematichthys hymenorrhinus* Bleeker. The separate posteriorly directed patches are not developed in this specimen. Gill-membranes meeting in an angle, forming a fold across the isthmus. Gill-rakers 6 + 10.

Distance from dorsal spine to tip of snout 2¾ in the standard length, $1^5/_7$—2 in the length of the head. The anterior margin roughened, the sides striate, the posterior margin serrate; somewhat shorter than the pectoral spine. The space between dorsal and adipose 3½—4 in the standard length. The lateral surfaces with vertical series of pores. The adipose as long as the dorsal. Caudal deeply forked, the upper lobe longer, about 4 in the standard length. Anal fin as high as long, 2 in the length of the head. Pectoral roughened at the outer margin, at the inner strongly serrate, the length of the spine 1¼—1¾ in the length of the head.

Colour: lead coloured above, silvery on the sides, fins dusky.

D. I/7. P. I/10-11. V. 8. A. 18.

Selenaspis dowii (Gill)

Leptarius dowii Gill, Proc. Acad. Nat. Sc. Phil., 1863, p. 170 (Panama).
Arius dowii Günther, Fish. Centr. Am., 6, 1866, p. 393 and 476 (copied); — Jordan & Gilbert, Bull. U. S. Fish. Comm., 1882, p. 50 (Panama).
Galeichthys dowii Jordan, Proc. U. S. Nat. Mus., 1885, p. 360 (name only).
Tachisurus dowii Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 142 (Panama); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 61 (Panama).
Arius alatus Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 19, pl. VI (Panama); — idem, Denkschr. Akad. Wiss. Wien, 41, 1880, p. 45, pl. V fig. 2-2a (Guayaquil); — Jordan & Gilbert, Bull. U.S. Fish. Comm., 1882, p. 37 and 39 (copied); — idem, Proc. U.S. Nat. Mus., 1882, p. 621 (Panama).
Selenaspis dowi Jordan & Evermann, Bull. U. S. Nat. Mus., 47, 1896, p. 125.

Museum Leiden:

No. 8416, road of Trinidad, Buitendijk, 1 ex., 440 mm.

Width below the dorsal spine slightly greater than the depth, the width at the humeral process equals the greatest width of the head at the opercles. Head depressed, its depth at the base of the occipital process 1¼ in the greatest width of the head, becoming more depressed forward. The greatest width of the head $1^1/_5$ in its length; this length 3½ in the standard length. Snout short, 3 in the head. The top of the head granular, the granules forming striae in front, vermiculations posteriorly. The occipital process truncate, its width at the tip greater than its length, keeled. The dorsal plate large, saddle-shaped. The opercular bones granular, the humeral process with bony tubercles. Fontanel obsolate, reaching to behind the eyes.

Eye small, $2^2/_3$ in the snout, $7^2/_3$ in the head and 3¼ in the interorbital.

The posterior nares are connected by a narrow membrane.

Maxillary barbels reaching the pectorals, postmentals reaching the gill-openings. Upper jaw produced. Teeth of the intermaxillary band villiform, the band is narrowed in front. Vomer with a rather broad band, confluent with the much wider palatine patches, which are angularly produced backwards. The pterygoids with a little ovate patch, separated from the palatine teeth. The teeth of the vomer and palatine bluntly conical. Gill-membranes broadly united, joined to the isthmus, but with a free margin. Gill-rakers 7+15.

Distance from dorsal to tip of snout $3^1/_7$ in the standard length. The dorsal spine granular, its length 2½ in the length of the head. Distance from adipose to dorsal nearly 4 in the standard length. Caudal deeply forked. Ventrals reaching the anal. Pectoral spine granular on the sides, the outer margin with a series of larger granules which become recurved notches towards the tip, the inner edge with recurved hooks. Length $2^1/_5$

in the head. A small pectoral pore, no evident vertical series of pores on the lateral surfaces of the body.

Colour bluish grey above, changing into white below, the fins brownish with dark dots.

D. I/7. A. 17.

Notarius Gill

Arius Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 91 (*grandicassis*), not *Arius* Bleeker, 1858.

Notarius Gill, Proc. Acad. Nat. Sc. Phil., 1863, p. 171 (*grandicassis*).

Type: *Arius grandicassis* Cuv. & Val.

Distinguished by its peculiar and variable occipital crest. Dorsal plate small. Occipital crest not wider, usually much narrower at its base than towards its middle or tip.

Notarius grandicassis (Cuv. & Val.)

Arius grandicassus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 41, p. 427 (Guiana); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 153 (copied).

Galeichthys grandicassis Jordan, Proc. U. S. Nat. Mus., 9, 1886, p. 559 (name only).

Tachisurus grandicassis Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 141 (Maranhao, Bahia); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 65 (Maranhao, Bahia).

Netuma grandicassis Jordan & Evermann, Bull. U. S. Nat. Mus., 47, I, 1896, p. 126 (without locality).

Notarius grandicassis Eigenmann, Mem. Carn. Mus., 5, 1912, p. 142, textfig. 28, pl. VIII fig. 1 (Georgetown market).

Museum Amsterdam:

Georgetown market, British Guiana Exp., 1908, Eigenmann, 1 ♂, 295 mm.

Body slender, somewhat cylindrical, tapering to a compressed caudal peduncle. Head broad, greatly depressed, profile straight, but the sides on the lateral margin of the occiput very steep. The length of the head $3^3/_8$ in the standard length, the width of the head $1^1/_3$ in its length, its depth $1^3/_4$ in its length. The occiput with ridges, which are arranged ray-like from four centres. The occipital process granular, leaf-shaped with a deep constriction where it joins the occiput, and margined to meet the tip of the dorsal plate. The width of the occipital process $1^1/_2$ in its length; keeled with 3 strong granular ridges in the middle. The interorbital region with four ridges, the inner one touching the fontanel, which is ovately oblong, with its centre across the middle of the eye, and not continued backwards as a groove; the outer ridges run backwards from near the posterior nares.

Eye oval, 3 in the snout, 8 in the head, $3^1/_2$ in the interorbital.

Maxillary barbels scarcely reaching the gill-openings, mentals and postmentals much shorter. Upper jaw projecting the lower, the lip very wide in

front, the snout somewhat pointed. Teeth in both jaws large, the depth of the intermaxillary band 7 in its width, the mandibulary band shallow, broadly interrupted in the middle. Vomerine patches small, one on each side, meeting with the triangular palatine patches, which are produced backwards. Gill-membranes meeting in an angle forming a fold across the isthmus. Gill-rakers 6 + 10.

Distance from dorsal spine to tip of snout $2^1/_3$ in the standard length, the length of the spine $1^1/_2$ in the length of the head. The anterior margin of the spine roughened with some blunt hooks at its top, the posterior margin serrate on the upper half. Distance from adipose to dorsal more than 4 in the standard length. The adipose $1^1/_2$ in the length of the caudal. Caudal fin forked to its base, the upper lobe longer. Dorsal, anal, ventrals and pectorals have the rays covered with a thick skin. The pectorals with a heavy spine, which is striate on the sides, granular on the outer and strongly serrate on the inner margin. Humeral process striate, the ridges consist of granules.

Colour dark grayish above, the sides white or silvery, somewhat swarthy because of minute scattered dots.

D. I/7. A. 18.

Notarius stricticassis (Cuv. & Val.)

Arius stricticassis Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 44 (Cayenne); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 154 (copied); — Bleeker, Silures de Suriname, 1864, p. 55, pl. 5 and pl. 12 fig. 4 (Surinam).

Tachisurus grandicassis stricticassis Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 141 (Bahia, Maranhao); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 68 (Bahia, Maranhao).

Netuma stricticassis Jordan & Evermann, Bull. U. S. Nat. Mus., 47, I, 1896, p. 126 (without locality).

Notarius stricticassis Eigenmann, Mem. Carn. Mus., 5, 1912, p. 144 (Georgetown market).

Museum Leiden:

No. 3034, Surinam, Dieperink, 1 ex., 316 mm.

Body cylindrical in front, tapering to a slender caudal peduncle. Head greatly depressed, its width $1^1/_3$ in its length, its depth 2 in its length; its length $3^1/_2$ in the standard length. Occipital process narrow, the margins being little convex, narrowing to the base, at the top nearly twice as broad as at the base. The fontanel pointed anteriorly and posteriorly, reaching to $^2/_3$ of the length of the head, not continued backwards as a groove. Occipital process, top of head and humeral process granular.

Eye 3 in the snout, $8^1/_2$ in the head and $4^1/_2$ in the interorbital.

Maxillary barbels reaching to the base of the pectorals, mentals to the gill-openings, postmentals a little longer. Upper jaw projected, the lip very

wide, the snout pointed. Teeth in both jaws rather large, those on the palatine somewhat smaller. On the vomer some dispersed teeth. Palatine patches triangular, not conspicuously produced backwards, but with a notch at the outer margin. Gill-membranes meeting in an angle, forming a fold across the isthmus. Gill-rakers 6 + 10.

Distance from dorsal spine to tip of snout $2^1/_2$ in the standard length. The space between dorsal and adipose 4 in the standard length, adipose as long as the dorsal fin. Caudal forked. Anal longer than high. Ventrals small. Pectoral spine strong, $1^1/_3$ in the length of the head. The anterior margin with blunt teeth, the posterior margin strongly serrated. Pectoral pore large, slit-like.

Colour brown above, somewhat lighter below.

D. I/7. A. 18.

Hexanematichthys Bleeker

Hexanematichthys Bleeker, Ichth. Arch. Ind. Prodr., I, 1858, p. 62 and 65.

Type: *Bagrus sondaicus* Cuv. & Val.

Gill-membranes united to the isthmus, with a very narrow free margin across the latter. Teeth in the palate villiform.

Hexanematichthys rugispinis (Cuv. & Val.)

Arius rugispinis Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 58 (Cayenne); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 388 (Para); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 156 (copied); — Vaillant, Nouv. Arch. Mus. d'Hist. Nat. (4), vol. 2, 1900, p. 124 (Cayenne, French Guiana).

Galeichthys rugispinis Jordan, Proc. U.S. Nat. Mus., 9, 1886, p. 559 (name only).

Tachisurus rugispinis Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 145 (Para); — idem, Occ. Pap. Cal. Acad. Sc. vol. 1, 1890, p. 83 (Para).

Hexanematichthys rugispinis Eigenmann, Mem. Carn. Mus., 5, 1912, p. 147, pl. 9 fig. 3 (Georgetown).

Tachisurus rugispinis phrygiatus Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 84 (Maranhao).

Arius phrygiatus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 59 (Cayenne); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 157 (copied).

Galeichthys phrygiatus Jordan, Proc. U. S. Nat. Mus., 1886, p. 559 (name only).

Tachisurus phrygiatus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 145 (Maranhao).

Arius dieperinki Bleeker, Silures de Suriname, 1864, p. 50, pl. X and XII fig. 3 (Surinam).

Museum Leiden:

No. 3038, Surinam, Dieperink, 1 ex., 227 mm, with 3 eggs in different stages of development, type of *A. dieperinki*.

No. 17297, Surinam, Van Heurn, 1 ex., 184 mm.

Body slender, tail compressed. Body nearly as broad as high. Head broad and depressed, tapering forwards, its length $3^1/_3$-$3^1/_2$ in the standard length.

Width of the head $1^1/_4$-$1^1/_3$, the depth $1^1/_2$-$1^2/_3$ in its length. Profile flat to slightly arched. Top of head granular, the granulation not extending forwards to the posterior margin of the eye; in one specimen the eyes are on an equal distance from the end of the granulations and the tip of the snout. Occipital process triangular, with a blunt tip, which is emarginate and nearly co-ossified with the granular dorsal plate, the width at the base $1^1/_2$ in its length. The median ridge is not prominent but a ridge of coalescent granules. Fontanel long, tapering forwards in both specimens, posteriorly in one specimen angular, in the other rounded; not continued backwards as a groove, the posterior $^1/_4$ of its length is separated from the anterior ¾ by a not conspicuous bridge.

Eye small, 3-3½ in the snout, 10-13 in the head, 3½-5½ in the interorbital.

Maxillary barbels to the gill-opening in the young, not so far in the adult. Mental and postmental barbels short. Snout broad, projecting beyond the lower jaw. Lips thick, teeth villiform. Depth of the intermaxillary band 4-5 in its width, palatine patches larger than the eye. Gill-membranes joined to the isthmus, with a broad free margin, forming an angular fold across. Gill-rakers 6+11.

Distance from dorsal spine to tip of snout 2½-2¾ in the standard length. The spine serrate on its posterior margin, its anterior margin granular on the lower portion, with 4-5 strong teeth near the tip. The sides are granular at the base, striate above, the ridges consisting of coalescent granules. Space between dorsal and adipose 5-6 in the standard length. Base of the adipose longer than the base of the dorsal. The adipose adnate, its base as long as that of the anal. Ventrals nearly reaching the base of the anal. Caudal forked. The pectoral spine equals the dorsal in size, but is somewhat longer. There is no pectoral pore, but a great number of vertical series of pores along the side of the body.

Dark, olive coloured above, nacreous below. The fins yellowish, the adipose spotted with dark brown.

D. I/7. A. 19-20. V. 6. P. I/9.

The establishing of the subspecies *Tachisurus rugispinis phrygiatus* by Eigenmann & Eigenmann (1890, p. 84) must be rejected so far as this subspecies will be synonymous with *Arius dieperinki* Bleeker. I have seen the type of *dieperinki* in the Leiden collection, which is similar to *rugispinis*. The differences between *rugispinis* and *rugispinis phrygiatus*, as far as they concern the form of the fontanel, the spines and the palatine teeth, are of an individual character.

Hexanematichthys surinamensis Bleeker

Hexanematichthys surinamensis Bleeker, Versl. & Mededeel. Akad. Wetensch. Amsterdam, 1862, 14, p. 380 (name only); — idem, Silures de Suriname, 1864, p. 55, pl. VI fig. 2 and pl. XII fig. 1 (Surinam).

Arius surinamensis Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 148.

Galeichthys surinamensis Jordan, Proc. U.S. Nat. Mus., 1886, p. 559 (name only).

Tachisurus surinamensis Eigenmann & Eigenmann, Proc. Cal. Acad. Sci. (2), vol. 1, 1888, p. 143 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 81 (name only).

Museum Leiden:

No. 3055, Surinam, Dieperink, 1 ex., 268 mm, type.

Body long and slender, compressed, the head depressed. The depth of the body 6 in the standard length. The depth of the head nearly 1½ in its width, its length 3½ in the standard length. The upper surface of the head granular to above the middle of the eyes. The occipital process at its base nearly as broad as long, coossified with the dorsal plate, and without a conspicuous ridge. Head flat, the sides covered with skin, smooth, with numerous mucous canals. Interorbital area flat without ridges. The fontanel long and wide, but not continued backwards as a groove.

Eye 1½ in the snout, 6 in the head and 2½ in the interorbital.

Snout broad and rounded, projecting beyond the lower jaw. Maxillary barbels reaching the base of the pectorals, the mentals and postmentals much shorter. The depth of the intermaxillary band of teeth 4 in its width. The palatine and vomerine patches contiguous. The teeth are conical.

Distance between origin of dorsal and tip of snout $2^2/_3$ in the standard length. The dorsal spine granulate in front at the bottom, with some teeth near the tip, the posterior margin serrate, the sides inconspicuously striate. The base of the dorsal short, equal to the base of the adipose and 3 in the length of the head. The distance between dorsal and adipose $3^1/_3$ in the standard length. Adipose fin as high as long. Caudal deeply forked. Anal fin obliquely truncate. Pectoral spine somewhat longer than the dorsal spine, the inner margin strongly serrate, the outer margin granular, but with some teeth near the tip, sides not conspicuously striate.

Colour of the specimen, preserved in alcohol for more than 100 years, is black above, silvery with iridescent colours on the sides. The lower surface white.

D. I/7. A. 18. V. 7. P. I/9.

Hexanematichthys coerulescens (Günther)

Arius coerulescens Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 149 (Guatemala); — idem, Fish. Centr. Amer., 6, 1866, p. 393 (name only); — Jordan, Proc. Acad. Sc. Phil., 1883, p. 282 (without locality).

Galeichthys coerulescens Jordan, Proc. U.S. Nat. Mus., 1885, p. 366 (name only).
Tachisurus coerulescens Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 142 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 81 (name only).

Museum Leiden:

No. 5148, Rio Presidio, Mexico, A. Foirer, 2 ex., 145 and 210 mm.

Body and caudal peduncle compressed, head depressed, its depth 1½ in its width. Width of the head 1½ in its length. The length of the head 4 in the standard length. Upper surface of the head granular. The occipital process as broad as long, subtruncated at the tip, and little raised along the median line.

Eye 1½ in the snout, 4½-5½ in the head and 2-2½ in the interorbital.

The teeth in the intermaxillary and the mandible villiform. Those on the vomer and palatine granular. The patches on the vomer and palatine are subcontinuous, forming an irregular band. The maxillary barbels reach to 1/3 or ½ of the length of the pectoral spine; the postmentals to the base of the pectorals; the mentals are much smaller.

Distance from dorsal spine to tip of snout 3 in the standard length. The spine strong and serrate on the posterior margin, the anterior margin granular. The first soft ray longer than the height of the body. The base of the adipose equal to that of the dorsal, the distance between them 3 in the standard length. Caudal deeply forked, the upper lobe longest, its length nearly equal to the length of the head. Length of the anal 1½ in the length of the head. Ventrals not reaching the anal. Pectorals with a strong spine, which is serrate on its inner margin and on the tip of the outer margin, on which the serrations are more granular towards its base.

Colour blackish towards the back, bluish on the sides, the lower parts silvery. Fins blackish; anal fin with numerous minute dark dots.

D. I/7. A. 17. V. 6. P. I/10..

Arius Cuv. & Val.

Arius Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 40 (part.); — Bleeker, Ichth. Arch. Ind. Prodr., I, 1858, p. 62 and 67 (*arius*).

Type: *Pimelodus arius* Buchanan.

Palatinal patches of teeth without a backward projecting angle; teeth on the palate granular, no teeth on the vomer; gill-membranes united and joined to the isthmus, with a very narrow free margin across the latter.

Arius spixii (Agassiz)

Pimelodus albidus Spix, Selecta Gen. et Spec. Pisc. Bras., 1829, pl. 7 fig. 1 (Equatorial Brazil).
Pimelodus spixii Agassiz, Selecta Gen. et Spec. Pisc. Bras., 1829, p. 19.

Arius spixii Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 57 (copied); — Regan, Proc. Zool. Soc. London, 1906, I, p. 386 (Trinidad); — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 145, pl. IX fig. 2 (Georgetown, Mahaica).

Tachisurus spixii Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 146 (Maranhao, Bahia, Rio de Janeiro, Para, Santos, Abrolhos); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 88 (Maranhao, Bahia, Rio de Janeiro, Para, Santos in Sao Paulo, Abrolhos, Brazil); — Jordan & Evermann, Bull. U.S. Nat. Mus., 47, I, 1896, p. 131 (without locality); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 27 (Para, Cayenne, Surinam); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 529 (Trinidad).

Arius arenatus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 106 (Cayenne); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 172 (copied); — Bleeker, Silures de Suriname, 1864, p. 53, pl. 4 fig. 2 (Surinam).

Galeichthys arenatus Jordan, Proc. U.S. Nat. Mus., 9, 1886, p. 558 (name only).

Arius nuchalis Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 171 (British Guiana).

Galeichthys nuchalis Jordan, Proc. U.S. Nat. Mus., 9, 1886, p. 559 (name only).

Tachisurus nuchalis Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 145 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 86 (name only); — Jordan & Evermann, Bull. U.S. Nat. Mus., 47, 1896, p 131 (without locality).

Museum Leiden:

No. 3036, Surinam, Dieperink, 1 ex., 168 mm.
No. 3037, Cayenne, from Museum Paris, 2 ex., 149 and 164 mm.
No. 3039, Surinam, Dieperink, 1 ex., 152 mm.
No. 8419, Coast of Venezuela, Buitendijk, 2 ex., 247 and 268 mm.
No. 14766, Georgetown market, British Guiana Exp., 1908, Eigenmann, 1 ex.
No. 17288, West Indies, 1 ex., 210 mm.
No. 17289, Caribbean Sea, Buitendijk, 1 ex., 168 mm.
No. 17290, Surinam, Van Heurn, 3 ex., 161, 170 and 182 mm.
No. 17322, Gonini, Surinam, Gonini-Exp., Versteeg, 1 ex., 145 mm.

Museum Amsterdam:

Surinam, from the Aquarium Zoological Garden Amsterdam, 2 ex., 205 and 213 mm.
Georgetown, British Guiana Exp., 1908, Eigenmann, 1 ex., 130 mm, without caudal.

Body and caudal peduncle compressed, head depressed. Head narrowed forward, its greatest depth $1^1/_5$ in its greatest width and 1¾ in its length. Its length $3^1/_3$ in the standard length. Top of the head granular, in the older specimens the granules are more united to reticulating ridges, especially on the occipital process. This process with a blunt median ridge, its width at the base nearly equal to its length, its tip emarginate. Fontanel narrow, without interruptions, reaching from the posterior nares to $^2/_3$ of the length of the head, continued as a deep tapering groove to the base of the occipital. The opercles and the humeral process covered with skin.

Eye 1½ in the snout, 5½-6½ in the head and 3-3½ in the interorbital.

Maxillary barbels varying in extent from the base of the pectorals to the base of the ventrals; the postmental barbels do the same from the gill-opening to the base of the pectoral; the mentals do not reach as far as the gill-opening. Upper jaw more or less projecting, lips papillose, teeth on

the intermaxillary and the mandible villiform. The teeth on the palate granular; the teeth in two patches in the younger specimens, in the older ones the subovate patches are more coalescing in front, forming a single patch of teeth. Gill-membranes united and joined to the isthmus, not forming a free margin across it.

Distance from dorsal spine to tip of snout 2½-2¾ in the standard length, the length of the spine 1½ in the length of the head, granular or smooth on its anterior margin, the posterior margin serrate. The distance between dorsal and adipose 3-3 1/3 in the standard length. The adipose small, its outer margin rounded, free posteriorly. Caudal forked, the upper lobe slightly longer, 4-4½ in the standard length. Anal fin scarcely longer than high, obliquely emarginate. Ventrals 1¾-2 in the head. Pectoral spine strong, granular or smooth on its outer margin, serrate on the inner. The second and third ray of the pectoral the longest. The pectoral pore moderate.

Colour dark above, sides and ventral surface silvery with several fine brown dots.

D. I/7. A. 19-21. V. 6. P. I/7.

CALLOPHYSIDAE

Callophisinae Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 94; — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 148.

Nares remote, barbels six, adipose fin well-developed. Teeth incisor-like, in two series in the upper jaw and in a single series in the lower jaw. The first dorsal and pectoral rays are not spine-like, the adipose fin long.

Callophysus Müller & Troschel

Callophysus Müller & Troschel, Horae Ichth., 3, 1849, p. 1; — Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 101 (*macropterus*).

Pimelotropis Gill, Proc. Acad. Nat. Sc. Phil., 1859, p. 196 (*lateralis* = *macropterus*).

Pseudocallophysus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 102 (*ctenodus* = *macropterus*).

Type: *Pimelodus macropterus* Lichtenstein.

The first dorsal and pectoral ray not spine-like. Adipose long. A wedge-shaped fontanel between the eyes and a circular one at the base of the occipital process. One series of teeth in the lower jaw, two series in the upper, the teeth flattened, incisor-like.

Callophysus macropterus (Lichtenstein)

Pimelodus macropterus Lichtenstein, Wiedemann's Zool. Mag., I, 3, 1819, p. 59 (Brazil).

Callophysus macropterus Müller & Troschel, in Schomburgk's Reisen, 3, 1848, p. 629 (Essequibo); — idem, Horae Ichth., 3, 1849, p. 1 (Brazil, Guiana); — Günther,

Cat. Fish. Brit. Mus., 5, 1864, p. 137 (copied); — Peters, MB. Akad. Wiss. Berlin, 1877, p. 470 (Apuré); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 120 (Obidos, Lake José Assu, Cameta, Rio Negro, Santarem, Tonantins, Manacapura); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 95 (Obidos, Lake José Assu, Cameta, Rio Negro, Santarem, Tonantins, Lake Manacapura, Villa Bella, Serpa); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 27 (Amazon, Solimoens, Maranon); — Eigenmann & Bean, Proc. U.S. Nat. Mus., 31, 1907, p. 659 (Amazon); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 382; — idem, Mem. Carn. Mus., 5, 1912, p. 148 (British Guiana); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 206 (Peru).

Pimelodus ctenodus Agassiz, Gen. et Spec. Pisc. Bras., 1829, p. 21, pl. 8a (Equatorial Brazil); — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 138 (copied); — Caste'nau, Anim. Amer. Sud, Poiss., 1855, p. 35 (Amazon).

Callophysus ctenodus Müller & Troschel, Horae Ichth., 3, 1849, p. 2 (Brazil); — ? Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 422 (without locality); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 137 (copied).

Pimelodus insignis Schomburgk, Fish. Brit. Guiana, I, 1841, pl. 6 (name only).

Pimelotropis lateralis Gill, Proc. Acad. Nat. Sc. Phil., 1859, p. 196 (Amazon).

Callophysus lateralis Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 136 (copied); — Steindachner, Ichth. Beitr., 5, Sitz. Ber. Akad. Wiss. Wien 74, 1876, p. 105 (Santarem, Tabatinga, Montalegre, Obidos, Rio Negro, Tonantins, Lake Manacapura, San José Assu); — Cope, Proc. Am. Phil. Soc., 17, 1878, p. 676 (Peruvian Amazon); — Vaillant, Bull. Soc. Philom. (7), vol. 4, 1880 (Calderon).

Museum Leiden:

No. 14776, Tabatinga, from Museum Cambridge, Mass., 1 ex., 295 mm.

Body rather slender. Depth at the origin of the dorsal nearly equal to the width, 5½ in the total length. The body highest at the origin of the adipose, gradually tapering to the caudal. Profile nearly straight, somewhat curved near the tip of the snout. Head rather broad, somewhat depressed above the eyes. The top of the head covered with skin. Length of the head 5 in the standard length. Fontanel from the posterior nares to beyond the posterior margin of the eyes. A circular fontanel at the base of the occipital process. Occipital process not meeting the dorsal plate.

Eye about 3 in the snout, 5½ in the head, 2½ in the interorbital.

Nares remote. Barbels rather flat. The maxillary barbels reaching beyond the end of the adipose. Mental barbels beyond the base of the pectorals, postmental barbels to the middle of the ventrals. Teeth incisor-like, in two series in the upper, in a single series in the lower jaw. Gill-membranes entirely free. Br. 9.

First dorsal ray higher than the following rays, but not spine-like. The basal half is somewhat stiff, the upper part soft, but there is no exact separation between these parts. Adipose $2^1/_3$ in the standard length. Caudal deeply emarginate. Anal emarginate, the fifth ray highest. Ventrals large, nearly equal to the length of the head. The pectoral as long as the head,

the first ray stiff but not spine-like, longest, the following rays rapidly shortening.

Eigenmann gives the colour as light brownish, in one specimen uniform, in another with darker spots along the sides and the adipose fin. Other fins plain, or smutty. The colour of the here described specimen is white.

D. 7. A. 12. V. 6.

Probably this species also may be found in Surinam.

The inner ray of the ventrals in the described specimen is divided to the base, it looks as if the ventral has 7 rays; but just as Eigenmann says the inner ray counts for one ray only and consequently the ventrals count 6 rays in total.

PIMELODIDAE

Pimelodus Lacépède, Hist. Nat. Poiss., 5, 1803 (part.); — Cuvier, Règne Animal, 2, 1817, p. 203 (part.); — Cuvier & Va'enciennes, Hist. Nat. Poiss., 15, 1840, p. 92.

Pimelodinae Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 97; — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 149.

Pimelodidae Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 28.

Gill-membranes free from the isthmus. Nares remote. Barbels six. Adipose well developed. Teeth villiform, in bands in both jaws. Sometimes teeth on the vomer in little patches.

Heptapterus Bleeker

Heptapterus Bleeker, Ichthyol. Arch. Ind. Prod., Siluri, 1858, p. 197 (***mustelinus***).

Type: *Pimelodus mustelinus* Cuv. & Val.

Body long and slender. Skull covered with a thin skin. Orbit without a free margin. Snout not produced. Teeth in both jaws well developed, villiform, vomer without teeth. Dorsal fin without a spine, situated above the ventrals. Caudal rounded.

Heptapterus mustelinus (Cuv. & Val.)

*Pimelodus **mustelinus*** Valenciennes in d'Orbigny, Voyage Amér. Merid., Poiss., 1847, pl. 2 fig. 1-4; Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 122 (La Plata); — Hensel, Wiegm. Arch., 1870, p. 77 (Santa Cruz, Rio Grande do Sul).

*Heptapterus **mustelinus*** Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 271 (copied); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p.172 (Maldonado); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 144 (Maldonado); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 29 (Rio Grande do Sul, Rio La Plata); — idem, Mem. Carn. Mus., 5, 1912, p. 130 (footnote).

Museum Amsterdam:

Joinville, Brazil, 1 ex., 112 mm.

Body and head somewhat depressed, tapering; the caudal portion com-

pressed. Head very short, 5½ in the standard length, its depth 1½ in its length, its width equal to its length. The head entirely covered with skin. Fontanel very narrow, continued to the base of the occipital.

Eye small, 3 in the snout, 7 in the head and 2½ in the interorbital.

Maxillary barbels to the posterior edge of the gill-opening, the mental and postmental barbels to the anterior edge of the gillopening. Width of the mouth 2 in the length of the head. Teeth villiform in a band in both jaws. Gill-membranes separate to below the eyes.

The distance between tip of snout and dorsal 2¾ in the standard length. The first ray of the dorsal not spinous. The adipose long, $2^1/_2$ in the standard length. Its distance to the dorsal equal to the length of the base of the dorsal. The adipose fin continuous with the caudal fin. Caudal fin obliquely rounded, its accessory rays continued forwards, the anterior portion scarcely rayed, adipose-like. The anal fin inserted below the origin of the adipose. The ventrals inserted below the third dorsal ray. The pectorals without a spinous first ray.

Colour brownish dotted with dark, except on the belly.

D. 7. A. 20. V. 6. P. 8.

Heptapterus surinamensis Bleeker

Heptapterus surinamensis Bleeker, Silures de Suriname, 1864, p. 91, pl. 15, fig. 1 (Surinam); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 271 (copied); — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 130-131 (footnote).

Acentronichthys surinamensis Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 146 (name only); — Eigenmann, Rep. Princeton Univ. Exp. Patagonia, 3, 1911, p. 385 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 130-131 (footnote).

Museum Leiden:

No. 2984, Surinam, Dieperink, 1 ex., 112 mm, without caudal, holotype of the species.

Body elongate. Head depressed, entirely covered with thin skin, its depth 2½ in its width. Length of the head 6½ in the standard length. Fontanel a narrow slit to the base of the occipital process. Distance from anterior margin of the eye to tip of snout nearly $^1/_3$ of the length of the head.

Diameter of the eye 2 in the interorbital. The eyes are situated on the upper surface of the head and directed upwards.

Maxillary barbels reaching beyond the base of the pectorals to the edge of the gill-opening. Outer mental barbels half this length. Width of the mouth 2½ in the length of the head. Teeth on both pre-maxillaries in a band, the depth of which 1½ in its width.

Distance from dorsal fin to tip of snout 2½ in the standard length. First ray of the dorsal neither stiffened nor spinous. Adipose rather long, the

length of its base nearly equal to its distance from the dorsal and 4 in the standard length; not continuous with the caudal fin. Caudal fin with numerous accessory rays especially on the ventral side. Ventral fins situated before the vertical from the origin of the dorsal base. The last ventral ray and the first dorsal ray nearly equidistant from the tip of the snout.

Colour dark brown above, whitish below. The back and adipose fins with small brown dots. The other fins hyaline.

In the specimen in the Leiden Museum, which is the type of the species and the only one known, the caudal is badly damaged. All the rays are broken off. So it is quite impossible to say whether the caudal fin is rounded or forked. Therefore it will not be possible to stipulate if it belongs to the genus *Heptapterus* or *Acentronichthys* as Eigenmann (1910, p. 131) has stated in the footnote. I quite agree with Bleeker when he says that it belongs to the genus *Heptapterus*.

Luciopimelodus Eigenm. & Eigenm.

Luciopimelodus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 122 (*pati*).

Type: *Pimelodus pati* Cuv. & Val.

First dorsal and pectoral rays not spinous, flexible and longer than any of the subsequent rays. Free margins of the dorsal and anal emarginate. Head depressed. Snout elongate and spatulate. Fontanel continued above the eye. A circular depression at the base of the occipital process. Occipital process very narrow, a mere ridge, not touching the dorsal plate.

Luciopimelodus pati (Cuv. & Val.)

Pimelodus pati Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 131 (Parana, La Plata, Corrientes, Buenos Ayres); — Valenciennes, in d'Orbigny, Voyage Amer. du Sud, 1847, pl. 1 figs. 7-9; — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 416 (Forte de S. Joaquim, Rio Branco); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 128 (copied); — Perugia, Ann. Mus. di Genova, 10, 1892, p. 631 (Rio La Plata); — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 464 (Rio Branco); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 297 (Rio da Prata).

Luciopimelodus pati Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 122 (Buenos Ayres); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 106 (Buenos Aires); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 28 (name only); — Lahille, Revista Mus. de La Plata, 6, 1895, p. 270 (non vidi); — Boulenger, Trans. Zool. Soc. London, 14, 1896, p. 27 (Paraguay); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1909, p. 383 (name only).

Museum Amsterdam:

Parana River, Rosario de Sante Fé, Capt. Noordraven, 1 ex., 208 mm.

Body compressed, width below the first dorsal ray much less than the depth, tapering to a slender caudal peduncle. Head strongly depressed, its

width $1^2/_3$ in its length. Length of the head 4 in the standard length. Snout elongate, spatulate, depressed, its width at the rictus 2 in the length of the head. Cheek, nasal and orbital region of the head covered with reticulated skin. Fontanel long and wide, reaching from between the posterior nares to the occipital, continued as a groove to the base of the occipital process, which is very narrow, not more than a mere ridge.

Eye behind the middle of the head, 5 in the snout, 10 in the head, 3½ in the interorbital and 3½ diameters behind the rictus.

Mouth large, the upper jaw slightly projecting. Width of the band of teeth in the lower jaw equal to the diameter of the eye. The intermaxillary band narrowed in the middle and separated, deepest at the outer edges which are emarginate. Maxillary barbels somewhat compressed, reaching to beyond the base of the anal, the mentals reaching to beyond the tip of the pectorals and the postmentals to beyond the tip of the ventrals. Gill-rakers short, 4+13. Dorsal plate present, narrow, but concealed under the thick skin.

First dorsal ray not spinous, slender, articulated on its upper half, but not branched, longer than the following rays, its length 1½ in the length of the head. Dorsal rays rapidly decreasing in height to the last, which is less than ½ the length of the first. Adipose fin 3 in the standard length. The distance between the base of the dorsal and the adipose 4 in the length of the base of the adipose. Caudal deeply forked, the lobes long and pointed, the upper lobe longer. The length of the caudal $1^1/_5$ times the length of the head. Anal emarginate. Ventrals inserted behind the vertical from the last dorsal ray. First pectoral ray similar to the first dorsal ray, with short teeth on the posterior margin, its length 1¼ in the length of the head. The fin when laid back is reaching the base of the ventral.

Colour marks cannot be noticed.

D. 7. P. 12. A. 13.

Pseudopimelodus Bleeker

Pseudopimelodus Bleeker, Ichth. Arch. Ind. Prod., Siluri, 1858, p. 196; — idem, Nederl. Tijdschr. Dierk., I, 1863 (*bufonius* = *zungaro*).

Batrachoglanis Gill, Ann. Lyc. Nat. Hist. N.Y., 1858 (*raninus*).

Zungaro Bleeker, Nederl. Tijdschr. Dierk., I, 1863 (*zungaro*).

Lophiosilurus Steindachner, Sitz. Ber. Ak. Wiss. Wien, 74, 1876, p. 106 (*alexandri*).

Type: *Pimelodus raninus* Cuv. & Val.

Eye covered with skin, orbit without a free margin. Dorsal plate well developed, usually joined to the occipital process. Head broad, depressed. Dorsal and pectoral spines well developed. Caudal rounded or emarginate.

Pseudopimelodus zungaro (Humboldt)

Pimelodus zungaro Humboldt, Obs. Zool., 2, 1833, p. 170, pl. 46 fig. 1 (Maranon); — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 119 (copied); — Schomburgk, Fish. Guiana, 2, 1843, p. 205 (Tomependa, Amazon).

Pseudopimelodus zungaro Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 122 (Goyaz); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 112 (Goyaz); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 28 (Goyaz); — idem, Mem. Carn. Mus., 9, 1922, p. 32 (Rio Atrato, El Dique, Rio Magdalena); — Lahille, Rev. Mus. La Plata, 6, 1895, p. 270 (non vidi); — Eigenmann & Norris, Rev. Mus. Paulista, 4, 1900, p. 350 (without locality); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 255, 256, pl. 43 fig. 1 (Rio S. Francisco, Rio das Velhas, Rio Cipo, Cuyaba, Amazon, Araguaya, Paraguay, Magdalena, Cauca, Matto Grosso).

Pimelodus bufonius Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 115 (Cayenne); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 421 (Cuyaba); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 133 (Rio Cipo, Rio das Velhas); — Cope, Proc. Amer. Phil. Soc., 17, 1878, p. 675 (Peruvian Amazon); — Steindachner, Denkschr. Akad. Wiss. Wien, 42, 1880, p. 59, pl. II fig. 1-1b (Cauca); — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 456 (without locality).

Pimelodus Charus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 118 (after a drawing of a specimen from Rio Sabara).

Pseudopimelodus charus Lütken, Dansk. Selsk. Skr., 1875, Velhas Flodens Fiske, p. 180 (Rio das Velhas).

Pimelodus mangurus Valenciennes, Voyage d'Orbigny, 1847, pl. I fig. 2 (Rio La Plata); — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 116 (Brazil, Paraguay); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 134 (copied).

Zungaro humboldtii Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 101 (name only).

Pseudopimelodus zunigaro Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 28 (Rio La Plata to Rio Magdalena).

Zungaro zungaro Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 209 (Peruvian Amazon).

Museum Amsterdam:

Parana River, Rosario de Santa Fé, Capt. Noordraven, 1 ex., 252 mm.

Body wedge-shaped, compressed at the caudal, depth behind the head 1½ in the width. The width of the caudal peduncle 2 in its depth. Head 3½ in the standard length, as wide as long, depressed, its greatest depth 2 in its greatest width. The bones covered with skin. The occipital process short, its width 1½ in its length, deeply notched at the tip, holding the point of the much longer dorsal plate. Profile straight, nearly horizontal, head flat.

Eye small, covered with skin. Snout 3½ in the length of the head, interorbital 2 in the length of the head.

Maxillary barbels reaching the gill-opening, the mental and postmental barbels very short. Jaws subequal, the lower very little producing. Bands of teeth very wide, the mandibulary band tapering backwards to a point.

Humeral process scarcely projecting beyond the arch. Distance from dorsal point to tip of snout $2^4/_5$ in the standard length. The spine straight, 2 in the head, ending in a soft flexible point, on its anterior margin with

fine recurved teeth, the soft rays nearly as long as the spine. The whole fin is covered with a thick leathery skin. Distance from adipose to dorsal 1½ times as long as the base of the dorsal. Adipose somewhat longer than the dorsal fin. Caudal fin forked. Anal reaching the caudal fin when laid back. Ventrals inserted behind the vertical from the last dorsal ray; the five rays split for more than half their length, giving the appearance of twice as many in number. Pectoral spine scimitar-shaped, blunt at its tip, its inner margin with numerous blunt teeth near its tip, the outer margin with similar teeth, but on its basal third part. The teeth are hardly noticeable, after Eigenmann and Eigenmann they are more conspicuous in younger specimens. The spine is hollow, open at the tip, which is obvious after removing the leathery skin covering the spine. The spine produced in a flexible prolongation which is nearly half as long as the spinous portion.

The colour of the specimen is of a dubious light brown, with darker spots on the head and dark portions on the back and the sides. In the middle of the dorsal fin a light band.

D. I/6. A. 10. P. 10. V. 5.

Pseudopimelodus albomarginatus Eigenmann

Pseudopimelodus albomarginatus Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 1910, p. 384 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 153, pl. XI fig. 1 (Tukeit, Waratuk).

Museum Amsterdam:

Tukeit, Lower Potaro, British Guiana Exp., 1908, Eigenmann, 1 ex., 38 mm, paratype of the species.

Body lumpish, much depressed, heat flat above. Width of the head nearly equal to its length. The length of the head 2½ in the standard length. Depth of the head 2 in its width. Anterior nares with a projecting tube. Jaws equal, width of the mouth 2 in the length of the head. Premaxillary band of teeth interrupted in the middle and with a long pointed backwards projected angle. The maxillary barbels scarcely reaching to the gill-openings. The mental barbels reaching the base of the post-mentals, the latter reaching the gill-opening.

Distance between tip of snout and base of the dorsal spine 2¼ in the standard length. The spine slightly rough on the upper half of its margin. Dorsal rays nearly equal in height, 2 in the length of the head, but the spine much shorter. The caudal fin of the here described specimen is broken off. Anal nearly reaching the base of the caudal. The ventrals reaching the anal. The pectorals are not reaching the ventrals. The pectoral spine short, strong and curved, with strong recurved hooks on both margins. The hooks on its outer margin retrorse near the base, antrorse near the tip.

Colour black with markings of brown, forming a large blotch below the space between the two dorsals and a smaller one below the base of the dorsal spine. A characteristic white margin along dorsal, caudal, anal and ventrals, and a very narrow white margin along the margin of the pectorals.

D. I/6. A. 10.

Chasmocranus Eigenmann

Chasmocephalus Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 384 (name preoccupied).

Chasmocranus Eigenmann, Mem. Carn. Mus., 5, 1912, p. 160.

Type: ***Chasmocranus longior*** Eigenmann.

First ray of dorsal and pectoral not spine-like. Top of head covered with thin skin. Fontanel narrow, extending to the base of the occipital, interrupted over the eyes and again some distance behind the eyes. Eyes superior, orbit without a free margin. Occipital process short and narrow. Adipose fin low, not connected with the caudal. Caudal forked. Anal with ± 11 rays. Origin of the ventrals far in front of the middle of the body, under the origin of the dorsal.

Chasmocranus longior Eigenmann

Chasmocephalus longior Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 384 (name only).

Chasmocranus longior Eigenmann, Mem. Carn. Mus., 5, 1912, p. 160, pl. XIV fig. 2 (Amatuk, Maripicru?, Waratuk, Konawaruk, Warraputa).

Museum Amsterdam:

Warraputa Falls, Essequibo river, British Guiana Exp., 1908, Eigenmann, 1 ex., 46 mm, paratype of the species.

Head and body depressed, tail compressed. Tip of the occipital process, which is very short, equidistant from the snout and the origin of the dorsal fin. Head flat, depressed, its length 5 in the standard length. Its width little less than its length, its depth 2 in its length. Anterior nostrils nearer to the snout than to the posterior nostrils.

Eye small, situated on the upper side of the head, looking upwards, 2 in the snout, 5 in the head and 1½ in the interorbital.

The intermaxillary band of teeth deep, its depth 1½ in the length of its outer margin. Fontanel narrow, interrupted between the eyes and behind them. The posterior part a narrow slit at the base of the occipital process. Maxillary reaching somewhat beyond the origin of the pectoral, the barbel concealing in a groove below the eye. Mental and postmental barbels in a straight line, their distance from the edge of the lower lip equal to that between the inner barbels.

Distance between dorsal and tip of snout 2½ in the standard length. The rays nearly equal in length. The distance between dorsal and adipose nearly equal to the length of the adipose, which is 3¾ in the standard length. Caudal slightly forked, the lobes nearly equal in length, its length 1½ in the length of the head. Pectorals rounded, their length 2 in the head.

Colour dark brown, a light streak across the back from one gill-opening to the other, a light spot at the base of the first dorsal ray. A dark blotch at the base of the caudal.

D. 7. A. 10. V. 6. P. 7.

Rhamdioglanis R. von Ihering

Rhamdioglanis Rudolf von Ihering, Notas Preliminares da Rev. Mus. Paulista S. Paulo, vol. I, fasc. 1, 1907, p. 16; — idem, Rev. do Mus. Paulista S. Paulo, vol. 7, 1907, p. 457; — Jordan, Genera of Fishes, 4, 1920, p. 524.

?*Imparfinis* Eigenmann & Norris, Rev. Mus. Paulista, vol. 4, 1900, p. 351; — Jordan, Genera of Fishes, 4, 1920, p. 524.

Type: *Rhamdioglanis frenatus* Von Ihering.

Orbit with a free margin. Head distinctly longer than broad, occipital process not reaching the dorsal plate. Fontanel continued to the base of the occipital process. No dorsal spine, first pectoral ray spinous at its base. Upper caudal lobe longer.

Rhamdioglanis transfasciatus Ribeiro

Rhamdioglanis transfasciatus Ribeiro, Arch. Mus. Nac. Rio de Janeiro 16, 1911, p. 260, pl. 44 fig. 1 (without locality).

Museum Amsterdam:

Joinville, Brazil, 1 ex., 127 mm.

Head quadrangular, depressed, its length 5 in the standard length, its width 1½ in its length, its depth 2. Body and caudal peduncle more slender, compressed. Caudal peduncle long. Head covered with a thick skin.

Eye 2 in the snout, 6½ in the head, 1½ in the interorbital.

Width of the mouth 2 in the length of the head. Intermaxillary band of teeth broad, narrowed in the middle. In the lower jaw two series of teeth, interrupted in the middle. Maxillary barbels reaching beyond the base of the pectorals, the barbel concealing in a groove below the eye. The post-mental barbels reaching to the gill-opening, the mental barbels ¾ of this length. The posterior nares in the middle between the anterior nares and the eyes.

The distance between the dorsal and the tip of the snout 3 in the standard length. The first ray of the dorsal fin spinous for $^2/_3$ of its length. The adipose long, its base 3½ in the standard length. Caudal forked to its

base, the upper lobe long. The anal long, truncate. The ventrals rounded, the vent between their bases. Pectoral fins rounded, the first ray spinous for half its length. Lateral line straight and simple.

Colour light brown with a dark lateral band from the eyes to the tip of the snout. A transversal dark blotch in the nuchal area. A dark transversal band at the origin of the dorsal fin and at the posterior end of its base. The caudal peduncle with 3 transversal bands.

D. I/6. A. 10. V. I/5. P. I/7.

Rhamdia Bleeker

Pimelodus Lacépède, Hist. Nat. Poiss., 5, 1803; — Cuvier, Règne Animal, 2, 1817, p. 203; — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 114.

Pteronotus Swainson, Class. Fishes, Amph. and Rept., 2, 1839, p. 309 (*quinquetentaculatus*), preoccupied in Mollusks.

Rhamdia Bleeker, Ichth. Arch. Ind. Prodr., I, 1858, p. 197 and 207; — idem, Nederl. Tijdsch. Dierk., I, 1863, p. 101 (*queleni*).

Pimelonotus Gill, Ann. Lyc. Nat. Hist. N.Y., 6, 1858, p. 391 (*vilsoni*).

Notoglanis Günther, Cat. Fish. Brit. Mus., 5, 1864, p 136 (*multiradiatus*).

Type: *Pimelodus quelen* Quoy & Gaimard.

Orbit with a free margin. Vomer without teeth or with teeth in minute patches. Occipital process not reaching the dorsal plate. Fontanel not continued behind the eye. Caudal forked. Barbels terete.

Rhamdia quelen (Quoy & Gaimard) (Table I)

Mystus cirris sex longissimis Seba, Rerum Nat. Thes. Acc. Descr., III, 1758, p. 84, pl. 29 fig. 5; — Gronovius, Mus. Ichthyol., Pisc., 1754, p. 34; — idem, Zoophyl., 1763, p. 125.

Rhamdia ou Bagre de Rio Marcgravius, Hist. rerum nat. Brasiliae, 1648, p. 149.

Pimelodus quelen Quoy & Gaimard, Voyage Uranie, Zool., 1824, pl. 49, fig. 3-4.

Rhamdia quelen Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 126 (Santa Clara, Rio Mucuri, Juiz de Fora, Campos, Rio Jequitinhonha, Mendez, Rio de Janeiro, Macacos, Sao Matheos, Rio Parahyba, Cannavierias, Rio do Sul); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 127 (localities as mentioned before); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 28 (name only); — Berg, Ann. Mus. Nac. Buenos Aires, 4, 1895, p. 133 (without locality); — Eigenmann & Norris, Rev. Mus. Paulista, 4, 1900, p. 350 (Taubaté); — Eigenmann & Kennedy, Proc. Acad. Nat. Sc. Phil., 1903, p. 499 (Estancia la Armonia, Asuncion, Campo Grande); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 13, 1906, p. 177 (without locality); — Eigenmann & Bean, Proc. U.S. Nat. Mus., 31, 1907, p. 660 (Amazon); — Eigenmann, Ann. Carn. Mus., 4, 1907, p. 113 (Corumba); — idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1919, p. 386 (name only); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 278, pl. 45 fig. 2 (Quinta Boa Vista near S. Christovao, R. Branco); — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 163 (Gatuck Creek, Aruataima, Yackeatonuk Fall, Nickaparu Creek, Upper Potaro, Rupununi, Holmia Creeks, Chipoo Creek, branch of the Ireng); — Ind. Univ. Stud., 7, no. 44, 1920, p. 6 (Rio Castano, Maracay, El Concejo).

Rhamdia queleni Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 101 (name only); — idem, Silures de Suriname, 1864, p. 75 (Surinam).

Pimelodus queleni Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 123 (Brazil); — Boulenger, Boll. Mus. Zool. Anat. Comp. Torino, 15, 1900, p. 370 (Caradasiñho).

Pimelodus (*Rhamdia*) *queleni* Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 74 (Rio Parahyba near Juiz de Fora, Campos, Rio Doce, Porto Alegre, Cannavierias, Amazon near Para, Bahia).

Pimelodus queleni cuprea Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 74 (Juiz de Fora).

Pimelodus sebae Cuvier, Règne animal, 2e ed., 1829, p. 294, footnote (name only); — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 125 (Surinam, Cayenne, Rio de Janeiro, Buenos Aires); — Müller & Troschel, in Schomburgk, Reisen, 3, 1848, p. 628 (all Guiana rivers); — Hyrtl, Denkschr. Akad. Wiss. Wien, 16, 1859, p. 16 (without locality); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 417, fig. 19 (Marabitanos); — Quoy & Gaimard, Voy. Uranie et Physicienne, Zool., 1824, p. 228, pl. 49 figs. 3 and 4; — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 119 (Demerara, British Guiana, Brazil); — Boulenger, Ann. Mus. Genova, 19, 1899, p. 126 (without locality); — idem, Bol. Mus. Torino, 15, 1900, p. 370 (without locality).

Pimelodus (*Rhamdia*) *sebae* Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 68 (Demerara, Essequibo, St. Martha, mouth of the Magdalena); — idem, Denkschr. Akad. Wiss. Wien, 39, 1878, p. 17 (Rio Magdalena); — idem, Denkschr. Akad. Wiss. Wien, 40, 1879, p. 7 (Cauca).

Rhamdia sebae Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 126 (Tonantins, Gurupa, Rio de Janeiro, Bahia, Xingu, Santa Cruz, Cudajas, Sao Matheos, Rio Doce, Serpa, Tabatinga, Goyaz, Para, Teffé, Surinam, Villa Bella); — idem, Occ. Pap. Cal. Acad. Sci., vol. 1, 1890, p. 123 (localities as mentioned before); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 279, pl. 45 fig. 3 (without locality); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 385 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 164 (Aruka River, Essequibo, Barima River, Mora Passage, Gluck Island, Kumaka, Lama stop- off, Georgetown, Wismar); — idem, Mem. Carn. Mus., 9, 1922, p. 39 (Soplavicato); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 258 (Rupununi); — idem, Proc. Acad. Nat. Sc. Phil., 1915, p. 209 (Surinam, Peruvian Amazon); — Güntert, Zool. Anz., 138, 1942, p. 31 (Nariva River, Trinidad; Rio Tocyua, Venezuela).

Pimelodus stegelichii Müller & Troschel, in Schomburgk, Reisen, 3, 1848, p. 628 (forest brooks); — idem, Horae Ichth., 3, 1849, p. 3 (Surinam); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 121 (Demerara, Surinam).

Pimelodus musculus Müller & Troschel, Horae Ichth., 3, 1849, p. 4 (America).

Pimelodus mülleri Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 119 (River Capin, Para, Surinam); — Goeldi, Bol. Mus. Paraense, 2, 1898,p. 459, 461, 476 (without locality).

Pimelodus (*Rhamdia*) *kneri* Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 73, footnote (Cujaba).

Rhamdia sebae kneri Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 126 (Tabatinga, Jutahy); — idem., Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 126 (localities as mentioned before); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 28 (localities as mentioned before); — Güntert, Zool. Anz., 138, 1942, p. 32 (Nariva River, Trinidad).

Rhamdia sebae Martyi Güntert, Zool. Anz., 138, 1942 (Riactis, Canâwé, Ita Paraguay).

?*Pimelodus vilsoni* Gill, Ann. Lyc. Nat. Hist. N.Y., 6, 1858, p. 391 (Trinidad); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 209 (Trinidad, British Guiana) and p. 529 (Trinidad).

?*Pimelodus wilsoni* Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 122 (copied after Gill); — Jordan, Proc. U.S. Nat. Mus., 9, 1886, p. 559 (name only).

Heterobranchus sextentaculatus Agassiz, Selecta Genera et Spec. Pisc. Bras., 1829, p. 28, pl. 11 (without locality).

Pimelodus sellonis Müller & Troschel, Horae Ichth., 3, 1849, p. 2 (Brazil).
Pimelodus bahianus Castelnau, Anim. Am. Sud, Poiss., 1855, p. 35, pl. 16 fig. 2 (Bahia).
Pimelodus holomelas Günther, Ann. Mag. Nat. Hist., 12, 1863, p. 442 (Essequibo); — idem, Cat. Fish. Brit. Mus., 5, 1864, p. 120 (Essequibo).
Rhamdia holomelas Eigenmann, Mem. Carn. Mus., 5, 1912, p. 166 (Essequibo, Lama stop-off).
? *Rhamdia holomelas rupununi* Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 258, fig. 11 (Rupununi).
Silurus sapipoca (ex Natterer MS.) Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 418 (without locality).
Pimelodus wuchereri Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 123 (Bahia).
Pimelodus (*Rhamdia*) *queleni cuprea* Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 74 (Juiz de Fora).
Pimelodus (*Rhamdia*) *cuyaba* Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 75, footnote (Cuyaba).

Museum Leiden:

No. 3064, Surinam, Dieperink, 1 ex., 285 mm.
No. 3065, Surinam, Dieperink, 1 ex., 210 mm.
No. 3066, Surinam, Dieperink, 1 ex., 158 mm.
No. 3067, Surinam, Dieperink, 4 ex.,184, 191, 205 and 275 mm.
No. 3068, Surinam, Dieperink, 2 ex., 127 and 192 mm.
No. 6884, Surinam, Bleeker, 1 ex., 213 mm.
No. 10728, Berbice River, New Amsterdam, British Guiana, Young, 2♀♀, 247 and 253 mm.
No. 11056, Surinam, 1911, Van Heurn, 1 ex., 202 mm.
No. 14753, Rio de Janeiro, from Museum Cambridge, Mass., 1 ex.
No. 16063, Brazil, 1 ex., 273 mm.
No. 17245, Brazil, 1 ex.
No. 17261, Surinam, June 1910, Bolten, 2 ex., 84 and 185 mm.
No. 17262, Swamps behind the Botanic Garden, Lower Surinam River, 10-III-1939, 1 ex., 208 mm.
No. 17312, Surinam, 1911, Van Heurn, 2 ex., 124 and 167 mm.
No. 17313, Upper Saramacca, VI-1911, Saramacca Exp., Mr. De Kok, 1 ex., 239 mm.
No. 17314, Surinam, VI-1910, Bolten, 1 ex., 219 mm.
No. 17315, Port Real, Rio de Janeiro, 1890, Hardy du Dréneuf, 4 ex., 153, 202, 216 and 222 mm.

Museum Amsterdam:

Surinam, 1 ex., 160 mm.
South America, 3 ex., 1188, 153 and 160 mm.
Aruka River, British Guiana Exp., 1908, Shideler, 1 ex., 170 mm.
Aruataima Falls, Upper Potaro River, British Guiana Exp., 1908, Eigenmann, 2 ex., 130 and 178 mm.

Body strongly compressed in the posterior part and the caudal peduncle. The head depressed, its length 4-4$^{9}/_{10}$ in the standard length; flat above, the sides sometimes making a decided angle with the top, but sometimes sloping without a distinct angle. Greatest width of the head 1-1¾ in its length, its width at the angle of the mouth 1$^{3}/_{4}$-2$^{1}/_{3}$ in its length. Top of

the head covered with thin skin, the bones in all the specimens almost smooth or slightly roughened. There are two fontanels, a circular one above the posterior margin of the eye near the base of the occipital process, the occipital fontanel and the usual frontal fontanel, which is slit-shaped, broader in the young, reduced to a narrow slit in the older specimens.

Large pores regularly distributed all over the head, especially on the cheeks proportionally many more.

Eye in some specimens circular, in others elliptical. The diameter of the eye 5-7 1/2 in the head, 2-2 1/2 in the snout, 2-2 7/10 in the interorbital.

Maxillary barbels compressed or villiform, their length is extremely variable, the shortest extending to the end of the dorsal, in specimen no. 16063, the longest to the base of the caudal. Sometimes there is a great difference in length between the right and the left barbel. The mental barbels are also varying in length, reaching to the gill-opening or to beyond the base of the pectoral, the postmentals varying from the base of the pectoral to the top of the fin. Mouth wide, terminal, the jaws usually equal, but in some specimens the lower considerably shorter. Teeth in the lower jaw well developed, in the upper in a band of uniform width or shallow interrupted in the middle. Gill-rakers 2 + 8 — 2 + 10, simple or profusely branched.

Distance from the dorsal to the tip of the snout 2¾-3 in the standard length, the dorsal spine slender, pungent, with a few notches on the anterior margin, its length 2-2½ in the length of the head. The distance between the dorsal and the adipose is very variable. In some specimens the two fins are meeting, in others there is a distance, equal to the length of the base of the dorsal. The length of the adipose 2½-3½ in the standard length. Caudal forked, the cleft reaching to the base, the lower lobe sometimes broader and more rounded, the length 3½-5 in the standard length. Anal reaching to below the vertical from the end of the adipose, in some specimens much shorter. Ventrals inserted below the last ray of the dorsal, the length 1 2/5-2 in the length of the head. Pectoral spine with minute straight teeth on the outer margin and recurved teeth near the tip of the inner margin, its length 1 1/2-2 1/10 in the length of the head.

Colour brown, with irregularly distributed darker spots. The dorsal fin with a conspicuous light transparent band.

D. I/6. A. 8-11. P. 8-11.

Eigenmann & Eigenmann have mentioned that the only constant difference between *sebae* and *quelen* is that of the length of the maxillary barbels, which in *quelen* reach to the posterior third of the adipose in the young, and are much shorter in the adult; in *sebae* they reach to the middle

of the adipose down to the tip of the caudal. In the specimens collected by Eigenmann at Aruataima Falls and determined by him as *quelen* the barbels reach to beyond the end of the adipose in the young as well as in the adult specimens. So this character here is as variable as in *sebae,* where the barbels vary in reaching to the end of the base of the dorsal and to the tip of the caudal. We want more material from different localities to ascertain the possibility of local races.

According to the characters given in table I, which contains the sizes of the most characteristic material of the collection of the Leiden Museum classified under the names *Rhamdia sebae* (Cuv. & Val.), *Rh. quelen* (Quoy & Gaimard), and *Rh. bahianus* (Castelnau), I am convinced that these names are synonyms and because *quelen* has the priority, I have joined them into the species *Rhamdia quelen* (Quoy & Gaimard). Also the subspecies *Rhamdia sebae kneri* (Steind.) and *Rhamdia sebae martyi* Güntert (1942, p. 33) resemble *quelen,* as the table shows, because their characters fit in between the limits of the sizes of *quelen.*

Concerning this subspecies it may be pointed out that it is wrong to establish a new subspecies, based on some little differences in the characters of a single specimen, differences which are to be considered as individual variations.

Pimelodus holomelas Günther too must be considered as a synonym. It is remarkable that Eigenmann & Eigenmann (1890, p. 124) have mentioned *holomelas* as a synonym of *Rh. sebae.* Eigenmann (1912, p. 166) gives *Rhamdia holomelas* (Günther) as a separate species, but he does not record the former statement of Eigenmann & Eigenmann (1890, p. 124).

Rhamdia sapo (Cuv. & Val.)

Pimelodus sapo Valenciennes, in Voyages d'Orbigny, 9, Atlas, II, 1847, pl. II figs. 6-8; — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 133 (Buenos Aires); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 417 (without locality); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 132 (Rio Plata); — Steindachner, Sitz. Ber. Akad. Wiss. Wien, 60, 1869, p. 5 (Montevideo); — Hensel, Wiegm. Arch., I, 1870, p. 69 (Guahyba); — Perugia, Ann. Mus. di Genova, 1890-1891, p. 631 (Rio de La Plata); — Lahille, Revista do Mus. La Plata, 6, 1895, p. 270 (non vidi).

Pimelodus (Rhamdia) sapo Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 60 (La Plata, Rio Grande do Sul).

Rhamdia sapo Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1889, p. 126 (Rio Grande do Sul); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 130 (Rio Grande do Sul); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 28 (name only); — idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 386 (name only); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 277 (Guahyba); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 213 (Rio Jacuhy, Sao Joan to Rio Negro, Chapada, Brazil).

Museum Leiden:

No. 9264, 1 ♀, 418 mm.
No. 9872, 1 ♂, 410 mm.

Museum Amsterdam:

Paramaribo, Surinam, don. Bolten to the Aquarium Zoological Garden, Amsterdam, 2 ♂♂, 380 and 398 mm.

Body robust, its greatest width less than its greatest depth. Its length 3½ in the standard length. Head elongate, flat above, width $1^1/_3$ in its length; width at the corner of the mouth 2 in the length of the head. Head covered with skin, fontanel not continued behind the eye; occipital process small, as broad as long, imbedded in the skin, not reaching the dorsal plate.

Eye nearly median, slightly nearer to tip of snout than to the edge of the opercle, 8 in the length of the head, 2½ in the snout, $2^1/_3$-3 in the interorbital.

Maxillary barbels in the specimen no. 9264 scarcely beyond the base of the dorsal spine, in the specimen no. 9872 they are reaching little beyond the gill-opening. The mental barbels are not reaching to the gill-opening. Jaws subequal, mouth wide, lips conspicuously papillose. Width of the intermaxillary band of teeth 3 in the length of the head, the band is rather deep in front and tapering to the end.

Distance from dorsal spine to tip of snout 2½-3 in the standard length, the length of the spine 3 in the length of the head, the base of the fin much longer than the highest ray. Adipose fin 3¼-4 in the standard length. Caudal deeply forked, the lower lobe broad. Pectoral spine stout, recurved teeth on the outer margin, strongest near the tip, the length 2 in the length of the head.

Colour uniform dark brown.

D. I/7-8. A. 11.

The ♀ has in the characters of the head a more robust form. The interorbital is broader, the eye greater. The barbels are longer and the dorsal fin has 8 rays; in the male there are 7. In the more slender male the distance from tip of snout to dorsal spine is greater, but the spine is smaller.

Pimelodella Eigenmann & Eigenmann

Pseudorhamdia Steindacher (non Bleeker), Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 46 (*lateristriga*).

Pimelodella Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 131; — idem, Occ. Pap. Cal. Acad. Sc. vol. 1, 190, p. 99 and 147.

Type: *Pimelodus cristatus* Müller & Troschel.

Nares remote, gill-membranes free from the isthmus. Maxillary barbels varying in length from the end of the pectoral to beyond the tip of the

caudal fin. A frontal and a parietal fontanel. The parietal fontanel reaching to the base of the occipital process. The occipital process narrow, reaching the dorsal plate. No teeth in the vomer or the palate. Adipose fin long. Caudal deeply forked. Anal fin with 11-15 rays. Pectoral spine strong, pungent, the inner margin armed with thorn-like teeth. Humeral process spine-like.

Pimelodella cristata (Müller & Troschel)

Pimelodus insignis Schomburgk, Fish. Brit. Guiana, 1843, p. 180 (not plate); — Goeldi, Boll. Mus. Paraense, 2, 1898, p. 459 (name only).

Rhamdia insignis Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 267, pl. 44 fig. 2 (Upper Amazon, Calderon).

Pimelodus cristatus Müller & Troschel in Schomburgk, Reise in Br. Guiana, 1848, p. 628 (Takutu and Mahu Rivers); — idem, Horae Ichthyol., 3, 1849, p. 4 (Guiana, Essequibo); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 117 (Guiana, Essequibo, River Capin, Para); — Vaillant, Bull. Soc. Philom., ser. 7, vol. 4, 1880, p. 152 (Calderon); — Steindachner, Denkschr. Akad. Wiss. Wien, 46, 1882 (1883), p. 4 (Rio Huallaga); — Perugia, Ann. Mus. Genova, 10, 1892, p. 631 (Tucuman); — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 466 and 476 (name only).

Pimelodus agassizii Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 147 (Amazon near Teffé); — idem, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 615, footnote.

Pimelodus ophthalmicus Cope, Proc. Am. Philos. Soc., 17, 1878, p. 675 (upper Amazon).

Pimelodella cristata Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 132 (San Gonçallo, Avary, Villa Bella, Jutahy, Topajos, Rio Mucuri, Tabatinga, Hyavary, Coary); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 150 (localities as before); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 29 (Rivers North of Cape S. Roque); — idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 388 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 168 (Lower Potaro, Packoo Falls, Tumatumari, Rockstone, Konowaruk, Twoka, Pan, Essequibo); — idem, Mem. Carn. Mus., 7, 1920, p. 236 (San Joaquin, Villa Bella, Santarem, Rio Guaporé, Amazon, Parahyba, Coary, Tapajos, Sao Gonçallo, Rio Mucuri, Içа, Hyavary); — Eigenmann & Bean, Proc. U.S. Nat. Mus., 31, 1907, p. 660 (Amazon); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 214 (type of *Pimelodus ophthalmicus* Cope, Upper Amazon); — idem, Proc. Acad. Nat. Sc. Phil., 1914, p. 263 (Rupununi).

Pimelodus (Pseudorhamdia) wesselii Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 614, footnote (Essequibo).

Rhamdia wesselii Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 268 (copied).

Pimelodella wesselii Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 132 (Cudajas, Para, Marajo, Rio Madeira, Rio Puty, Santarem); — idem, Occ. Pap. Cal. Acad., vol. 1, 1890, p. 152 (localities as before); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 29 (Rio Puty to Essequibo, Amazon).

Museum Leiden:

No. 17300, Upstream from Gran Rio, 2-IX-1910, Corantyn Exp., 1910/1911, Hulk, 2 ex., 105 and 137 mm.

Museum Amsterdam:

Pikien River, Tresling, 1 ex., 288 mm.

Potaro Landing, Lower Potaro River, British Guiana Exp., 1908, Eigenmann, 1 ex., 160 mm.

Body much compressed, especially towards the caudal, elongate. Head conical, covered with skin, 5 in total length. The greatest depth of the body at the base of the dorsal spine somewhat greater than the length of the head. Depth of the head $1^4/_5$ in its length. Occipital crest narrow and long, reaching the comparatively large dorsal plate. A pore between the nasal openings. Maxillary barbels reaching to the tip of the caudal. The mental barbels reaching beyond the base of the pectorals, postmentals to the middle of the pectorals.

Eye large, 2 in the snout, $1^1/_3$ in the interorbital region.

Mouth small, its width 3 in the length of the head. Gill-membranes separate to below the anterior margin of the eye.

Dorsal spine slender, with fine notches behind and several large ones at the tip in front. The spine midway between snout and anal. In the largest specimen the spine of the dorsal and the pectorals are broken off. Adipose fin very long, 2¼ in the standard length. Space between the dorsal and the adipose nearly equal to the diameter of the eye. Caudal cleft to near its base, the upper lobe longer. Pectoral spine strong, $1^1/_3$ in the length of the head, fine recurved teeth on its outer margin, with a few larger ones near the tip.

D. I/6. A. 13.

Pimelodella gracilis (Val.)

Pimelodus gracilis Valenciennes, in Voy. d'Orbigny, Atlas, 2, 1847, pl. II fig. 5; — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 134 (Buenos Aires, Parana in the province Corrientes); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 418 (Caicara, Matto Grosso, Rio Guaporé, Cujaba); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 121 (copied); — Boulenger, Trans. Zool. Soc. London, 1896, p. 27 (Descalvados).

Pimelodus (*Pseudorhamdia*) *gracilis* Steindachner, Denkschr. Akad. Wiss. Wien, 41, 1879, p. 9 (Orinoco near Ciudad Bolivar).

Pimelodella gracilis Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 132 (Goyaz); — idem, Occ. Pap. Cal. Acad. Sc. vol. 1, 1890, p. 153 (Goyaz); — Goeldi, Bol. Mus. Paraense, 1898, p. 153 (name only); — Eigenmann & Ward, Annals Carn. Mus., 4, 1907, p. 114 (without locality); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 29 (name only); — idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 389 (name only); — idem, Mem. Carn. Mus., 7, 1920, p. 238 (Villa Bella, San Joaquin, Assuncion, Corumba, Rio Jauru, San Luiz, Paraguay Basin, Parana, Uruguayana, Rio Paranahyba); — Ribeiro, Rev. Mus. Paulista, 10, 1918, p. 732 (Piracicaba, Entre-Rios, Parana, Rio Grande do Sul); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 263, fig. 13 (Rupununi).

Rhamdia gracilis Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1912, p. 269 (copied).

Pimelodus lateristriga Boulenger (non Müller & Troschel), Trans. Zool. Soc. London, 1896, p. 27 (Descalvados).

Pimelodus (*Pimelodella*) *taeniophorus* Regan, Ann. Mag. Nat. Hist. (7), vol. 12, 1903, p. 625 (Descalvados).

Museum Leiden:

No. 10388, locality given as: La Plata River, from the Aquarium of the Zool. Garden, Rotterdam, 1 ex., 100 mm.

Body slender, the width at the pectorals about equal to the depth, much compressed toward the tail. Head short, flat above, $3^2/_3$ in the standard length, the profile slightly arched, the width of the head nearly 2 in its length. Occipital process with the sides parallel, its width 3½ in its length. Fontanel narrow, pointed in front and at the back, reaching to the base of the occipital process, a bridge across it above the posterior part of the eye.

Eye round, 1½ in the snout, 4½ in the head, its diameter equal to the interorbital.

Maxillary barbels reaching to the tip of the anal. Mental barbels to the half of the pectorals, postmentals to the base of the pectorals. Lower jaw slightly shorter than the upper jaw, the width at the rictus 4 in the length of the head. Intermaxillary band of teeth not wider than the mandibulary band at the symphysis. Gill-membranes separate to below the anterior margin of the orbit. Gill-rakers 3+7.

Distance from dorsal spine to tip of snout the same as to tip of ventral rays and nearly 3 in the standard length. The height of the dorsal spine $1^1/_3$ in the length of the head. Distance between adipose and dorsal 3½ in the standard length. Caudal deeply forked, 3½ in the standard length. Anal higher than long, the longest ray 1½ in the length of the head. Ventrals $1^2/_3$ in the length of the head. Pectoral spine broad, on its outer margin minute teeth on the basal half and notches near the tip; all along the inner margin strong recurved teeth; the length of the spine 1½ in the length of the head.

Colour dark brown with dark punctuations, a dark lateral band beginning at the posterior margin of the eye. All the fins dotted.

D. I/6. A. 12.

Pimelodella megalops Eigenmann

Pimelodella megalops Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 389 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 169 (Tumatumari, Crab Falls); — idem, Mem. Carn. Mus. 7, 1919-1920, p. 242 (name only).

Museum Amsterdam:

Tumatumari, Lower Potaro River, British Guiana Exp., 1908, Eigenmann, 2 ex., 67 and 87 mm, paratypes of the species.

Body slender, caudal peduncle strongly compressed. Head distinctly longer than broad, its width $1^2/_3$ in its length. Its length $4^1/_3$ in the standard length. The width of the occipital process 2½-3 in its length, reaching the

dorsal plate. Posterior fontanel somewhat wider than the anterior, but narrowed backwards, reaching the base of the occipital process.

Eye large, its centre slightly behind the middle of the head; its diameter 1 in the snout, 2½ in the head and 3 in the interorbital.

Maxillary barbels reaching to the end of the adipose. Dorsal spine slender, not so long as the second and third rays, a few recurved teeth at the tip in front, fine recurved teeth on the posterior margin for nearly its entire length.

The distance between dorsal and adipose greater than the diameter of the eye. The caudal deeply forked, the lower lobe longer, its length 3¾ in the standard length. Anal fin when laid back as long as the head. Ventrals not reaching the anal. Pectoral spine strong, curved with straight teeth on $^2/_3$ of its anterior margin and recurved hooks at its tip, the posterior margin with 18 recurved spines.

A dark band of chromatophores running posteriorly along the lateral line from a dark blotch above the base of the pectorals. Dorsal hyaline, a narrow streak of chromatophores along the anterior margin of each ray.

D. I/6. A. 11. P. I/8.

Pimelodella macturkii Eigenmann

Pimelodella macturkii Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 389 (name only).

Pimelodella macturki Eigenmann, Mem. Carn. Mus., 5, 1912, p. 170, pl. XVI fig. 1 (Mora Passage, Georgetown, Morowhana); — idem, Mem. Carn. Mus., 7, 1919-1920, p. 248 (name only).

Museum Leiden:

No. 17254, Surinam, June 1910, Bolten, 1 ex., 92 mm.

Museum Amsterdam:

Morawhana, British Guiana Exp., 1908, Shideler, 1 ex., 45 mm.

Eigenmann states that this species takes the place of *cristata* along the coast from Georgetown to Morawhana. I cannot agree with him, because one of the specimens here described was collected in Surinam. It differs from *cristata* in the length of the adipose, and the serration on the pectoral spine. I have seen a paratype in the collection of the Zoological Museum Amsterdam.

Head distinctly longer than broad, 4½ in the standard length. The width $1^1/_3$ in the length of the head. The depth of the body 1¼ in the length of the head. The length of the occipital process more than three times its width, reaching the dorsal plate. Fontanel becoming narrower backwards, reaching to the base of the occipital process.

Eye about in the middle of the head, its diameter 3 in the length of the head, equal to the interorbital.

Maxillary barbel reaching the middle of the adipose fin.

Dorsal fin rounded, low, the spine equal to the third or fourth ray, rough near the tip in front and on the distal half of the posterior margin. Space between the dorsals much larger than the diameter of the eye. The adipose 3 in the standard length. Caudal deeply forked, the lower lobe broader, nearly $1^1/_3$ in the length of the head and 3½ in the standard length. Ventrals not reaching the anal, pectorals not reaching the ventrals. Pectoral spine about equal in length to snout and eye, with 13 minute teeth along the anterior margin and 11 long, recurved spines along the middle of its posterior margin, the larger nearest the tip.

An obscure lateral stripe. Tip of caudal and dorsal dusky.

D. I/6. A. 11-13.

Pimelodella lateristriga (Müller & Troschel)

Pimelodus lateristrigus Müller & Troschel, Horae Ichthyo', 3, 3, 1849 (Brazil).

Pimelodus lateristriga Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 118 (Brazil); — Hensel, Wiegm. Arch., 1870, vol. 1, p. 69 (Porto Alegre); — Boulenger, Trans. Zool. Soc. London, 14, 3, 1896, p. 27 (Descalvados, Matto Grosso); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 29 (name only); — Ihering, Rev. Mus. Pau'ista, 1897, p. 11 (Rio Grande do Sul).

Pseudorhamdia lateristriga Lütken, Dan. Selsk. Skr., 1875, p. 171 (Rio das Velhas); — Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 45 (Rio Parahyba, Rio Doce, Rio Jequitinhonha, Cannavierias, Muriahé and Rio de Janeiro); — Vaillant, Bull. Soc. Philom. (7), vol. 4, 1880, p. 52 (Calderon).

Rhamdia lateristriga Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 271 (Calderon, Upper Amazon).

Pimelodella lateristriga Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 133 (Santa Clara, Rio Mucuri, Rio Doce, Cannavierias, Sao Matheos, Mendez, Rio Trombetas, Obidos, Içá); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 156 (localities as before); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 388 (name only); — idem, Mem. Carn. Mus., 7, 1919-1920, p. 245 (Rio San Francisco, Rio Parahyba, Rio Itapemerin).

Museum Leiden:

No. 17301, Port Real, Rio de Janeiro, Hardy du Dréneuf, 5 ex., 113, 115, 124, 139 and 144 mm.

Body elongate, slender, compressed posteriorly, head entirely covered with skin. Fontanel rather narrow, reaching to the base of the occipital process. Occipital process of nearly uniform width, touching the dorsal plate.

Eye large, its diameter 3½ in the head. The interorbital $1^1/_3$ in the orbital diameter.

Maxillary barbels to the origin of the adipose, mental barbels to the base of the ventrals. Gill-membranes separate to below front of eyes.

Dorsal spine slender, the posterior margin roughened, the anterior with some hooks at the tip, its length $1^1/_3$ in the length of the head. The spine is produced with a flexible top. Dorsal fin nearer to snout than to the anal fin. Base of the adipose 3 in the standard length. The distance between dorsal and adipose ¾ of the base of the latter. Caudal deeply forked, the lobes pointed, the upper longer, the lower broader. Ventrals scarcely reaching half way the anal, inserted a little behind the vertical from the last dorsal ray. Pectoral spine unusually strong and sharp, 12-14 retrorse hooks along the inner margin. The spine is very long, reaching almost to the ventrals.

The colour of these specimens, preserved during nearly 50 years in alcohol, is dark brown above and light silvery on the lower part. A dark lateral band not visible anymore. The fins are hyaline with dark punctuations at their tips.

D. I/6. A. 12.

Pimelodus Lacépède

Pimelodus Lacépède, Hist. Nat. Poiss., 5, 1803 (in part); — Cuvier, Règne animal, 2, 1817, p. 203 (species of several genera having a single band of teeth in the upper jaw); — Swainson, Class. Fish. Amph. and Rept., 2, 1839, p. 305 (*quadrimaculatus*); — Lütken, Dansk. Vidensk. Selsk. Skr. (5), vol. 12, 1875, p. 163 (*maculatus* = *clarias*).

Pseudariodes Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 99 (*clarias*).

Pseudorhamdia Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 101 (*maculatus* = *clarias*); — Lütken, Dansk. Vidensk. Selsk. Skr. (5), vol. 12, 1875, p. 49, 169 (*fur*).

Type: *Pimelodus maculatus* Lacépède.

Orbit with a free margin. Occipital process tapering, reaching the dorsal plate. Fontanel not continued behind the eyes. Humeral process broad, not spine-like. Caudal forked.

Pimelodus clarias (Bloch) (Table II)

Silurus clarias Linnaeus, Syst. Nat., ed. 10, 1758, p. 306 (in part); — Bloch, Ausl. Fische, 1795, pl. 35 figs. 1-2; — Bloch & Schneider, Syst. Ichthyol., 1801, p. 379 (in part); — not *Silurus clarias* Hasselquist, which is *Synodontis clarias* from the Nile.

Pimelodus clarias Lacépède, Hist. Nat. Poiss., 5, 1803, p. 93 (without locality); — Castelnau, Anim. Amér. Sud, Poiss., 1855, p. 34 (Crixas, Araguay, Ucayale, Amazon); — Steindachner, Denkschr. Akad. Wiss. Wien, 1878, p. 15 (Magdalena River); — idem, Denkschr. Akad. Wiss. Wien, 1882, p. 4 (Rio Huallaga); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 134 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 171 (Goyaz, Rio Grande do Sul, Para, Porto do Moz, Santarem, Obidos, Villa Bella, Coary, Teffé, Fonte Boa, Tabatinga, Hyavary, Cudajas, Rio Gonçallo, Montalegre, Rio Preto, Rio Puty, Manacapuru, Tocantins, Lago Alexo, Cameta, Rio San Francisco, Avary, Içа, Jutahy); — Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 29 (name only); — idem, Ann. N.Y. Acad. Sc. 7, 1894, p. 633 (Rio Grande do Sul); — idem,Repts.Princeton Univ. Exp. Patagonia, 3, 1910, p. 388 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 172 (British Guiana); — idem, Mem. Carn. Mus., 9, 1922, p. 44 (several localities in Colombia); — Eigenmann & Norris, Rev. Mus. Paulista, 4, 1900, p. 353 (Iguapé); — Eigenmann & Kennedy,

Proc. Acad. Nat. Sc. Phil., 1903, p. 499 (Rio Paraguay at Asuncion, Arroyo, Trementina); — Eigenmann & Ward, Ann. Carn. Mus., 4, 1907, 2, p. 115 (without locality); — Lahille, Rev. Mus. de La Plata, 1895, p. 6 (without locality); — Ihering, Annuario do Estado do Rio Grande do Sul para o anno 1897, p. 12 (non vidi (Rio Grande do Sul); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 289, pl. 46 fig. 1 (Rio Grande do Sul); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 263 (Rupununi); — Borodin, Amer. Mus. Nov., 271, 1927, p. 1 (Bahia, Franca, Pirapora).

Bagrus (*Ariodes*) *clarias* Müller & Troschel in Schomburgk, Reisen, 3, 1848, p. 627 (Waini, Barima).

Ariodes clarias Müller & Troschel, Horae Ichthyol., 3, 1849, p. 10 (British Guiana); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 413 (without locality).

Pseudariodes clarias Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 99 (name only); — Lütken, Vid. Med. Naturhist. For. Kjöbenhavn, 1874, p. 194, 199 (Guiana).

Silurus callarias Bloch & Schneider, Syst. Ichthyol., 1801, p. 379 part.

Pimelodus maculatus Lacépède, Hist. Nat. Poiss., 5, 1801, p. 94, 107 (Rio La Plata); — Valenciennes, in d'Orbigny, Voy. Amer. Mer., 5, vol. 2, 1847, pl. 1 figs. 1-3 (La Plata to Mexico, Lake Maracaibo); — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 143 (Cayenne, Lake Maracaibo); — Schomburgk, Fish. Brit. Guiana, I, 1841, p. 175 (Rivers of Guiana, Rio Negro, Amazon); — Steindachner, Sitz. Ber. Akad. Wiss. Wien, 1867, p. 32 (La Plata); — idem, Sitz. Ber. Akad. Wiss. Wien, 9, 1869, p. 6 (Montevideo); — Hensel, Archiv f. Naturgesch., I, 1870, p. 69 (Jacuhy); — Lütken, Vidensk. Selsk. Skr. (5), vol., 12, 1875, p. 163, pl. II fig. 3 (Rio das Velhas); — Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 40 (La Plata, Rio S. Francisco, Rio das Velhas, Amazon between Para and Santarem, Rio Grande do Sul, Porto Alegre); — Peters, M. B. Akad. Wiss. Berlin, 1877, p. 470 (Calabozo); — Boulenger, Proc. Zool. Soc. London, 1891, p. 233 (Rio Grande do Sul);— Perugia, Ann. Mus. Genova (2), 10, 1891, p. 630 (Rio Durazno, Rio La Plata, Paraguay, Parana, Montevideo, Buenos Aires); — Von Ihering, Süsswasserf. Rio Grande do Sul, 1893, p. 17 (Rio Grande do Sul); —Lahille, Rev. Mus. La Plata, 6, 1895, p. 271 (La Plata); — Boulenger, Boll. Mus. Zool. ed Anat. Comp. Torino, 12, 1879, p. 170 (Mission S. Francisco); — Perugia, Ann. Mus. Genova (2), 18, 1897, p. 149 (Puerto 14 de Mayo); — Pellegrin, Bull. Mus.Hist. Nat. 5, 1899, p. 157 (Apuré); — Vaillant, Nouv. Arch. Mus. d'Hist. Nat. (4) 1900, p. 124 (Carsevenne, French Guiana); — Steindachner & Von Bayern, Denkschr. Akad. Wiss. Wien, 72, 1902, p. 135 (without locality); — Eigenmann & Bean, Proc. U.S. Nat. Mus., 31, 1907, p. 668 (Amazon); — Eigenmann, Ann. Carn. Mus., 4, 1907, p. 115 (Porto Murtinho, Bahia Negra, Corumba); — Jordan & Evermann, Bull. U.S. Nat. Mus., 1896, p. 155 (part); — Boulenger, Trans. Zool. Soc. London, 14, p. 2a, 1897, p. 27 (without locality); — idem, Trans. Zool. Soc. London, 14, 1898, p. 422 (without locality); — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 475 (name only); — Boulenger, Ann. Mus. Civ. d'Hist. Nat. de Genova, 19, 1899, p. 126 (without locality); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 214 (Pebas, Ecuador, Demerara, Ambiuca, Surinam, Rio Negro).

Pimelodus rigidus Agassiz, Selecta Gen. et Spec. Bras., 1829, p. 19, pl. 7 fig. 2.

Pimelodus blochii Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 139, pl. 35 (Cayenne, Surinam).

Piramutana blochii Günther, Cat. Fish. Brit. Mus. 5, 1864, p. 111 (copied); Vaillant, Bull. Soc. Philom. (7), 5, 1880, p. 152 (Calderon).

?*Pimelodus arekaima* Schomburgk, Fish. Brit. Guiana, I, 1841, p. 178, pl. V (Essequibo, Rio Branco, plate does not square with the description).

Mystus ascita Gronow, Cat. Fish., ed. Gray, 1854, p. 156 (based on Mus. Ichthyol., I, 1754, p. 35 and Zoophyl., I, 1763, p. 125, no. 385).

Pimelodus schomburgkii Bleeker, Ichth. Arch. Ind. Prodr., I, 1858, p. 208 (for *P. maculatus* Schomburgk).

Pseudorhamdia ascita Bleeker, Versl. en Meded. Akad. Wetensch. Amsterdam, 14, 1862, p. 384 (Surinam).

Pimelodus macronema Bleeker, Silures de Suriname, 1864, p. 79, pl. 14 (Surinam).

Pseudorrhamdia piscatrix Cope, Proc. Am. Phil. Soc., 11, 1870, p. 569 (Pebas); — idem, Proc. Acad. Nat. Sc. Phila., 1872, p. 262 (Ambyaca River); — idem, Proc. Am. Phil. Soc., 17, 1878, p. 674 (Peruvian Amazon).

Pseudariodes pantherinus Lütken, Vid. Med. Naturhist. For. Kjöbenhavn, 1874, p. 192, 199 (Venezuela).

Pseudariodes albicans Lütken, Vid. Med. Naturhist. For. Kjöbenhavn, 1874, p. 194, 198, not *Arius albicans* Val. (La Plata and its tributaries); — Steindachner, Denkschr. Akad. Wiss. Wien, 1878, p. 61, note (Magdalena River).

Pseudariodes clarias Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 99 (name only).

Piramutana macrospila Günther, Ann. Mag. Nat. Hist. (5), vol. 6, 1880, p. 10, pl. 2 (Rio La Plata).

Museum Leiden:

No. 3069, Surinam, Dieperink, 1 ♀, 220 mm.
No. 3070, Surinam, Dieperink, 1 ex., 164 mm.
No. 3071, Surinam, Dieperink, 1 ex., 190 mm.
No. 3072, Surinam, Dieperink, 1 ex., 120 mm.
No. 14780, Montalegre, Brazil, from Museum Cambridge, Mass., Thayer Exp., 1865, 3 ex., 123, 137 and 147 mm.
No. 16146, Surinam River, 1911, Van Heurn, 1 ♂, 282 mm.
No. 17255, Surinam, 1910, Bolten, 10 ex., 90-140 mm.
No. 17302, La Plata River, Beckers, 1 ex., 113 mm.
No. 17303, Surinam, 1911, Van Heurn, 3 ex., 70, 87, 131 mm.
No. 17304, Paramaribo, 1911, Van Heurn, 5 ex., 96-205 mm.
No. 17333, Paramaribo, 1911, Van Heurn, 2 ex., 290 and 291 mm.
No. 17334, Surinam, 1910, Bolten, 1 ex., 373 mm.
No. 17479, Surinam, Bleeker, 1 ex., 58 mm.

Museum Amsterdam:

South America, 3 ex., 100-105 mm.

This species is so variable in all characters, that there is a considerable confusion in its nomenclature, as the great number of synonyms already show. From the material at my disposal, during a long time preserved in alcohol, and to a large extent without distinct colour marks, as a consequence it was impossible to discover whether the specimens belong to one of the three varieties recognized by Eigenmann and Borodin. Of some characteristic specimens from the Leiden collection I have given the characters in Table II, showing the variation.

Body robust to slender; especially in the older specimens the body is heavy and tapering to the more slender caudal peduncle. Head somewhat conical, in general somewhat higher than wide. Its greatest depth 1-1$^2/_3$ in the length of the head, its width 1$^1/_3$-2. The length of the head 2$^2/_3$-4$^4/_5$ in the standard length. The upper surface of the head granular, the occipital

process arched transversely, in some specimens roof-shaped. The width of its base 1¼-2 in its length.

Maxillary barbels terete, in a great number of the specimens extending beyond the tip of the caudal, but there are others with the barbels reaching merely to the origin of the base of the adipose. The mental barbels are reaching beyond the base of the pectorals; in some specimens beyond their tip. The postmental barbels mostly reach to or beyond the base of the ventrals, in some cases extending to the tip. Mouth moderate in width; its width at the rictus 3-4 in the length of the head. Teeth in the lower jaw in a band tapering to a point behind the rictus, interrupted in the middle. In the upper jaw the teeth in a broad not interrupted band. In the vomer the teeth are placed in a patch or scattered, or they are missing. When there is a patch of teeth on the pterygoid, as a rule it is larger than the vomerine patch.

Eye variable in size, 1½-2½ in the snout, 3½-7 in the head, 1-2 in the interorbital.

Dorsal spine 1-1¾ in the length of the head, its anterior margin smooth, roughened or with some teeth near the tip. The posterior margin always serrate. Adipose fin 4-5½ in the standard length. The caudal fin forked, in many specimens divided to the base, sometimes upper lobe longer. Anal emarginate. The pectoral spine on the outer margin roughened or serrate, the teeth sometimes imbedded in a bony ridge, in some older specimens the outer margin is smooth. The inner margin serrate with strong, recurved teeth.

In the Leiden collection there is one specimen from La Plata with three series of dark blotches along the sides; there are some specimens from Surinam and one from La Plata with a light lateral line and two dark bands. All the specimens have a dark spot at the base of the dorsal spine.

D. I/6. A. 11-12. V. 6. P. I/9.

Pimelodus ornatus Kner

Pimelodus ornatus Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 411, fig. 18 (Surinam, Rio Negro, Cujaba); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 116 (River Capin, Para); — Peters, Monatsber. Akad. Wiss. Berlin, 1877, p. 470 (Calabozo); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 134 (Goyaz); — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 456, 461, 475 (name only); — Eigenmann & Kennedy, Proc. Acad. Nat. Sc. Phil., 1903, p. 499 (Paraguay); — Eigenmann & Ward, Ann. Carn. Mus., 4, 1907, p. 115 (Corumba); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 388 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 175 (Potaro, Tumatumari, Rockstone, Crab Falls); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 287, fig. 113 (Para, Goyaz, Rio Negro, Prata, Amazon, Corumba, Matto Grosso, Lagune Arroyo-Trementina, Lagune da Assumpçao).

Pimelodus ornata Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 168 (Goyaz); — Eigenmann, Proc. U.S. Nat. Mus., 1891, p. 29 (name only).
Pseudorhamdia ornata Bleeker, Silures de Suriname, 1864, p. 77 (Surinam).
Silurus megacephalus Natterer, in Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 411 (name only).

Museum Leiden:

No. 3062, Surinam, Dieperink, 1 ex., 216 mm.
No. 3063, from the collection Frank, 1839, 1 ex., 175 mm.

Museum Amsterdam:

Tumatumari, Lower Potaro River, British Guiana Exp., 1908, Eigenmann, 2 ex., 58 and 71 mm.

Body slender, elongate. Head depressed, flat above, its depth at the base of the occipital process 2 in its length, its greatest width nearly 2. Fontanel wedge-shaped, its broad end on a line connecting the posterior margin of the eyes. Occipital process slender, tapering to the tip, which reaches the dorsal plate. A little ovate frontal fontanel at the base of the occipital process in the young specimens.

Eye large, 2 in the snout, 5 in the head, 1-1¼ in the interorbital.

Maxillary barbels reaching to beyond the adipose fin, postmental barbels to beyond the base of the pectorals.

In the specimens collected by Eigenmann on the Lower Potaro river and now in the collection of the Zoological Museum Amsterdam, the maxillary barbels reach the tip of the caudal. They are undoubtedly young specimens.

Snout depressed, elongate, the upper jaw projecting beyond the lower jaw. Intermaxillary band of teeth very deep, its depth 4 in its width.

The distance between tip of snout and base of dorsal spine 2½ in the standard length. The spine slender, just shorter than the first soft ray, its length 2 in the length of the head. Anterior margin smooth, the posterior somewhat verrucose. The length of the dorsal base equal to its distance from the adipose. Base of the adipose 5 in the standard length. The fin somewhat triangular. Caudal deeply forked. Anal fin when laid back reaching the base of the caudal. Pectoral spine nearly as long as the dorsal spine, serrate on both margins, the teeth on the outer margin more or less blunt.

Back and sides dark brown with two light bands along the side, one above the lateral line, and another below. These bands join at the base of the dorsal fin. A dark transversal band on the orbit and one before the dorsal fin. The caudal with a dark band along the middle of the lobes. The dorsal fin with a dark blotch in the adult specimens, but with a dark band over the whole length of the fin in the young.

D. I/6. A. 13. V. I/5. P. I/10.

Pimelodus eigenmanni nom. nov.

Pimelodus altipinnis (not Steindachner) Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 180 (Para); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 180 (Para); — Perugia, Ann. Mus. Genova (2), vol. 18, 1897, p. 18 (Rio Beni); — Eigenmann & Bean, Proc. U.S. Nat. Mus., 31, 1907, p. 660 (Amazon); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 388 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 177 (without locality).

Museum Leiden:

No. 15465, Brazil, from Museum Rio de Janeiro, 1 ex., 140 mm., without caudal.

The length of the single specimen in the Leiden collection is 140 mm, without the caudal fin, which is severely mutilated. Body deeper than wide, gradually compressed towards the caudal. Head flat below, its length 5 in the standard length. Profile straight, width of the head about $1^2/_5$ in its length, its width at the corner of the mouth 3, its depth $1^4/_5$ in its length. Upper surface of the head striate. Fontanel wedge-shaped, its broad base not behind the eyes. Occipital process narrow, its width at the base 2 in its length, its tip truncate, reaching the dorsal plate.

Eye very small, 3 in the snout, 6 in the head and $1^1/_2$ in the interorbital. Maxillary barbels reaching far beyond the tip of the caudal fin, the mental barbels reaching to the middle of the pectorals, the postmentals beyond the ventrals. Mouth narrow, inferior, the upper jaw projecting beyond the lower. Numerous minute pores on the snout. Gill-membranes separated by a deep notch past the eyes.

Dorsal spine $1^1/_5$ in the length of the head, the posterior margin serrate with short sharp teeth. The longest dorsal soft ray about as long as the head. Dorsal and adipose close together, there is hardly any distance between them. Adipose low and long, $2^2/_5$ in the standard length. Pectoral spine flat and curved, the outer margin roughened near the middle, the inner margin with strong recurved hooks along its entire length.

Colour silvery. Fins hyaline, the tip of the dorsal fin dusky.

D. I/6. A. 11.

The specimen here described has the general characters of the 23 specimens described by Eigenmann & Eigenmann (1890b, p. 167) and mentioned by Eigenmann (1912 b, p. 177). All these specimens are from the Amazon and its tributaries. Their characters are different in many respects from those of the type in the Vienna Museum, described by Steindachner (1864). The type is a specimen of 86 mm from Demerara. Steindachner mentions that there are two fontanels, the frontal is pointed anteriorly and posteriorly, the occipital is circular, lying at the base of the occipital process. This process is sharp pointed. The dorsal plate is covered with skin and not

visible. The adipose is perpendicularly cut off posteriorly. These characters make it probable that the specimen in the Vienna Museum is not a *Pimelodus* but a *Pimelodella.* Anyhow the species *P. altipinnis* Steindachner does not resemble the *Pimelodus altipinnis* mentioned by Eigenmann & Eigenmann, and therefore I have introduced the new name *Pimelodus eigenmanni.*

Brachyplatystoma Bleeker

Platystoma Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840 (preoccupied).
Brachyplatystoma Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 97 (*vaillanti*).
Piratinga Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 100 (*reticulata*).
Malacobagrus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 100 (*filamentosus*).

Type: *Platystoma vaillanti* Cuvier & Valenciennes.

Head broader than deep, flattened, upper jaw projecting beyond the lower. Inner teeth in the upper jaw slender and freely movable. Teeth on vomer and palatines much smaller, villiform.

Brachyplatystoma vaillanti (Cuv. & Val.)

Platystoma vaillanti Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 16, pl. 423 (Cayenne, Surinam); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 397 (Para); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 108 (Demerara); — Peters, M. B. Akad. Wiss. Berlin, 1877, p. 469 (Calabozo).

Brachyplatystoma vaillanti Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 97 (name only); — idem, Silures de Suriname, 1864, p. 70 (Surinam); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 136 (Para, Tabatinga, Porto do Moz, Arary, Rio Puty, Juiz de Fora); — idem, Occ. Pap. Cal. Acad. Sc. vol. 1, 1890, p. 196 (localities as before); — Eigenmann & Bean, Proc. U.S. Nat. Mus., 31, 1907, p. 622 (Amazon); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 390 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 180 (Rockstone, Georgetown market); — Ribeiro, Rev. Mus. Paulista, S. Paolo, 10, 1918, p. 247-255 (without locality); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 218 (Surinam).

Platystoma affine Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 18 (Brazil); — Castelnau, Anim. Amer. Sud, Poiss., 1855, p. 40 (Araguay); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 109 (copied).

Platystoma mucosa Vaillant, Bull. Soc. Philom. (7), vol. 4, 1880, p. 151 (Calderon).

Platystoma verrucosum Boulenger, Zool. Record, 19, Pisces, 1880 (name only); a substitute for *mucosa* Vaillant.

Brachyplatystoma goeldi Eigenmann & Bean, Proc. U.S. Nat. Mus., 31, 1907, p. 660, fig. 1 (Amazon).

Bagrus piramuta Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 382 (Barro do Rio Negro, Borba, Rio Madeira).

Piramutana piramuta Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 99 (name only); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 111 (copied); — Steindachner, Denkschr. Akad. Wiss. Wien, 44, 1881, p. 2, pl. 4 (Para); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., I, 1890, p. 186 (copied).

Museum Leiden:

No. 3016, Surinam, Dieperink, 1 ex., 290 mm.
No. 3017, Surinam, Dieperink, 1 ex., 230 mm.

No. 3018, Surinam, Dieperink, 1 ex., 330 mm.
No. 11060, Surinam, 1911, Van Heurn, 2 ex., 300 and 315 mm.
No. 14762, Pará, Brazil, from Mus. Cambridge, Mass., 2 ex., 248 and 248 mm.
No. 16051, Brazil, 1 ex., 207 mm.
No. 17291, Surinam, 1911, Van Heurn, 1 ex., 466 mm, with caudal filament 651 mm.

Museum Amsterdam:

Georgetown market, British Guiana Exp., 1908, Eigenmann, 1 ex., 228 mm.

Body rather short and deep, subtriangular in section, its width below the dorsal spine not equal to its depth. Snout much depressed, the tail moderately compressed. Profile steep, width of the head at the rictus 2 in its length. Length of the head 3-3½ in the standard length. Occipital process reaching but not joining the dorsal plate, not much tapering. An elongate depression along the middle of the head, fontanel narrow, extending to the posterior margin of the eye.

Upper jaw scarcely projecting, mouth lunate. Maxillary barbels reaching past tip of caudal, but in some specimens merely to beyond the ventrals. Eigenmann & Eigenmann (1890 b, p. 194) claim that the latter are the adults. They have seen specimens of 800 mm and one of 1190 mm. Eigenmann (1912b, p. 180) remarks that all the specimens from Georgetown he has seen, of a length of 178-290 mm, have the maxillary barbels extending beyond the tip of the middle caudal rays. Of the numerous specimens of various length in the Leiden Museum there are many which have the maxillary barbels reaching beyond the tip of the caudal; for instance a specimen with a length of 290 mm has maxillary barbels of 595 mm, one of 300 mm barbels of 534 mm, and one of 305 mm, 587 mm barbels. A specimen of 300 mm with barbels of 450 m is an adult female. Mental barbels extending till half way the length of the pectorals and the postmentals to the base of the pectorals.

Eye 10-15 in the length of the head, 4½-8 in the snout, 2-4 in the interorbital and 1½-2 diameters behind the rictus.

Teeth of the upper jaw in a broad band, the inner ones freely movable, those in the vomer and in the palatine patches small. Gill-membranes separate to below the corner of the mouth. Skin on the sides of the head and on the anterior portion of the lateral line reticulate.

Dorsal spine 1½ in the length of the head, with recurved hooks on the posterior margin, most strongly marked towards the tip. The distance from tip of snout to dorsal spine equal to the distance from the dorsal spine to the half of the adipose fin.

Colour pale brown below, darker above.

D. I/6. A. 13.

Steindachneria Eigenm. & Eigenm.

Steindachneria Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 137 (*amblyura*); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 202.

Type: *Steindachneria amblyura* Eigenm. & Eigenm.

No palatine teeth; teeth on the vomer in one or two patches. Dorsal and pectoral spine prolonged in a flexible part. No dermal ossifications on the head. Adipose longer than anal.

Steindachneria doceana Eigenm. & Eigenm.

Steindachneria doceana Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 30 (Rio Doce); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 204 (Rio Doce); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 391 (name only).

Museum Leiden:

No. 17321, Port Real, Rio de Janeiro, Hardy du Dréneuf, 1 ex., 408 mm.

Body and caudal peduncle compressed, robust, head depressed, broad. The depth at the base of the occipital process 2½ in the length of the head, its width $1^2/_5$, greatest depth of the body 2 in the length of the head. The head 3 in the standard length. The anterior part of the head broad and flat and strongly depressed. The snout broad and rounded, 2½ in the length of the head. Fontanel elongate, narrow. The occipital process broad, at the base as wide as at the tip. The tip rounded, not reaching the long triangular dorsal plate.

Eye 3½ in the snout, 8¾ in the head, 3½ in the interorbital.

Maxillary barbels reaching the origin of the dorsal. Mental barbels short, postmental barbels reaching the gill-opening. Upper jaw somewhat projecting beyond the lower. Teeth all similar in the upper jaw and the vomer, no palatine teeth. Intermaxillary band of teeth not narrowed in the middle.

Dorsal spine flexible at the top, distance from its base to tip of snout 2½ in the standard length. The base of the dorsal fin 1½ in its distance from the adipose. Adipose long, its base 1¼ in the base of the anal. Caudal deeply emarginate, the lobes rounded. Pectoral spine stout, with a flexible top.

Sides and back brown with light marks. The fins light, profusely spotted with brown. The lower side of the body uniformly brown.

D. I/7. A. 14. V. 6. P. I/9. Br. 9.

Pseudoplatystoma Bleeker

Platystoma Agassiz, Selecta Gen. et Spec. Pisc. Bras., 1829, p. 23 (preoccupied).
Sorubim Spix, Selecta Gen. et Spec. Pisc. Bras., 1829, pls. 12-15 (in part).
Pseudoplatystoma Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 97 (*fasciatum*).
Hemiplatystoma Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 97 (*tigrinum*).

Type: *Silurus fasciatus* Linnaeus.

Head longer than broad, depressed, flattened, its width at the mouth equal to its greatest width. Teeth in the upper jaw and the vomer the same. Adipose fin shorter than the anal fin. Barbels short.

Pseudoplatystoma fasciatum (L.)

Silurus fasciatus Linnaeus, Syst. Nat., ed. 12, I, 1766, p. 505; — Gmelin, Syst. Nat., I, part 3, 1788, p. 1359; — Bonnaterre, Tabl. Enc. Meth. Ichth., 1788, p. 154, 252; — Bloch, Ausl. Fische, 8, 1794, p. 30, pl. 366; — Bloch & Schneider, Syst. Ichthyol., 1801, p. 382 (Surinam).

Pimelodus fasciatum Lacépède, Hist. Nat. Poiss., 5, 1803, p. 94, 99, 100.

Platystoma fasciatum Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 11 (copied); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 401 (Surinam); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 107 (Essequibo, Surinam, River Capin, Para); — Peters, M. B. Akad. Wiss. Berlin, 1877, p. 469 (Calabozo); — Steindachner, Denkschr. Akad. Wiss. Wien, 39, 1878, p. 15 (Rio Magdalena); — Cope, Proc. Amer. Philos. Soc., 17, 1878, p. 674 (Peruvian Amazon); — Steindachner, Denkschr. Akad. Wiss. Wien, 42, 1880, p. 5 (Cauca); — idem, Sitz. Ber. Akad. Wiss. Wien, 80, 1879, p. 54 (Surinam); — idem, Denkschr. Akad. Wiss. Wien, 46, 1882, p. 4 (Amazon, Iquitos).

Pseudoplatystoma fasciatum Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 97 (name only); — idem, Silures de Suriname, 1864, p. 72 (Surinam); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 138 (Coary, Obidos, Hyavary); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 208 (localities as before); — Steindachner & Therese von Bayern, Denkschr. Akad. Wiss. Wien, 72, 1902, p. 136 (Rio Lebrya, Colombia); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 391 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 182 (Rupununi Pan, Wismar); — idem, Mem. Carn. Mus., 9, 1922, p. 45, pl. III fig. 4 (Soplaviento, Calamar, Puerto Berrio Apulo); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 218 (Nauta, Ecuador, Surinam).

Platystoma truncatum Agassiz, Select. Gen. et Spec. Bras., 1829, p. 27, pl. 13a (Rio Japura and Solimoens); — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 15 (Brazil); — Hyrtl, Denkschr. Akad. Wiss. Wien, 16, 1859, p. 17 (without locality); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 108 (copied).

Platystoma tigrinum (not of Cuv. & Val.) Schomburgk, Fishes Brit. Guiana, I, 1841, p. 185 (most of the rivers); — Müller & Troschel, in Schomburgk, Reisen, 3, 1848, p. 62 (nearly all rivers); — Vaillant, Bull. Soc. Philom. Paris (7), 4, 1879-1880, p. 151 (Calderon).

Platystoma punctifer Castelnau, Anim. Am. Sud, Poiss., 1855, p. 40, pl. 19 fig. 2 (Amazon).

Museum Leiden:

No. 3019, Surinam, Dieperink, 1 ex., 392 mm.
No. 17341, Surinam, VI-1910, Bolten, 1 ex., 365 mm.
No. 17311, Surinam, Van Heurn, 2 ex., 474 and 671 mm.

Museum Amsterdam:

South America, 1 ex., 275 mm.

Body long, slender, terete. Head long, depressed, $2^4/_5$ in the standard length, its width at the corner of the mouth scarcely narrower than the greatest width of the head, which is $2^3/_5$ in its length.

Eye 13-13½ in the length of the head, 4-6⅓ in the snout and 3 in the interorbital; 3½-4 in its distance from the corner of the mouth.

Fontanel with a deep groove, which does not reach the base of the occipital process, but at this base a deep groove runs across the head, which is not conspicuous in all specimens.

Maxillary barbels reaching the tip of the caudal. Teeth all villiform, in the lower jaw in a band of uniform depth, in the upper jaw in a band which is much narrower in the middle. Teeth in the vomer in two patches, which are separated along the median line.

Dorsal nearer to the tip of the adipose than to the tip of the snout. The spine slender, serrate behind and in front near the tip. Adipose shorter than the anal, placed above the first rays. Ventrals extending one half their length beyond the vent; distance from the vent to the caudal equal to the length of the head. Pectoral spine with strong recurved hooks on its entire inner margin, a few teeth near the tip of the outer margin, its length 2¼ in the length of the head.

Colour yellow to brown above, in one specimen dark gray. White below. A number of brown cross-bars on the sides and brown dots on the back and the fins.

D. I/6. A. 13. Br. 15.

Sorubim Spix

Platystoma Agassiz, Gen. et Spec. Pisc. Bras., 1829 (preoccupied).
Sorubim Spix, Gen. et Spec. Pisc. Bras., 1829 (in part).
Sorubim Bleeker, Nederl. Tijdschr. Dierk., I, 1862, p. 22 (*lima*).

Type: *Silurus lima* Bloch & Schneider.

Head abnormally depressed. The eyes strictly lateral. Snout broad, upper jaw greatly produced. Teeth in the upper jaw in a broad crescent-shaped patch. Barbels fleshy, not reaching the anal.

Sorubim lima (Bloch & Schneider)

Silurus lima Bloch & Schneider, Syst. Ichthyol., 1801, p. 384 (Rio Maranha).

Platystoma lima Agassiz, Gen. et Spec. Pisc. Bras., 1829, p. 24 (Equatorial Brazil); — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 6 (Amazon, Equatorial Brazil); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 399 (Rio Guaporé, Rio Branco, Rio Negro).

Sorubim lima Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 105 (copied); — Peters, M. B. Akad. Wiss. Berlin, 1877, p. 469 (Calabozo); — Steindachner, Denkschr. Akad. Wiss. Wien, 39, 1879, p. 31 (Rio Magdalena); — idem, Denkschr. Akad. Wiss. Wien, 42, 1880, p. 57 (Rio Cauca); — idem, Denkschr. Akad. Wiss. Wien, 46, 1883, p. 4 (Rio Huallaga); — Cope, Proc. Am. Phil. Soc., 17, 1878, p. 674 (Peruvian Amazon); — Vaillant, Bull. Soc. Philom. Paris (7), 4, 1880, p. 150 (Calderon); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 138 (Manacapura, Sao Paolo, Fonteboa, Tabatinga, Hyavary, Teffé, Obidos, Maranon, Ucayale, Içа, Lago de Manino,

Para, Rio Puty, Jutahy); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 213 (localities as before and Rio Plata, Amazons and tributaries to the Rio Magdalena and its tributaries); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 31 (Rio La Plata, Amazon, Orinoco, Rio Magdalena); — Boulenger, Trans. Zool. Soc. London, 14, 1898, p. 421 (name only); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 392 (name only); — Eigenmann & Kennedy, Proc. Acad. Nat. Sc. Phil., 1903, p. 500 (Asuncion, Rio Paraguay); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 309 (Rio Parana, Sao Paolo); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 263 (Rupununi); — idem, Proc. Acad. Nat. Sc. Phil., 1915, p. 219 (Peru, Ambyiacu River, Hyavary); — Eigenmann, Mem. Carn. Mus., 9, 1922, p. 46 (Soplaviento, Calamaz, Puerto Berrio, Honda).

Sorubim infraocularis Spix, Gen. et Spec. Pisc. Bras., 1829, pl. XV (Equatorial Brazil).

Platystoma luceri Weyenbergh, Nuevos Pescados, 1877, p. 10, pl. III figs. 1-3 (Santa Fé) (Actas Acad. Scienc. Exactas, III).

Museum Leiden:

No. 14777, Teffé, Brazil, from Museum Cambridge, Mass., 1 ex., 340 mm.

Museum Amsterdam:

Brazil 1 ♀, 300 mm.

Body elongate, subcylindrical, head abnormally depressed, its depth 4 in its length, its length scarcely 3 in the standard length.

Eye strictly lateral, 10½ in the length of the head, 4½ in the snout, $2^4/_5$ in the interorbital and 2½ in the interocular space on the lower side of the head, scarcely 2 diameters behind the corner of the mouth.

Maxillary barbels extending to the dorsal. Mental barbels reaching beyond the eyes but not to the gill-openings, postmental barbels beyond the base of the pectorals. Gill-membranes separate till in front of the eyes, gill-rakers overlapping, 3+13.

Occipital process reaching the dorsal plate, its width 2 in its length, the top emarginate. The dorsal plate is formed as a spearhead, the point of which is reaching the occipital process. Teeth all alike; those of the upper jaw in a broad crescent-shaped patch, its depth at the middle being one half its width, teeth on the vomer in four patches, forming a horse-shoe, which is interrupted in the middle.

The caudal is deeply lobed, the lower lobe longer and wider; both lobes are damaged, so the length cannot be given. Ventrals extending for $^2/_3$ of their length beyond the vent. Eye 3¾ in the distance between the vent and the anal. Adipose shorter than anal. Pectoral spine 2½ in the length of the head, serrated on its posterior margin and near the tip on the anterior margin. Pectoral pore moderate.

Colour brownish above, silvery to white on the sides and below. A broad dark band running along the side from the eye to the posterior margin of the lower lobe of the caudal fin.

D. I/6. A. 18.

8 thin plates on the anterior portion of the lateral line in the specimen of the Leiden collection, but in the specimen of the collection of the Zoological Museum Amsterdam there are none.

DORADIDAE

Doradini Bleeker, Silures de Suriname, 1864, p. 30.
Doradinae Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sci., vol. 1, 1890, p. 219; — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 184.
Doradidae, Eigenmann, Trans. Am. Phil. Soc., n.s., vol. 22, 1925, p. 281.

Distinguished from all other Nematognathi by the presence of a series of plates along the sides, each plate with a more or less strong median backwards directed spine.

Megalodoras Eigenmann

Megalodoras Eigenmann, Trans. Am. Phil. Soc., n. s., vol. 22, 1925, p. 306.

Type: *Megalodoras irwini* Eigenmann.

Lateral plates few, adipose fin continued forwards as a keel, head depressed, snout not conical. Serrae of the posterior margin of the dorsal spine less than those of the anterior margin. Eye in the middle or near the middle of the head. Occipital roof-shaped, with or without a median groove. 17 or 18 lateral scutes.

Megalodoras paucisquamatus nov. spec. (figs. 1 and 2)

Museum Leiden:

No. 15480, Brazil, from Museum Rio de Janeiro, 1 ex., 138 mm.

The body rather slender, its greatest depth equal to its greatest width and 4½ in the standard length. The caudal peduncle compressed. The length of the head $4^1/_5$ in the standard length. The upper surface of the head granular. The posterior part of the head roof-shaped, the sides steep. The postorbital portion of the profile arched. Superciliar margins raised, roughened, emarginate anteriorly. The prenasal bone large, almost equal to the diameter of the eye, its margin serrate. Fontanel pear-shaped, pointed anteriorly, about as long as the eye and situated in a clavate depression. This depression runs from the upper lip as a deep and wide groove as far as the eyes, from here it converges to the middle of the head and it then continues as a narrow deep marked groove to the end of the occipital.

Eye well protected by dermal ossifications, its diameter $1^4/_5$ in the snout, $4^1/_5$ in the head and 2 in the interorbital.

Maxillary barbels reaching beyond one third of the humeral process,

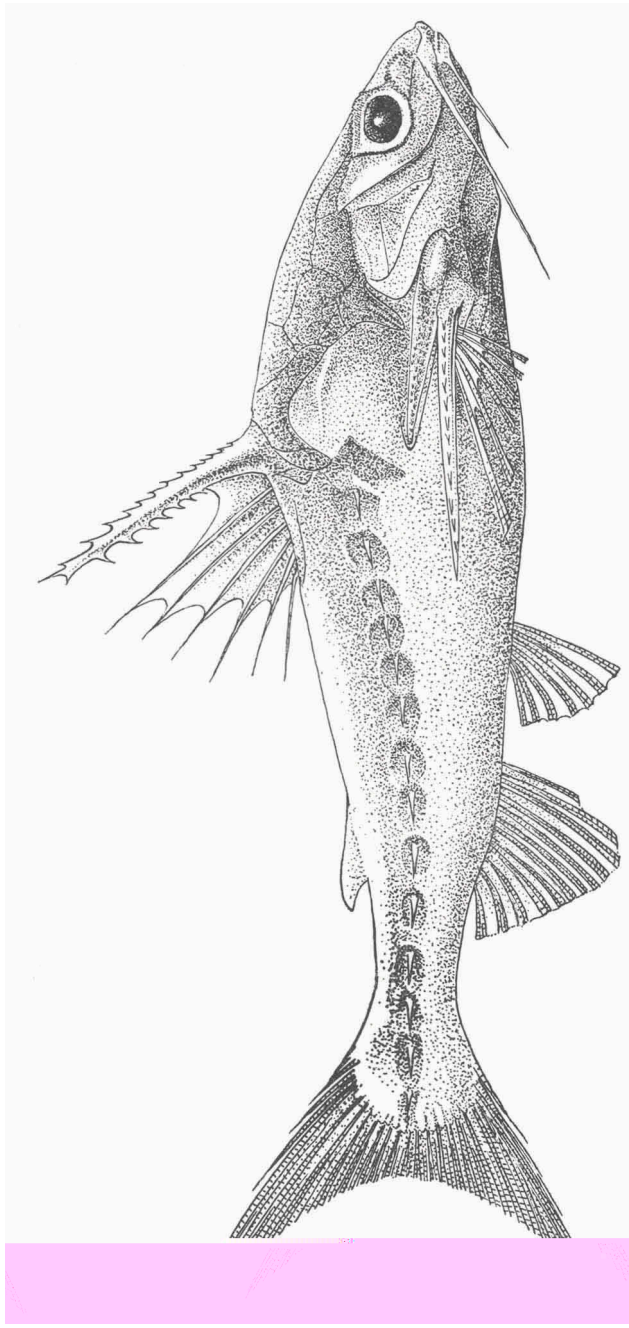

Fig. 1. *Megalodoras paucisquamatus* nov. spec. × 1¼.

mental barbels slightly longer than the snout, postmental barbels not reaching the base of the pectoral spine.

The snout rather narrow, covered with short papillae, its width at the rictus nearly 3 in the length of the head. The upper jaw little projecting beyond the lower. The teeth all villiform, the intermaxillary band 4 times as wide as deep.

The dorsal plate not prolonged behind the first dorsal soft ray, but a strong process descends nearly to the middle of the distance between the base of the dorsal fin and the humeral process. Distance from dorsal spine

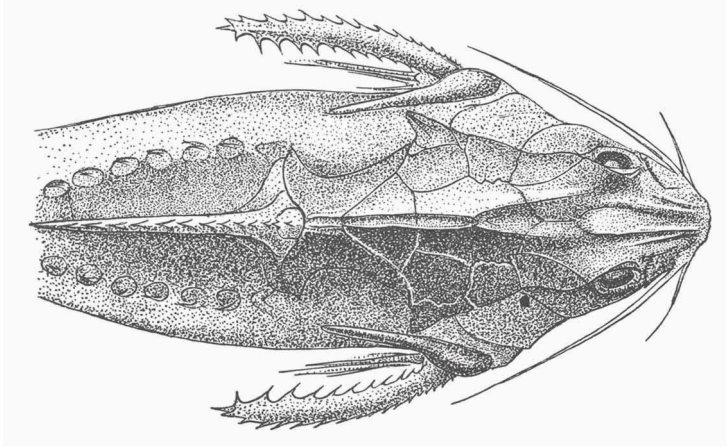

Fig. 2. *Megalodoras paucisquamatus* nov. spec. Dorsal view. × 1 1/4.

to tip of snout 2½ in the standard length. The spine as long as the head, strongly serrate on both margins, the teeth larger and fewer towards the tip, those on the posterior margin larger than the corresponding teeth on the anterior margin. The sides of the spine striate.

There are only 14 lateral scutes. In the humeral region there are two rudimentary embedded plates, and two little plates on the caudal. So the lateral plates are numbered 2-14-2. It is peculiar that on the left side of the caudal base the two rudimentary scutes are grown together to one scute with two hooks. The scutes are decreasing in height from the third, which is the highest and which touches the dorsal plate. The scutes have all a strong curved hook, the strongest to be found on the scutes in the middle of the caudal peduncle. There are no scutes on the dorsal or ventral surface.

Distance from the adipose to the dorsal fin 4 in the standard length. The base of the adipose 2 in the length of the base of the dorsal. The caudal deeply forked, its length 3 in the standard length. The anal fin emarginate,

the fourth ray the highest, its length 1½ in the length of the head. Pectoral spine strong, curved, with a flexible tip. The recurved teeth on the inner margin fewer and stronger than those on the outer margin. The spine does not extend to the ventrals, but reaches the vertical from the posterior end of the base of the dorsal fin. A small pectoral pore.

The colour of the described specimen, which was conserved for a long time in alcohol, is brownish. The region above the lateral scutes dark brown, the region below them as well as the belly light. The fins are plain, the lobes of the caudal fin are yellow, the middle rays darker, with a black patch at their base.

D. I/6. A. 13. V. 7. P. I/7.

Megalodoras paucisquamatus nov. spec. shows in many respects characteristics, which remind of the species *irwini*. On the other hand important deviations are so striking that these induce me to establish a distinct species for them.

These deviations are the following: Dorsal spine as long as the pectoral spine. Both spines as long as the head. The number of serrae of the dorsal spine anteriorly 14 (*irwini* 32-35), posteriorly 9 (*irwini* 22-25). Few lateral plates (*irwini* many). The lateral plates near the caudal base very small. The strong keel of the adipose not prominent.

As there is only one specimen, the type proper, at my disposal, I cannot take the responsibility to use it for investigation as to the shape of the air-bladder.

Pterodoras Bleeker

Pterodoras Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 16 and 86.

Type: *Doras granulosus* Val.

Eye small, far in front of the middle of the head. Palatine bone very small, the first suborbital rudimentary, the second small. Adipose prolonged forwards as a keel; dorsal spine strongly serrate on both margins; Lateral scutes 22-29; caudal forked; caudal peduncle naked above and below. Head depressed, snout broad, fontanel continued as a groove to the tip of the occipital process; barbels simple, similar to *Megalodoras*.

Pterodoras granulosus Val.

Doras granulosus Valenciennes in Humboldt, Obs. Zool., 2, 1812, p. 184; — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 229 (Arary?, Uruguay, Buenos Aires, Serpa); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 392 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 185, pl. 17 fig. 4 (British Guiana); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 215 (copied).

Pterodoras granulosus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 15 (name only); — idem, Silures de Suriname, 1864, p. 36 (Surinam); — Eigenmann, Trans. Amer.

Phil. Soc., n. s., vol. 22, 1925, p. 312 (Asuncion, Belem, Marañon, R. Ucayali, Iquitos, R. Puinahua).

Doras maculatus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 209 (Buenos Aires); — Valenciennes in d'Orbigny, Voy. Am. Mer., 5, part 2, 1847, p. 7, pl. 5 fig. 3; — Müller & Troschel, in Schomburgk, Reisen, 3, 1848, p. 629 (Guiana); — Steindachner, Denkschr. Akad. Wiss. Wien, 41, 1879, p. 47 (Rio de la Plata); — Lahille, Rev. Mus. La Plata, 6, 1895, p. 270; — Günther, Ann. Mag.Nat. Hist., 1880, p. 11; — Perugia, Ann. Mus. Civ. Hist. Nat. Genova (2), X, 1892, p. 634; — Eigenmann & Kennedy, Proc. Acad. Nat. Sc. Philad., 1903, p. 500 (Rio Paraguay, Asuncion); — Boulenger, Trans. Zool. Soc. London, 14, 2nd part, 1886, p. 28; — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 456.

Doras murica (Natterer MS.) Kner, Sitz. Ber. Akad. Wien, 17, 1885, p. 129 (Cujaba).

Doras muricus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 202 (Demerara?).

Museum Amsterdam:

Surinam, 1 ex., 265 mm.

The here described specimen from the collection of the Zoological Museum Amsterdam (formerly in the aquarium of the Zoological Garden) is said to have come from Surinam. Bleeker too has mentioned a specimen from Surinam.

Body and head robust, the depth below the dorsal spine equal to the width, caudal peduncle slender. Head as broad as long, its depth equal to its length, its length 4 in the standard length. Surface of the bones of the head with ridges of granules, which are diverging from two centres on each side. Fontanel elongate, extending far beyond the eye both forwards and backwards, continued as a groove to the tip of the occipital process, transverse profile above the opercle strongly arched. Nasal bones covered with skin, not serrated on the posterior margin. The naked portion of the skin on the snout, the sides of the head, and the humeral region thickly covered with small papillae; the sides of the head with a few conspicuous mucous canals.

Eye small, $3^1/_2$ in the snout, 10 in the head, 4 in the interorbital; the suborbitals are granular in the here described specimen, which is a character of an old specimen, as Eigenmann & Eigenmann (1890 b, p. 229) mentioned.

Maxillary barbels reaching the posterior third of the pectoral spine, postmentals beyond the base of the pectoral spine, mentals nearly $^2/_3$ as long as the postmentals. Snout bluntish, its width at the rictus 2 in the head, its length 2 in its width. Upper jaw projecting beyond the lower teeth all setiform.

Breast naked, entirely covered with skin. Lateral scutes 27. Third lateral scute much higher than the rest. In the humeral region in front of the first scute a small concealed plate. Each lateral scute with a strong median hook

without marginal spines, the largest towards the tail. No plates on the dorsal or ventral surfaces. Humeral process narrower than the pectoral spine, reaching to below the second lateral scute, its surface finely granular.

Distance between base of dorsal and tip of snout $2^1/_2$ in the standard length, dorsal spine equal to the length of the head, its sides smooth, both margins strongly serrate, the spines on the posterior margin much stronger than those on the anterior. Space between dorsal and adipose equal to the length of the dorsal fin, adipose shorter than dorsal. Caudal deeply forked, its length 3 in the standard length. Anal fin truncate, the fourth ray the highest. Ventrals reaching the base of the anal fin. Pectoral spine strong, reaching to below the third dorsal ray, strongly serrate on both margins.

Colour rusty brown above, lighter below; back, belly and fins with round brown spots.

D. I/6. A. 12. V. 7. P. I/8.

Platydoras Bleeker

Doras Lacépède, Hist. Nat. Poiss., 5, 1803, p. 116 (*carinatus* and *costatus*).

Doras Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 199 (*carinatus* and *costatus*).

Platydoras Bleeker, Nederl. Tijdschr. Dierk., I, 1863, pp. 16 and 86 (*costatus*).

Type: *Doras costatus* Linnaeus.

Head a little depressed, arched in the occiput, snout moderately depressed, mouth subterminal, the lower jaw shorter; eye lateral, about in the middle of the head; anterior nostrils close to the lips; fontanel not constricted in the middle. Width at the clavicle more than $3^3/_5$ in the length; lateral scutes 28-34, almost covering the sides over the anal and forward; on the caudal peduncle in contact with the caudal fulcra above and below, the first three scutes in contact with the dorsal plate; adipose fin continued forwards as a keel; caudal emarginate; serration on the anterior margin of the dorsal spine stronger than on the posterior margin, opercle striate.

Platydoras costatus (L.)

Silurus costatus Linnaeus, Syst. Nat., ed. 12, part 1, 1766, p. 506.

Cataphractus costatus Bloch, Ausl. Fische, 8, 1794, p. 82, pl. 376.

Doras costatus Lacépède, Hist. Nat. Poiss., 5, 1803, p. 116, part (South America); — Cuv. & Val., Hist. Nat. Poiss., 15, 1840, p. 200 (Guiana); — Castelnau, Anim. Am. Sud, Poiss., 1855, p. 48 (Amazon); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 201 (British Guiana; River Cupai); — Eigenmann & Eigenmann, Proc. Cal. Ac. Sc. (2), part 1, 1888, p. 161 (Rio Preto, Rio Puty, San Gonçallo, Xingu Cascade, Obidos, Gurupa, Teffé); — idem, Occ. Papers Cal. Ac. Sci., part 1, 1890, p. 231 (localities as before); — Perugia, Ann. Mus. Genova (2), 1891, p. 34 (Villa Maria, Paraguay); — Kindle, Ann. N.Y. Ac. Sc., 8, 1895, p. 251 (Trocera on the Tocantins); — Eigenmann & Kennedy, Proc. Ac. Nat. Sc. Phil., 1903, p. 500 (Paraguay); — Eigenmann, Ann.

Carn. Mus., 31, 1907, p. 166 (Corumbà, Laguna Ipacarai); — idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 393; — idem, Mem. Carn. Mus., 5, 1912, p. 186 (British Guiana, Twoca Pan, Gluck Island); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 263 (Rupununi); — idem, Proc. Acad. Nat. Sc. Phil., 1915 (Rupununi); — Fisher, Ann. Carn. Mus., 11, 1917, p. 419 (Maciél, Rio Guapore, Joaquin, Bolivia, Santarem, Corumba, Puerto Suarez, Rio Jaurii, Paraguay Basin); — Eigenmann, Transact. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 316 (Rio Tocantins; Santarem; Lake Rogoa, Bolivia; Twoca Pan, Gluck Island, Brit. Guiana; Yarinacocha, Rio Morona, Peru; Corumba, Paraguay); — Bleeker, Ned. Tijdschr. Dierk., I, 1863, p. 16 (name only); — idem, Silures de Suriname, 1864, p. 38 (Surinam).

Doras cataphractus (not of Linnaeus) Schomburgk, Fish. Brit. Guiana, I, 1841, p. 158 (Rio Negro).

Doras armatulus Müller & Troschel, in Schomburgk, Reisen, 3, 1848, p. 629 (Rupununi, Awaricura).

Museum Leiden:

No. 2969, Surinam, Dieperink, 1 ex., 305 mm.
No. 2970, Surinam, Dieperink, 1 ex., 205 mm.
No. 16145, Paramaribo, Van Heurn, 1 ex., 250 mm.
No. 17250, Surinam River, Van Heurn, 4 ex., 230, 268, 270 and 279 mm.
No. 17295, Surinam, Van Heurn, 1 ex., 356 mm.
No. 1894, Cuyaba, Brazil, from Museum Vienna, 1 stuffed ex., 230 mm.
No. 1909, Surinam, Dieperink, 1 stuffed ex., 329 mm.
No. 1910, Surinam, Dieperink, 1 stuffed ex., 247 mm.

Vernacular name: Rivier Kwi-Kwi.

The greatest depth little less than the width, caudal peduncle as wide as deep. Head as wide as long, its depth $1^1/_5$ in its length, which is $3^1/_2$-4 in the standard length. Profile steep, upper portion of the head with radiating series of granules. Fontanel wedge-shaped. Dorsal plate with a narrow inward directed process behind.

Eye large, $1^1/_2$-$2^1/_3$ in the snout, $3^1/_2$-$5^1/_2$ in the head, $1^1/_2$-2 in the interorbital.

Maxillary barbel reaching the second fourth part of the pectoral spine; postmental barbels little beyond base of pectoral; mental barbels half as long as the postmental barbels. Snout rounded. Upper jaw projected. Teeth villiform, in moderate bands.

Breast entirely covered with skin. First and second hook bearing lateral scutes touching the dorsal plate above, lower than the third scute which is $1^1/_2$ in the length of the head. Two granular plates between the scapula and the hook-bearing scutes. The latter are covering the entire sides of the body, leaving a naked dorsal and ventral area. Lateral scutes 29-30, decreasing in height backwards, conform with the outline of the body, and not meeting the bases of the adipose and anal fins. The surface of the scutes covered with small lateral ridges which end in a short marginal spine of a blunt projection. Caudal peduncle entirely covered

with plates above and below. Humeral process reaching the second or third spine-bearing scute, its surface granular with a series of hooks near its lower margin.

Distance from dorsal fin to snout $2^1/_3$ in the standard length. Dorsal spine as long as the head. Anterior margin with upturned serrae, the inner margin with serrae along the central portion; the sides deeply grooved. Space between dorsal and adipose 5 in the standard length. Base of adipose shorter than dorsal. Caudal emarginate. Anal fin rounded, higher than long. Ventrals not reaching the anal. Pectoral spine very strong, reaching beyond the base of the ventrals, both margins strongly serrate; surface striate. Pectoral pore simple.

Colour brown, lower surface with brown dots, dorsal with a large brown blotch at its tip.

D. I/6. A. 11-12. V. 7. P. I/7.

Franciscodoras Eigenmann

Type: *Doras marmoratus* Reinhardt.

Eye in front of the middle of the head. Fontanel not continued as a groove. Dorsal spine serrate in front only. Adipose longer than anal, not continued as a keel. Caudal peduncle almost covered with modified fulcra above and below, the fulcra not in contact with the low lateral plates. Caudal deeply forked or emarginate. Lateral scutes 31-32, heavy towards the end of the series. Breast covered with skin.

Franciscodoras marmoratus (Reinhardt)

Doras marmoratus (Reinhardt MS.) Lütken, Dan. Selsk. Skr., 1874, p. 30 (Rio das Velhas); — idem, Dan. Selsk. Skr., 1875, p. 146, pl. I fig. 1; — Steindachner, Sitz. Ber. Ak. Wien, 71, 1875, p. 147, pl. IV (Brazil); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc., (2), vol. 1, 1888, p. 163 (Rio S. Francisco, Rio das Velhas); — idem, Occ. Pap. Cal. Ac. Sc., vol. 1, 1890, p. 237 (Rio S. Francisco and its tributaries); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 393; — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 204, pl. 38 fig. 1 (without locality); — Fisher, Ann. Carn. Mus., 11, 1917, p. 420 (Penedo, Cidadedo Barra; Joazeiro).

Franciscodoras marmoratus Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 318 pl. 3 fig. 7; pl. 22 fig. 1, textfig. 12B (Rio S. Francisco).

Museum Leiden:

No. 7972, Rio San Francisco, Steindachner, 1 ex., 192 mm.

Museum Amsterdam:

Rio San Francisco, 1 ex., 162 mm.

Body robust, as deep as wide below the dorsal spine, somewhat compressed behind. Head short and broad, its length equal to its width, its depth $1^2/_5$ in its length. Sides of the head and snout entirely covered with

smooth skin. Fontanel long, though scarcely evident externally, surface of the bones with vermiculating ridges.

Eye $2^1/_4$ in the snout, $7^1/_2$ in the head, $2^3/_4$ in the interorbital.

Nasal and suborbital bones concealed beneath the skin.

Maxillary barbel reaching the second half of the pectoral spine, mental barbels to beyond the lower angle of the gill-opening, postmentals scarcely beyond the base of the pectorals. Snout at the rictus measuring $2^1/_3$-$2^1/_4$ in the length of the head. Upper jaw projected. Teeth well developed, setiform. Gill-membranes separate to below the posterior margin of the eye.

Breast entirely covered with skin, no plates on back and belly. Dorsal plate greatly enlarged, scarcely narrower than the widest part of the skull. The plate with a backward process, and with a downward projection in front. First three lateral plates touching the emarginate edge of the process of the dorsal plate, not extending to the humeral process; region between scapula and first lateral plate naked; the third lateral plate highest, about 2 in the head, the fourth only two-thirds as high as the third. 30 lateral scutes, all more or less concealed beneath the skin, with a strong median hook and from 0-2 marginal spines below and 0-3 above the median hook. Several smooth well-developed plates above and below on the caudal peduncle. Humeral process large and broad, pointed or rounded behind, its surface with vermiculating ridges.

Distance from the dorsal fin to the tip of the snout $2^1/_3$-$2^1/_4$ in the standard length. The dorsal spine slightly curved, its length nearly equal to the head, its posterior margin smooth, with a median groove, the anterior margin with upturned serrae, the sides striate. Space between the dorsal and the adipose nearly equal to the base of the adipose, which is considerably longer than the dorsal. Caudal emarginate. Anal fin rounded. Ventrals $1^3/_4$ in the head. Pectoral spine broad, strong and long, reaching to the ventrals, both margins strongly serrate, upper and lower surface striate. Pectoral pore large in the specimen no. 7972.

Sides and back with large dark spots. Dorsal and caudal fin with dark spots on the rays.

D. I/6. A. 12. P. I/8. V. 6.

Lithodoras Bleeker

Lithodoras Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 84.

Type: *Doras dorsalis* Cuvier & Valenciennes.

Eye large, lateral, slightly in front of the middle of the head. Snout truncate, not depressed, the occiput roof-shaped, mouth terminal, teeth

well developed, in bands; fontanel continued as a groove to the end of the nuchal plate. Teeth on the posterior margin of the dorsal spine larger than those on the anterior. Adipose fin not continued forward as a ridge. Lateral scutes 18-20, narrow, with a single hook, the first two in contact with the dorsal plate. Granular scutes scattered on the dorsal and ventral side of the body, in older specimens covering more or less all the naked parts of the body.

Lithodoras dorsalis (Val.)

Doras carinatus Valenciennes, in Humboldt, Rec. d'Observ. Zool. et d'Anat. Comp., II, 1811, p. 184 (not *Silurus carinatus* L.).

Doras dorsalis Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 211 (Cayenne); — Guérin-Méneville, Icon. Règne Anim, 1830, pl. 52 fig. 2; — Kner, Sitz. Ber. Akad. Wien, 17, 1855, p. 128 (Para); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 205 (copied); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2)| vol. 1, 1888, p. 159 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 225 (Para); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 32 (Para, Rio Negro, Cayenne); — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 462, p. 480 (Marajo); — Eigenmann & Bean, Proc. U.S. Nat. Mus., 31, 1907 (Amazon); — Eigenmann, Repts. Princeton Univ. Exp., 3, 1909, p. 392 (name only); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 212, pl. 39 (Tabatinga, Para); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 220 (Para, Brazil); — Fisher, Ann. Carn. Mus., 11, 1917, p. 419 (Para).

Doras papilionatus Filippi, Rev. and Mag. Zool., 1853, 5, p. 167 (Amazons); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 205 (copied).

Doras lithogaster Heckel MS. in Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 132 (Forte do Rio Branco); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 205 (copied); — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 469 (Rio Branco).

Lithodoras lithogaster Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 15 (name only).

Lithodoras dorsalis Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 318, pl. 2 fig. 7 and pl. 9 fig. 6 (Para, Brazil, Belem).

Museum Amsterdam:

Island Onca near Para, 1 ex., 188 mm.

Body slender, caudal peduncle slightly compressed, depth below the dorsal spine about equal to the width. Head somewhat shorter than wide, $3^1/_2$ in the standard length. Humeral process and the bony head finely granular, the opercle with radiating lines. Interorbital flattish, the head becoming more roof-shaped backwards to the dorsal plates, with the sides very steep. Fontanel bottle-shaped, with the widest part between the eyes, situated in a clavate depression; from the fontanel a marked groove extends to the tip of the dorsal plate.

Eye $1^1/_2$ in the snout, $4^1/_2$ in the head and 2 in the interorbital.

Maxillary barbels reaching about the middle of the humeral process, postmental barbels not reaching the base of the pectorals, mental barbels $1^1/_2$ times as long as the diameter of the eye. Snout rather narrow, covered with papillae, its width at the rictus $2^1/_2$ in the length of the head. Upper

jaw little projecting beyond the lower. Teeth villiform. Gill-membranes separate to the base of the humeral process.

Breast naked, entirely covered with skin. Lateral plates 17, the first three plates are partly covering each other, and touch the dorsal plate, the third plate the highest, the following decreasing in height to the last, the median hooks increasing in strength backwards to above the posterior end of the anal fin. Between the dorsal and the adipose fin and between the latter and the caudal fin there is a series of plates of varying size. On the sides of the adipose two plates, which join behind and in front, partially surround the adipose. The dorsal plates are very irregularly situated; they do not form a joined series. On the lower surface of the caudal peduncle, between the anal and the caudal, there is also a series of similar plates. Humeral process narrow and pointed, reaching beyond the middle of the pectoral spine, its surface smoothly granular.

Distance from dorsal spine to tip of snout $2^2/_3$ in the standard length. The dorsal spine as long as the head, serrated on both margins. The teeth on the anterior margin of the spine are less in number towards the tip, but larger, not so large though as the corresponding ones on the posterior margin. The sides of the spine are finely striate. The distance from the adipose to the dorsal $3^1/_2$ in the standard length. Caudal deeply forked, 4 in the standard length. Anal fin truncate, the fourth and fifth ray the longest, $1^1/_2$ in the length of the head. Pectoral spine very strong, reaching the sixth lateral scute, its margins with less, but much stronger serrae than in other species.

Colour of the region above the lateral scutes brown, the region below lighter. Sides of the head and anterior portion of the body with minute dark dots. The middle rays of the caudal fin dark.

D. I/6. A. 13. V. 7. P. I/8.

Acanthodoras Bleeker

Acanthodoras Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 86 (*cataphractus*); — Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 319 (*cataphractus*).

Type: *Silurus cataphractus* L.

Width at the clavicle 2-$2^3/_4$ in the total length. Head depressed, the nuchal region arched. Mouth terminal, wider than the orbital. Teeth well developed, in bands. Eye very small, lateral, before the middle of the eye. Anterior nares near the lip. Preorbital expanded, with serrae on the outer edge. Fontanel subcircular, not continued as a groove. Skull finely granular. No teeth on the posterior margin of the dorsal spine. Lateral plates 24-30, covering more than half of the sides, no plates on upper or lower surface of the caudal peduncle. Adipose not continued forwards as a keel.

Acanthodoras cataphractus (L.)

Silurus cataphractus Linnaeus, Syst. Nat., ed. 10, 1758, p. 307; ed. 12, I, 1766, p. 506 (after a figure and the description of Gronovius in Mus. Ichthyol., I, p. 28, pl. III fig. 3 and 4; specimen from the collection of Seba).

Doras cataphractus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 205 (without locality); — Schomburgk, Fish. Guiana, I, 1841, p. 276 (Rio Negro); — Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 126 (Rio Guaporé, Barra do Rio Negro); — Bleeker, Ichthyol. Arch. Ind. Prodr., I, 1858, p. 54 (name only); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 204 (after a skin from Gronovius' collection); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 234 (name only); — — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 32 (name only); — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 457 (Guiana); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 393 (name only); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 208 (copied); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 221 (Surinam); — Fisher, Ann. Carn. Mus. 11, 1917, p. 419 (Maciel, Rio Guaporé).

Acanthodoras cataphractus Bleeker, Nederl. Tijdschr. Dierk., I, 1863 p. 17 (name only); — idem, Silures de Surinam, 1864, p. 40 (Surinam); — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 188 (Kangaruma, Georgetown, Gluck Island); — idem, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 230 (Gluck Island).

Cataphractus americanus Bloch & Schneider, Syst. Ichthyol., 1801, p. 107, pl. 28 (part); — Lacépède, Hist. Nat. Poiss., 5, 1803, p. 124 and 127 (Carolina).

Doras blochii Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 207 (copied).

Doras castaneo-ventris Schomburgk, Fish. Brit. Guiana, I, 1841, p. 161, pl. 3 (Rio Pasawiri).

Doras brunnescens Schomburgk, Fish. Brit. Guiana, I, 1841, p. 163 (Upper Essequibo); — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 456 (Guiana).

Doras polyramma & *polygramma* (Heckel MS.) Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 126 and 127.

Callichthys asper Gronovius, Cat. Fish., ed. Gray, 1854, p. 157 (without locality).

Callichthys cirris sex Gronovius, Mus. Ichthyol., 1754, p. 28, pl. III fig. 4 and 5 (ex Museo Sebae).

Museum Leiden:

No. 2967, Surinam, Dieperink, 1 ex., 98 mm.
No. 2971, Surinam, 1 ex., 91 mm.

Museum Amsterdam:

Gluck Island, Essequibo River, British Guiana Exp., 1908, Eigenmann, 1 ex., 62 mm.

Body slender, little depressed, head flat and broad, slightly arched in the posterior part, the nuchal region not roof-shaped. The length of the head $4^1/_4$ in the standard length. The depth of the head equals the length, the width at the corner of the mouth $1^1/_2$ in the length of the head.

The eye in the first third section of the head, $2^1/_2$ in the snout, 5 in the head and 5 in the interorbital. Snout 2 in the interorbital.

Fontanel round, between the eyes. Posterior nares just in front of the supra-orbital ridges, scarcely protected by the nasal bone. Upper surface of the head granular till between the anterior nares. Orbital margin, preopercle and opercle granular. Mouth nearly terminal, jaws equal. Maxillary

barbels reaching beyond the base of the pectorals, nearly to half the length of the pectoral spine.

Dorsal spine serrate on both margins, the sides of the spine with a series of similar hooks.

Lateral plates 29. The scutes highest above the origin of the anal. The median spine of these plates nearly straight, each plate, starting from the seventh, with a series of 5-20 marginal spines in the upper part and 3-4 in the lower part of the scute, increasing in size toward the upper and lower margins, the anterior plates having more numerous and smaller spines.

Caudal rounded. Humeral process reaching $^3/_4$ of the pectoral spine. The pectoral spine strongly serrate on both margins; upper surface with numerous straight teeth, the lower surface striate. Ventral surface of the coracoid not exposed.

Dark coloured. Caudal black with hyaline bars, in the specimen from Gluck Island the black is dispersed in separate blotches. The other fins dark with hyaline blotches. Sides of the head marbled.

D. I/5. A. 10. V. 6. P. I/4.

Astrodoras Bleeker

Astrodoras Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 17; — Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 323.

Type: *Doras asterifrons* Kner.

Width at the clavicle $2^3/_5$ in the total length. Lateral plates numerous, covering half or more than half the sides. Caudal fulcra covering about half the caudal peduncle above and below. Adipose fin not continued forwards as a keel. Anterior margin of the dorsal spine serrate, the posterior margin and the sides smooth. Fontanel elongate, continued as an obscure interrupted groove. Caudal emarginate.

Astrodoras asterifrons (Heckel)

Doras asterifrons Heckel MS. in Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 123, pl. II fig. 2 (Barra do Rio Negro, Guaporé); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 203 (Rio Cupai); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 241 (Jutahy, Teffé, Porto do Moz, Serpa); — Ribeiro, Arch. Mus. Rio de Janeiro, 16, 1911, p. 202, fig. 96 (without locality); — Fisher, Ann. Carn. Mus., 11, 1917, p. 420 (Maciel, Rio Guaporé, Santarem, San Joaquin).

Astrodoras asterifrons Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 323, pl. 1 fig. 11, pl. 4 figs. 2 and 4 (Jutahy, Santarem).

Museum Leiden:

No. 2972, Rio Negro, Natterer, 1856, 1 ex., 85 mm.

Museum Amsterdam:

South America, 1 ex., 85 mm.

Body wide and depressed in front, the depth below the dorsal spine 2 in its width, the depth at the caudal equals its width. Breast very wide, the width between the outer margin of the clavicles equal to the distance from the snout to the dorsal spine. Head short and pointed, its length $3^1/_2$ in the standard length, its width equal to its length, its depth $1^1/_4$ in its length. Bones of the head with series of fine granules. The dorsal plate ending in a sharp process at either side of the end of the base of the dorsal. Posterior portion of the head with a strong median keel, which has a median groove. Orbital edges raised, the interorbital deeply concave. Suborbital bones and preopercle granular. Nasal bones forming a high crest, which is deeply pectinate. Fontanel extending scarcely beyond the middle of the eye, continued as a groove along the median keel.

Eye equal to the snout, 4 in the head and $1^1/_5$ in the interorbital.

Maxillary barbels reaching beyond the middle of the pectoral spines, mental barbels not half as long as the postmental, which reach beyond the base of the pectoral spines. Snout narrow, its width at the rictus 2 in the head; jaws equal, or the upper somewhat longer, teeth in narrow bands. Gill-openings extending forwards to below the eye.

Coracoid bones exposed, striate in front, the points of the processes sharply granular. In the humeral region 2 small plates. The first and second hook-bearing lateral scutes touch the dorsal plate, the fifth lateral plate the highest, $1^1/_2$ in the length of the head. The scutes gradually decreasing in height backwards, leaving a narrow naked area on the back. Lateral line with 21-25 scutes. Each scute with one marginal spine below and 2-4 above the median hook. Caudal peduncle with a single plate above and below, back and belly naked.

Humeral process swollen in front, tapering, reaching the second median scute, its surface sharply granular, near its lower margin a series of recurved hooks, the largest of these near the tip.

Distance from the dorsal spine to the tip of the snout $2^1/_4$ in the standard length. Dorsal spine straight, as high as its distance from the anterior margin of the eye. The posterior margin smooth, its sides with two high ridges, its anterior margin with upturned serrae. Distance from adipose to dorsal $3^1/_2$ in the standard length, its base $1^1/_2$ in the base of the dorsal fin. Caudal emarginate. Anal rounded, the middle rays the highest, 2 in the length of the head. Ventrals not reaching the anal. Pectoral spine reaching the end of the base of the ventrals, its sides striate, the margins serrate. Pectoral pore simple.

Colour of sides and back brown, breast and belly lighter.
D. I/6. A. 12. V. 7. P. I/7.

Amblydoras Bleeker

Amblydoras Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 86 (*affinis*); — Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 325 (*hancocki* = *affinis*).
Zathorax Cope, Proc. Acad. Nat. Sc. Phil., 1872, p. 271 (*monitor*).

Type: *Doras affinis* Kner = *Doras hancocki* Cuv. & Val.

Width at the clavicles 3 in the standard length. Head depressed, the skull arched, finely granular. Fontanel elongate, not continued as a groove. Eye in the middle of the head. Anterior nostril near the lip. Mouth terminal, the teeth well developed, in narrow bands. Dorsal spine without hooks or thorns, grooved and ridged on sides and in front. Adipose not continued forward as a keel. Lateral scutes 26-27.

Amblydoras affinis (Kner)

Doras affinis Kner (not Steindachner), Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 121, pl. 11 fig. 1 (Rio Branco, Guaporé); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 202 (copied); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 238 (name only); — idem, Proc. N.S. Nat. Mus., 14, 1891, p. 32 (name only); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 200, fig. 95 (copied).
Amblydoras affinis Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 17 (name only).
Doras truncatus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 18 (Guaporé).

Museum Leiden:

No. 2973, Rio Guaporé, Natterer, 1856, 1 ex., 83 mm, paratype?

This specimen is the type of *Doras truncatus* Bleeker. It is possible that it is also the paratype of the *Doras affinis* of Kner.

Body lumpish, tail more slender. Head and body compressed, caudal peduncle depressed. The species is characterized by its heavy occipital and dorsal plate and its breast-armature. Head very broad and rounded. The profile anterior of the eyes very steep. The length of the head 3 in the standard length. The fontanel has the form of a bottle, the base of which is situated on a line connecting the posterior margins of the eyes. The occipital with a broadly based triangular process, which is firmly attached to the broad dorsal plate. The dorsal plate has the form of a butterfly, the posterior process reaches the end of the base of the dorsal fin.

The eye equal to the snout, 7 in the head and $2^1/_2$ in the interorbital.

The lower jaw slightly projected beyond the upper. The maxillary barbels reaching the tip of the humeral process, the mental and postmental barbels the base of the pectoral spine.

Lateral line with 25 scutes; the scutes with a strong, hooked median

spine, and with a lower series of marginal spines. The scutes are almost entirely covered with skin, through which the spines stick out.

The dorsal spine not serrate, but with two strong ridges along the sides. The space between the dorsal and the adipose 3 in the standard length. Caudal fin subtruncate. Anal long, rounded. The ventrals reaching the base of the anal. Pectoral spine strong, curved, with strong teeth on the outer and inner margin, the sides striate. Humeral process spine-like, striate, swollen at the base, the tip reaching to $^2/_3$ of the pectoral spine.

The peculiar characteristic is the breast-armature, a large bony striated plate formed by the coracoids, which are exposed, the coracoid processes reaching to the middle of the pectoral spine.

The upper part of the body dark brown, the belly light brown. The fins are hyaline. The caudal fin with a dark blotch on its base and at the tip. The anal has a dark blotch at the tip.

D. I/4. P. I/5. V. 7. A. 9.

This specimen was described by Bleeker (1863, p. 18) as *Doras truncatus* with the following characters: "Sulco frontali triangulari brevi maxime declivi, osse interspinoso primo triangulari, prima dorsali quinque radiata et spina breviore, scutis lateralibus posterioribus et mediis multo humilioribus". These characters are not sufficient to justify the forming of a separate species. Admitted, that in the specimen described above, which is the type of Bleeker's *Doras truncatus*, the dorsal has but I/4, whereas the 11 specimens described by Kner as *Doras affinis* have I/6, just like *Doras hancocki* of Cuvier and Valenciennes and *Doras costata* of Hancock, the most typical character remains the breast-armature, so the species of Bleeker must be cancelled.

It may be that *Amblydoras affinis* (Kner) is a synonym of *A. hancocki* (Cuv. & Val.) as Eigenmann (1925, p. 326) states, but the material at my disposition is not sufficient to come to a decision; therefore it will be necessary to study the types.

Amblydoras hancocki (Cuv. & Val.)

Doras costata (not of Linnaeus) Hancock, Zool. Journ., 4, 1828, p. 242 (Demerara); — Schomburgk, Fish. Brit. Guiana, I, 1841, p. 156 (British Guiana).

Doras hancockii Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 207 (copied); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 202 (Demerara, Rio Cupai); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 234 (name only); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p 393 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 187 (Lama stop-off, Maduni Creek, Wismar, Rockstone, Gluck Island, Tumatumari, Rupununi Pan); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 210 (copied); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 264 (Rupununi).

Amblydoras hancocki Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 326, pl. 3 fig. 9, pl. 13 figs. 1-4 (Georgetown, Essequibo, Maduni Creek, Rockstone, Tumatumari, Rupununi, Itaya above Iquitos, Lagoon near Reyes).

Acanthodoras hancocki Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 17 (name only).

Museum Leiden:

No. 14754, Manoas, Brazil, from Museum Cambridge, Mass., May 1934, 1 ex., 273 mm.

Museum Amsterdam:

Lama stop- off, British Guiana Exp., 1908, Eigenmann, 5 ex., 45, 47, 48, 53 and 56 mm.

Length of the head nearly equal to the depth and 4 in the standard length. Somewhat compressed, width at the tip of the humeral process $1^1/_4$ in the greatest depth. Occipital and nuchal plates with a blunt keel, roof-shaped, the bones granular till the anterior nares. Nasal bones movable, large, forming a part of the orbit. Coracoid and its processes exposed.

Eye $1^1/_2$ in the snout, 4 in the head and $1^1/_2$ in the interorbital.

Maxillary barbels reaching beyond the base of the pectoral, halfway the length of the strong pectoral spine or to the base of the ventral. Outer mental barbel half the length of the maxillary barbel. Mouth terminal, jaws equal; its width less than half the space between the gill-openings.

Lateral scutes 25-33, very high, covering the whole sides of the body and the tail, leaving a narrow naked area on the dorsal side and reaching the base of the anal, but regularly decreasing in height backwards. Each scute with a strong recurved hook and ridges above and below. The ridges end in a little spine on the posterior margin.

Dorsal spine shorter than pectoral spine, with four sharp ridges on each side and a median ridge in front, which is partly broken up in teeth near the base of the spine. The adipose without spine. The caudal truncate. The caudal fulcra extending above and below the caudal peduncle. Humeral process a little broader than the pectoral spine, not quite extending to the posterior third of the latter, with lines of granules, which become stronger along the lower margin. At the tip of the humeral process a number of recurved hooks. The pectoral spine with sharp ridges on both sides and strongly serrate on both margins. The ridges on the lower side are severely worn off in the here described old specimen. The spine is reaching beyond the base of the ventrals.

Ash coloured, head and body marked with black, a black band along the sides below the median hooks. A black spot at the base of the caudal. The fins marked with black. The maxillary barbels with dark blotches.

D. I/7. P. I/7. V. 7. A. 7.

Pseudodoras Bleeker

Pseudodoras Bleeker, Ichthyol. Arch. Ind., Siluri, 1858, p. 53 (to include *Doras niger* Val., *Doras brevis* Kner, *Doras humeralis* Kner, *Doras lipophthalmus* Kner); — Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 331.

Oxydoras Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 14 (type: *Doras niger* Val. = *Pseudodoras niger* Bleeker).

Type: *Doras niger* Val.

Width at clavicles less than length of head. Head not depressed, snout conical, mouth inferior, teeth feeble or none. Occipital region roof-shaped, granular or striate. Fontanel not continued as a groove. Eye lateral, entirely behind the middle of the head. Anterior nares remote from the lip. Dorsal spine with stronger teeth on the anterior margin than on the posterior. Coracoid covered with skin. Lateral scutes 21-26. Adipose continued forwards as a keel.

Pseudodoras niger (Val.)

Doras niger Valenciennes, in Humboldt, Rec. Obs. Zool., 2, 1811, p. 184 (Amérique équinoxiale); — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 216 (without locality); — Schomburgk, Fish. Brit. Guiana, I, 1841, p. 165 (Rivers of British Guiana); — Müller & Troschel, in Schomburgk, Reisen, 3, 1848, p. 629 (Rivers of Guiana); — Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 14 (name only).

Rhinodoras niger Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 209 (Amazons); — Cope, Proc. Amer. Phil. Soc., 17, 1878, p. 678 (Nauta); — Vaillant, Bull. Soc. Philom. (7), 4, 1880, p. 14 (Calderon).

Oxydoras niger Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 159 (Teffé, Gurupa, Manacapura, Coary, Obidos); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 247 (Teffé (*prionomus*), Gurupa, Manacapura, Coary, Obidos); — Kindle, Ann. N.Y. Acad. Sc., 8, 1894, p. 251 (Para); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 393 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 190 (Rupununi); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 193, pl. 37 (without locality); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 221 (Nauta, Ecuador, Maranon between Rio Negro and Peru); — Fisher, Ann. Carn. Mus., 11, 1917, p. 420 (Santarem, Manaos).

Doras humboldti Agassiz, Selecta Gen. et Spec. Pisc. Bras., 1829, p. 129, pl. 5 (Rio San Francisco, Brazil); — idem, A Journey in Brazil, 1868 (non vidi).

Corydoras edentatus Spix, Selecta Gen. et Spec. Pisc. Bras., 1829, pl. 5 (without locality).

Rhinodoras prionomus Cope, Proc. Acad. Nat. Sc. Phil., 1874, p. 134 (Nauta); — idem, Proc. Amer. Phil. Soc., 17, 1878, p. 678 (Nauta).

Rhinodoras teffeanus Steindachner, Sitz. Ber. Akad. Wiss. Wien, 71, 1875, p. 145, pl. 3 (Teffé).

Museum Leiden:

No. 1906, Rio Branco, Brazil, 1832, from Museum Vienna, 1856, 1 stuffed ex., 680 mm.

Body slender, depth equal to its width, the caudal peduncle depressed. Head long and pointed, its length $3^2/_5$ in the standard length, its width

equal to its depth and $1^1/_2$ in its length. The top of the head striate, becoming somewhat granular-striate anteriorly to the middle of the snout. The anterior part of the snout is smooth. The posterior part with an obtuse keel, which is continued in the roof-shaped dorsal plate. Fontanel long and narrow, not extending beyond the posterior margin of the eye and not continued as a groove.

Eye somewhat behind the middle of the length of the head, 5 in the snout, $9^1/_2$ in the head and $3^1/_3$ in the interorbital.

Barbels thick at the base, thickly papillose. The exact length of the barbels cannot be given. Snout long and rather pointed, covered with smooth skin. The upper lip strongly developed, the lower thick and papillose; the width of the mouth cannot be given. The maxillaries are broken into pieces and the parts are separated. Teeth none. Distance from the anterior nares to the tip of the snout larger than to the posterior nares. Gill-openings extending to below the posterior angle of the preopercle.

Breast and belly entirely covered with skin. Lateral scutes not very high, the highest scutes between the ventrals and the anal. There are 22 scutes along the lateral line and 3 small imbedded plates in the humeral region. No plates on the dorsal and ventral surfaces.

The distance from the dorsal spine to the tip of the snout $2^1/_2$ in the standard length. The spine somewhat curved, its length $1^1/_2$ in the length of the head, serrate in front and behind, the sides striate. The adipose long and low, shaped as a dermal crest. Caudal emarginate, the lobes rounded, the rays leathery. The anal of the stuffed specimen is laid back, so no characters can be given. Ventrals long, reaching till the middle of the distance between the origin of the ventrals and that of the anal. Pectorals long, the spine very strong, somewhat curved, finely striate on both sides, serrate on both margins, not reaching beyond the vertical from the base of the last dorsal ray. Humeral process extending to the posterior third of the pectoral spine, its surface sharply granular, with a median ridge without spines.

Colour of the stuffed specimen brown, lighter below.

D. I/6. P. I/10. V. 7. A. 12.

Rhinodoras Bleeker

Rhinodoras Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 14; — Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 336.

Type: *Doras* (*Oxydoras*) *d'Orbignyi* Kröyer.

Eye in the middle of the head. Adipose prolonged forwards as a keel. Dorsal spine strongly serrate. Lateral scutes about 30. Caudal peduncle

covered with plates above and below, caudal forked. Fontanel not divided, continued as an obscure groove to the dorsal. Mental barbels in two distinct pairs.

Rhinodoras d'orbignyi (Kröyer)

Doras (Oxydoras) d'Orbignyi (Kröyer MS.) Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 149, pl. V fig. 9 (Rio La Plata).

Oxydoras d'orbigny Eigenmann & Eigenmann, Proc. Cal. Acad. Sc., (2), vol. 1, 1888, p. 159 (name only) ; — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 249 (name only) ; — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 394 (name only).

Doras d'orbignii Hyrtl, Denkschr. Akad. Wiss. Wien, 16, 1859, p. 17 (vertebrae 6 + 4 + 21).

Rhinodoras orbignyi Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 14 (name only) ; — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 209 (copied).

Rhinodoras d'orbignyi Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 336, pl. 1 fig. 18, pl. 26 fig. 5 (probably Asuncion).

Doras nebulosus Eigenmann &Kennedy, Proc. Acad. Nat. Sc. Phil., 1903, p. 500 (Asuncion) .

Museum Amsterdam:

South America, 1 ex., 215 mm.

Body slender, somewhat compressed. Caudal peduncle more compressed, its width 2 in its depth. Head conical, its width equal to its depth, snout pointed. The length of the head nearly 4 in the standard length. Dorsal profile nearly straight, only somewhat convex from the tip of the snout to the anterior nostril. Bones of the upper surface of the head with little granules. The occipital process and dorsal plate roof-shaped. Fontanel narrow, reaching from the posterior nares to beyond the posterior margin of the eyes, anteriorly enclosed by the narrow prefrontal bones, posteriorly continued as a marked groove to the posterior margin of the dorsal plate, lying in the middle between the tip of the snout and the posterior margin of the opercle. The posterior nares nearer to the eyes than to the anterior ones.

The diameter of the eye 4 in the snout, $9^1/_2$ in the head and 2 in the interorbital.

Mouth narrow, its width at the rictus 4 in the length of the head. Numerous villiform teeth. The upper jaw projecting beyond the lower. Maxillary barbels do not reach the gill-opening, with a pair of little fringes near their bases. The mental barbels broad at the base, which is papillose, the postmental barbels more rounded at the base. The barbels not connected by a membrane. The lower lip very papillose.

The dorsal plate is butterfly-shaped, with a long process reaching to below the third soft dorsal ray. The distance from the dorsal spine to the

tip of the snout 3 in the standard lgenth. The spine is very strong, serrate on both margins, the teeth on the anterior margin weaker than those on the posterior. The adipose long, rather low, anteriorly gradually merging into the profile of the back, posteriorly abruptly cut off.

Lateral line with 29 scutes, which are butterfly-shaped, bearing a strong recurved hook in the middle, and little spines at the posterior margin. On the dorsal side of the caudal peduncle between adipose and caudal base 7 scutes, on the lower side 8 scutes.

Caudal deeply forked. Anal fin long, the fourth ray the longest, $1^3/_4$ in the length of the head. The vent in the middle between the bases of the ventrals and the anal. The pectoral spine strong, with a short soft tip, strongly serrate on both margins, the sides finely striate. The humeral process swollen at the base, spearhead-shaped, striate at its base, towards its margin granular, broader than the pectoral spine and reaching to $^3/_4$ of the length of same.

The here described specimen, preserved in alcohol during a long time, has no colour marks.

D. I/6. A. 12. V. 7. P. I/7.

Doras Lacépède

Doras Lacépède, Hist. Nat. Poiss., 9, 1803, p. 149 (*Silurus carinatus* L. and *Silurus costatus* L.).

Doras Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 13 (type *carinatus*).

Oxydoras Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855 (various species, *stenopeltis, carinatus, niger* (non Cuv. & Val.), *lipophthalmus, d'orbignyi*).

Hemidoras Bleeker, Ichth. Arch. Ind. Prodr., Siluri, 1858 (type *stenopeltis*). In 1863 Bleeker, 1863a, p. 12 has abandoned this generic name, placing *stenopeltis* in the present genus *Doras*. *Stenopeltis* is now replaced in the genus *Hemidoras*; — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 250.

Oxydoras Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 206.

Doras Jordan, The Genera of Fishes, 1917, p. 65 (*Silurus carinatus* L.); — Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1929, p. 340.

Moryrostoma Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 192 (*carinatus*).

Type: *Silurus carinatus* Linn.

Head not depressed, conical. Fontanel not continued as a groove. Snout short, teeth well developed. Anterior nares on or near the lip. Maxillary barbels with barblets, mental barbels with a basal membrane, with or without barblets. Lateral scutes 28-31, the first connecting the dorsal plate with the humeral process. Adipose short, not continued as a keel. Origin of ventrals nearer to caudal than to tip of snout.

Doras brevis Heckel MS. Kner

Doras brevis Heckel, MS., in Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 138, pl. VI fig. 11 (Barra do Rio Negro); — Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 342 (name only).

Museum Leiden:

No. 2965, Barra do Rio Negro, Natterer, 1856, 1 ex., 96 mm, paratype?

Body short and very high, strongly compressed. The greatest width $1^1/_2$ in the greatest depth. The profile steep. The length of the head $2^1/_2$ in the standard length. The snout somewhat pointed, as long as the diameter of the eye. Fontanel long and narrow, reaching from the posterior margin of the eye to the base of the occipital, continued as a narrow groove on the keel of the roof-shaped dorsal plate.

The eye large, 1 in the snout, 3 in the head and equal to the interorbital.

The snout narrow, the upper jaw without teeth, the lower jaw with some very small teeth. The lower lip with long fringes, the rictus barbels as long as the diameter of the eye.

Dorsal plate not reaching beyond the base of the dorsal spine, with a posterior process, which is directed straight downwards, reaching the first lateral scute.

The dorsal with a long and strong spine, which reaches the adipose when laid back, and a long second ray, the rays rapidly decreasing in height. The length of the last ray $^1/_3$ of the length of the second ray. The spine strongly serrate on both margins, the sides striate. The distance between the base of the dorsal spine and the tip of the snout 2 in the standard length. The base of the dorsal equal to its distance from the adipose. The adipose long, without a spine.

The lateral line with 29 scutes, each bearing a strong recurved hook. The first scute the largest.

The caudal fin emarginate. The anal reaching the caudal base when laid back. The ventrals not reaching the anal. The pectoral fin with a long and strong spine, which reaches the middle of the ventral fin. The spine is strongly serrate on both margins and striate on the sides. The humeral process, swollen at the base, broad, rounded at the tip, reaches the middle of the pectoral spine.

Colour brown, lower parts lighter.

D. I/6. A. 12. V. 7. P. I/7.

The here described specimen was collected by Natterer and apparently is a paratype of *Doras brevis* (Heckel MS.) Kner.

Doras punctatus Kner

Doras punctatus Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 136, pl. VI fig. 10 (Matto Grosso, Rio Guaporé); — Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 343 (S. Joaquin, Paranapura, Lake Cashiboya).

Corydoras punctatus Hyrtl, Denkschr. Akad. Wiss. Wien, 16, 1859, p. 17 (vertebrae 5 + 1 + 21).

Oxydoras punctatus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 207 (copied).
Hemidoras punctatus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 158 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 251 and 255 (description in the key to the species copied); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 394 (name only).
Hemidoras nattereri Fisher, Ann. Carn. Mus., 11, 1917, p. 421 (S. Joaquin).
Hemidoras brevis Fisher, Ann. Carn. Mus., 11, 1917, p. 421 (S. Joaquin).

Museum Leiden:

No. 2966, Guaporé, Natterer, 1856, 1 ex., 105 mm, paratype?

Greatest depth of the body equal to its greatest width and equal to the length of the head. The dorsal outline nearly straight, increasing to the greatest height before the dorsal spine. The sides very steep in the occipital region, roof-like. Fontanel long, merging anteriorly in the naked skin of the snout.

Eye large and round, 2 in the snout, 4 in the head and $1^1/_2$ in the interorbital.

Snout narrow. Mouth with teeth in both jaws. The intermaxillaries with a few tiny teeth; in the lower jaw a narrow band of the same kind of teeth. The lower lip forms a narrow papillose membrane, which connects the four mental barbels. These barbels are fringed and of equal length. The maxillary barbels are not reaching the gillopening and have two or three cirri on their outer margin (partly fringed).

The dorsal spine is broken off.

Lateral plates 29, except the first two rudimentary plates. The lateral plates are small with median hooks, which are growing stronger posteriorly, and 3-2 smaller hooks above and below on the posterior margin of each scute. The first two lateral plates are higher. The first plate is very high and narrow, connecting the dorsal process with the humeral process. Its median hook lies somewhat higher than the others. In the naked area between dorsal plate and humeral process there are two rudimentary scutes, almost entirely covered with skin. The humeral process rather broad, obliquely truncate before the first lateral scute, the surface granular, striate, the lower margin swollen. Coracoid with a long, naked, straight process, which is reaching the end of the humeral process. The junction of the coracoids is covered with a narrow dermal strip.

The pectoral spine is nearly straight, passing beyond the base of the ventrals.

After Kner's description the sides and back are brownish with darker spots.

D I/6. A. 11. V. 7. P. I/8.

The number of anal rays 11; Kner gives 13.

Doras carinatus (L.)

Silurus carinatus Linnaeus, Syst. Nat., ed. 12, I, 1766, p. 504 (Surinam); — Bloch & Schneider, Syst. Ichth., 1801, p. 108 (Surinam).

Doras carinatus Lacépède, Hist. Nat. Poiss., 5, 1803, p. 116 (Surinam); — Cuvier & Valenciennes, Hist. Nat. Poiss. 15, 1840, p. 214, pl. 442 (Cayenne); — Müller & Troschel in Schomburgk, Reisen, 3, 1848, p. 629 (Essequibo); — Bleeker, Ichth. Arch. Ind. Prodr., Siluri, I, 1858, p. 54 (name only); — idem, Nederl. Tijdschr. Dierk., I, 1863, p. 13 (name only); — idem, Silures de Suriname, 1864, p. 31 (Surinam); — Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 345, pl. 1 figs. 8, 9, 10; pl. 2 fig. 6; pl. 23 fig. 4; pl. 27 fig. 8 (Rockstone, Georgetown, Crab Falls).

Doras (Oxydoras) carinatus Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 144 (Surinam).

Oxydoras carinatus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 206 (Surinam, Essequibo River); — Vaillant, Bull. Soc. Philom. (7), 4, 1880, p. 154 (Calderon).

Hemidoras carinatus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 158 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 258 (name only); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 394 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 194 (British Guiana, Rockstone, Georgetown, Crab Falls).

Doras oxyrhynchus Valenciennes in Humboldt, Rec. Obs. Zool., II, 1833, p. 184 (without locality).

Museum Leiden:

No. 2968, Surinam, Dieperink, 1 ex., 225 mm.
No.1961, Surinam, Dieperink, 1 stuffed ex., 315 mm.

Museum Amsterdam:

Crab Falls, Essequibo River, British Guiana Exp., 1908, Eigenmann, 6 ex., 47, 55, 75, 92, 101 and 168 mm.

Body heaviest below the dorsal, the width $1^1/_4$ in the depth. The depth $4^1/_2$ in the standard length. The caudal peduncle is as wide as deep, its depth less than the distance from the anal to the lower caudal rays. The length of the head $3^1/_5$ in the standard length. The occipital area roof-shaped, with a median groove, which is not continued till the fontanel. The profile is abruptly descending in front of the eye.

The diameter of the eye $1^1/_2$ in the snout, 3 in the head; the interorbital $1^1/_2$ in the diameter of the eye.

The snout is sharply pointed and proportionately longer in the older specimens of the Leiden collection. A pair of patches of small teeth in each jaw; those of the upper jaw wanting in some specimens. Mouth narrow, $1\text{-}1^1/_2$ in the distance between the gill-openings. Maxillary barbels reaching the base of the pectorals except in the specimen of 225 mm of the Leiden collection.

The distance between the snout and the base of the dorsal spine $2^1/_2$ in the standard length. The dorsal spine is longer than the distance between the tip of the snout and the posterior margin of the eye. In one

of the larger specimens in question, viz., the specimen of 225 mm, the upper fourth part of the dorsal spine has the anterior margin convex, whereas the lower part is slightly concave; this is probably the result of a healed wound. The adipose fin is low, its base equal to the base of the dorsal without the spine.

Lateral line with 33 scutes, nearly all of the same size. Humeral process truncate, its upper and lower margins nearly parallel, its depth one third of its length.

Axillary pores numerous.

Colour white below, ash-grey above, no definite markings.

D. I/6. A. 11.

Hassar Eigenmann & Eigenmann

Hassar Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), I, 1888, p. 158; — Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 355.

Type: *Oxydoras orestis* Steindachner.

Head compressed, profile arched, snout decurved, prolonged. Mouth large, a small patch of minute teeth in the lower jaw. Barbels slender, with barblets, the mental barbels connected by a narrow membrane. Anterior nares equidistant from tip of snout and eye. Fontanel either continued as a groove or not. Lateral scutes 21-33. Humeral process blunt, rounded.

Hassar affinis (Steind.)

Oxydoras affinis Steindachner, Denkschr. Akad. Wiss. Wien, 43, 1882, p. 107, pl. I fig. 1 (Rio Puty, tributary of Parnahyba north of Therezina).

Hemidoras affinis Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 158 (Rio Puty); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 258 (Rio Puty, O. St. John); — idem, Proc. U.S.Nat. Mus., 14, 1891, p. 33 (name only); — Steindachner, Anz. Akad. Wiss. Wien, 52, 1915, p. 217 (Itapicuru, at Caxias, Paranahyba at Engenho da Agua).

Hassar affinis Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 188, fig. 90 and 90A (copied); — Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 356, pl. 27 fig. 4 (name only).

Museum Leiden:

No. 7973, Rio Puty, Steindachner, 1907, 1 ex., 162 mm.

Body subterete, tapering backwards, the depth $1^1/_4$ the width, compressed. Head rather long, $2^4/_5$ in the standard length, compressed. Snout long and pointed, the profile not very steep from the dorsal spine to the eye, much steeper in front of the eye. The space in front of the anterior nostrils somewhat concave. Bones of the head finely granular, the sutures appear as smooth grooves. An ovate foramen covered with skin, surrounded by the dorsal plate, the occipital process and a plate of dermal

ossification. Scapula with a distinct dermal ossification, which at its narrowest part is as wide as the foramen, not meeting the humeral process, its surface finely granular. Fontanel narrow and short, not so long as the eye, with a bridge across its posterior fifth part. Dorsal plate reinforced on the sides by dermal ossifications, their size and form marked by a smooth line.

Eye large, placed on $^2/_3$ of the length of the head, nearly in the middle between the posterior margin of the dorsal plate and the tip of the snout, measured to the orbital rim; $2^1/_2$ in the snout, nearly 5 in the head, the interorbital width nearly equal to the diameter of the orbit.

Maxillary barbels touching the middle of the orbit. The four mental barbels connected by a membrane, the barbels continuing as a thickening of the membrane, short and covered with short fleshy cirri. Snout covered with skin. Posterior nares in the middle between the anterior nares and the eye; the anterior nares on $^1/_3$ between the eye and the tip of the snout. Mouth very small, wholly inferior. A small patch of villiform teeth on each intermaxillary, a larger patch on the dentary bone. Gill-openings wide, the isthmus a little wider than the orbital diameter.

Coracoids covered with skin, but evident as a ridge. Lateral scutes 19-21, low, the highest above the anal, their height a half orbital diameter, anterior to the tips of the ventrals they are becoming smaller, looking like minute embedded ossicles, extending forwards to a subdermal process, which extends downwards from the posterior angle of the dorsal plate to the posterior end of the humeral process. Each scute with a median hook.

Distance from the dorsal fin to the tip of the snout $2^1/_3$ in the standard length. The dorsal spine is broken off. Space between dorsal and adipose 4 in the standard length. The adipose free posteriorly, its base $1^1/_2$ in the base of the dorsal fin. Caudal forked, its rays leathery, accessory rays 12, forming a small plate above and below the caudal peduncle. The longest ray of the dorsal fin 2 in the length of the head. Anal leathery, slightly emarginate, its highest ray 3 in the length of the head. Ventrals not reaching the anal, their length about $2^1/_2$ in the length of the head. The pectoral spines are broken off.

Small pores in the axil and beneath the lower margin of the humeral process make the skin appear as a sieve.

Humeral process broad and strong, rounded at the tip, its surface striate. Two thin plates embedded in the skin above the humeral process.

Colour purplish brown above, lighter below. Dorsal with a dusky tip.

D. I/6. A. 12. V. 7. P. I/10.

Leptodoras Boulenger

Leptodoras Boulenger, Ann. Mag. Nat. Hist. (7), 2, 1898, p. 477; — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 191; — Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 356.

Type: *Oxydoras acipenserinus* Günther.

Maxillary barbels fringed, mental barbels connected by a membrane. No teeth in either jaw. Eye large. Anal given by Boulenger as 15-17, by Eigenmann as 12-14. I found anal 13 in the hereafter described paratype of *L. linnelli* Eigenmann. The number of anal rays will not be of great importance. *Leptodoras* is closely related to *Hemidoras*, but it must be kept apart on account of the failing of teeth in both jaws.

Leptodoras linnelli Eigenmann

Leptodoras linnelli Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 395 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 191, pl. XVII fig. ,1 pl. XVIII fig. 1 (Tumatumari, Rockstone, Crab Falls, Georgetown market); — idem, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 357, pl. 2 fig. 2, pl. 5 figs. 3, 4, pl. 20 fig. 4, pl. 24 figs. 3-5 (Macièl, Rio Guaporé, Tumatumari, Crab Falls, Rockstone); — Fowler, Proc. Acad. Nat. Sc., Phil., 1914, p. 264 (Rupununi).

Leptodoras acipenserinus Fisher (not Günther), Ann. Carn. Mus., 11, 1917, p. 422 (Maciél, Rio Guaporé).

Hemidoras (*Leptodoras*) *linneli* Steindachner, Anz. Akad. Wiss. Wien, 52, 1915, p. 217-219 (Rio Branco at Boa Vista and Serra Grande).

Museum Amsterdam:

Tumatumari, Lower Potaro River, British Guiana Exp., 1908, Eigenmann, 1 ex., paratype.

Body slender, depth equal to width, caudal peduncle depressed, its depth 2 in its width and 2 in the distance from the anal to the caudal. Head $3^1/_2$ in the standard length. Profile arched before the eyes, the snout steep, pointed. Fontanel narrow between the eyes over the whole length, continued as a sharp narrow groove to the tip of the occipital process, and anteriorly to the tip of the snout. A small foramen on either side of the occipital process in which a few small plates are completely embedded, only the tips of the hooks are visible.

Mouth small, on the lower side of the body. No teeth in either jaw. Maxillary barbels fringed, scarcely reaching the gill-opening. The four mental barbels connected by a broad membrane.

Eye $1^1/_2$ in the snout, 3 in the head, the interorbital 2 in the diameter of the eye.

Dorsal spine equal to the length of the head, serrate on both sides. The base of the dorsal fin nearly 2 in the distance between the dorsal and the adipose. The adipose small, free behind. In the specimen in question, the

base of the adipose almost equal to the base of the dorsal without the spine, as mentioned by Eigenmann. The caudal deeply forked. Anal emarginate. Pectoral fins long, reaching to the middle of the ventrals, the spine as long as the head, somewhat curved, serrate on both margins, the teeth on the inner margin much stronger. Pectoral pore large.

Lateral scutes well developed, partly concealed by the skin. The plates with a strong median hook and a series of marginal spines. The median hook strongest on the plates behind the anal fin.

Humeral process short and broad, its upper margin very much bent.

Colour of the upper surface of the head and the back dark brown, the sides lighter, covered with minute dark brown dots, the lower side white. The fins light, the rays also covered with minute dark brown spots.

D. I/6. A. 13. V. 6. P. I/6.

AUCHENIPTERIDAE

Auchenipterinae Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 261; — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 197.

Auchenipteridae Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 281.

Gill-membranes united and joined to the isthmus. Nares remote, without barbels. Maxillary and mental barbels present.

Centromochlus Kner

Centromochlus Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1875, p. 430 (*megalops* = *heckelii*).

Glanidium (ex Reinhardt MS.) Lütken, Dan. Vidensk. Selsk. Skr., 12, 1874, p. 31 (*albescens*).

Type: *Centromochlus megalops* Kner.

Head blunt, mouth terminal, jaws equal. Palatine teeth none. The vomer with or without teeth. Eye variable in size, covered with skin. Adipose very short. Anal 7-11 rays. Dorsal I/4-5. Occipital process firmly joined to the dorsal plate. Barbels six, mental barbels in two pairs.

Centromochlus albescens (Reinhardt)

Glanidium albescens (Reinhardt MS.) Lütken, Dan. Vidensk. Selsk. Skr., 1874, p. 31 (Rio das Velhas and tributaries); — idem, Dan. Vidensk. Selsk. Skr., 1875, pl. III fig. 5; — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 157 (Rio Parahyba, Rio Janeiro, Macacos); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 395 (name only).

Centromochlus (*Glanidium*) *albescens* Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 106 (Rio Parahyba).

Centromochlus albescens Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 270 (Rio Parahyba, Rio Janeiro, Macacos).

Museum Leiden:

No. 17246, Brazil, 1 ex., 132 mm.
No. 17294, Port Real, Rio de Janeiro, Hardy du Dréneuf, 1890, 7 ex., 71, 80, 82, 102, 108, 116 and 129 mm.

Body somewhat compressed, head depressed, broad, flattish above, its width somewhat less than its length, its depth $1^1/_3$ in its length. The length of the head 4 in the standard length. Surface of the bones of the head roughened but covered all over with skin. Dorsal plate with an outwards projecting process before and behind. Fontanel elongate. Snout abruptly decurved, broadly rounded in front.

Eye lateral, equal to snout, 5 in the head, 3 in the interorbital.

Maxillary barbels reaching to beyond the tip of the humeral process, mental barbels very short. Jaws equal, the mouth terminal, teeth villiform. Lateral line straight.

Distance from dorsal spine to tip of snout $3^1/_2$ in the standard length. The dorsal spine short, smooth on the anterior margin, roughened on the posterior, its length 2 in the distance from the dorsal spine to the tip of the snout. No adipose fin. Caudal forked. Anal short. Ventrals not reaching the anal. Pectoral spine stout and somewhat curved, its sides finely striate, the outer margin smooth with some teeth at the tip, the inner margin entirely dentate.

Humeral process extending somewhat beyond the middle of the pectoral spine.

Sides and back covered with dark dots, ventral surface plain light. Fins with dark dots, the caudal abruptly dark at its posterior margin.

D. I/5. A. 10-11. V. 6. P. I/6.

Trachycorystes Bleeker

Trachycorystes Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 88 (*typus* = *trachycorystes*).

Parauchenipterus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 88 (*galeatus*).

Type: *Trachycorystes typus* Bleeker.

Mental barbels in two pairs. Adipose fin shorter than the anal fin. Anal 19-41 rays. Caudal obliquely truncate or slightly emarginate. The outer margin of the pectoral spine serrate.

Trachycorystes galeatus (L.)

Silurus galeatus Linnaeus, Syst. Nat., ed. 12, I, 1766, p. 503 (based on Seba, Rer. Nat. Thes. Acc. Descr., 3, 1748, pl. 29 fig. 7); — Gmelin, Syst. Nat., I, 3, 1788, p. 1357; — Bloch, Ausl. Fische, 8, 1794,p.39; — Bloch & Schneider, Syst. Ichthyol., 1801, p. 384.

Pimelodus galeatus Lacépède, Hist. Nat. Poiss., 5, 1803, p. 97, 114 (South America).

Auchenipterus galeatus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 196 (Guiana); — Peters, MB. Akad. Wiss. Berlin, 1877, p. 470 (Calabozo).

Parauchenipterus galeatus B'eeker, Nederl. Tijdschr. Dierk., I, 1863, p. 88 (name only); — idem, Silures de Suriname, 1864, p. 45 (Surinam).

Trachycorystes galeatus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 155 (Pernambuco, San Gonçallo, Rio S. Francisco be'ow the Falls, Tabatinga, Teffé, Rio Puty); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 279 (localities as before); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 396 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 198 (Mud-flats, Demarara River below Wismar, Barima, River, Aruka River, Lama stop-off, Georgetown trenches, Maduni Creek, Chipoo Creek); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 266 (Rupununi); — idem, Proc. Acad. Nat. Sc. Phil., 1915, p. 222 (Surinam), p. 529 (Trinidad).

Auchenipterus maculosus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 161 (Cayenne); — Müller & Troschel in Schomburgk, Reisen, 3, 1848, p. 639 (Essequibo); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 425 (Marabitanos); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 196 (Surinam, Essequibo); — Vaillant, Bull. Soc. Philom. (7), 4, 1880, p. 154 (Calderon).

Auchenipterus immaculatus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 162 (Cayenne).

Auchenipterus punctatus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 163 (Brazil?); — Müller & Troschel in Schomburgk, Reisen, 3, 1848, p. 629 (Essequibo); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 425 (Rio Branco).

Auchenipterus lacustris Lütken, Dan. Vidensk. Selsk. Skr., 12, 1875, p. 148 with fig. (Rio das Velhas).

Auchenipterus robustus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 197 (Demerara).

Trachycorystes robustus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 156 (name only); — idem, Occ. Pap. Cal. Acad. Sc. vol. 1, 1890, p. 281 (name only).

Museum Leiden:

No. 3007, Surinam, Dieperink, 1 ex., 160 mm.
No. 3008, Surinam, Dieperink, 1 ex., 232 mm.
No. 3011, Surinam, Dieperink, 1 ex., 190 mm.
No. 16054, Brazil, 1 ex., 203 mm.

Museum Amsterdam:

Lama Stop- off, British Guiana Exp., 1908, Eigenmann, 1 ex., 152 mm.
South America, 3 ex., 114, 130 and 150 mm.

Body robust, somewhat compressed. Head short and heavy, width of the head nearly as great as its length, its length $4^1/_3$-$4^3/_4$ in the standard length. Width of the mouth $1^2/_5$-$1^3/_4$ in the length of the head. Depth at the occipital process about equal to the length of the head. Bones of the head and humeral process granular. Occipital process emarginate on the sides, with rather long backwards projecting processes, which are not curved downwards behind, its smallest width more than its smallest length. Fontanel pear-shaped, open in front in the young, reduced to a small circular opening between the frontals in the old.

Eye $1^2/_3$ in the snout, 6 in the head, $4^1/_2$ in the interocular.

Lower jaw considerably longer, teeth all short, villiform or setiform, intermaxillary band very shallow, its depth 10 in its width. Maxillary barbels reaching the tip of the humeral process or a little farther. Mental barbels about half the length of the head, postmentals reaching somewhat beyond the base of the pectoral. Gill-openings not extending below the base of the pectorals. Humeral process variable in length, always reaching beyond the middle of the pectorals. Pectoral pore present, situated well forward.

Distance from dorsal spine to tip of snout $2^4/_5$-3 in the standard length, dorsal spine varying in length, $1^1/_3$-$1^1/_2$ in the length of the head, its anterior margin almost smooth, granular, or with rather sharp teeth, in some specimens almost smooth. First dorsal ray usually somewhat higher than the spine. Distance between dorsal and adipose $2^1/_2$ in the standard length. The adipose fin rather large, its anterior margin merging into the outline of the back. Caudal obliquely truncate, the longest rays about 5 in the total length. Anal fin comparatively short. Its free margin either straight or emarginate in front, always strongly curved behind. Ventrals short and broad, reaching the anal, their length about $1^3/_4$ in the length of the head. Pectoral spine very strong, of varying length, reaching halfway its distance to the ventrals, in some specimens halfway its distance to the anal. The length of the spine 4-5 in the total length. First pectoral ray about as long as the spine.

Colour variable; sometimes light brown with dark spots on the dorsal, caudal and pectoral, the anal and ventrals white. The specimen from British Guiana is darker brown, mottled with lighter brown and has all the fins dark, the ventral surface thickly covered with brown and dark dots.

D. I/6. A. 22-24. V. 6. P. I/7.

Pseudauchenipterus Bleeker

Felichthys Swainson, Class. Fishes, Amph., and Rept., 2, 1839, p. 305 (species of several genera); — Swain, Proc. Acad. Nat. Sc. Phil., 1882, p. 281 (*nodosus*).

Pseudauchenipterus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 88 (*nodosus*).

Type: *Silurus nodosus* Bloch.

Head narrow, compressed, strongly convex transversely. Teeth villiform in upper and lower jaw, no teeth in the vomer or the palate. Eye lateral, covered with skin. Anal fin rather long, emarginate. Caudal forked. Lateral line bifurcated on the base of the caudal.

Pseudauchenipterus nodosus (Bloch)

Silurus nodosus Bloch, Ausl. Fische, 8, 1794, p. 35, pl. 368 fig. 1(Tranquebar); — Bloch & Schneider, Syst. Ichthyol., 1801, p. 383.

Arius nodosus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 53 (copied).
Auchenipterus nodosus Müller & Troschel, Horae Ichthyol., 3, 1849, p. 11; — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 424 (Surinam); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 194 (British, Dutch and French Guiana); — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 479 (Marajo).
Felichthys nodosus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 154 (Para, Bahia); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p 290 (Para, Bahia).
Pseudauchenipterus nodosus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 88 (name only); — idem, Silures de Suriname, 1864, p. 43, pl. XI fig. 1, and pl. XIII fig. 6 (Surinam); — Eigenmann & Eigenmann, Proc. U.S. Nat. Mus., 14, 1891, p. 34 (Bahia, Para, Guiana); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 396 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 201 (Georgetown, Mahaica, Demerara River); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 354 (copied); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 529 (Trinidad).
Auchenipterus furcatus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 157 (Cayenne, Surinam).
?Parauchenipterus paseae Regan, Proc. Zool. Soc. London, 1906, I, p. 387, pl. 23 (Caroni River, Trinidad); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 396 (name only).
?Pseudauchenipterus guppyi Regan, Proc. Zool. Soc. London, 1906, I, p. 387, pl. 24 (Caroni River, Trinidad); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 396 (name only).

Museum Leiden:

No. 3012, Surinam, Dieperink, 1 ex., 222 mm.
No. 3013, Surinam, Dieperink, 1 ex., 185 mm.
No. 3014, Surinam, Dieperink, 1 ex., 185 mm.
No. 3015, Surinam, Dieperink, 3 ex., 121, 132 and 139 mm.
No. 8400, River Paramaribo, 1904, Buitendijk, 1 ex., 208 mm.
No. 8414, River Demerara, 1904, Buitendijk, 1 ex., 243 mm.
No. 14795, Surinam, from Museum Cambridge, Mass., 1 ex., 203 mm.
No. 17260, Surinam, June 1910, Bolten, 1 ex., 230 mm.
No. 17310, Caribbean Sea, November 1908, Buitendijk, 1 ex., 245 mm.
No. 17309, Surinam, Noordijk, 1 ex., 152 mm.

Museum Amsterdam:

Georgetown market, British Guiana Exp., 1908, Eigenmann, 1 ex., 245 mm.
South America, 1 ex., 155 mm.

Body elongate, slightly compressed, depth all along somewhat greater than the width. Head short, robust, its width $1^1/_4$ in its length, its depth also $1^1/_4$ in its length. The length of the head $3^1/_5$ in the standard length. Bones of the skull covered with exceedingly thin skin, their surfaces finely striate and granular, the frontal bones are swollen. Frontal fontanel open in front. Occipital process rounded behind, firmly joined to the dorsal plate. Dorsal plate emarginate behind, sending two long curved processes backwards past the dorsal spine, where they are curved downwards and afterwards slightly forwards.

Eye moderate, situated immediately above and behind the corner of the

mouth; its diameter $1^3/_4$ in the snout, $6^3/_4$ in the head and $3^1/_{10}$ in the interorbital.

Maxillary barbels reaching to the pectoral or beyond the posterior third part of the pectoral spine.

Mental barbels reaching beyond the base of the pectorals, the post-mental barbels to the middle of the pectoral spine. Snout broad, rounded in front, jaws subequal, the lower somewhat shorter, teeth all villiform. Gill-opening extending to the base of the pectoral. Gill-rakers short, 6 + 16.

Distance from dorsal spine to tip of snout 3 in the standard length, the spine either shorter or longer than the head and 3-$3^3/_4$ in the standard length, its base swollen, its anterior margin rough, its posterior margin with short teeth. The first soft ray of the fin as high as the spine. Distance between adipose and dorsal $2^3/_4$ in the standard length. The adipose fin shorter than the anal fin. Caudal deeply forked. Ventrals not reaching the anal. Pectoral spine $3^1/_4$-$3^3/_4$ in the standard length, outer margin smooth to granular, inner margin strongly serrate; not so long as the dorsal spine.

Humeral process striate, not extending to the middle of the pectoral spine. Pertoral pore present.

Lateral line undulating, with very short lateral branches.

Colour on the back brown, sides lighter. An undulating white streak follows the lateral line even after the bifurcation on the caudal.

D. I/6. A. 20. V. 8. P. I/7.

Auchenipterus Cuv. & Val.

Auchenipterus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 154 (*nuchalis*).
Evanemus Müller & Troschel, Horae Ichthyol., 3, 1849, p. 11 (*colymbetes* = *nuchalis*).

Type: *Hypophthalmus nuchalis* Spix.

Barbels six. Mental barbels arranged in a line parallel with the margin of the lip. Adipose short. Dorsal I/6. Anal long, 40-47. Bones of the head thick, covered with skin. Pectorals I/11. Teeth villiform. No teeth on the vomer or on the palate. Lateral line zig-zag with numerous branches, bifurcated on the base of the caudal.

Auchenipterus demerarae Eigenm.

Auchenipterus demerarae Eigenmann, Mem. Carn. Mus., 5, 1912, p. 202, pl. XXI fig. 1 (Wismar and mud-flats just below Wismar, Malali); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 266 (Rupununi).

Museum Leiden:

No. 4824, 1 ex., 147 mm.

Body much compressed, depth $4^3/_4$ in the total length. The depth of the caudal peduncle 2 in the length of the head. Head short, blunt, depres-

sed; its length $5^1/_4$ in the standard length. Occipital process as long as wide. Fontanel nearly as long as the eye, continued anteriorly as a groove almost as wide as the fontanel.

Eye 1 in the snout, 3 in the head and $1^1/_2$ in the interorbital.

Maxillary barbels extending to the tip of the pectorals, mental barbels to the middle of the pectorals. Lower jaw slightly enclosed, the teeth in a very narrow band. Gill-membranes free to behind the lower margin of the pupil.

Distance from tip of snout to dorsal $4^1/_3$ in the standard length, the spine equal to snout and eye, with a few recurved notches on the posterior margin near the tip. These important characters are given by Eigenmann. The specimen in the Leiden collection has the dorsal so badly damaged, that no characters can be given. Caudal deeply forked, the middle rays about half as long as the outer. The highest anal ray equals snout and eye in length. Ventrals reaching to about the sixth anal ray. Pectorals not reaching the ventrals. The pectoral spine but little shorter than the head, smooth in front, with recurved teeth along its entire posterior margin.

Sides peppered all over; a dark lateral band from the gill-opening to the caudal. Caudal dusky, the tip of the upper caudal lobe quite dark. The lower fins hyaline.

The character of the dark lateral band, given by Eigenmann as the only striking difference between *Auchenipterus nuchalis* (Spix) and *Auchenipterus demerarae* Eigenm., is very obvious in the here described specimen. The specimens mentioned by Eigenmann are from Demerara, unfortunately the name of the locality on the label of the specimen in the Leiden collection is illegible.

A. 44. V. 12. P. I/11.

Auchenipterus brevior Eigenmann

Auchenipterus brevior Eigenmann, Mem. Carn. Mus., 5, 1912, p. 202 (Tumatumari, Lower Potaro).

Museum Amsterdam:

Tumatumari, Lower Potaro, British Guiana Exp., 1908, Eigenmann, 1 ex., without caudal 45 mm, paratype.

Body slender, much compressed, greatest width of the body 2 in its depth. Head short, blunt, depressed, its length 5 in the standard length, its depth 2 in its length. Occipital with a broad and blunt process. Fontanel long and broad, continued anteriorly as a wide groove to the tip of the snout.

Eye large, on the lower half of the lateral side of the head; its diameter

equal to the snout, $2^1/_2$ in the head and 2 in the interorbital and equal to the interocular distance.

Lower jaw slightly enclosed, the teeth in very narrow bands. Maxillary barbels reaching to the tip of the pectorals, the mental and postmental barbels to beyond the lower angle of the gill-opening. The gill-opening reaching to below the middle of the eye.

Dorsal very short, its distance from tip of snout $3^3/_4$ in the standard length. The length of its base 4 in its distance from the tip of the snout. The spine is broken off. Adipose very small. The rays of the caudal are broken off. Anal very long, the longest ray equal to snout and eye. The ventrals are reaching the sixth anal ray. Pectoral spine scarely reaching the base of the ventrals, its outer margin smooth, the inner serrate.

Colour of the head and dorsal part dark, the sides light brown. A dark median lateral band from the gill-opening to the base of the caudal. The caudal dusky with a dark stripe in the middle. The lower fins hyaline.

D. I/6. A. 43. V. 12. P. I/11.

Eigenmann mentions that the species *Auchenipterus demerarae* differs from *brevior* only in the length of the mental and postmental barbels, which are longer, reaching to the pectorals in *demerarae*. It is doubtful whether a character of such a minor importance justifies the forming of a new species. The types of the species have to be examined before a definite decision can be reached.

AGENEIOSIDAE

Ageneiosinae Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., I, 1890, p. 299; — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 203.

Ageneiosidae Eigenmann, Trans. Amer. Phil. Soc., n.s., vol. 22, 1925, p. 281.

Air bladders almost entirely surrounded by bone on either side of the centrum of the modified vertebrae. Maxillary barbels only, these are short.

Ageneiosus Lacépède

Ageneiosus Lacépède, Hist. Nat. Poiss., 5, 1805, p. 132 (*armatus*).
Hypophthalmus Schomburgk, Fish. Brit. Guiana, 1849, p. 191 (*dawalla*).
Pseudageneiosus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 108 (*brevifilis*).
Davalla Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 108 (*davalla*).
Ageneiosus Günther, Cat. Fish. Brit. Mus., V, 1864, p. 191 (species of several genera).

Type: *Ageneiosus armatus* Lacépède.

Maxillary barbels only, no mental barbels. Teeth villiform; none on the vomer or on the palate. Orbit without a free margin. Eye large, lateral. Adipose very short. Anal long, 34-44. Lateral line zig-zag, with numerous branches, bifurcated on the base of the caudal.

Ageneiosus brevifilis Cuv. & Val.

Ageneiosus inermis (not *Silurus inermis* L. or Bloch) Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 178, pl. 440 (Surinam); — Castelnau, Anim. Amer. Sud, Poiss., 1855, p. 48 (Amazon).

Ageneiosus brevifilis Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 180 (Cayenne); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 438 (Rio Cuyaba); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 192 (River Capin, Para); — idem, Proc. Zool. Soc. London, 1868, p. 229 (Xeberos); — Cope, Proc. Amer. Phil. Soc., 17, 1878, p. 676 (Peruvian Amazon); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 150 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 309 (Serpa, Villa Bella, Thayer Exp.); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, III, 1910, p. 397 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 205 (Lama stop-off); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 224 (Peruvian Amazon).

Pseudageneiosus brevifilis Bleeker, Silures de Suriname, 1864, p. 83, pl. 16 fig. 1 (Surinam).

Hypophthalmus dawalla Schomburgk, Fish. Brit. Guiana, I, 1841, p. 191, pl. 9 (Guiana); — Müller & Troschel in Schomburgk, Reisen, 3, 1848, p. 643 (without locality).

Ageneiosus dawalla Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 150 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 309 (copied).

Ageneiosus sebae Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 192 (copied).

Museum Leiden:

No. 2975, Surinam, Dieperink, 2 ex., 271 and 228 mm.

Body robust, becoming compressed backwards. Head depressed, broad and flat, its length $3^2/_3$ in the standard length. Profile steep. Fontanel reaching the eyes, extending as a groove to the base of the occipital process. The process coössified with the dorsal plate. The upper surface of the bones of the head striate, covered with skin. Opercle emarginate, branched, with branched ridges radiating from its angle.

Eye $3^1/_2$ in the snout, 6-7 in the head, 5 in the interorbital.

Maxillary barbels compressed at the base, short, their length equal to the diameter of the eye. Snout depressed, rounded. The upper jaw slightly projected. Teeth cardiform. Both bands interrupted in the middle. Gill-membranes separate till in front of the eye. Pectoral pore round, placed high, near the gill-opening.

Lateral line with numerous branches, bifurcated on the base of the caudal.

Distance from the dorsal spine to the tip of the snout $3^1/_3$-$3^2/_3$ in the standard length, the spine long and slender, its length 2 in the length of the head. The spine granular in front, its posterior margin smooth. Distance from dorsal to adipose $2^3/_4$ in the standard length. The adipose fin higher than long. Caudal emarginate. Origin of anal equidistant from the base of the caudal and the anterior margin of the eye. The first rays thickened

and osseous. The ventrals reaching somewhat beyond the origin of the anal, the length about 2 in the length of the head. Pectoral spine flexible, smooth on both margins, reaching the ventral base, length about 2 in the length of the head.

Colour steel blue above, lighter below. Dorsal, pectorals and ventrals spotted. The caudal margined with a light coloured band.

D. I/6. A. 34.

Ageneiosus ucayalensis Castelnau

Ageneiosus ucayalensis Castelnau, Anim. Amer. Sud, Poiss., 1855, p. 49, pl. 17 fig. 2 (Ucayale); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 150 (Rio Para); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, 306 (Rio Para).

Museum Leiden:

No. 14765, Para, Murajo, Dr. Conto de Magelhaes, Thayer Exp., 1 ex., 168 mm, without caudal.

Body elongate, compressed. In front of the ventrals the depth is $1^1/_2$ times the width. The body becomes strongly compressed behind the ventrals. Length of the head ± 4 in the standard length; much depressed, the snout rounded, spatulate; the surface of the bones with longitudinal ridges, covered with skin. Fontanel continued backwards as a groove to the base of the occipital process. The process as broad as long, firmly joined to the dorsal plate. Width of the head 2 in its length, and the same at the rictus.

Eye lateral, 4 in the snout, 8 in the head and 4 in the interocular.

Maxillary barbels simple, scarcely reaching the corner of the mouth, concealable in a groove. Length of the snout scarcely greater than the interorbital. Cleft of the mouth 2 in the length of the head. Teeth villiform, in an intermaxillary band, which is deepest in front and tapering backwards. Teeth depressible, the inner series larger than the outer, teeth of the mandible similar. Gill-membranes confluent with the skin of the isthmus in a point behind the eyes. Gill-rakers 5 + 12. Pectoral pore small.

Lateral line zig-zag, branching, bifurcated on the base of the caudal.

Distance from dorsal spine to tip of snout $3^1/_2$ in the standard length, the spine $2^1/_5$ in the length of the head, slender, flexible, with small teeth on both margins. Distance between dorsal and adipose nearly 2 in the standard length. The adipose fin high and short, half as long as the dorsal fin. The caudal is totally broken off in the described sperimen. Origin of anal in the middle between the base of the caudal and the rictus. Pectoral spine smooth on its outer margin, serrated on the inner, its length 2 in the length of the head.

The colour of the specimen preserved in alcohol is pale, so that characters cannot be given.

D. I/6. A. 46. V. 7. P. I/14.

The specimen in the Leiden Museum, collected by Dr. Conto de Magelhaes during the Thayer Exp. at Murajo on the River Para, is approximately from the same locality as those described by Eigenmann & Eigenmann. Our specimen answers in all characters to the description by Castelnau, although we must bear in mind that this description is anything but satisfactory. Because some characters of our specimen are different from those given by Eigenmann & Eigenmann, it will be necessary to see the type of the species before a decision can be arrived at.

Ageneiosus dentatus Kner

Ageneiosus dentatus Kner, Sitz. Ber. Akad. Wiss. Wien, 26, p. 441, 1857 (Surinam); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 192 (Para); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 307 (Teffé, Para, Cameta); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 397 (name only); — idem, Mem. Carn. Mus., 9, 1922, p. 50 (name only).

Ageneiosus paradalis Lütken, Vidensk. Medd., 1874, p. 190 (Caracas); — Steindachner, Denkschr. Akad. Wiss. Wien, 39, 1878, p. 17, pl. III fig. 1-1a (Magdalen River); — idem, Denkschr. Akad. Wiss. Wien, 42, 1880, p. 10 (Cauca River); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 150 (Teffé, Para, Cameta).

Museum Leiden:

No. 16052, Brazil, 1 ex., 186 mm.

Body elongate, compressed, the width under the dorsal fin $1^1/_4$ in the depth. The depth below the dorsal $7^1/_2$ in the standard length. Fontanel continued as a groove to the base of the occipital process. Head depressed, the snout spatulate. The length of the head $4^1/_4$ in the standard length. The occipital process coössified with the dorsal plate. The surface of the bones of the head striate.

Eye lateral, 2 in the snout, 6 in the head and 3 in the interorbital.

Maxillary barbels not reaching the end of the intermaxillary bone. The band of teeth in the intermaxillary is not interrupted, the dental band interrupted. Length of the snout equal to the interocular width. Gill-membranes separate to the posterior margin of the eye. Gill-rakers short, 7 + 14.

Lateral line zig-zag, branching, bifurcated on the base of the caudal.

Distance from the dorsal spine to the tip of the snout $3^3/_4$ in the standard length; the spine slender, flexible, crenated in front, its length 2 in the length of the head. Distance between dorsal and adipose less than 2 in the standard length. The adipose is shorter than the dorsal fin. The caudal is forked, its length 6 in the standard length. The origin of the anal nearer to the rictus than to the base of the caudal fin. Ventrals reaching the origin

of the anal, their length 2 in the length of the head. Pectoral spine $1^1/_2$ in the length of the head, roughened in front, serrate on the inner margin.

Colour on the back dark, the top of the head marbled whitish. The inner surface of the ventrals and more especially of the pectorals with dark dots. The tip of the dorsal and the caudal blackish.

D. I/6. A. 44.

HELOGENEIDAE

Siluridae anomalopterae Günther, Cat. Fish. Brit. Mus., V, 1864, p. 3 (part).
Helogeneidae Eigenmann, Mem. Carn. Mus., V, 1912, p. 207.

Dorsal small, behind the middle of the body. Anal long. Dorsal and pectoral without spines. Adipose minute. Teeth few. Eyes very small, directed upwards and outwards.

Helogenes Günther

Helogenes Günther, Ann. Mag. Nat. Hist. (3), 12, 1863, p. 443 (*marmoratus*).

Type: *Helogenes marmoratus* Günther.

Resembles *Hypophthalmus* in the length of the anal and the backward position of the dorsal, but differs from it in having a band of teeth on the jaws and two patches on the vomer. Eye small, covered with skin, just above the level of the angle of the mouth. No dorsal or pectoral spines.

Helogenes marmoratus Günther

Helogenes marmoratus Günther, Ann. Mag. Nat. Hist. (3), 12, 1863, p. 443 (Essequibo); — idem, Cat. Fish. Brit. Mus., 5, 1864, p. 66 (Essequibo); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 312 (copied); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 398 (name only). — idem, Mem. Carn. Mus., 5, 1912, p. 207, pl. XXII fig. 2 (Aruataima, Holmia, Potaro Highland, Tukeit); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 228 (Holmia, British Guiana).

Museum Amsterdam:

Holmia, Upper Potaro, British Guiana Exp., 1908, Eigenmann, 1 ex., 70 mm.

Body greatly compressed, its width all along more than 2 in its depth. Head short, rounded, bullet-shaped, its length nearly 5 in the standard length, its width equal to its depth and nearly equal to its length. The upper surface of the head covered with thick skin.

Eye $2^1/_2$ in the snout, 6 in the head and 4 in the interorbital.

Maxillary barbels fitting into a groove below the eye, reaching the middle of the pectorals. The mental and postmental barbels close together, the mental barbels opposite the maxillary barbels reaching to beyond the tip of the pectorals, the postmentals somewhat shorter. Gill-membranes large, with a broad free margin, overlapping, covered in front with a recurved

fold of the mental skin. Mouth with fine cardiform sharp teeth in both jaws and in two patches on the vomer.

Dorsal fin placed far backwards, origin of its base in the middle between the occiput and the base of the caudal. The fin small, placed in a groove extending from the head to the adipose. which is also very small. Caudal forked, the lower lobe somewhat broader and longer. Anal very long. The distance between the tip of the snout and the origin of the anal $1^1/_3$ in the length of the fin. The fin slightly curved, only the posterior part rounder. Ventrals small, just reaching the base of the anal. The pectorals reaching beyond the base of the ventrals.

Colour reddish brown, marbled dark. The caudal fin with a dark transverse band on its base, posterior of the straight margin of this band the fin abruptly lighter. All the fins with a hyaline margin.

D. 6. A. 38. V. 5. P. 7.

HYPOPHTHALMIDAE

Siluridae anomatopterae Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 3 (part.).
Hypophthalmidae Cope, Proc. Amer. Assoc. Adv. Sci., 20, 1871, p. 331.

Dorsal over the anal, anal very long, nearly $^2/_3$ of the standard length, with 34 or more rays. Adipose small. Eye lateral, partly below the level of the angle of the mouth.

Hypophthalmus Spix

Hypophthalmus Spix, Selecta Gen. Spec. Pisc. Bras., 1829, p. 16, pl. 9 (part); — Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 109 (*edentatus*).
Notophthalmus Hyrtl, Denkschr. Akad. Wiss. Wien, 16, 1859, p. 17 (*marginatus* = *edentatus*).
Pseudohypophthalmus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 109 (*fimbriatus* = *edentatus*).

Type: *Hypophthalmus edentatus* Spix.

No teeth in the jaws or on the vomer. Eye situated behind and partly below the level of the corner of the mouth. Adipose small. Anal very long, 64-68 rays. Barbels six.

Hypophthalmus edentatus Spix

Hypophthalmus edentatus Spix, Selecta Gen. et Spec. Pisc. Bras., 1829, p. 16, pl. 9 (Equatorial Brazil); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 67 (copied); — Cope, Proc. Amer. Phil. Soc., 17, 1878, p. 673 (Peruvian Amazon); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 120 (Para); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 313 (Para); — Eigenmann & Bean, Proc. U.S. Nat. Mus., 31, 1907, p. 664 (Amazon); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 398 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 209 (Wismar, Morowhanna?); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 228 (Peruvian Amazon).

Hypophthalmus marginatus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 168, pl. 439 (Cayenne, Surinam); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 68 (copied); — Vaillant, Bull. Soc. Philom. (7), 4, 1880, p. 150 (Calderon); — Wright, Trans. Royal Soc. Canada, 3, sect. 4, 1886, p. 107-118, pls. 8-10 (important paper on structure); — Perugia, Ann. Mus. Genova (2), 10, 1891 (Chaco Centrale)

Notophthalmus marginatus Hyrtl, Denkschr. Akad. Wiss. Wien, 16, 1859, p. 17 (vertebrae 2 + 5 + 54).

Hypophthalmus longifilis Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 171 (Surinam); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 68 (Demerara, Surinam); — Bleeker, Silures de Suriname, 1864, p. 88 (Surinam).

Hypophthalmus spixii Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 172 (copied); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 446 (Rio Branco).

Hypophthalmus edentulus Castelnau, Anim. Amer. Sud, Poiss., 1855, p. 47 (without locality).

Hypophthalmus fimbriatus Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1857, p. 444, pl. 9 fig. 30 (Rio Negro); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 68 (copied).

Hypophthalmus perporosus Cope, Proc. Amer. Phil. Soc., 17, 1878, p. 673 (Nauta); — Steindachner, Denkschr. Akad. Wiss. Wien, 46, 1882, p. 4 (Rio Huallaga, Rio Amazonas).

Museum Leiden:

No. 2374, Surinam, Dieperink, 1 ex., 148 mm, without caudal.
No. 2988, Surinam, Dieperink, 1 ex., 180 mm.
No. 17298, Surinam, Van Heurn, 1 ex., 455 mm.
No. 17330, Paramaribo, Van Heurn, 3 ex., 180-315 mm.

Museum Amsterdam:

South America, 1 ex., 240 mm.

The characters of the specimens are very variable, due to the fact of their different stages.

The body is much compressed, the snout depressed, the head rounded above. Greatest width of the head 3 in its length, its greatest depth 2 in the length. Profile straight and steep, mouth horizontal, placed low. Lower surface of the head flat. The length of the head $3^3/_4$ in the standard length. A long groove from the occiput widening forward.

Eye placed at the lower margin of the head, $9^1/_2$ in the length of the head, 4 in the snout and $2^1/_4$ in the space between the eyes, measured along the underside of the head.

Upper jaw thin, papery, without teeth. Maxillary barbels inserted in front of the anterior nares, reaching about the tip of the pectorals, in the young specimens reaching the adipose fin. The mental and postmental barbels reaching the anal. All the barbels broadly fringed, especially in the young. Gill-membranes separate to below the maxillary, gill-rakers slender, about two diameters of the eye in length, very numerous.

Lateral line prominent, sending branches upwards and downwards. A series of pores on either side of the lateral line and its branches, not very conspicuous in the young specimens.

Dorsal fin short, its insertion is variable, but in general nearer to the adipose than to the tip of the snout. The dorsal spine $2^1/_2$-3 in the length of the head. The adipose fin small. Caudal forked, the lobes pointed. Ventrals small, extending to the anal. Pectoral spine scarcely reaching the anal, its length $2^1/_2$ in the length of the head.

Colour silvery, darker above, fins with a dark margin.

D. I/6. A. 68.

CETOPSIDAE

Cetopsidae Eigenmann, Mem. Carn. Mus., 7, 1918, p. 276.
Trachelyopteriformes Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 111 (part).
Siluridae stenobranchiae Günther, Cat. Fish. Brit. Mus., V, 1864, p. 191.

Dorsal fin entirely in front of the ventrals. No adipose fin. Head compressed. Vomer with a series of conical teeth on each side and a narrow band of conical teeth in each jaw. A pair of maxillary barbels and two pairs of mental barbels. Gill-membrane broadly united with the isthmus; opercles unarmed. Eye almost entirely concealed under the skin.

Cetopsis Agassiz

Cetopsis Agassiz, Gen. et Spec. Pisc. Bras., 1829, p. 11.
Cetopsis Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 111 (*coecutiens*).
Hemicetopsis Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 111 (*candira*).
Pseudocetopsis Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 111 (*gobioides*).

Type: *Silurus coecutiens* Lichtenstein.

Barbels six, the mental barbels placed in pairs. Eyes rudimentary, covered with skin. Teeth villiform, conical or incisorlike, in a single series or in a band; also teeth in the vomer. No nasal barbels. Caudal forked.

Cetopsis coecutiens (Lichtenstein)

Silurus coecutiens Lichtenstein, Wiedem. Zool. Mag., 1819, I, p. 61.
Cetopsis coecutiens Agassiz, Selecta Gen. et Spec. Pisc. Bras., 1829, p. 12, tab. 10 fig. 2 and tab. A fig. 5 (anatomy); — Kner, Sitz. Ber. Akad. Wiss. Wien, 26, 1858, p. 409 (Rio Branco); — Cuvier & Valenciennes, Hist. Nat. Poiss., 14, 1839, p. 384 (copied); — Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 111 (name only); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 157 (Gurupa); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 320 (Gurupa); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 36 (Gurupa). Goeldi, Bol. Mus. Paraense, 2, 1898, p. 179 and 457 (name only); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 159 (River Cupai); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 280 (copied); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 228 (Ambyiacu River, Amazon, between the mouth of the Rio Negro and Peru).

Museum Leiden:

No. 14781, Gurupa, Brazil, from Museum Cambridge, Mass., May 1934, 1 ♂, 191 mm.

Body heavy, somewhat compressed, tapering rapidly to the caudal

peduncle. Head bluntly conical, the bones covered all over with a thick layer of muscles. The length of the head $3^4/_5$ in the standard length, the depth $4^4/_5$. The width of the head $1^1/_4$ in the greatest depth; the profile is arched. The anterior nares are situated near the lip, 3 times as wide apart as the posterior nares, which are twice as large, oval and situated on a line connecting the middle of the eyes.

Eye small, rudimentary, covered with skin, not larger than the posterior nares.

Maxillary barbels almost entirely concealed in a slit-like groove, its length $2^2/_3$ in the length of the head. Mental and postmental barbels of about the same length, placed in pairs behind the corner of the mouth and fit in shallow grooves. Mouth inferior, its width at the rictus $2^1/_2$ in the length of the head. The intermaxillaries with a narrow band of fine villiform teeth; both mandible and vomer with a single series of firmly set, thick, compressed, incisor-like teeth. Opercle with a broad membranous border. Gill-opening extending farther below than above the first pectoral ray. The pectoral pore is an elongate slit near the upper edge of the gill-opening.

Lateral line straight and simple.

Distance from dorsal spine to tip of snout 3 in the standard length. The here described specimen is a male, and as a typical character the first dorsal ray is produced in a long filament. The other rays are rapidly decreasing in height backwards; the last is scarcely one third of the length of the second. Caudal deeply emarginate, its length 4 in the standard length. Anal rays decreasing in height backwards. Ventrals short, with the basal half of their inner margin attached to the belly. The first pectoral ray is produced, which is also a character of the male, it reaches beyond the base of the ventrals, but on both sides it is broken off, so the exact length cannot be given.

The colour of the specimen in question is plain white. Eigenmann & Eigenmann (1890 b, p. 322) mention as colour characters: "Dorsal surface grayish brown, becoming gray on sides, lighter below".

D. I/6. A. 21. V. 6. P. I/9.

PYGIDIIDAE

Siluroidei trichomycteriformes Bleeker, Nederl. Tijdsch. Dierk., I, 1863, p. 112.
Siluridae opisthopterae Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 4.
Siluridae branchicolae Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 4.
Trichomycteridae Gill, Arrangement of the Fam. of Fishes, 1872, p. 649.

Nematognaths without an adipose fin. The dorsal fin situated over or behind the ventrals. The fins without spines. Nares remote, the anterior

with a barbel. A short maxillary barbel and a lower labial barbel. Opercle and interopercle erectile and with thorn-like spines, except in *Nematogenys*.

PYGIDIINAE

Pygidium Meyen

Trichomycterus Valenciennes in Humboldt, Rec. d'Observ. Zool. et Anat., 2, 1833, p. 348 (*nigricans*) ; not *Thrichomycterus* Cuvier & Valenciennes of which it is a misspelling ; — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 272.

Thrychomycterus Cuvier & Valenciennes, Hist. Nat. Poiss., 18, 1846, p. 357 (misspelled).

Thrychomycterus (non Cuvier & Valenciennes) Girard, Proc. Acad. Nat. Sc. Phil., 7, 1854, p. 198 ; — Girard, U.S. Nat. Astronom. Exp., 2, 1855, p. 242 (misquoted).

Pygidium Meyen, Reise um die Erde, I, 1835, p. 474 (*fuscum*).

Type : *Pygidium fuscum* Meyen.

Head depressed, as broad as long, 5-6 in the standard length. Body terete, the caudal peduncle compressed. The nasal barbel nearly as long as the head. Two barbels at the corner of the mouth, no mental barbels. Eye small, situated in the middle of the head, without a free orbital margin. Interoperculum with numerous spines in several series, the outer ones the largest ; the opercle with a bunch of similar spines. Mouth moderate. Jaws with chisel-shaped or conical teeth ; no teeth in the vomer or the palate. Ventrals in the middle or behind the middle of the body, the anal below the dorsal. Origin of the dorsal between the verticals from the origins of the ventrals and the anal. Caudal rounded, truncate or marginate, accessory rays variable. The fins without spines.

Pygidium dispar Tschudi

Pygidium dispar Tschudi (partim), Fauna Peruanum, Ichthyol., 1845, p. 22, pl. 3 upper figure (Eastern slope of the Peruvian Andes at an altitude of 14.000 ft.) ; — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 52 (Callao) ; — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 335 (Callao) ; — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 36 (name only) ; — Pellegrin, Bull. Soc. Zool. Paris, 29, 1904, p. 91 (Lake Titicaca) ; — idem, Poissons des Lacs des Haut Plateaux de l'Amer. Sud, 1907, p. 17 (Lake Titicaca) ; — Starks, Proc. U. S. Nat. Mus., 30, 1906, p. 770 (Eten, Peru) ; — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 400 (name only) ; — idem, Mem. Carn. Mus., 7, 1919-1920, p. 299, pl. XLV fig. 5 (copied) ; — The *Pygidium dispar* recorded by Ribeiro, Arch. Nac. Mus. Rio de Janeiro, 16, 1911 from the Rio Iporango is a different species ; — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 229 (Callao Bay or Tinta?) ; — Evermann & Redcliff, Bull. U.S. Nat. Mus., 95, 1917, p. 35 (name only) ; — Eigenmann, Mem. Carn. Mus., 9, 1922, p. 64 (?Callao, Eten).

Museum Leiden :

No. 1802, Decan d'après Frank, Amérique Méridional d'après Bleeker, from the coll. Frank, 3 ♀ ♀, 67, 69 and 83 mm.

Body elongate, depressed, the depth all along less than the length of the head. The caudal peduncle compressed. Head longer than wide, its length 6 in the standard length.

Eye moderate, 2½-3 in the snout, 5-6 in the head and 2½-3 in the interorbital, equidistant from tip of snout and end of the opercle.

None of the barbels quite reaching the gill-openings. The gill-openings continued forwards to below the eyes.

The origin of the dorsal equidistant from the tip of the caudal and the anterior margin of the eye; the base of the fin behind the ventrals and over the whole base of the anal. Caudal emarginate. The distance between the anal and the base of the caudal 5½ in the standard length. Origin of the ventrals nearly midway between the tip of the snout and the tip of the caudal. The pectorals are obliquely rounded, the first ray produced in a filament.

Colour marks are not to be seen in the specimens of the Leiden Museum. They are preserved in alcohol since 1849, and are all of a dark brown colour.

D. 13. A. 9.

The locality given on the label is absolutely a mistake. With Decan probably is meant Deccan in British India. The second indication: "Amérique méridionale d'après Bleeker", on the label, proves that Bleeker has seen these specimens, but neither the genus nor the species have been described by him.

Pygidium rivulatum (Cuv. & Val.)

Trichomycterus rivulatus Cuvier & Valenciennes, Hist. Nat. Poiss., 18, 1846, p. 367 (Guasacona); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 274 (copied); — Cope, Proc. Amer. Phil. Soc., 17, 1877, p. 46 (Lake Titicaca); — Pellegrin, Bull. Soc. Zool. Paris, 29, 1904, p. 91 (Rio de Pazna, Lake Poöpo); — idem, Poissons des Lacs des Hauts Plateaux de l'Amer. Sud, 1907, p. 17 (Rio Pazna, Lake Poöpo).

Pygidium rivulatum Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 51 (Cuzco, Moho and Puno, Lake Titicaca); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 330 (Cuzco, Moho and Puno, Lake Titicaca); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 36 (name only); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 399 (name only); — idem, Mem. Carn. Mus., 7, 1919-1920, p. 301, pl. 45 figs. 2 and 3 (Tirapata, Eastern Peru, Ol'antaytambo, Jequetepeque, Peru, Lake Titicaca); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 228 (Jequetepeque, Peru, Lake Titicaca, Tinta, Ucayale, Uhabamba); — Evermann & Redcliff, Bull. U.S. Nat. Mus., 95, 1917, p. 34 (Lake Titicaca, Ucayale and its tributaries).

?*Trichomycterus incae* Cuvier & Valenciennes, Hist. Nat. Poiss., 18, 1846, p. 368 (Rio Guatanai at Cuzco).

Trichomycterus gracilis Cuvier & Valenciennes, Hist. Nat. Poiss., 18, 1846, p. 369 (Rio Azangaro near Guasacona, Rio Guatanai near Cuzco, Rio Pontezuola near Corsico, Lake Compucila near Cuzco); — Cope, Proc. Amer. Phil. Soc., 17, 1877, p. 681 (Tinta).

Trichomycterus barbatula Cuvier & Valenciennes, Hist. Nat. Poiss., 18, 1846, p. 369 (Guasacona, Rio Pontezuola near Coroico).

Trichomycterus pentlandi Castelnau, Anim. Nouv. Amer. Sud., 1855, p. 49, pl. 24 fig. 1 (Lake communicating with the Ucayale).

Trichomycterus pictus Castelnau, Anim. Nouv. Amer. Sud, 1855, p. 59, pl. 24 fig. 2 (Lake Titicaca).

Trichomycterus dispar Günther (partim), Cat. Fish. Brit. Mus., V, 1864, p. 273 (Lake Titicaca, Rio Pontezuola, Andes de la Paz, Guasacona, Rio de Azangaro); — Garman, Bull. Mus. Comp. Zoöl., III, 1875, p. 275 (Lake Titicaca); —? Pellegrin, Bull. Soc. Zool. Paris, 29, 1904, p. 91 (Lake Titicaca); — idem, Poissons des Lacs des Hauts Plateaux d'Amer. Sud, 1907, p. 7 (Lake Titicaca).

Trichomycterus pardus, Cope, Proc. Acad. Nat. Sc. Phil., 1874, p. 132 (Lake Titicaca).

Museum Leiden:

No. 1798, near La Paz, Andes, 13000 feet, Lat. 16° 40′, from Museum Paris, 2 ex., 60 and 62 mm.

No. 1799, Rio Pontezuola near Coroico, from Museum Paris, 1842.

No. 1800, Rio Portesculo near Corocoro?, Lat. 130° 10′, probable the same locality as of no. 1799, from Museum Paris, 2 ex., 70 mm.

No. 1801, Guasacona, from Museum Paris, 1842, 2 ex., 84, 87 mm.

No. 2922, Guasacona, from Museum Paris, 1842, 1 ex., 58 mm.

No. 15066, Cuzco Valley, Peru, from Museum Cambridge, Mass., May 1934, 3 ex., 128, 140 and 150 mm.

No. 15483, Lake Titicaca, from Smithsonian Inst., 1880/1881, 1 ex., 185 mm.

Body and head depressed, tapering to the caudal peduncle, which is compressed. Greatest depth $3^3/_4$-$6^1/_2$ in the standard length. The head is about as wide as long, its length $4^1/_2$-$5^1/_2$ in the standard length.

The eye very small, equidistant from the tip of the snout and the end of the opercle.

The nasal barbels reaching the posterior margin of the eye, somewhat longer in the young specimens. Upper maxillary barbels reaching about the edge of the pre-opercle. Mouth wide, more than $^1/_3$ of the length of the head. Teeth in about five series in the middle of the jaws, those of the outer series are narrow incisors, those of the innermost row conical.

The origin of the dorsal equidistant from the tip of the caudal and a point between the occiput and the posterior nares; its posterior portion always over the anterior half of the anal. The accessory rays of the caudal very numerous, their division from the caudal rays properly marked. Caudal rounded. The distance between the anal and the base of the caudal $4^2/_5$-$4^1/_2$ in the standard length. The pectorals rounded, the first ray prolonged in a short filament, except in the very young specimens.

The specimens in the Leiden Museum, preserved during a long time in alcohol are all of a plain brown colour without any marks.

D. 13. A. 11.

The specimens nos. 1798, 1799, 1800, 1801 and 2922 described by Cuvier & Valenciennes (1846, p. 369) are probably the types of their species

Trichomycterus barbatula and *gracilis*. Only the material in the Paris Museum can lead to a decision in this respect.

Pygidium gracilior Eigenm.

Pygidium gracilior Eigenmann, Mem. Carn. Mus., V, 1912, p. 213 (Erukin); — idem, Mem. Carn. Mus., 7, 1919-1920, p. 326, pl. 50 fig. 3 (Erukin).

Museum Leiden:

No. 17287, Makambi-creek, Surinam, 27-IX-1938, D. C. Geyskes, 4 ♀♀, 47, 50, 58, 63 mm.

Body slender, depressed, caudal peduncle compressed. Head slightly longer than wide, its length $5^1/_2$-6 in the standard length. Greatest depth of the body 8-9 in the total length.

Eye about 2 in the snout, 6-7 in the head and 2 in the interorbital.

Maxillary barbels reaching the tip of the first pectoral ray, nasal barbels reaching the half of the length of the pectoral.

Distance between the origin of the dorsal and that of the caudal $3^1/_2$ in the standard length. Caudal fin 5 in the standard length. The origin of the short anal fin under that of the dorsal. The first pectoral ray is prolonged and nearly equal in length to the head.

The whole body except the belly and the lower surface of the head are covered with dark spots. The spots on the back are larger and placed so closely that the colour is more obscure than along the sides. The fins are spotted on the rays, forming transversal lines.

D. 8. A. 6.

The specimens in the Leiden collection are considerably larger than the specimen of Eigenmann from Erukin, which is the type of the species and which has a length of 27 mm. It is undoubtedly a young specimen. The here described ones with a length of 47-63 mm are all adult females, captured about spawning-time.

The locality given as "Makambikreek" surely must be Makamie, a rillet south from Kabelstation on the left border of the Surinam River.

Homodiaetus Eigenm. & Ward

Homodiaetus Eigenmann & Ward, Annals Carn. Mus., IV, 1907, p. 117, pl. 34 figs. 2 and 3 (*anisitsi*).

Type: *Homodiaetus anisitsi* Eigenm. & Ward.

Opercle with four or five spines directed upwards and backwards, interopercle with more spines, directed downwards and backwards. Eye $3^1/_2$-5 in the length of the head. Caudal emarginate or obliquely rounded. Origin of ventrals nearly equidistant from snout and caudal.

Homodiaetus maculatus (Steind.)

Stegophilus maculatus Steindachner, Denkschr. Akad. Wiss. Wien, 41, 1879, p. 25, pl. IV fig. 2 (La Plata); — Eigenmann & Eigenmann, Proc. Cal. Acad. (2), vol. 2, 1889, p. 54 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 343 (name only); — idem, Proc. U.S. Nat. Mus. ,14, 1891, p. 37 (La Plata).

Henonemus maculatus Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 401 (name only).

Homodiaetus maculatus Eigenmann, Mem. Carn. Mus., 7, 1919-1920, p. 352 (Uruguayana, Cacequy); — Devincenzi & Ferreira, Arch. Soc Biol. Montevideo, 9, 1939, p. 171 and 175 (Uruguayana, Cacequy).

Museum Leiden:

No. 17284, La Plata River, from J. H. Jurriaanse, 12-VII-1924, Beckers, 1 ex., 40 mm.

Body very slender. Head and body depressed, the width equal to the length of the head. Head 8 in the standard length. The width of the mouth nearly equal to the length of the head. The barbels at the rictus equal to the diameter of the eye.

Eye $3^2/_3$ in the length of the head, 2 in the interorbital, equal to the snout.

Teeth villiform, curved, in 7 series in the upper, in 4 series in the lower jaw. The inner series weakly undulated. Opercle and interopercle with a bundle of spines of equal size. Gill-opening narrow, not so long as the eye.

Dorsal not so long as high, the third and fourth ray longest and nearly equal to the pectoral. The origin of the dorsal is nearer to the tip of the snout than to the tip of the caudal. The outer caudal rays are somewhat prolonged. The length of the fin $5^2/_3$ in the standard length. The origin of the anal nearly under the vertical from the base of the posterior ray of the dorsal. Pectoral nearly as long as the head, the second and third ray somewhat longer than the spine.

The specimen preserved in alcohol during 20 years has no colour marks as given by Steindachner; only the cross-bar at the base of the caudal and the dark spotted caudal tips are still left.

D. I/8. A. 7. V. 6. P. I/5.

The type described by Steindachner is a specimen of 105 mm from La Plata. The seven specimens dealt with by Eigenmann & Eigenmann, collected by J. D. Haseman, are 64-70 mm long; these are from Uruguayana and Cacequy. The specimen of the Leiden Museum is 40 mm long, a female, with the ovaries completely developed.

CALLICHTHYIDAE

Callichthyoidei Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 82.

Siluridae proteropodes Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 4 (Hypostomatinae in part.).

Callichthyidae Gill, Arrangement of the Families of Fishes, 1872, p. 19; — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sci., I, 1890, p. 449.

Distinguished from other families of the Nematognathi by the double series of dermal plates which meet along the middle of the sides, and which are not developed before the young have attained a centimeter or more in length. The young strongly resemble some forms of the Pygidiidae.

Callichthys (L.) Gronovius

Callichthys Linnaeus, Amoenitates Academicae, I, 1754, p. 317; — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 219-225 (*asper* = *callichthys*); — Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 82 (*tamoata* = *callichthys*).

Cataphractus Bloch, Ausl. Fische, 8, 1794, p. 80 (preoccupied in Mammals); — Lacépède, Hist. Nat. Poiss., 5, 1804, p. 124 (*callichthys*); — Swainson, Class. Fish., Amph. and Rept., II, 1839, p. 304 (*depressus* = *callichthys*).

Type: *Silurus callichthys* L.

Two pairs of nuchal plates between occiput and dorsal plate. Coracoid covered with skin. No mental barbels. Dorsals spine rudimentary. Caudal rounded.

Callichthys callichthys (L.)

Callichthys tamoata Linnaeus, Mus. Adolphi Fred., 1754, p. 731; — Bleeker, Silures de Suriname, 1864, p. 22 (Surinam).

Silurus callichthys Linnaeus, Syst. Nat., ed. 10, I, 1758, p. 307 (America); — idem, Syst. Nat., ed. 12, I, 1766, p. 506 (America); — Gmelin, Syst. Nat., I, 3, 1788, p. 1361.

Cataphractus callichthys Eigenmann & Eigenmann, Proc. Cal. Acad. Nat. Sc. (2), vol. 1, 1888, p. 164 (Rio de Janeiro, Pernambuco, Juiz de Fora, Bahia, Mendez, Macacos, Porto Seguro, Surinam); — Bloch, Ausl. Fische, 8, 1794, p. 86, pl. 377 fig. 1 (after a figure by Prince Maurice, much changed in copying); — Bloch & Schneider, Syst. Ichthyol., 1807, p. 107. — Lacépède, Hist. Nat. Poiss., 5, 1803, p. 124 (the two Indies?).

Callichthys asper Quoy & Gaimard, Voy. Uranie et Physicienne, Zool., 1824, p. 232; — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 225 (Cayenne, Rio de Janeiro); — Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 38 (Bahia, name only); — Bleeker, Ichthyol. Arch. Ind. Prodr., I, 1858, p. 53 (name only); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 226 (Bahia, Para); — Cope, Proc. Amer. Phil. Soc., 17, 1878, p. 681 (Nauta); — Perugia, Ann. Mus. Genova (2), 10, 1891, p. 636 (Chaco centrale); — Boulenger, Bol. Mus. Torino, 10, 1895, p. 33 (Paraguay); — idem, Trans. Zool. London, 14, 1896, p. 29 (Matto Grosso, Paraguay).

Cataphractus depressus, Swainson, Class. Fish., Amph. and Rept., 2, 1839, p. 304 (based on Bloch, pl. 377).

Callichthys laeviceps Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 229 (La Mana, Brazil).

Callichthys arcifer Hensel, Wiegm. Arch., 1868, I, p. 373 (Rio de Janeiro); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 164 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 455 (name only); — idem, Proc. U.S.

Nat. Mus., 14, 1891, p. 43 (name only); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 402 (name only); —Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 147 (copied); — Ellis, Ann. Carn. Mus., 8, 1913, p. 387 (name only).

Cataphractus arcifer Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 164 (name only).

Callichthys coelatus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 229 (Rio Janeiro); — Müller & Troschel in Schomburgk, Reisen, 3, 1848, p. 630 (trenches); — Günther, Cat. Fish. Brit. Mus. 5, 1864, p. 227 (copied).

Callichthys loricatus Gronow, Cat. Fish., ed. Gray, 1854, p. 157.

Callichthys hemiphractus Hensel, Arch. f. Naturg., I, 1868, p. 374 (Costa da Serra, the young).

Callichthys affinis Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 226 (Rio Grande).

Callichthys kneri Gill, Syn. Fishes of Trinidad, Am. Lyc. Nat. Hist. New York, VI, 1858, p. 394 (Trinidad); — Regan, Proc. Zool. Soc. London, 1906, I, p. 388 (Trinidad).

Callichthys callichthys Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sci., I, 1890, p. 452 (Pernambuco, Juiz de Foia, Rio de Janeiro, Bahia, Mendez, Macacos, Porto Seguro, Surinam); — Von Ihering, Koseritz' Deutscher Volkskalender f. Brasilien, 1893 (Rio Grande do Sul) (non vidi); — Eigenmann, Ann. N. Y. Acad. Sc., 7, 1894, p. 633 (Rio Grande do Sul); — Lahille, Rev. Mus. de La Plata, 6, 1895, p. 272 (Puerto Viejo); — Pellegrin, Bull. Mus. d'Hist. Nat. Paris, 1899, p. 158 (Apuré); — Eigenmann, Ann. Carn. Mus., 4, 1907, p. 123 (Bahia Negra); — idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 402 (name only); — idem, Mem. Carn. Mus. 5, 1912, p. 215 (Small Creek at Holmia, Chipoo Creek, Nickaparoo Creek, Upper Essequibo, Kumaka, Pacopoo Pass); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 146, pl. 35 fig. 1 (Brazil); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 270 (Rupununi); — idem, Proc. Acad. Nat. Sc. Phil., 1915, p. 229 (Surinam, Nauta, Pebas, Ambyiacu River, Rio Jacuhy) and p. 529 (Trinidad); — Ellis, Ann. Carn. Mus., 8, 1913, p. 386 (Rio Catu, Rio San Francisco, Entre Rios, Barra da Pirahy, Cubatão, Rio Ribeiro, Urucum, Corumba, Ignapé, Rio Grande do Sul, Bahia Negra, British Guiana, Trinidad).

Callichthys callichthys haemaphractus Eigenmann & Kennedy, Proc. Acad. Nat. Sc. Phil., 1914, p. 504 (Campo Grande).

Museum Leiden:

No. 3096, Mexico, from Museum Berlin, 1843, 2 ex.
No. 3097, Surinam, Dieperink.
No. 3099, Surinam, collected 1845.
No. 6914, Surinam, Bleeker, 2 ex.
No. 7486, Upper Nickerie, 1904, H. van Capelle.
No. 8406, Paramaribo, 1904, Buitendijk.
No. 10720, Berbice River, New Amsterdam, British Guiana, Young.
No. 14793, Lake Hyanuary, Brazil, from Museum Cambridge, Mass., 1934.
No. 15508, Brazil, from Museum Rio de Janeiro, 1 ex., 169 mm.
No. 17276, Upper Saramacca, VI-1903, Saramacca Exp., De Kok, 1 ex., 89 mm.
No. 17278, Surinam, 1911, Van Heurn, 1 juv. spec., 50 mm.
No. 17279, Surinam, Van Heurn.
No. 17281, Aquarium Leiden, Zwart, 2 ex. probably ♀ ♀, 156 and 158 mm.
No. 17292, Surinam, June 1911, Van Heurn, 1 ex., 54 mm, without caudal.
No. 17293, Port Real, Rio de Janeiro, Hardy du Dréneuf, 1890, 9 ex., 75-139 mm.
No. 1911, Surinam, Dieperink, 1 stuffed specimen, 161 mm, without caudal.

Museum Amsterdam:

Kumaka, Demerara River, British Guinea Exp., 1908, Eigenmann, 1 ex.,120 mm.

Buenos Aires, 1 ex., 148 mm.
Joinville, Brazil, 1 ex., 125 mm.
2 ex., 1 ♀, 160 mm, 1 ♂, 175 mm.
10 ex., 133-182 mm.

Head flat and broad, $4^1/_3$-$4^1/_2$ in the standard length, depressed. Body more or less rounded, the depth below the dorsal spine equal to the width. Body and caudal peduncle gradually compressed backwards. Head short, its width greater than its length in the male, equal in the female; profile steep, fontanel circular. Occipital broad, with a short and broad, rounded process. Snout and cheeks naked, suborbital bones covered with skin, opercule with short marginal bristles.

Eye small, equal to the fontanel, 4 in the snout, 12-14 in the head, 9 in the interorbital.

Snout narrowed to broad and rounded, especially in the older male. Mouth terminal, lower lip with a broad free margin and an incision at the symphysis. Upper jaw toothless, in the lower jaw a little patch of teeth on both sides.

Lateral plates covering the entire sides, leaving a naked area on the dorsal and ventral surfaces of the body. A narrow naked area on the back near the base of the dorsal fin. Lateral series of plates $\frac{26\text{-}29}{25\text{-}28}$, the plates with fine bristles on their posterior margins. In front of the adipose a series of deeply pectinate scale-like plates varying in number. The scales not meeting the lateral plates. A naked area along and posteriorly of the adipose.

Dorsal with a very short flat spine, its distance from the tip of the snout $2^3/_4$-$2^4/_5$ in the standard length. The spine of the adipose very long and strong, in the male reaching beyond the base of the caudal. Caudal broad, rounded. Anal rounded, placed very close to the caudal, in the female reaching the caudal base when laid back, in the male reaching beyond this base. Vent between the base of the ventrals or a little posterior to this. The ventrals are situated below the posterior half of the base of the dorsal. The pectoral spine is thick and short in the female, long in the male, the sides and outer margin are covered with bristles.

Colour of the body dark brown to black. Fins plain, in some specimens with dark round spots.

D. I/7-8. A. I/5. V. I/5. P. I/7.

Hoplosternum Gill

Callichthys Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 232 (*laevigatus*).
Hoplosternum Gill, Ann. Lyc. Nat. Hist. New York, 6, 1858, p. 395 (*laevigatum* = *littorale*).

Type: *Callichthys laevigatus* Cuv. & Val.

Two pairs of nuchal plates between occiput and dorsal plate. Coracoid exposed below, joined to the clavicle along its whole length. Dorsal spine low and flat.

Hoplosternum littorale (Hancock)

Callichthys littoralis Hancock, Zool. Journ., 4, 1828, p. 244 (Demerara); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 227 (Demerara, British Guiana, Trinidad); — Lütken, Vid. Med. Naturhist. For. Kjöbenhavn, 1874, p. 215 (Trinidad); — Vaillant, Bull. Soc. Philom. (7), 4, 1880, p. 165 (Calderon); — Steindachner, Denkschr. Akad. Wiss. Wien, 46, 1882, p. 6 (Rio Huallaga); — Jordan, Proc. U.S. Nat. Mus., 9, 1886, p. 559 (name only); — Boulenger, Ann. Mus. Genova (2), vol. 19, 1898, p. 126 (Puerto 14 de Mayo); — Vaillant, Nouv. Arch. Mus. d'Hist. Nat. (4), vol. 2, 1900, p. 124 (Carsevenne); — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 468 (Marajo); — Regan, Proc. Zool. Soc. London, 1906, I, p. 388 (Trinidad).

Hoplosternum littorale Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 164 (Surinam, Gurupa, Para, Santarem, Tabatinga, Arary, Silva, Lake Saraca, Villa Bella, Porto do Moz, Lake Hyanuary, Ueranduba); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 456 (localities as before); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 44 (name only); — Berg, Ann. Mus. Nac. Buenos Aires, 4, 1895, p. 136 (name only); — Eigenmann & Kennedy, Proc. Acad. Nat. Sc. Phil., 1903, p. 504 (Arroyo Carumbey and Yajamar, Estanzia la Armonia); — Eigenmann, Ann. Carn. Mus., 4, 1907, p. 123 (Bahia Negra); — idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 402 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 217 (Mahaica, Georgetown market, Botanic Garden); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 149 (copied); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 229 (Trinidad, Venezuela) and p. 529 (Trinidad); — Ellis, Ann. Carn. Mus., 8, 1913, p. 388 (San Luiz de Caceres, Manaos, Santarem, British Guiana, Bahia Negra, Trinidad, Campos Grande).

Callichthys subulatus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 232 (Cayenne, Buenos Aires).

Callichthys laevigatus Valenciennes, in d'Orbigny, Voyage Amer. Mer., 5, 2, 1847, pl. 5 fig. 2; — Cuvier & Valenciennes, Hist. Nat. Poiss., 4, 1840, p. 231 (Buenos Aires, Trinidad); — Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 109 (without locality); — Perugia, Ann. Mus. Genova (2), vol. 10, 1891, p. 636 (Tucuman); — Goeldi, Bol. Mus. Paraense, 2, 1898, p. 480 (name only).

Hoplosternum laevigatum Gill, Ann. Lyc. Nat. Hist. New York, 6, 1858, p. 396 (Trinidad); — Bleeker, Silures de Suriname, 1864, p. 24 (Surinam).

Callichthys albidus, Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 235 (Cayenne).

Hoplosternum stevardii Gill, Ann. Lyc. Nat. Hist. New York, 6, 1858, p. 401 (Trinidad).

Museum Leiden:

No. 10719, Berbice River, New Amsterdam, British Guiana, Dr. Young, 2 ex., 1 ad., 177 mm and 1 juv., 140 mm.

No. 11054, Surinam, 1911, Van Heurn, 1 juv. ex., 131 mm.

No. 14758, Gurupa, Brazil, from Museum Cambridge, Mass., May 1934, 1 ex., 170 mm.

No. 17234, Aquarium Leiden, Zwart, 1 ex., 160 mm.

No. 17328, Surinam, 1910, Bolten, 4 ex., 199-205 mm.

No. 1893, Cuyaba, Brazil, from Museum Vienna, 1 stuffed ex., 153 mm.

Museum Amsterdam:

Georgetown Market, British Guiana Exp., 1908, Eigenmann, 1 ex., 162 mm.
Surinam, 3 ex., 160-198 mm.
South America, 3 ex., 120-210 mm.
1 ex., 142 mm.

Body compressed, depth all along the body greater than the width. Head about as long as broad, its depth $1^1/_4$ in its length, its length 3-$3^3/_4$ in the standard length. The head is longer than wide in the young specimens, in the old the width equals the length. The profile is even convex, in some specimens steep. The fontanel is oval, its width 2 in its length, in some specimens pear-shaped, in others rhombic. The temporal and supra-orbital bones with a series of pores ending in the frontals on each side of the fontanel above the eye. Occipital broad and short with a broad, bluntly rounded process, which in some specimens is nearly circular.

Eye circular, nearly equidistant between tip of snout and the margin of the opercle, 2-3 in the snout, 5-$7^1/_2$ in the head and $3^1/_2$-5 in the interorbital.

Two barbels at the rictus, the lower the longest, reaching the middle of the pectoral spine in the old specimens, the base of the spine in the young. Snout more or less depressed, somewhat pointed. Mouth with scattered little patches of minute granular teeth in both jaws. Lower lip with a free margin, which is incised at the symphysis. Gill-openings continued to the middle or the external coracoid, the isthmus $1^1/_2$-$2^1/_2$ orbital diameters.

Sides of the body and caudal peduncle entirely covered with two series of scutes $\frac{24\text{-}26}{23}$, which are margined with minute bristles. The ventral surface with a rather broad naked area. The space between the lateral plates on the dorsal side covered with a series of azygous plates between dorsal and adipose and between the latter and the caudal fin.

The distance from the dorsal spine to the tip of the snout $2^1/_3$-$2^1/_2$ in the standard length. The spine is short, broad and flat, its length 2 in the longest dorsal soft ray. The lateral line is to be seen anteriorly as a simple tube across the lower portion of the superior series of scutes, continued as pores situated in pits along the sides of the head. Adipose with a curved spine. Caudal fin deeply emarginate, the outer rays thickened. The first anal ray is a spine similar to that of the dorsal fin, the second is also spine-like, but longer, both are covered with bristles. The margin of the fin obliquely truncate. Ventrals $1^1/_4$ in the length of the head, the margin rounded to pointed. The spine $1^1/_4$ in the length of the longest

ray of the fin. The pectoral spine very variable in length, covered with short bristles. Its tip sharp in the young, more blunt and claw-like hooked in the older specimens,

The coracoid and clavicle are joined along their whole length and exposed in most of the specimens; in one of the older specimens of the collection of the Museum Amsterdam, with a length of 210 m, they are almost entirely covered by the skin. The coracoid processes in some specimens are joined anteriorly, diverging posteriorly, in others they leave a broad naked area between them in their whole length.

The colour is olivaceous, some specimens have two series of light spots along the middle of the sides. The fins are dusky, in some specimens somewhat marbled.

D. I/8. A. II/6. V. I/5. P. I/6.

Hoplosternum thoracatum (Cuv. & Val.)

Callichthys thoracatus Cuvier & Valenciennes, Hist. Nat. Poiss. 15, 1840, p. 230, pl. 443 (Mana, Martinique); — Peters, M. B. Akad. Wiss. Berlin, 1877, p. 471 (San Fernando de Apuré); — Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 108 (Surinam); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 228 (copied); — Jordan, Proc. U.S. Nat. Mus., 9, 1886, p. 559 (name only); — Regan, Proc. Zool. Soc. London, 1906, I, p. 388 (Trinidad).

Callichthys (Hoplosternum) thoracatus Steindachner, Denkschr. Akad. Wiss. Wien, 42, 1880, p. 14 (Cauca).

Hoplosternum thoracatum Gill, Ann. Lyc. Nat. Hist. New York, 6, 1858, p. 396 (Trinidad); — Bleeker, Silures de Suriname, 1864, p. 26 (Surinam); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 164 (Curupira, Tabatinga, Cudajas, Gurupa, Teffé, Lake Hyamany, Villa Bella, Para, Ueranduba, Porto do Moz, Pernambuco, Obidos); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 458 (the same localities as before, moreover: Lake Saraca, Silva, Santarem); — Eigenmann & Bean, Proc. U.S. Nat. Mus., 31, 1907, p. 665 (Amazon); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 402 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 218, pl. 24 fig. 2 (British Guiana, Georgetown, Aruka, Kanaka, Gluck Island, Packoo Falls, Chipoo Creek); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 148, pl. 35 fig. 2 (without locality); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 270 (Rupununi); — idem, Proc. Acad. Nat. Sc. Phil., 1915, p. 229 (Nauta, Ecuador) and p. 530 (Trinidad); — Ellis, Ann. Carn. Mus., 8, 1913, p. 389 (San Luiz, Rio Guaporé, Bolivia, Manaos, Santarem, Bragança, Rio San Francisco, British Guiana).

Callichthys longifilis Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 235 (Cayenne); — Schomburgk, Fish. Brit. Guiana, I, 1841, p. 150, 151 and 154, drawing no. 22 (Curassarraka); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 228 (Surinam, River Cupai).

Hoplosternum longifilis Gill, Ann. Lyc. Nat. Hist. New York, 6, 1858, p. 396 (Trinidad); — Cope, Proc. Amer. Phil. Soc., 17, 1878, p. 681 (Nauta); — Bleeker, Silures de Suriname, 1864, p. 27 (Surinam).

Callichthys personatus Ranzani, Nov. Com. Acad. Scient. Inst. Bonon., 5, 1842, p. 322, pl. 24 (?).

Callichthys exaratus Müller & Troschel in Schomburgk, Reisen, 3, 1848, p. 630 (Guiana).

Callichthys pictus Müller & Troschel in Schomburgk, Reisen, 3, 1848, p. 630 (Guiana).

Callichthys sulcatus Kner, Sitz. Ber. Akad. Wiss. Wien, 17, 1855, p. 110 (Rio Branco, Marabitanos).

?*Callichthys chiquitos* Castelnau, Anim. Amer. Sud, Poiss., 1855, p. 38, pl. 18 fig. 2 (Chiquitos).

Museum Leiden:

No. 3098, Rio Branco, Natterer, 1856, 1 ex., 112 mm.
No. 3135, Surinam, Dieperink, 1 ♂, 150 mm.
No. 3137, Surinam, Dieperink, 1 ♂, 161 mm.
No. 3138, Surinam, Dieperink, 1 ♀, 134 mm.
No. 8404, Paramaribo, 1904, Buitendijk, 2 ex., 137, 140 mm.
No. 8405, Paramaribo, 1904, Buitendijk, 1 ex., 160 mm.
No. 11053, Surinam, 1911, Van Heurn, 1 ex., 149 mm.
No. 16050, Brazil, 1 ex., 170 mm.
No. 17282, Surinam, XII-1896, Van der Hoek, 1 ex., 160 mm.
No. 17329, Surinam, VI-190, Bolten, 7 ex., 109-171 mm.

Museum Amsterdam:

Surinam, De Weger, 1 ex., 182 mm.
Gluck Island, Essequibo River, British Guiana Exp., 1908, Eigenmann, 2 ex., 76, 78 mm.
Surinam, Bolten, 6 ex., 82-145 mm.
South America, 4 ex., 90-190 mm.
Surinam, 18-XI-1893, 1 ex., 120 mm.
The West Indies, 1 ex., 120 mm.

Body compressed, the depth all over the body greater than the width, nearly equal at the tip of the occipital. Width of the head equal to the length, which is $3^1/_2$-4 in the standard length. Ventral profile horizontal; dorsal profile scarcely descending backwards, from the dorsal spine forwards steep, nearly flat. Apex of the first nuchal plate rounded to circular in the young, truncate in the older specimens; the second plate emarginate. The fontanel somewhat oval, elongate in the young, more circular in the adult specimens. Suborbital bones narrow in the young, broader and covered with skin like the outer operculum in the adult.

Eye smaller than in *Hoplosternum littorale*, 3-$3^1/_2$ in the snout, 6-$7^1/_2$ in the head and $3^1/_2$-$4^1/_2$ in the interorbital.

Barbels very long, the inner ones reaching beyond the tip of the pectoral spines, in the very young specimens from Gluck Island they are longer, reaching the tip of the ventrals. Snout somewhat pointed.

In the upper jaw in some specimens a few scattered teeth, in others none. In the lower jaw a small elongate group of teeth on the sides.

Two lateral series of plates $\frac{25\text{-}26}{24}$, covering the entire sides, four plates are meeting on the dorsal surface immediately behind the dorsal fin. In front of the adipose 7 azygous plates. All scutes covered with bristles.

Dorsal spine short and flat, $2^1/_2$ in the length of the longest ray of the dorsal fin, i.e., the third ray. The distance between the base of the dorsal spine and the tip of the snout $2^1/_2$ in the standard length. The fin rounded, its height $1^1/_2$ in its length. Caudal truncate. Anal obliquely rounded, the third ray the longest, with two spines, the first similar to the dorsal spine. The ventrals more rounded than in *H. littorale*. The pectoral with a strong and bristled spine, which is sharp in the young specimens. In the older specimens the spine becomes more blunt, but it is not claw-like as in *H. littorale*.

The coracoid processes in the ♀♀ diverging backward; in the ♂♂ they are meeting all along the margin, in some specimens, particularly in two fine specimens of the collection of the Museum Amsterdam, they are overlapping each other. In the young the coracoids are small, leaving a broad naked space between them.

Colour olivaceous, with irregular darker markings; dark round spots on the belly. Dorsal fin spotted. Caudal fin also spotted, moreover with a broad median transversal band, a narrow band on the base and on the posterior margin of the fin.

D. II/7. A. II/5. V. I/5. P. I/7.

Corydoras Lacépède

Corydoras Lacépède, Hist. Nat. Poiss., 5, 1803, p. 145 (*geoffroyi* = *punctatus*).
Hoplisoma Swainson, Class. Fishes, Amph. and Rept., II, 1839, p. 304 (*punctata*).
Hoplosoma Gill, Ann. Lyc. Nat. Hist. New York (4), VI, 1858, p. 402 (*punctata*).
Gasterodermus Cope, Proc. Amer. Phil. Soc., 17, 1878, p. 681 (type ?).

Type: *Corydoras geoffroyi* Lacépède.

Occipital process extending to the dorsal plate. Coracoid process exposed. Dorsal I/6-8. Dorsal and pectoral spines long, pungent, their margins smooth.

Corydoras punctatus (Bloch)

Cataphractus punctatus Bloch, Ausl. Fische, 8, 1794, pl. 377 fig. 2 (without locality); —Bloch & Schneider, Syst. Ichth., 1801, p. 108 (without locality); — Lacépède, Hist. Nat. Poiss., 5, 1803, p. 125 (Surinam).

Hoplisoma punctata Swainson, Class. Fishes, Amph. and Rept. 2, 1839, p. 304 (name only).

Callichthys punctatus Günther (not of Valenciennes), Cat. Fish. Brit. Mus., 5, 1864, p. 229 (Essequibo).

Corydoras punctatus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 166 (José Fernandez); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 466 and 472 (José Fernandez); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 44 (name only); —? Perugia, Ann. Mus. Genova (2), vol. 10, 1891, p. 635 (Rio de La Plata); — Eigenmann & Kennedy, Proc. Acad. Nat. Sc. Phil., 1903, p. 506 (name only); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 403 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 220 (Mud-flats of Demerara River, Erukin, Malali, below Packeoo Falls, Tumatumari, Kumaka, Wismar, Konawaruk, Rockstone sand-

bank, Creek below Potaro Landing); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 159 (copied); — idem, Rev. Mus. Paulista, 10, 1918, p. 721 (Rio Jurua); — Ellis, Ann. Carn. Mus., 8, 1913, p. 721(British Guiana.)

Corydoras geoffroyi Lacépède, Hist. Nat. Poiss. 5, 1803, p. 147 (without locality).

Corydoras ambiacus Cope, Proc. Acad. Nat. Sc. Phil., 1871, p. 280 (Ambyiacu River, Ecuador).

Gasterodermus ambiacus Cope, Proc. Amer. Phil. Soc., 17, 1878, p. 681 (Nauta).

Museum Amsterdam:

From the Aquarium of the Zoological Garden Amsterdam, 1 ex., 55 mm.

Potaro Landing, Lower Potaro, British Guiana Exp., 1908, Eigenmann, 2 ex., 43, 48 mm.

Body short and deep, head 3-3 1/3, depth 2 2/3 in the standard length. Profile strongly curved, very steep in front of the eyes, rounded transversally. Fontanel elongate.

Eye large, 1 1/2 in the snout, 3 1/4 in the head and 1 1/4 in the interorbital. Snout compressed, pointed, protractile. Rictal barbels not reaching the gill-openings. Lower lip broad, terminating in two barbels.

Lateral line with $\frac{22}{22\text{-}21}$ plates. Coracoid processes scarcely encroaching on breast and belly. 3-4 azygous plates in front of the adipose fin.

The distance from the dorsal spine to the tip of the snout and from the dorsal spine to the spine of the adipose equal in one specimen, in the others the former equal to the distance from the dorsal spine to the fulcra of the caudal. Dorsal spine nearly equal to the length of the head. Its anterior margin smooth, the posterior margin finely serrate. The second and third rays higher than the spine. Caudal deeply forked. The pectoral spine similar to the dorsal spine and equal to its length.

The colour-marks are very conspicuous in the aquarium specimen. Sides and back yellowish, profusely covered with little spots and with larger spots, regularly placed at the margin of the plates. A black band around the head across the eyes. Dorsal black all over in two specimens, in the third black up to the fourth soft ray, the black colour continued in a black vertical bar on the sides of the body. Caudal with 4-5, anal with 3 brown cross-bars. In the aquarium specimen the humeral process and the opercle with silvery reflections.

D. I/7. A. I/6-7. P. I/8-9.

Corydoras paleatus (Jenyns)

Callichthys punctatus (not of Günther) Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 236 (Surinam); — Valenciennes in Voyage d'Orbigny, 9, 1847, Atlas, 2, pl. V fig. 1.

Callichthys paleatus Jenyns, Voyage Beagle, Zool., Fishes, 4, 1842, p. 113 (without locality); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 230 (copied); — Hensel, Wiegm.

Arch. Naturg., I, 1870, p. 71 (Porto Alegre); — Boulenger, Trans. Zool. Soc. London, 14, 2, 1896, p. 29 (Descalvados, Matto Grosso).

Corydoras marmoratus Steindachner, Denkschr. Akad. Wiss. Wien, 41, 1879, p. 26, pl. V fig. 1 (La Plata).

Corydoras paleatus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 166 (Uruguay); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 471 (Uruguay); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 44 (Rio La Plata); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 403 (name only); — Eigenmann & Kennedy, Proc. Acad. Nat. Sc. Phil., 1903, p. 506 (without locality); — Regan, Ann. Mag. Nat. Hist. (8), 10, 1910, p. 212 (Buenos Aires, Parana, Rio Grande do Sul, Cordova, Joinville); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 160, fig. 77 (copied); — Ellis, Ann. Carn. Mus., 8, 1913, p. 410 (Rio Grande do Sul, Porto Alegre, Rio Jacuhy, Cacequy, Uruguayana); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 233 (Rio Jacuhy, Brazil); — Ribeiro, Rev. Mus. Paulista, 10, 1918, p. 721 (Itaqui, Rio Grande do Sul).

Corydoras aurofrenatus Eigenmann & Kennedy, Proc. Acad. Nat. Sc. Phil., 61, 1903, p. 507 (Aguada); — Eigenmann & Ward, Ann. Carn. Mus., 4, 1907, pl. 38 fig. 4 (Aguada); — Ellis, Ann. Carn. Mus., 8, 1913, p. 407 (Aguada, Caceres, Villa Rica).

Corydoras ehrhardti Steindachner, Anz. Akad. Wiss. Wien, 47, I, 1910, p. 60 (Joinville); — Ellis, Ann. Carn. Mus., 8, 1913, p. 407 (name only).

Corydoras meridionalis Von Ihering, Rev. Mus. Paulista, 8, 1911, p. 381 (name only).

Corydoras nattereri triseriatus Von Ihering, Rev. Mus. Paulista, 8, 1911, p. 386 (name only).

Corydoras flaveolus Von Ihering, Rev. Mus. Paulista, 8, 1911, p. 387 (name only); — Ellis, Ann. Carn. Mus., 8, 1913, p. 407 (Sapucay).

Museum Leiden:

No. 10443, from a tributary of the La Plata River, from the Zoological Garden Rotterdam, 1 ex., 48 mm.

No. 17194, aquarium specimen, Stol, 11-7-1941, 1 ex., 59 mm.

No. 17283, Lucy River, Corantyn Exp., 1910/1911, Hulk, 3 juv. ex., 27-33 mm.

Museum Amsterdam:

South America, 1 ex., 82 mm.

Aquarium specimen, 1 ex., 60 mm.

The West Indies, 1 ex., 52 mm.

Body short, chubby, ventral outline nearly straight, profile steep, evenly arched. The length of the head 3-3$^1/_2$, the depth of the body 3 in the standard length. Occipital tapering into a pen-shaped occipital process reaching the dorsal plate. Fontanel elongate, reaching from the middle of the interorbital to the posterior margin of the occipital.

Snout acute. Rictal and lower lip barbels nearly equal, not reaching beyond the eyes.

The dorsal fin, when laid back, reaches the adipose fin except in the specimen of 59 mm. A rather broad naked area between the dorsal and the adipose.

Breast and belly entirely covered with skin. Coracoid process scarcely encroaching on the breast and the belly. Lateral line with $\frac{23}{21}$ scutes.

Colour silvery with a series of large dark spots along the sides. In the three specimens from the Lucy River these spots are united to a dark band as far as the base of the caudal. A series of smaller spots on the back. The dorsal and caudal fin with dark spots on the rays forming transversal bands.

D. I/7. A. 7.

Corydoras treitlii Steind.

Corydoras treitlii Steindachner, Anzeiger Akad. Wiss. Wien, 27, 1906, p. 1 (Rio Parnahyba); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 167 (a rillet joining the Parnahyba near Victoria, Estado do Piauhy); — Regan, Ann. Mag. Nat. Hist. (8), vol. 10, 1912, p. 210 (copied); — Ellis, Ann. Carn. Mus., 8, 1913, p. 407 (name only).

Museum Leiden:

No. 7974, Rio Parnahyba near Victoria, Steindachner, 1 ex., 60 mm.

Body comparatively slender, head very compressed. Depth of the body equal to the length of the head. The length of the head nearly 3 in the standard length. Snout pointed and extended, its length $1^1/_2$ in the length of the head. Occipital process narrow, with the sides concave, reaching the dorsal plate. Fontanel long, reaching from the anterior margin of the eye to the base of the occipital process.

Eye 3 in the snout, $4^1/_2$ in the head and 2 in the interorbital.

Maxillary barbels reaching to the gill-openings and 3 times as long as the mental barbels.

The dorsal spine is somewhat longer than the pectoral spine. The latter with recurved hooks on its inner margin. Caudal fin forked, with a triangular slit, the upper lobe somewhat longer than the head.

Lateral plates $\frac{23}{21}$, the plates with a great number of very fine teeth on the free margin. 5 azygous plates in front of the adipose fin.

The coracoid process not encroaching on the breast or belly, both are naked.

The colour of the upper part of the body is light brown, the under parts yellowish. A dark grey lateral stripe is running backwards from a vertical line below the dorsal fin and ends at the base of the caudal fin. The caudal fin with a dark upper and lower margin.

D. I/8. A. I/7. V. I/6. P. I/10.

Corydoras julii Steind.

Corydoras julii Steindachner, Anz. Akad. Wiss. Wien, 27, 1906, p. 2 (Rio Parahim); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 165 (Rio Parnahyba, Estado do Piauhy); — Regan, Ann. Mag. Nat. Hist. (8), vol. 10, 1912, p. 214 (copied); — Ellis, Ann. Carn. Mus., 8, 1913, p. 408 (name only).

Museum Leiden:

No. 7975, Rio Parnahim, outlet of the Lake Parnagua, Steindachner, 3 ex., 28-32 mm.

Body rather thick-set. The length of the head to the gill-opening 3-$3^1/_3$ in the standard length. The height of the body $2^1/_3$-$2^1/_2$ in the standard length. Fontanel rather broad, convex, short, reaching from the middle of the frontal almost till the base of the occipital process. This process scarcely diminishing in width posteriorly. The snout is short and arched, the profile rather steep. The rictal barbels are shorter than in *C. treitlii* and do not reach the gill-openings.

Eye small, 2 in the snout, 4 in the head and 2 in the interorbital.

Dorsal spine smooth in front, the posterior margin finely serrate, somewhat shorter than the pectoral spine. The caudal fin of the 3 specimens described here is so damaged that no characters can be given. The pectoral spine is similar to the dorsal spine but somewhat longer, nearly as long as the head.

Lateral line with $\frac{21}{20}$ scutes, with fine teeth on their posterior margin. Three azygous plates before the adipose fin. Coracoid processes scarcely encroaching on breast and belly.

The colour of the specimens shows no particular characteristics, except the black patch on the dorsal, and in the two specimens of 28 mm three dark transverse bands on the caudal fin.

D. I/8. A. I/6. P. I/8-9.

Corydoras raymundi Steind.

Corydoras raymundi Steindachner, Anz. Akad. Wiss. Wien, 17, 1907, p. 84 (Rio Parnahyba near Victoria); — Regan, Ann. Mag. Nat. Hist. (8), vol. 10, 1912, p. 215 (copied); — Ellis, Ann. Carn. Mus., 8, 1913, p. 409 (name only).

Museum Leiden:

No. 7962, collected by Steindachner. The name of the locality on the label is practically illegible. The specimen in question is the type of the species and according to the description by Steindachner it must be from a rillet flowing into the Rio Parnahyba near Victoria. The length of the specimen is 40 mm.

The specimen of the Leiden Museum is the type of the species. The upper lobe of the caudal is damaged. I found that some characters of the type differ from the description given by Steindachner, as the following shows.

The body is more slender than in *C. julii* and less compressed than in *C. treitlii*, snout broader than in the latter. Head to the gill-openings $3^2/_3$, the depth of the body $3^1/_{10}$ in the standard length. Fontanel between the eyes, nearly circular.

Eye $2^1/_2$ in the snout, 5 in the head, and $2^1/_2$ in the interorbital.

Pectoral spine nearly equal to the length of the head.

Caudal fin somewhat longer than the head.

Lateral series with $\frac{23}{22}$ scutes.

Colour of the body brownish with 3 longitudinal series of greyish spots on the body, a blackish band across the middle of the dorsal fin, caudal with cross-bars.

D. I/8. A. I/6.

Corydoras barbatus (Quoy & Gaimard)

Callichthys barbatus Quoy & Gaimard, Voyage de l'Uranie, Zoologie, Poissons, 1824, p. 234; — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 239 (Rio de Janeiro); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 229 (copied).

Scleromystax barbatus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 164 (name only); — idem, Occ. Pap. Cal. Acad. Sc. vol. 1, 1890, p. 451 (copied); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 43 (name only); — Ellis, Ann Carn. Mus., 8, 1913, p. 385 (Iguape, S. Paulo).

Corydoras kronei Ribeiro, A Lavoura, 11, 5, 1907, p. 189, fig. c (Rio da Estrella); — Steindachner, Anz. Akad. Wiss. Wien, 47, 1910, p. 61 (Jaragua); — Regan, Ann. Mag. Nat. Hist. (8), 10, 1912, p. 210 (Santos, paratypes of *C. eigenmanni*); — Ellis, Ann. Carn. Mus., 8, 1913, p. 409 (Cubatao, Raiz da Serra, type and paratype of *C. eigenmanni*, Rio Catu, Cabatoz, Rio Grande do Sul, Iporanga, Rio Ribeiro, Parana).

Scleromystax kronei Ribeiro, Rev. Mus. Paulista, 10, 1918, p. 721 (Raiz da Serra, Joinville, Cubatao).

Corydoras eigenmanni Von Ihering, Not. Prel. Rev. Mus. Paulista, I, 1907, p. 34 (Fortalezza, Ceara); — Ribeiro, Rev. Mus. Paulista, 10, 1918, p. 271 (Raiz da Serra, type of *C eigenmanni*).

Corydoras juquiae Von Ihering, Not. Prel. Rev. Mus. Paulista, I, 1907, p. 36 (Cabatao, Raiz da Serra); — Ribeiro, Rev. Mus. Paulista, 10, 1918, p. 721 (Rio Juquia); — Ellis, Ann. Carn. Mus., 8, 1913, p. 403 (Rio Juquia, Rio Ribeiro).

Corydoras barbatus Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 168, pl. 36 fig. 3 (Rio Iporanga, Rio d'Estrella near Mandioca).

Museum Leiden:

No. 8864, Brazil, from the Zoological Garden Rotterdam, 1 ♂, 78 mm.

No. 9869, South-East Brazil, from the Zoological Garden Rotterdam, 12-III-1917, imported in Holland 12-IX-1910, 2 ex., 1 ♀ and 1 ♂, 84 and 90 mm.

No. 12532, imported from British Guiana, from the Zoological Garden Rotterdam, Jan. 1915, 1 ♀, 85 mm.

Museum Amsterdam:

Joinville, Brazil, a young ♀, 41 mm.

Joinville, Brazil, 1 adult ♀, 74 mm.

Body slender, compressed. Snout pointed, head very steep, its length 3 in the standard length. Snout $1^2/_3$-2 in the length of the head. Depth of the body equal to the length of the head. Occipital with a triangular process, meeting the triangular dorsal plate at its tip.

Eye $1^1/_2$ in the snout, 6 in the length of the head and $2^1/_2$-3 in the interorbital.

Mouth very small, protractile. Maxillary barbels in the male scarcely to the gill-opening, in the female $1^1/_2$ in the distance between the rictus and the gill-opening.

The male specimens have a series of bristles on the side of the snout, but the female and the young have none or only tiny bristles.

Distance from dorsal spine to tip of snout $2^1/_2$ in the standard length. The dorsal spine nearly 2 in the length of the head, serrated on the posterior margin, the serrae all embedded in a continuous thin translucent bony ridge with a sharp cutting margin. The base of the dorsal in the male equals its distance from the adipose, 5-6 lateral plates are meeting behind the dorsal. Anterior of the adipose in the male 6, in the female 5 azygous plates. The adipose with a strong spine. Caudal fin deeply forked, in the male the outer rays are more produced. Anal fin when laid back reaching to the base of the caudal in the male. Pectoral spine reaching the base of the ventrals in the female, in the male the spine is prolonged by a filament reaching beyond the tip of the ventrals. The humeral scutes are wide apart, each separated from the base of the ventrals by 2 lateral scutes.

Lateral line with $\frac{26}{22\text{-}23}$ scutes.

The specimens of the Leiden collection, imported in Holland by the Zoological Garden at Rotterdam between 1910 and 1917, are all preserved in alcohol and their colours have somewhat faded. The body is white to yellow with dark blotches along the lateral line, with a conspicuous blotch at the base of the dorsal and the adipose. The head of the male is dark, reticulated by a number of white spots. The fins are light, crossed by dark bars.

D. I/7. A. I/6. One of the male specimens has the D. I/8 and the anal A. I/7.

The descriptions by Eigenmann & Eigenmann (1890b, p. 451) and Günther (1864, p. 229) are wrong; they have not seen any specimens and have copied the description by Quoy & Gaimard, placing *Callichthys barbatus* of these authors into a new genus *Scleromystax*.

The definition of this genus by Günther, however, contains a large error; he describes the head as depressed, whereas it is compressed. Eigenmann & Eigenmann have added another blunder in this respect by giving their *Scleromystax* 2 series of plates between the occipital and the base of the dorsal spine, whereas the occipital process is touching the tip of the triangular dorsal plate. Ribeiro has studied the species very seriously. He has seen a great number of specimens from different localities. By his first

description of the fish (1905, p. 189), which description I have not seen, because it was not accessible to me, he was misled by the diagnoses given by Eigenmann and Günther and placed them into a new species *Corydoras kronei*:

„Quando descrevemos pela primeira vez este peixes, sob o nome de *Corydoras kronei,* suspeitamos a possibilidade de ter em mãos um *Scleromystax* o que reycitamos então, após a leitura das diagnoses do Professor Günther e dos Professores Eigenmann". (Ribeiro, 1911, p. 169).

He had observed himself, however, a likeness with *Callichthys barbatus* of Quoy & Gaimard and the variability of some characters. Moreover he had obtained specimens from the same locality where Quoy & Gaimard have collected their material, viz., Rio da Estrella near Mandioca. These specimens have proved the exactness of the descriptions by Quoy & Gaimard and Cuvier & Valenciennes.

To prove that the genus *Scleromystax* must be a mystification, Ribeiro (1911, p. 170) states the following:

"E não sómente verificámos a veracidade das affirmativas de Quoy e Gaimard e de Cuvier e Valenciennes, como a identidade das especies do Estrella e da Ribeira de Iguape, não se devendo levar á conta de caractéres de especie, as differenças encontradas. Assim, a diagnose das chaves de Günther e dos Eigenmanns está errada. E não sómente nós fomos, por ella, conduzidos ao erro, mas tambem o Prof. C. Eigenmann, com a descripçao de *Corydoras juquiae* procedente do Rio Juquiá, affluente do Rio da Ribeira. E consequentemente concluimos a impossibilidade da existencia do genera *Scleromystax*".

The specimen No. 12532 imported by the Zoological Garden at Rotterdam from British Guiana, must be a specimen bought in British Guiana, but obtained from a locality somewhere in South-East Brazil, because no specimens are known north from Rio de Janeiro at all.

In the collection of the Museum Amsterdam I have seen a young female specimen of 41 mm determined by Steindachner as *Corydoras kronei* Rib. from Joinville, Brazil, and a female specimen of *Corydoras eigenmanni* Ihering, determined by Steindachner, of 74 mm from Joinville, Brazil, which have the specific characters of *Corydoras barbatus* (Quoy & Gaimard), and in spite of being female specimens they have the series of bristles on the sides of the snout. All this proves very distinctly that *C. kronei* Rib. and *C. eigenmanni* Ihering are synonyms of *C. barbatus* (Quoy & Gaimard).

LORICARIIDAE

Siluroides Cuvier, Règne Animal, ed. 1, 2, 1817, p. 199 (part.).
Goniodontes Agassiz, Selecta Gen. et Spec. Pisc. Bras., 1829, p. 1.
Loricata Kner, Denkschr. Akad. Wiss. Wien, 6, 1853, p. 75.
Loricaroidei Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 77.
Hypostomatina Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 11 (part.).
Loricariidae Gill, Arrangement of the Families of Fishes, 1872, p. 19 (part.).
Loricariidae Eigenmann & Eigenmann, Am. Nat., *22*, 1888, p. 649; — Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 351.
Loricariidae Regan, Trans. Zool. Soc. London, 17, 1904, p. 191.

The body covered with bony plates, which are sometimes provided with tooth-like spines. Sometimes the lower surface of the body is partly naked. Mouth inferior, provided with a broad disk-like lip. Teeth, if present, bifid and hooked. No teeth on the palate. The head without fontanels. Dorsal fin present. Adipose fin, if present, with a spine and a thin membrane. Anal fin short.

PLECOSTOMINAE

Plecostomus Gronow

Plecostomus Gronow, Mus. Ichth., I, 1754, p. 24 (part.); — idem, Zoophyl., 1763, p. 127 (species of several subfamilies of the Loricariidae); — Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 77 (*brasiliensis*).
Hypostomus Lacépède, Hist. Nat. Poiss. 5, 1803, p. 144 (*guacari*); — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 361 (*plecostomus*).

Type: *Plecostomus brasiliensis* Bleeker = *Plecostomus plecostomus* (L.).

Operculum and interoperculum not independently movable and not margined with bristles. Snout granular to its margin. Adipose fin present.

Plecostomus plecostomus (L.)

Loricaria plecostomus Linnaeus, Syst. Nat., ed. 12, I, 1766, p. 508 (America); — Gmelin, Syst. Nat., I, 3, 1788, p. 1363; — Bloch, Ausl. Fische, 8, 1794, pl. 374 (without locality); — Bloch & Schneider, Syst. Ichth., 1801, p. 124 (without locality); — Hyrtl, Denkschr. Akad. Wiss. Wien, 16, 1859, p. 18 (without locality).
Hypostomus plecostomus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 361 (Maracaibo); — Schomburgk, Fishes Brit. Guiana, I, 1841, p. 139 (Rio Branco); — Müller & Troschel in Schomburgk, Reisen, 3, 1848, p. 643 (Takutu, Rio Branco); — Kner, Denkschr. Akad. Wiss. Wien, 7, 1853, p. 263 (Ypanema, Matto Grosso, Barra do Rio Negro, Surinam).
Plecostomus plecostomus Eigenmann & Eigenmann, Proc. Acad. Sc. (2), vol. 1, 1888, p. 169 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 406 (Silva, Laka Saraca, Pará, Hyavary, Coaty, Rio Puty); — Kindle, Ann. Acad. Nat. Sc. New York, 8, 1895, p. 253 (Marajo on Rio Tocantins); — Lahille, Rev. Mus. La Plata, 6, 1895, p. 272 (Island Santiago); — Eigenmann & Bean, Proc. U.S. Nat. Mus., 31, 1907, p. 665 (Amazon); — Eigenmann, Ann. Carn. Mus., 4, 1907, p. 122 (Corumbas, Asuncion, Rio Apa, Arroyo Trementina); — idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 403 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 223 (Georgetown, Kumaka, Wismar); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 274

(Rupununi); — idem, Proc. Acad. Nat. Sc. Phil., 1915, p. 233 (Surinam) and p. 530 (Trinidad); — Eigenmann, Ind. Univ. Stud., 7, no. 44, 1920, p. 7 (Concejo, Isla del Buro, Maracay).

Hypostomus guacari Lacépède, Hist. Nat. Poiss., 5, 1803, p. 145 (America).

Plecostomus guacari Regan, Trans. Zool. Soc. London, 17, 1904, p. 205 (Amazon, Guiana, Venezuela, Trinidad); — idem, Proc. Zool. Soc. London, 1906, I, p. 389 (Trinidad).

Loricaria flava Shaw, Gen. Zool., V, 1805, p. 38, pl. 101 (without locality).

Plecostomus flavus Vaillant, Bull. Soc. Philom. (7), 4, 1880, p. 158 (Calderon).

Plecostomus bicirrhosus Gronow, Cat. Fish., ed. Gray, 1854, p. 158 (without locality); — Günther, Cat. Fish. Brit. Mus., V, 1864, p. 231 (part.); — Kner & Steindachner, Abhand. K. Bayer. Akad., 2, vol. 10, 1865, p. 60 (name only); — Hensel, Archiv. f. Naturg., 36, 1870, p. 75 (Rio Cadeo); — Steindachner, Denkschr. Akad. Wiss. Wien, 43, I, 1881, p. 109 (name only).

Hypostomus robinii Gill, Ann. Lyc. Nat. Hist. New York, 6, 1858, p. 46 (Trinidad).

Plecostomus brasiliensis Bleeker, Silures de Suriname, 1864, p. 7 (Surinam).

Plecostomus seminudus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 169 (Brazil); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 409 (name only).

Plecostomus boulengeri Eigenmann & Kennedy, Proc. Acad. Nat. Sc. Phil., 1903, p. 502 (Paraguay).

Museum Leiden:

No. 3101, Surinam, 3 ex., 102-164 mm.
No. 3102, Surinam, Dieperink, 1 ex., 321 mm.
No. 3103, Chile, from collection Frank, 1849, 1 ex., 227 mm.
No. 3104, Surinam, Dieperink, 2 ex., 88, 98 mm.
No. 3095, Mexico, from Museum Berlin, 1843, 2 ex. with the caudal damaged, 73 and 74 mm.
No. 8407, Paramaribo, Buitendijk, 1904, 1 ex., 432 mm.
No. 17295, Botanical Garden Paramaribo, 17-III-1939, Cossee.
No. 17286, La Plata River, Beckers, 12-VII-1924.
No. 17305, La Plata River, Beckers.
No. 17306, Surinam, Noordijk.
No. 17335, Surinam, June 1910, Bolten, 6 ex., 110-296 mm.
No. 17336, Surinam, VI-1910, Bolten, 1 ex., without caudal.
No. 17337, Paramaribo, 1911, Van Heurn, 4 ex., 101-188 mm.
No. 17338, Surinam, 1911, Van Heurn, 2 ex., 71 and 76 mm.

Museum Amsterdam:

South America, 8 ex., 2 with caudal, 160 and 260 mm and 6 without caudal, 47-158 mm.
Surinam, 1 ex., 265 mm.
Brazil, from Museum Vienna, 2 ex., 122 and 132 mm.

Head pointed, its length 3 in the standard length. A strong keel on either side of the head from the nares to the occipital, the latter with a strong keel in the middle. Two nuchal plates conspicuously bicarinate. Scutes of the upper half of the body more or less strongly keeled. Humeral keel strong, extending backwards not beyond the 8th scute, the lower two series of scutes without keels. Lower surface of the caudal portion of the body rounded, similar to the dorsal surface of the same region. A distinct

occipital process, the occipital usually bordered by a single plate behind. The tip of the snout usually granular, sometimes with a triangular naked area.

Eye 3-4 in the snout, 7-8 in the head and 3 in the interorbital.

Lateral line with 26 scutes. Belly in adults entirely covered with minute scales, totally naked in the young.

The base of the dorsal fin equal to its distance from the adipose. The first rays of the dorsal either much higher than the posterior and then equal to the length of the head, or scarcely higher than the last rays. Outer caudal rays produced, shortest caudal rays $1^1/_2$-2 in the head.

Colour light brown, with dark spots all over the body, the spots on the head smaller and more in number.

D. I/7. A I/4. V. I/5. P. I/6.

The covering of the belly with scutes is very variable. In the old specimens the breast and belly are entirely or partly covered with minute scales, in the young the scutes are scattered about or concentrated in large patches. In one specimen of the collection of the Museum Amsterdam with a length of 265 mm, there is a large naked area anterior of the left ventral fin. This specimen is also characterized by very long pectoral spines reaching the middle of the ventral fins and covered with strong thorns near the tip.

Plecostomus commersonii (Cuv. & Val.)

Hypostomus commersonii Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 366 (Rio San Francisco, Rio La Plata); — Valenciennes, Voyage d'Orbigny, Poiss., 1847, Atlas, 2, pl. VII fig. 2.

Plecostomus commersonii Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 232 (Rio Grande); — Hensel, Wiegm. Arch., I, 1870, p. 73 (Porto Alegre, Guahyba); — Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 124 (La Plata, Rio San Francisco, Rio Jacuhy and Codea, Rio Parahyba, Rio Queda near Santa Cruz, Rio Grande do Sul); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 168 (Rio de Janeiro, Santa Cruz, Macacos, Itabapuana); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 403 (localities as before and Rio Parahyba); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 206 (Rio La Plata, Rio Grande do Sul); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 233 (Rio Jacuhy).

Plecostomus spiniger Hensel, Arch. f. Naturg., I, 1870, p. 73 (Rio Cadea).

Plecostomus limosus, Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 167 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 405 (name only).

?*Plecostomus aspilogaster* Cope, Proc. Amer. Phil. Soc., 33, 1894, p. 100, fig. 14 (without locality).

Museum Leiden:

No. 16528, from the Zoological Garden Rotterdam, 12-1-1938, 1 ex., 323 mm.
No. 1896, Brazil, from Museum Vienna, 1856, stuffed specimen, 238 mm.

Museum Amsterdam:

Brazil, fine specimen died in the aquarium of the Zoological Garden Amsterdam, 230 mm.

Head pointed, an indistinct keel on each side from the anterior nares to the occiput, a third keel on the occipital bone is a little more prominent. The occipital terminates into a triangular process, the base of which extends over the whole width of the occipital plate. Eigenmann & Eigenmann and Regan state that this occipital process is bordered by a single large nuchal plate. In the specimens of the Leiden collection the occipital is bordered by two plates, the left of these is joined with the right plate of the second series, an inconspicuous line marks the place where the plates are coalesced. In the specimen of the Museum Amsterdam the occipital plate is bordered by one plate. The nuchal plate is carinate. From the orbit a more or less distinctly carinate ridge, passing the temporal plate, is continued posteriorly in the second row of lateral plates. The tip of the snout naked. The length of the head $3^2/_5$ in the standard length.

Eye $4^7/_9$ in the snout, 8 in the head and $3^1/_3$ in the interorbital.

Lateral line with 28 scutes, all of which are carinate, the humeral keel is stronger than the others and is continued almost to the caudal fin. The belly is entirely covered with small scales. On the sides, above the base of the ventral fins, there is a triangular naked space, covered with a great number of groups of little spines.

The base of the dorsal fin is somewhat longer than its distance from the adipose. The first ray of the dorsal is twice as high as the last ray and nearly equal to the length of the head. The outer caudal rays are produced, the shortest about equal to the length of the head. Pectoral spine strong, slightly curved, the tip covered with recurved bristles, it reaches the base of the ventrals.

The colour of the body is brown; sides, back and all the fins covered with small, round dark spots, those on the caudal in one series between the rays and only on the anterior part of the fin. On the dorsal fin there are 2-5 series on each interspace. The ventral surface plain.

D. I/7. A. I/4. V. I/5. P. I/5.

In my opinion *P. punctatus* (Cuv. & Val.) is not a synonym of *commersonii*, as Eigenmann & Eigenmann state, and consequently I regard it as a separate species.

The stuffed specimen No. 1896 in the Leiden Museum is badly damaged, one side is burned, the dorsal and the caudal broken. But it is plainly visible that the occipital is bordered by a single nuchal plate.

P. commersonii affinis and *P. commersonii scabriceps* of Eigenmann &

Eigenmann, which these authors regard as two varieties of this species, are specimens of 13-35 mm. They have the spots larger and the lower surface of the head and abdomen partially naked, characters, in my opinion, of all young specimens, probably due to individual variation, but to come to a decision it will be necessary to see the types. The three specimens in the Leiden Museum and the specimen of the Museum Amsterdam, which are all adults, have naked spaces on the abdomen, but these differ in position and size.

Plecostomus punctatus (Cuv. & Val.)

Hypostomus punctatus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 364 (Rio de Janeiro); — Schomburgk, Fish. Brit. Guiana, I, 1841, p. 144 (Rio Branco).

Hypostomus subcarinatus Castelnau, Anim. Amer. Sud, 1855, p. 42, pl. XXI fig. 1 (Rivers of the Province of Mines).

Plecostomus punctatus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 233 (South America); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 404 (Southeastern Brazil); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 207 (Southern and Eastern Brazil).

Plecostomus affinis Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 127 (Rio Mucuri near Santa Clara, Rio Parahyba, Muriahé, San Antonio near San Antonio de Ferros).

Museum Leiden:

No. 11794, Brazil, 1 ♀, 182 mm.

No. 17307, Port Real, Rio de Janeiro, Hardy du Dréneuf, 2 ex., 257 and 322 mm, probably male specimens.

Head somewhat compressed, its depth $1^1/_4$-$1^3/_4$ in its length. In the female specimen the head is more slender than that of the male. The snout is more or less pointed, in the female more rounded. On the tip of the snout a small naked area. The supra-orbital edges are not raised, the supra-occipital has a low median ridge, which is more conspicuous in the male. The temporal plates are not carinate. The occipital ends into a rather narrow process, the base of which is half as broad as the occipital itself. The occipital is bordered by a single plate, which is originally formed by two plates. The line of coalescence is still to be seen. The length of the head $3^1/_2$-4 in the standard length. The depth of the body 4-$5^1/_2$ in the standard length. Interorbital $2^1/_2$-$1^3/_4$ in the length of the head, the snout $1^3/_4$-$1^5/_6$.

Eye $2^1/_2$-3 in the snout, $6^1/_2$-$8^1/_2$ in the head and $2^2/_3$-$3^1/_2$ in the interorbital.

Length of the mandibular ramus very variable, $2^4/_5$-5 in the interorbital width.

Lateral line with 28-29 scutes which are all spinate and carinate. In one male specimen the left series has 28 and the right 29 scutes. The female specimen has 29 scutes on each side. The lower surface is almost entirely

covered with small scutes, a narrow space along the base of the pectoral and the ventral fins and behind the mouth is naked.

The base of the dorsal fin is somewhat longer than its distance from the adipose. The first soft ray is $1^1/_7$ times the length of the head. The last ray $^2/_3$ of the length of the first. Caudal emarginate, the outer spines slightly produced. The lower spine longer than the upper. Pectoral spine extending just beyond the base of the ventral, in the male to $^1/_4$ of the ventral fin.

Colour brown, numerous spots on head, body and fins. On the dorsal 2 series of spots on each interradial membrane and one series on the membrane between the branches of the rays. On the caudal the spots are conspicuous to the end of the fin.

D. I/7. A. I/4. V. I/5. P. I/6.

Plecostomus emarginatus (Cuv. & Val.)

Hypostomus emarginatus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 369 (Brazil); — Kner, Denkschr. Akad. Wiss. Wien, 7, 1854, p. 260 (Barro do Rio Negro).

Plecostomus emarginatus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 233 (name only); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 167 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 400 (Cudajas, Santarem, Manacapura, Tonantins, Obidos, Fonteboa, Tabatinga, Hyavary, São Paolo, Goyaz); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 40 (name only); — Boulenger, Trans. Zool. Soc. London, 14, 1898, p. 424 (name only); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 210 (Brazil to Colombia); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 406 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 226 (copied); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 233 (Upper Amazon, Peru).

Hypostomus squalinum Schomburgk, Fish. Brit. Guiana, I, 1841, p. 142, pl. 3 (Rio Branco, Rio Negro, Rio Essequibo).

Hypostomus squalitus Müller & Troschel in Schomburgk, Reisen, 3, 1848, p. 142 (Rio Essequibo, Rio Branco, Takutu).

Hypostomus horridus Kner, Denkschr. Akad. Wiss. Wien, 7, 1854, p. 259 (name only).

Plecostomus horridus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 232 (name only); — Peters, M. B. Akad. Wiss. Berlin, 1877, p. 471 (Calabozo).

Plecostomus scopularius Cope, Proc. Acad. Nat. Sc. Phil., 1871, p. 55 and 286, pl. 16 fig. 1, 2 (Ambyiacu).

Plecostomus biseriatus Cope, Proc. Acad. Nat. Sc. Phil., 1872, p. 285, pl. 16 (Amazon); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc. vol. 1, 1890, p. 409 (name only).

?*Plecostomus virescens* Cope, Proc. Acad. Nat. Sc. Phil., 1874, p. 137 (Upper Amazon); — idem, Proc. Amer. Philos. Soc., 17, 1878, p. 681 (Peruvian Amazon); — idem, Proc. Amer. Philos. Soc., 33, 1894, p. 101 (Amazon); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 408 (name only).

Plecostomus villarsi Lütken, Overs. Kgl. Dan. Vidensk. Selsk. Forh., 1874, p. 211 (Caracas); — Steindachner, Denkschr. Akad. Wiss. Wien, 39, 1878, p. 26, pl. 7 (Rio Magdalena); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 408 (name only).

Plecostomus tenuicauda, Steindachner, Denkschr. Akad. Wiss. Wien, 39, 1879, p. 24, pl. 6 (Rio Magdalena); — idem, Denkschr. Akad. Wiss. Wien, 42, 1880, p. 11 (Rio Cauca).

Plecostomus annae Steindachner, Denkschr. Akad. Wiss. Wien, 43, 1881, p. 12, pl. 3 fig. 2 (name only).

Museum Leiden:

No. 14752, Manacapura, Brazil, from Museum Cambridge, Mass., May 1934, 2 ex., 154 and 193 mm.

Museum Amsterdam:

1 ex., 240 mm.

The description of *Hypostomus emarginatus* by Cuvier & Valenciennes was based on a dried specimen 510 mm long. They describe the occipital process as emarginate and obtusely keeled: "mais son caractère spécifique le plus marqué se montre dans son plaque interpariétale, relevée au milieu en une carène obtuse et peu marquée, loin de se terminer par une partie saillante; cette plaque a son bord postérieur échancré." Probably the age and the condition of the individual prevented the discovery of the small plates on the side of the occipital process, which form the most typical character of this species.

The two specimens in the Leiden Museum and the much larger specimen of the collection of the Museum Amsterdam have the body elongate and slender. The head is pointed. The snout is narrowed anteriorly and granular except a small triangular naked area on its tip. The length of the head $3\text{-}3^1/_7$ in the standard length. The occipital with a narrow ridge. Blunt ridges from the anterior nares to the occiput. Supraorbital edges moderately raised. Occipital margined by 3 plates on each side. The two in the middle, margining the occipital process, are almost united, a line still marking the coalescense. The humeral ridge strongest on the caudal portion of the body, margining the flat lower surface of the caudal peduncle.

Eye $3^1/_2\text{-}4$ in the snout, 6-7 in the head and $2^1/_2\text{-}3$ in the interorbital.

Lateral line with 28 scutes. The ventral surface entirely covered with small scales, except a small space in front of the ventrals.

The base of the dorsal almost equal to its distance from the adipose. The first soft ray of the dorsal is as long as the head and the last ray half as long. The outer caudal rays are greatly produced and show numerous long bristles near the tip. The pectoral spines also possess long bristles. The characters of *Plecostomus emarginatus,* as given by Eigenmann & Eigenmann (1890b, p. 400), differ in many respects from those mentioned above.

Straw or ashy coloured, with round dark brown spots on the dorsal surface, on the head numerous small spots. All the fins are spotted; on the

dorsal 2 series of spots on each interradial membrane, on the other fins and most distinct on the caudal, the spots form crossbars.

D. I/7.

Steindachner (1879a, p. 24, 1880, p. 11) has united *horridus* with *emarginatus*, but he regarded *tenuicauda* as a separate species on account of the entire granulation of the snout. Eigenmann & Eigenmann (1890b, p. 400) state to have examined a number of specimens, which are no doubt identical with *emarginatus*, and have the tip of the snout granular. The specimens which I have seen have a small triangular naked area on the tip of the snout. Eigenmann & Eigenmann (1890b, p. 400) describe two specimens, each 215 mm long, a ♂ from Fonteboa and a ♀ from Hyavary, which differ considerably. The male specimen has the tip of the snout entirely granular whereas the female has a naked area at the tip.

Cope (1872, p. 285) states that *scopularius* differs from his *biseriatus* in having the dorsal radii I, 12, 1, the plate, however, shows the dorsal radii as I, 7, 1. The report of the exhibition of a number of fishes from the Amazon by Prof. Cope at the meeting held by the Academy of Natural Sciences at Philadelphia on March 21st, 1871 shows that *Plecostomus scopularius* has D. I/7. A comparison of Cope's and Kner's plates proves the identity of the two species and their identity with *emarginatus*.

Plecostomus vaillanti Steind.

Plecostomus vaillanti Steindachner, Sitz. Ber. Akad. Wiss. Wien, 76, 1877, p. 225 (Rio Preto); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2) vol. 1, 1888, p. 169 (Rio Puty, Rio Preto, San Gonçallo); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 407 (localities as before); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 210 (Rio Puty, Rio Preto, E. Brazil).

Museum Leiden:

No. 7977, Rio Parnahyba near Theresina, Steindachner, 1 ex., 138 mm.

Head rather rounded, its length 3 in the standard length. Superciliary edges raised. A ridge from the nares to the eye and a small conspicuous ridge from the eye to the occiput. Occipital keeled, terminating into a broad, short process, margined by 2 nuchal plates, viz., a median and a small one on the right side. The tip of the snout granular with a small triangular naked space.

Eye $3^2/_3$ in the snout, 6 in the head and 2 in the interorbital.

Lateral series consisting of 28 scutes. The upper lateral plates scarcely keeled, the humeral keel indistinct on the anterior part, but distinct on the caudal part of the body. The belly is entirely covered with scales, except the space between the ventrals.

The base of the dorsal fin nearly twice its distance from the adipose.

Caudal very obliquely emarginate, the shortest rays more than half the length of the head. Pectoral spine reaching to $^1/_3$ of the length of the ventrals.

Colour brown, the sides of the body with large dark spots. Head with vermiculating light and dark lines. All the fins with large spots, forming about 4 series on the caudal.

D. I/7. A. I/2. V. I/5. P. I/6.

Plecostomus robinii (Cuv. & Val.)

Hypostomus robinii Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 370 (Trinidad, La Plata); —? Gill, Syn. Fish. Trinidad, W-I., 1858, p. 46 (Trinidad).

Plecostomus robinii Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 236 (Bahia) (not Cuv. & Val.); — Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 118 (Rio Una near Bahia); — Jordan, Proc. U.S. Nat. Mus., 1886, p. 560 (name only); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 170 and 171 (Rio Una); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 412 (Rio Una); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 215 (Trinidad, Montevideo); — idem, Proc. Zool. Soc. London, 1906, I, p. 389 (Trinidad); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 406 (name only); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 530 (Trinidad).

Plecostomus unae Steindachner, Sitz. Ber. Akad. Wiss. Wien, 77, 1878, p. 383 (Rio Una); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 215 (name only).

Museum Leiden:

No. 14782, Villa de Barro, Rio Grande, Brazil, from Museum Cambridge, Mass., May 1934, 1 ex., 158 mm.

Head depressed, its length $3^1/_3$ in the standard length. Snout broad, rounded. No keels on the head, interorbital slightly convex. The tip of the snout is naked. The occipital terminates into a short, broadly based triangular process, bordered by a single nuchal plate. In deviation from the figures given by Eigenmann & Eigenmann and by Regan, the specimen of the Leiden Museum with a length of 158 mm has the eye 3 in the snout, $7^1/_2$ in the head and $2^1/_2$ in the interorbital.

Eigenmann & Eigenmann (1890b, p. 412) state: eye $4^1/_2$ in the snout, $7^1/_2$ in the head and $2^1/_2$ in the interorbital. Regan (1904) says: eye 10 in the head.

Lateral series of scutes 26.7 between the dorsal and adipose, and 14 between the anal and the caudal. The scutes are not carinate, the humeral keel is strong up to the fifth plate, vanishes afterwards.

Belly almost naked, with a few minute rough scutes below the pectoral. Some minute scutes between the gill-opening and the rictus; a small number of dispersed scutes in the middle of the breast between the pectorals.

The base of the dorsal fin is longer than its distance from the adipose. The caudal and anal fin in the described specimen are so strongly damaged

that measurements cannot be given. Upper surface of the pectoral spine covered with bristles, especially on the outer margin. The longest, at the same time the strongest bristles, near the tip of the spine.

Colour brown, the dorsal surface with dark spots. Black round spots dispersed on the finrays.

D. I/7. A. damaged. V. I/6. P. I/6.

Günther (1864, p. 236) has mentioned the following: "Trinidad appears to be inhabited by a species with the scutes keeled, it has been described by Gill under the name of *Hypostomus robinii*, but is evidently different from our species". Cuvier & Valenciennes (1840, p. 370) also mentioned specimens from Trinidad. If this is right it is probable that this species can be found in Surinam as well.

I have compared the description of *Hypostomus robinii* Val. in Gill (1858, p. 406) with that of Cuvier & Valenciennes (1840, p. 370) and noticed important differences.

Plecostomus auroguttatus (Kner)

Hypostomus auroguttatus Kner, Denkschr. Akad. Wiss. Wien, 7, 1854, p. 269, pl. II fig. 3 (Rio Parahyba).

Hypostomus asperatus Castelnau, Anim. Amer. Sud, Poiss., 1855, p. 41, pl. XX fig. 1, abusively stated as fig. 2 (Araguay).

Plecostomus auroguttatus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 234 (copied); — Steindachner, Denkschr. Akad. Wiss. Wien, 44, 1881, p. 6 (Rio Janeiro); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 171 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 410 (copied); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 217 (East-Brazil).

Plecostomus johnii Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 133 (Rio Puty, Rio Preto); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 170, 171 (Rio Preto, Rio Puty); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 413 (Rio Preto, Rio Puty).

Museum Amsterdam:

South America, 1 ex., 230 mm.

Body depressed, greatest depth $1^1/_2$ in the greatest width. Caudal peduncle slender, compressed, its width nearly 2 in its depth. The length of the head $3^1/_4$ in the standard length, its width nearly equal to its depth. Profile steep, not arched. Occipital bluntly keeled, the process short, rounded, bordered by a single plate.

Eye 3 in the snout, $5^1/_2$ in the head and 2 in the interorbital.

Snout broadly rounded, naked at the tip. Mouth broad, $2^1/_4$ in the length of the head. Maxillary and dentary very broad with a large number of teeth, more than 30 on each side. Upper lip very broad, covering the mouth as a large fold.

Distance between tip of snout and base of dorsal spine $2^1/_2$ in the

standard length. Dorsal fin long, reaching the adipose when laid back. The spine $1^1/_5$ times the length of the head, the tip of the spine flexible. The base of the dorsal equal to the distance between its posterior end and the posterior margin of the adipose. Caudal obliquely emarginate. Ventrals long, reaching beyond the middle of the anal, with a strong curved spine which is reaching to $^1/_3$ of the ventrals.

Lateral line with 25 scutes in each series, these scutes not carinate, but striate. 7 plates between the dorsal and the adipose and 14 between the anal and the caudal. Lower surface of the head, breast and belly entirely covered with regular scutes, naked areas behind the mouth and at the base of the pectorals and the ventrals.

Colour yellow with indistinct spots on the upper part of the body.

D. I/7. A. II/4. V. I/5. P. I/6.

Plecostomus wuchereri Günther

Plecostomus wuchereri Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 235 (Bahia); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 413 (Rio Pedra); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 216 (Bahia, Rio San Francisco).

Museum Leiden:

No. 17308, Port Real, Rio de Janeiro, Hardy du Dréneuf, 5 ex., 260-291 mm.

Head and body depressed, caudal peduncle compressed. The length of the head $3^2/_3$ in the standard length. Head flat between the eyes, supra-orbital edges slightly raised in a blunt ridge from the temporals to the nares. Sides of the head steep. Occipital with a blunt process, bordered by 4 nuchal plates.

Eye in the last fourth part of the head, its diameter 4 in the snout, 6 in the head and $2^1/_2$ in the interorbital.

The tip of the snout naked. Upper lip with a large fold partly covering the opening of the mouth, lower lip broad, papillose. A great number of teeth in both jaws. Barbel equal to the diameter of the eye.

The distance between the base of the dorsal spine and the tip of the snout $2^1/_2$ in the standard length. The dorsal spine long, flexible, covered with bristles. The base of the dorsal equal to the distance between the end of the base and the tip of the adipose spine when laid back. Anal short, its margin truncate. Ventrals long, reaching beyond the middle of the anal. The spine long and covered with bristles. Pectoral spine long, somewhat curved and with strong curved spines on its upper surface.

Lateral line with 26 scutes, striate and with bristles on their posterior margin. The plates not carinate. The belly with small scutes in the middle,

a naked area at the base of the ventrals. A triangular patch of scutes anteriorly of the gill-openings, meeting in the middle of the breast.

Colour light brown, body and fins with numerous spots. Vermiculating dark lines on the temporals.

D. I/7. A. I/4. V. I/5. P. I/5.

It is possible that *wuchereri* is identical with *robinii*, but it is necessary to see the types of the species, before a decision can be arrived at.

Rhinelepis Spix

Rhinelepis Spix, Gen. et Spec. Pisc. Bras., 1829, p. 4, pl. 2 (*aspera*).

Type: *Rhinelepis aspera* Spix.

Resembling in all characters the broad- and flatheaded species of *Plecostomus*, but differing from this genus by the absence of the adipose fin.

Rhinelepis aspera Spix

Rhinelepis aspera Spix, Gen. et Spec. Pisc. Bras., 1829, p. 4, pl. 2 (without locality); — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 356 (Rio San Francisco); — Schomburgk, Fish. Brit. Guiana, I, 1841, p. 136 (without locality); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 253 (copied); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 42 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 417 (name only).

Plecostomus asper Regan, Trans. Zool. Soc. London, 17, 1904, p. 220 (Eastern Brazil).

Rhinelepis strigosa Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 354 (Parana); — Schomburgk, Fish. Brit. Guiana, I, 1841, p. 135 (Parana).

Museum Amsterdam:

South America, 1 ex., 226 mm.

Body greatly depressed, broad, flat; caudal peduncle somewhat compressed. Head broad, with the upper surface totally flat, its length $2^3/_4$ in the standard length, its depth 2 in its greatest width, the width nearly equal to its length. Occipital plate large and totally flat, bordered by 2 nuchal plates. A group of small granular plates behind the lower half of the temporal plate.

Eye small, 6 in the snout, 10 in the head, and 6 in the interorbital.

Snout broad and rounded, mouth wide, its width at the rictus $2^1/_2$ in the greatest width of the head; teeth bifid, 34 in the upper and 26 in the lower jaw on each side. Interopercle with few little spines at its margin.

Distance between tip of snout and base of dorsal $2^1/_4$ in the standard length. 4 pairs of nuchal plates between the occipital and the base of the dorsal spine. The spine $1^1/_2$ in the length of the head, flexible at its tip. There is no adipose, but it is represented by a small oval plate between the eighth pair of scutes behind the dorsal fin.

At the base of the caudal 6 azygous plates on the dorsal side of the caudal peduncle and 7 on the ventral side.

Lateral series of 23 scutes, not carinate, but with a series of spines at their posterior margin. 10 scutes between anal and caudal fin.

Caudal slightly emarginate. Anal long, nearly 2 in the length of the head, its margin rounded, the second and third ray the longest. Ventrals and pectorals with a strong spine. The pectoral spine reaching to $^1/_4$ of the length of the ventral. The spines covered with small thorns.

Lower side of the head, breast and belly entirely covered with granular scutes.

D. I/7. A. I/5. V. I/5. P. I/6.

There are but a few specimens known of this species. Unfortunately of the here described specimen of the Museum Amsterdam no exact locality can be given.

Rhinelepis parahybae Steind.

Rhinelepis parahybae Steindachner, Sitz. Ber. Akad. Wiss. Wien, 76, 1878, p. 218, pl. II (Parahyba); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 42 (Rio Parahyba at Barra do Pirahy); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 415 (locality as before).

Plecostomus parahybae Regan, Trans. Zool. Soc. London, 17, 1904, p. 219 (Rio Parahyba).

Museum Leiden:

No. 17316, Port Real, Rio de Janeiro, Hardy du Dréneuf, 2 ex., 302 and 345 mm.

Body elongate, depressed, the depth $1^1/_2$ in the width. Head broad, depressed, its length 3 in the standard length, its width equals its length as far as the upper angle of the gill-openings. Occipital slightly raised in the middle, terminating into a trangular process, which is bordered by 4 nuchal plates, interorbital concave. Snout broad, depressed, its tip naked.

Eye 4 in the snout, $7^1/_2$ in the head and 3 in the interorbital.

Lateral plates 25, the plates not keeled but covered with minute spines. On the ventral surface 2 granular patches near the bases of the pectoral spines, a series of granular plates along the sides of the belly, a band of granular patches between the posterior margins of the ventrals, and some granular patches in front of the vent; the rest of the ventral surface naked.

The base of the dorsal nearly equal to its distance from the first unpaired plate in front of the caudal fin. The caudal is truncate, the outer rays are prolonged. The pectoral spine reaches the base of the ventrals and the ventrals reach the vent.

The colour is dark brown above and lighter below.

D. I/7. A. I/5. P. I/5.

Hemipsilichthys Eigenm. & Eigenm.

Xenomystus Lütken, Vid. Medd. 13, 1873, p. 217, pl. IV (*gobio*). Name preoccupied by Günther, Cat. Fish. Brit. Mus., 7, p. 481 as subgenus.

Hemipsilichthys Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 46 (*gobio*).

Type: *Xenomystus gobio* Lütken.

Operculum and interoperculum not freely movable. Snout with a naked margin. A naked area behind the dorsal fin. Several highly keeled azygous plates in front of the adipose fin. Bases of the lateral plates concealed beneath the skin. Dorsal short.

Hemipsilichthys gobio (Lütken)

Xenomystus gobio Lütken, Vid. Medd., 13, 1873, p. 217, pl. IV (without locality).

Hemipsilichthys gobio Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 46 (Rio Parahyba); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 438 (Rio Parahyba); — Regan, Trans. Zool. Soc. London, 1904, p. 221 (Rio Parahyba, Santos); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 34, fig. 44 (Parahyba, Santos).

Plecostomus heylandii Boulenger, Ann. Mag. Nat. Hist. (7), vol. 5, 1900, p. 165 (Southern Brazil).

Museum Amsterdam:

Joinville, Santa Catherina, 1 ♂, 80 mm.

Body elongate, depressed in the anterior part, the caudal peduncle compressed. Head broad and flat, depressed, its length $3^1/_2$ in the standard length. The interorbital somewhat flat, the profile anterior of the eyes arched. The snout is rounded, its margin naked and its upper surface covered with small plates. The sides of the head with short bristles.

Eye small,4 in the snout, 7 in the head and $2^1/_2$ in the interorbital.

Lateral series of 27 plates, the basal portion of the plates covered with skin, the plates with many spines and bristles; 5 plates between the occipital and the dorsal, 9 between the dorsal and the adipose and 13 between the anal and the base of the caudal. The plates on the lower surface of the caudal peduncle smooth, covered with skin. A small area behind the temporal plate naked. The entire ventral surface and a large space behind the pectorals also naked. Between the dorsal and the adipose a broad naked median stripe.

The base of the dorsal spine just in the middle between the tip of the snout and the adipose. The base of the dorsal scarcely equal to the distance between dorsal and adipose. The dorsal spine equal to the length of the head. Adipose fin low. A series of six small, keeled and bristled azygous plates in front of the adipose spine. Caudal slightly emarginate. The here described specimen is a male and has an elongate anal papil. The spines

of the ventrals and the pectorals about equal in length and covered with bristles.

Colour of the body brown, with undistinct marks. The fins light with dark marks.

D. I/7. A. 6. V. I/5. P. I/6.

The here described specimen was identified by Steindachner as *Hemipsilichthys duseni* Ribeiro. In my opinion this must be a mistake. The specific characters of *duseni* are: the pectorals much larger than the ventrals, the skin of the snout without a lateral keel, with bristles. Abdomen granular (Ribeiro 1911, p. 34). In the specimen of the Museum Amsterdam the pectorals are scarcely equal to the ventrals, the abdomen naked.

Hemipsilichthys cameroni Steind.

Hemipsilichthys cameroni Steindachner, Sitz. Ber. Akad. Wiss. Wien, 116, 1907, p. 1, pl. I fig. 1 and pl. II (Rio Cubatao, Theresopolis); — idem, Akad. Anz. Akad. Wiss. Wien, 6, 1907, p. 1 (Localities as before).

Hemipsilichthys calmoni Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1906, p. 407 (name only); — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 36, fig. 45, 45A 45B (Rio Cubatao, S. Catharino).

Museum Leiden:

No. 7960, River Cubatao, Brazil, Steindachner, 1 ♂, 124 mm, holotype.
No. 7964, Theresopolis, Steindachner, 1 ♀, 68 mm.

Head depressed, especially in the male, caudal peduncle compressed. Width of the head nearly equal to its length, the depth 2 in its length, the latter $3^1/_2$-$3^1/_4$ in the standard length. The upper surface of the head is rough, especially on three blunt ridges, the middle of which is the strongest, they are covered with a great number of spines. The nares are in the middle of the length of the head.

Eye small, in the male $5^1/_2$, in the female 4 in the length of the head, the interorbital $5^1/_2$ to $3^1/_3$ in this length.

The margin of the lateral surface of the head is swollen, especially in the male, extending widely beyond the sides of the head and covered with some rows of slender hooked spines. In the female the spines are short, but in the male they are very long. The largest are longer than the diameter of the eye. The margin of the snout naked in the female specimen. In the male the margin and the upper surface of the snout are covered with a thick and wrinkled skin, below which a series of bony plates. The skin is covered with a great number of thick spines. The lower lip is broad, covered with papillae, growing larger towards the posterior margin, which is rounded. The teeth in both jaws in crescent-shaped series. Those of the outer series are short and curved inwards, standing very closely together.

The teeth of the inner series are larger, less in number and concealed between the folds of the mucous skin of the mouth. There are no rictus barbels.

The lateral series with 27-29 plates. The underneath part of the body is naked to the anal.

The tip of the snout nearer to the base of the dorsal spine than the latter to the base of the spine of the adipose. The dorsal spine only a little stronger than the other rays of the dorsal, flexible and on the anterior side, which is broad and rounded, covered with many oblique rows of short spines. The base of the dorsal nearly equal to its height, and equal to the length of the head. A margin of naked skin along the base of the dorsal extending posterior of the fin. The spine of the pectoral much stronger, flat, sword-shaped on the outer margin, the lower and upper surface covered with hooked spines. The tip of the spine reaching beyond the middle of the ventrals. In the male the spine is much stronger and covered with strong spine-like hooks, its length nearly 3 in the standard length. The spine of the adipose with soft bristles.

The anal papilla, in the middle between the mouth and the base of the caudal, is situated far in front of the anal fin and of the posterior margin of the ventrals, folded backwards.

Colour of back and sides brown with large faint spots. Lower surface red or brown-yellow. Fins with dark violet spots in transversal rows.

D. I/7. A. I/5. V. I/5. P. I/6.

The species name *cameroni* given by Steindachner (1907, p. 1) is no doubt an error. In his description he says: "Ich habe mir erlaubt, diese wie ich glaube, noch unbeschriebene zweite Art (oder Abart) der Gattung *Hemipsilichthys* Seiner Excellenz dem Herrn Minister für Handel und Industrie Dr. Miquel Calmoni Pin e Almeida in Rio de Janeiro als ein Zeichen meiner Verehrung und Dankbarkeit zu widmen".

It seems quite plainly that Steindachner had the intention to give the name *calmoni* to his new species. Why the name *cameroni* has been chosen, I am at a loss to understand.

Hemiancistrus Bleeker

Hypostomus Cuvier & Valenciennes, Hist. Nat. Poiss., XV, 1840 (species of several genera).
Ancistrus Kner, Denkschr. Akad. Wiss. Wien, 7, 1853 (species of several genera).
Hemiancistrus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 78 (*medians*).
Pseudacanthicus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 79 (*serratus*).
Chaetostomus Günther, Cat. Fish. Brit. Mus., V, 1864, p. 240.

Type: *Ancistrus medians* Kner.

Snout granular till its margin, sides of the head without bristles. Interoperculum with slender erectile spines. Last dorsal ray connected with the scute by an inconspicuous membrane. Dorsal 1/7-8.

Hemiancistrus brachyurus (Kner)

Ancistrus pictus Kner (non Castelnau), Denkschr. Akad. Wiss. Wien, 7, 1854, p. 277, pl. IV fig. 2 (Barra do Rio Negro).

Ancistrus brachyurus Kner, Denkschr. Akad. Wiss. Wien, 7, 1854, p. 279, pl. IV fig. 1 (Barra do Rio Negro); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 231 (copied).

Chaetostomus pictus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 242 (copied).

Chaetostomus brachyurus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 243 (copied).

Hemiancistrus pictus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 43 (name only); — idem, Occ. Pap. Acad. Sc., vol. 1, 1890, p. 418 (name only); — Kindle, Ann. Acad. Nat. Sc. New York, 8, 1895, p. 254 (Rio Tocantins).

Hemiancistrus brachyurus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 43 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 418 (name only); — Kindle, Acad. Nat. Sc. New York, 8, 1895, p. 255 (Rio Tocantins).

Museum Leiden:

No. 3130, Rio Negro, Natterer, 1856, 1 ex., 60 mm.

Body and head very depressed, the greatest width nearly equal to the length of the head. The depth 2 in the width. The length of the head $3^3/_4$ in the standard length. Head flat, the snout anterior of the nares rather steep. The margin of the snout broad and rounded to parabolical.

The diameter of the nares half the length of the diameter of the eyes; the nares close together, their distance 2 in the interorbital.

The diameter of the eye 4 in the length of the head (it is a very young specimen of 50 mm length); Kner gives of a specimen of 150 mm: eye 5 in the length of the head.

The margin and all scutes of the head are rough, covered with fine bristles. The upper surface of the head is striate, but not keeled. The occipital has no process and is margined by a single plate. The interopercle with 8 long and slender spines and a number of shorter ones, the first named spines are not reaching the base of the pectoral. They have no recurved tips.

The lateral series has 25 scutes. The scutes are striate with a strong keel in the middle, which is armed with a series of 3-4 strong and curved spines. The breast and belly are naked.

The base of the dorsal is nearly equal in length to its distance from the adipose. The length of the dorsal spine is equal to the length of the base of the dorsal fin. The adipose with a strong spine. The caudal fin of the specimen is badly damaged so that no characters can be given. The

anal long. The length of the base 2 in the length of the fin. Ventrals long, the distance between them 2 in the length of the head. The fins with a strong spine, which has strong bristles on its outer margin, the top of the spine soft, reaching beyond the base of the anal. The pectoral also with a strong, curved, bristly spine, which reaches the base of the ventrals.

The colour of the head and body light brown with 5 dark brown bands. The band crossing the dorsal very broad. The dorsal fin brown at the tip.

D. I/6. A. I/5. V. I/5. P. I/5.

Hemiancistrus schomburgkii (Günther)

Chaetostomus schomburgkii Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 245 (British Guiana).

Ancistrus schomburgkii Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 408 (name only); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 233 (British Guiana).

Hemiancistrus schomburgkii Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 43 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 420 (name only); — Kindle, Ann. Acad. Nat. Sc. New York, 8, 1895, p. 254 (name only); — Eigenmann, Mem. Carn. Mus., 5, 1912, p. 231 (copied from Regan).

Museum Leiden:

No. 17327, Surinam River, IX-1910, Corantin Exp., 1910/1911, Hulk, 1 ex., 118 mm.

Head much depressed, slightly longer than broad, 3 in the standard length. Occipital and nuchal region flat. Snout broad, much depressed, with granulations even on the margin, but with a naked area on the snout, the margin without bristles. The interoperculum with about 30 rather long setiform spines with hooked apices, the longest equal to the diameter of the eye. The spines can be everted and completely retracted beneath the operculum.

Eye small, 4 in the snout, 6 in the head and $2^1/_2$ in the interorbital

Lateral series with 25 scutes, 12 between anal and caudal and 6 between dorsal and adipose (Regan gives 6, Günther 7). The lateral scutes without keels, but their margins slightly serrate. Thorax and belly entirely naked.

Dorsal scarcely longer than high, the length of its base a little more than its distance from the adipose. The caudal obliquely truncate. The pectoral spine reaches somewhat beyond the base of the ventrals, spinate.

The caudal rays with brown dots, forming 4 transversal bands.

D. I/7. A. 5. V. I/5. P. I/6.

Pterygoplichthys Gill

Pterygoplichthys Gill, Ann. Lyc. Nat. Hist. New York, 6, 1858, p. 408 (*duodecimalis*).
Liposarcus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 238.

Type *Hypostomus duodecimalis* Cuv. & Val.

Interoperculum freely movable, armed with slender spines, with hooked apices, which can be everted and completely retracted beneath the operculum. Sides of the head without bristles. Snout granular to its margin. Teeth numerous, bifid. Last dorsal ray connected with the following scute by an inconspicuous membrane at its base. Dorsal I/10-13.

Pterygoplichthys multiradiatus (Hancock) (Table III)

Hypostoma etentaculatum Spix, Gen. et Spec. Pisc., 1829, p. 7 ,pl. IV fig. 1, 2, (Brazil).

Hypostomus duodecimalis Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 367, pl. 454 (Rio San Francişco).

Pterygoplichthys duodecimalis Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 251 (Rio San Francisco).

Hypostomus brevitentaculatus Ranzani, Nov. Comm. Acad. Sc. Inst. Bonon., 1842, p. 328.

Ancistrus longimanus Kner, Denkschr. Akad. Wiss. Wien, 7, 1854, p. 283 (without locality).

Ancistrus lituratus Kner, Denkschr. Akad. Wiss. Wien, 7, 1854, p. 285 pl. V fig. 3 (Rio Guaporé); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 227 (Rio Guaporé, Amazon).

Pterygoplichthys lituratus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 252 (copied); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 45 (Rio Preto, Rio Puty, Sao Gonçalo, Xingu Cascade); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 433 (localities as before).

Chaetostomus lituratus Steindachner, Denkschr. Akad. Wiss. Wien, 43, 1881, p. 115 (Rio Guaporé, Rio Puty, Santarem).

Ancistrus multiradiatus Regan, Trans. Zool. Soc. London, 17, 1904, p. 228 (Paraguay, Southern Brazil, River Amazon, Guiana).

Hypostomus multiradiatus Hancock, Zool. Journ., 4, 1828, p. 246 (Demerara).

Liposarcus multiradiatus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 238 (Demerara).

Pterygoplichthys multiradiatus Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 433 (name only); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 42 (name only); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 408 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 228 (copied); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 233 (Ambyiacu River, Ecuador, Amazon, Peru).

Ancistrus etentaculatum Regan, Trans. Zool. Soc. London, 17, 1904, p. 226 (Rio San Francisco, Brazil).

Pterygoplichthys etentaculatum Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 44 (Rio San Francisco below the Falls); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 428 (localities as before).

Hypostomus pardalis Castelnau, Anim. Amer. du Sud, 1855, p. 42, pl. XX fig. 3 (Amazon).

Liposarcus pardalis Günther, Cat. Fish. Brit. Mus. 5, 1864, p. 239 (copied); — Vaillant, Bull. Soc. Philom. (7), 4, 1880, p. 155 (Calderon).

Plecostomus pardalis Peters, M.B. Akad. Berlin, 1877, p. 471 (Calabozo); — Steindachner, Denkschr. Akad. Wiss. Wien, 43, 1881, p. 112 (Para, Santarem); — idem, Denkschr. Akad. Wiss. Wien, 46, 1882, p. 6 (Rio Huallaga, Para, Santarem).

Pterygoplichthys pardalis Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 45 (Santarem, Cudajas, Rio Negro, Teffé, Jutahy, Villa Bella, Obidos, Tabatinga); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 431 (localities as before, moreover a very dark specimen from Bahia).

Liposarcus varius Cope, Proc. Acad. Nat. Sc. Phil., 1871, p. 284 (Ambyiacu River).
Liposarcus jeanesianus Cope, Proc. Acad. Nat. Sc. Phil., 1874, p. 135 (Nauta).
Pterygoplichthys jeanesianus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 45 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 433 (without locality).

Museum Leiden:

No. 7978, Rio Puty, Steindachner, 1907, 1 ex., 320 mm.
No. 7979, Rio San Francisco, Steindachner, from Museum Vienna, 1907, 1 ex., 410 mm.

Body and head robust, depth slightly less than the width. Head broad, its length $3^1/_3$-$3^3/_4$ in the standard length, slightly longer than wide, its depth $1^1/_3$ in its length. Occipital with a low median ridge, bordered in one specimen by a single scute, in the other specimens by a median scute and a somewhat smaller scute on each side. Supraorbital edges slightly raised, interorbital flat. Temporal plates carinate.

Eye $4^1/_2$-5 in the snout, $8^2/_3$ in the head and $3^3/_3$ in the interorbital. The snout $1^3/_4$-2 in the length of the head, the interorbital $2^1/_4$-$2^1/_3$ in this length.

Snout anteriorly pointed, entirely granular. The length of the mandibular ramus 4 in the interorbital. The interoperculum erectile, with a few short spines at its tip.

Lateral series with 29 scutes, all scutes with a strong median keel, spinulose. 6 scutes between the dorsal and the adipose and 13 between the anal and the caudal.

The dorsal fin longer than its height. The length of its base $1^1/_3$-$1^3/_8$ in its distance from the caudal. The caudal fin obliquely emarginate, the outer rays thickened and slightly prolonged, the caudal peduncle 3-$3^1/_3$ times as long as deep. The ventrals reaching the base of the anal. The pectoral spine strong and spinous, reaching till $^3/_5$-$^4/_5$ of the length of the ventrals.

Colour of one of the specimens light brown, of the other dark brown with light vermiculations on body and fins.

D. I/11. A. I/4. V. I/5. P. I/5.

After comparing the characters of the here described specimens with those of *lituratus, etentaculatum, pardalis, jeanesianus* and *multiradiatus* as given by Hancock, Kner, Steindachner, Günther and Eigenmann & Eigenmann (1890 b, p. 431), I am convinced that they all belong to the same species which must be named *multiradiatus,* as this name has the priority. For the present, because I have not seen the types, I give the synonyms with a question mark, but Table III shows, that the difference in characters is only of individual importance or probably due to local variations.

Pterygoplichthys aculeatus (Perugia)

Chaetostomus aculeatus Perugia, Ann. Mus. Civ. Stor. Nat. Genova (2), vol. 10, 1890-1892, p. 637 (Asuncion on the Rio Paraguay).

Chaetostomus gigas Boulenger, Proc. Zool. Soc. London, 1895, p. 526 (Asuncion on the Rio Paraguay); — idem, Trans. Zool. Soc. London, 14, 1896, p. 30, pl. VI (Asuncion on the Rio Paraguay).

Ancistrus gigas Regan, Trans. Zool. Soc. London, 17, 1904, p. 223 and 230 (Asuncion on the Rio Paraguay).

Pterygoplichthys aculeatus Ribeiro, Archiv. Mus. Nac. Rio de Janeiro, 16, 1911, p. 73, pl. 27 (without locality).

Museum Leiden:

No. 2895, Miss E. J. Koperberg, 7 April 1927, stuffed ex., 550 mm.

Body lumpish, depressed. Head flat and broad, its length $2^1/_2$ in the standard length, its depth $4^1/_2$ in this length. The width of the head $1^1/_5$, the depth $1^4/_5$ in its length. The supraoccipital plate has no process and is bordered by one large nuchal plate. Occipital and interorbital regions flat, the spines in these regions are arranged in vermiculating ridges, which are extending till between the nares. The supraorbital edges not raised. The preoperculum is armed with a great number of slender spines with curved tips. The longest of these are $^1/_4$ of the length of the head. Snout broad and rounded, covered with a great number of spiny scutes. The spines at the margin of the head are the largest. Mouth with slender bifid teeth, 14 on each side in the upper jaw and 18 in the lower jaw.

Eye $5^1/_4$ in the snout, 10 in the head and 4 in the interorbital. The interorbital $2^1/_4$ and the snout $1^4/_5$ in the length of the head.

Lateral series 25 scutes, which are strongly spinous. 5 scutes between dorsal and adipose fin and 11 between anal and caudal. 4 azygous scutes on both the upper and lower surface of the caudal peduncle in front of the caudal fin.

Dorsal fin with a long and strong serrate spine, the 10 ramified rays with a series of spines on the lateral margin. The base of the dorsal twice as long as its distance from the caudal. Adipose fin very small, spinous. Caudal fin with all the rays spinous; the outer heavy. The margin of the fin truncate. Anal fin with a strong spine. Ventrals large with a heavy spine, which when laid back reaches the base of the anal. The pectoral with a heavy spine, covered with series of long and slender thorns on its outer margin. The spine and the first ray much longer than the other rays, reaching the tip of the ventral fins.

The breast and the belly are covered with small spinous scutes.

Colour of body and fins brown, covered with dark dots.

D. I/10. A. I/5. V. I/5. P. I/6.

The specimen described by Boulenger and by Regan probably is the same, viz., a specimen from Asuncion on the Paraguay River with a total length of 530 mm.

Perugia in his description of a specimen, also from Asuncion, has not given the total length.

Unfortunately the locality of the specimen in the Leiden collection, a fine stuffed one, cannot be given.

Pseudancistrus Bleeker

Pseudancistrus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 78 (*barbatus*); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 434.

Type: *Hypostomus barbatus* Cuv. & Val.

Similar to *Hemiancistrus,* but the sides of the head with bristles, which are much larger in the male, interopercle also with bristles. Adipose fin present.

Pseudancistrus barbatus (Cuv. & Val.)

Hypostomus barbatus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 374 (La Mana); — Schomburgk, Fishes of Brit. Guiana, I, 1841, p. 147 (Brit. Guiana); — Kner, Denkschr. Akad. Wiss. Wien, 7, 1853, p. 268, pl. 2 fig. 2 (Locality ?).

Plecostomus barbatus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 237 (Surinam).

Pseudancistrus barbatus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 45 (name only); — idem, Occ. Pap. Cal. Acad. Sc. vol. 1, 1890, p. 435 (name only); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 409 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 233, pl. 28 fig. 3 (Crab Falls, Warraputa, Rockstone).

Ancistrus barbatus Regan, Trans. Zool. Soc. London, 17, 1904, p. 240 (Guiana).

Hypostomus guttatus Cuvier & Valenciennes, Nat. Hist. Poiss., XV, 1840, p. 375 (Surinam).

Plecostomus guttatus Günther, Cat. Fish. Brit. Mus., V, 1864, p. 237 (British Guiana).

Pseudancistrus guttatus Bleeker, Silures de Suriname, 1864, p. 10, pl. 2 fig. 2, pl. 3 fig. 3 (Surinam); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 45 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 435 (name only); —idem, Proc. U.S. Nat. Mus., 14, 1891, p. 42 (name only).

Museum Leiden:

No. 3124, Surinam, Dieperink, 1 ♀, 108 mm.
No. 3126, Surinam, Dieperink, 1 ♀, 211 mm.
No. 3100, Cayenne, Frank, 1843, 2 ♀♀, 159 and 162 mm.

Head and body depressed. Length of the head 3 in the standard length, its depth $5^1/_2$ and its width slightly more than 3 in the standard length. The plates of the head without keels.

Eye 5-6 in the head, $1^1/_2$-$2^1/_4$ in the interorbital. Mandibular ramus $1^1/_4$ in the interorbital.

Opercle and margin of the snout with bristles, which are hardly notice-

able in the here described specimens because they are all female. In the male the bristles are much longer. The marginal bristles have a length up to $^3/_4$ of the diameter of the eye (Eigenmann). Lateral series with 24-25 scutes. The scutes without keels. 4 + 1 azygous plates between dorsal and adipose. Breast and belly entirely naked.

Length of the base of the dorsal fin almost equal to its distance from the caudal. The spine of the dorsal fin equal to the length of the snout and the diameter of the eye. The last ray of the fin scarcely adnate. Caudal obliquely emarginate. Ventrals reaching the base of the anal in the largest specimen, in the smaller passing beyond this base. The pectoral reaches to one third of the ventral.

The specimens, preserved in alcohol, have no colourmarks, only the largest has still a row of white dots in the interradial spaces of the dorsal fin left.

Eigenmann describes the colour as brown or slaty, with clear white dots.

D. 1/7. A. I/4-5.

Delturus Eigenm. & Eigenm.

Delturus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 45 (*parahybae*).

Type: *Delturus parahybae* Eigenm. & Eigenm.

This genus is closely allied to *Hemipsilichthys* from which it differs by its long adnate dorsal fin with 9-10 rays, the greater development of its lateral plates and the short and fine bristles on the sides of the head, bristles which do not encroach on the preopercle.

Tail flat below, trenchant above, triangularly shaped.

Delturus parahybae Eigenm. & Eigenm.

Delturus parahybae Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 45 (Parahyba, Thayer exp.); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 438 (locality as before); — Eigenmann, Repts. Princeton Exp. Patagonia, 3, 1910, p. 409 (name only).

Ancistrus parahybae Regan, Trans. Zool. Soc. London, 17, 1906, p. 241 (copied).

Museum Leiden:

No. 11786, Brazil, 1 ex., 236 mm.

Head and anterior part of the body depressed, the greatest depth of the body $1^2/_3$ in its width. Tail strongly compressed, flat below, trenchant above. None of the plates on the snout enlarged. Occipital plate subtriangular, margined by a pair of nuchal plates, a naked area behind the temporals. The margin of the snout till the inter-opercle covered with short bristles (probably a male specimen). The interorbital is concave, the superciliary edge

raised, margined with short bristles. A prominent ridge runs from the eye to the nares. The teeth are large with bifid tips.

Eye 3 in the snout, $5^1/_5$ in the head and $1^3/_5$ in the interorbital.

26 scutes in lateral series, 6 between dorsal and adipose and 10 between anal and caudal fin. A series of 3 trenchant azygous plates in front of the adipose. The plates of the lateral series with denticulated ridges, but not carinate. The ridges terminating into rather large marginal spines. The ventral surface naked, except a few granules behind the gill-opening. The plates on the lower surface of the caudal peduncle smooth and covered with skin.

The last ray of the dorsal fin joined to the back by a membrane. The caudal is obliquely truncate. Pectoral and ventral spines thick but flexible at the tip, covered with numerous short bristles; the pectoral reaching just beyond the base of the ventral, the ventrals reaching the anal.

Colour light brown, all the fins with large round blackish spots.

D. I/10. A. 6. V. I/5. P. I/6.

Cochliodon (Heckel MS) Kner

Cochliodon (Heckel MS.) Kner, Denkschr. Akad. Wiss. Wien, 7, 1853, p. 265 (*hypostomus* = *cochliodon*).

Type: *Hypostomus cochliodon* Kner.

But a single species is known of this genus. Adipose fin present. Interopercle without erectile spines. The teeth are spoon-shaped.

Cochliodon cochliodon (Kner)

Hypostomus cochliodon Kner, Denkschr. Akad. Wiss. Wien, 7, 1853, p. 265, pl. 11 fig. 1 (Rio Cujaba).

Plecostomus cochliodon Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 238 (copied).

Cochliodon cochliodon Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 44 (copied); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 425 (copied); — Regan, Trans. Zool. Soc. London, 12, 1904, p. 242 (copied).

Cochliodon hypostomus Heckel MS.

Loricaria melanoptera Natterer MS.

Museum Leiden:

No. 1897, Cuyaba, Brazil, from Museum Vienna, 1856, stuffed ex., 190 mm. This specimen is one of the 4 specimens described by Kner and also the type or one of the co-types.

The head is broad, the snout pointed. The length of the head $3^1/_3$ in the standard length. The occipital, with a broad and prominent keel and a broad occipital process, is margined by a single nuchal plate. The occipital crest is continued on the nuchal plates divided in two keels along the sides of the dorsal fin till the caudal fin, leaving the back between them flattened.

The orbital keel is continued along the sides of the body. The humeral keel is prominent as far as the fifth lateral scute. The snout is granular. The preopercle is not armed, there are only a few little spines along the margin. The most typical character is that of the teeth, which are few in number, 8 in each half of the jaws, they are spoon-shaped.

Eye $4^1/_2$ in the snout, $7^1/_2$ in the length of the head and 4 in the interorbital.

Breast and belly are covered with granular scutes.

The dorsal base is longer than its distance from the adipose. The distance from the tip of the snout to the base of the dorsal spine nearly $2^2/_3$ in the standard length. The spine is flexible at the tip and covered with small thorns. The spine of the ventral fins nearly equal to the dorsal spine, also flexible at the tip and covered with small thorns. The pectoral fin with a strong spine reaching the end of the base of the ventrals, near its tip covered with strong recurved hooks.

The stuffed specimen shows no signs of the original colour, it is plain brown and there are no spots whatever on body or fins.

D. I/7. A. I/4.

Chaetostomus Tschudi

Hypostomus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 361 (species of several genera).

Ancistrus Kner, Denkschr. Akad. Wiss. Wien, 7, 1853 (species of several genera).

Chaetostomus Tschudi, Fauna Peruana, 1845, p. 26 (*loborhynchus*); — Kner, Denkschr. Akad. Wiss. Wien, 7, 1853; — Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 78 (*loborhynchus*); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 240.

Type: *Chaetostomus loborhynchus* Tschudi.

Interoperculum freely movable. Mouth wide, the length of the mandibular ramus nearly equal to the interorbital. Naked margin of the snout very wide, without tentacles.

Chaetostomus loborhynchus Tschudi

Chaetostomus loborhynchus Tschudi, Fauna Peruana, Pisc., p. 26, pl. IV (Rio Tullumayo, Andes of Peru); — Günther, Cat. Fish. Brit. Mus. 5, 1864, p. 250 (copied); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 246 (Andes of Peru); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 410 (name only); — Evermann & Redcliff, Bull. U.S. Nat. Mus., 95, 1917, p. 37 (name only).

Museum Leiden:

No. 3131, Rio Apurimac, from Museum Paris, 1842, 1 ex., 117 mm.

Body short, depressed, anteriorly very broad, the posterior part of the caudal peduncle somewhat compressed. The greatest depth of the body $2^1/_4$ in its greatest width, the latter 3 in the standard length and equal to the

length of the head. The head almost flat. The margin of the head broadly rounded, the naked skin of which with a thick fold and a flat rounded prolongation in the middle of the snout. The skin at the lower side of the snout forms a broad flap covering the snout when laid back. The mouth very broad, $1^3/_4$ in the width of the head. The lower lip broad, rounded, covered with papillae and connected with the small barbel at the rictus. A great number of teeth, which are villiform and curved inwards. The upper surface of the head covered with scutes, on the snout a great number. The nasal opening nearly half the diameter of the eye.

The eye $2^1/_2$ in the snout, 5 in the length of the head and 2 in the interorbital.

The lateral series with 25 scutes. The interopercle, which is erectile, with 14 spines, the longest of these $1^1/_2$ times in the diameter of the eye.

The distance between the tip of the snout and the base of the dorsal $2^1/_4$ in the standard length. The base of the dorsal equal to its distance from the adipose. The characters of the dorsal rays cannot be given, because all are broken off and so are the caudal rays; only one of the middle caudal rays is left so that the length of the specimen is measurable. The anal fin is damaged too. The ventrals with a strong spine, the top of which is flexible. The spine is covered with bristles. The pectoral spine strong, somewhat curved, the upper surface with bristles, the lower striate.

The colour of the specimen, for more than 100 years preserved in alcohol, is brown, the lower portion white.

D. I/7. A. 5. V. I/5. P. I/6.

Ancistrus Kner

Ancistrus Kner, Denkschr. Akad. Wiss. Wien, 7, 1853, p. 272 (species of several genera); — Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 77 (*cirrhosus*).
Xenocara Regan, Trans. Zool. Soc. London, 17, 1904, p. 256 (*cirrhosa*).
Thysanocara Regan, Ann. Mag. Nat. Hist. (7), vol. 17, 1906, p. 95 (*cirrhosus*).
Ancistrus Eigenmann, Science, 21, 1905, p. 794.

Type: *Ancistrus cirrhosus* (Cuv. & Val.).

Interoperculum freely movable. Snout with naked margin, broad in the male, narrow in the female, with tentacles.

Ancistrus cirrhosus (Cuv. & Val.)

Hypostomus cirrhosus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 378 (without locality); — Valenciennes, in d'Orbigny, Voyage Amer. Mer., 5, 1847, p. 11, pl. VII fig. 3 (without locality).
Ancistrus cirrhosus Kner, Denkschr. Akad. Wiss. Wien, 7, 1853, p. 272 (Rio Guapore); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 47 (Cudajas, Obidos); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 446 (name only); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 43 (name only); — Eigenmann,

Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 411 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 238 (Ireng River near Holmia); — Holly, Blätt. f. Aq. u. Terr., 43, 1932, p. 341, fig. 10-13 (without locality); — Pearson, Ind. Univ. Studies, vol. 11, 64, 1924, p. 24 (Huachi); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 234 (Ambyiacu River, Ecuador) and p. 530 (Trinidad).

Chaetostomus variolus Cope, Proc. Acad. Nat. Sc. Phil., 1871, p. 285 (Ambyiacu); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 64 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1890, p. 442 (name only).

Chaetostomus cirrhosus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 247 (Essequibo, British Guiana); — Hensel, Wiegm. Archiv, I, 1870, p. 76 (stony mountain streams); — Vaillant, Bull. Soc. Philom. (7), vol. 4, 1880, p. 155 (Calderon); — Steindachner, Denkschr. Akad. Wiss. Wien, 46, 1882, p. 7 (Rio Huallaga); — Boulenger, Proc. Zool. Soc. London, 1887, p. 277 (Canelos); — Perugia, Ann. Mus. Genova (2), vol. 18, 1897, p. 21 (Rio Beni); — Schreitmüller, Blätt. f. Aquar. u. Terr., 33, 1922, p. 162 (without locality).

Ancistrus cirrhosus dubius, Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 48 (Gurupa, Tabatinga); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 446 (localities as before).

Xenocara cirrhosa Regan, Trans. Zool. Soc. London, 17, 1904, p. 256 (Rio Paraguay, River Amazon, Guiana, Trinidad); — Regan, Proc. Zool. Soc. London, 1906, I, p. 389 (Trinidad).

Thysanocara cirrhosus Regan, Ann. Mag. Nat. Hist. (7), vol. 17, 1906, p. 95 (without locality).

Museum Leiden:

No. 3129, Rio Negro, Natterer, 1806.
No. 17323, Upper Saramacca River, VI-1903, De Kok, Saramacca Exp., 1 ex., 93 mm.

Body lumpish, head broad, depressed and rounded anteriorly, without keels. The margin of the snout naked, but provided with tentacles. The length of the head 3 in the standard length. The naked area of the snout, reaching till half way the posterior margin of the eye, is conspicuously marked with large white spots. A series of simple tentacles on the margin and on the middle of the snout. The number of tentacles less than in *A. temmincki*. The region between the eye and the gill-opening partially naked. Interopercle erectile and with 12 spines, the greatest of these is about 5 times in the length of the head.

Eye 3-3$^1/_2$ in the interorbital and 6-7 in the length of the head.

The lateral series with 24 scutes, six between the dorsal and the adipose and 10 between anal and caudal. The scutes are not keeled. The thorax and belly are naked except a minute granular plate on the breast below the base of the pectoral spine.

The base of the dorsal greater than its distance from the adipose. Its length reaching from the end of the dorsal base to the end of the base of the adipose. The last dorsal ray scarcely reaching the spine of the adipose. Ventrals reaching to the middle of the anal. The pectoral is reaching to $^1/_3$ of the length of the ventral.

Colour dark brown, with here and there rather large light spots; the fins are dark brown with lighter spots. The dorsal fin has a dark spot at the base of the membrane and wavy interrupted horizontal bands.

D. I/7.

Ancistrus scaphirhynchus Kner

Ancistrus scaphirhynchus Kner, Denkschr. Akad. Wiss. Wien, 7, 1854, p. 280, pl. III fig. 2 (Barra do Rio Negro).

Xenocara scaphirhynchus Regan, Trans. Zool. Soc. London, 17, 1904, p. 231 (Amazon).

Chaetostomus scaphirhynchus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 244 (copied).

Hemiancistrus scaphirhynchus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 43 (Hyanuary, Coary, Teffé, Hyavary); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 419 (Solimoens); — Kindle, Ann. Acad. Nat. Hist. New York, 8, 1895, p. 254 (name only).

Museum Leiden:

No. 14779, River Coary, Brazil, from Museum Cambridge, Mass., May 1934, 1 ex., 141 mm.

Body long, slender, depressed, the depth of the body $2^1/_4$ in its width. Head broad, its length 3 in the standard length. The sides of the head almost vertical at the orbit; the margin of the orbit slightly raised. The bones of the head are regularly grooved, with a deep groove behind the eye. The occipital is bordered by 6 nuchal plates, the post-temporal plates forming partly the upper and partly the posterior margin of the orbit. The remaining part of the latter is formed by the suborbital bone. The frontal plates with a triangular lateral extension which reaches the orbit. The margin of the snout with short bristles. Preopercle and opercle erectile; the preopercle with a bunch of flexible spines, the longest of which is almost equal to the diameter of the orbit. The opercle with a marginal series of short fixed spines.

Eye $3^1/_2$ in the snout, $6^1/_2$ in the length of the head and $4^1/_4$ in the interorbital.

The lips are broad and sparingly papillose, the teeth are very fine.

The barbels rudimentary.

The lateral series with 25 scutes, the scutes are keeled, the keels strongest above the anal. The dorsal scutes are striate, not keeled. The ventral surface of body and head naked.

Distance from dorsal spine to tip of snout $2^2/_5$ in the standard length. The base of the dorsal nearly equal to its distance from the posterior margin of the adipose. The last dorsal ray little lower than the first. The caudal is badly damaged, so its shape cannot be described. The upper surface of the pectoral spine is thickly covered with fine cardiform bristles (is it a male specimen).

Colour brown with indistinct light spots, the fins obliquely banded.
D. I/7. A. I/4.

Ancistrus bufonius (Cuv. & Val.)

Hypostomus bufonius Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 377 (copied).

Chaetostomus bufonius Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 46 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 444 (name only).

Xenocara bufonia Regan, Trans. Zool. Soc. London, 17, 1904, p. 258 (Andes of Peru, Bolivia).

Ancistrus bufonius Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 411 (name only).

Ancistrus bufonia Pearson, Ind. Univ. Studies, vol. 11, 64, 1924, p. 24 (River Colorado, Popoi River, Espia).

Hypostomus calamita Cuvier & Valenciennes, Hist. Nat. Poiss., 5, p. 380 (copied).

Chaetostomus calamita Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 248 and 432 (Rio Apurimac).

Ancistrus calamita Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 48 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 449 (Rio Apurimac).

Chaetostomus jellskii Steindachner, Sitz. Ber. Akad. Wiss. Wien, 72, 1875, p. 603 (Amable Maria, Monterico); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 46 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 442 (name only).

Museum Leiden:

No. 7976, Bolivia, Steindachner, II-1907.

Head and body depressed. The width and the length of the head $2^1/_2$ in the standard length. The depth of the head 2 in its length. Snout with tentacles, the large ones are forked or ramified. The mouth is very wide, the length of the mandibular ramus equal to the interorbital. Lower lip circular, covered with tubercles.

Eye 5 in the snout, 9 in the length of the head and $2^1/_2$ in the interorbital.

The interoperculum is armed with 14 spines, the longest of which 5 in the length of the head, the base of the spines enveloped by the skin, but their top free.

Lateral series with 25 rough scutes. Breast and belly naked.

The base of the dorsal fin equal to its distance from the adipose. The spine, which is not pungent, reaches when laid back just half way between tip of snout and base of caudal. Caudal truncate. Ventrals and pectorals with strong bristly spines. The spine of the pectoral reaches the base of the ventrals.

Colour olivaceous, the fins with dark cross-bars.
D. I/7. A. I/4. V. I/5. P. I/5.

Ancistrus hoplogenus (Günther)

Chaetostomus hoplogenus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 247 (River Capin, Para).

Ancistrus hoplogenus Eigenman & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 48 (name only); — idem, Occ. Pap. Cal. Acad. Sc. vol. 1, 1890, p. 448 (Tajapuru); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 43 (name only); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 411 (name only); — idem, Mem. Carn. Mus., V, 1912, p. 239 (Gluck Island, Packeoo Falls, Essequibo, Rupununi Pan); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 274, (Rupununi); — Pearson, Ind. Univ. Studies, vol. 11, 1924, p. 24 (Lake Rogoagua).

Xenocara hoplogenus Regan, Trans. Zool. Soc. London, 17, 1904, p. 255 (Guiana, Amazon, Rio Paraguay).

Chaetostomus leucostictus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 248 (Essequibo); — Steindachner, Denkschr. Akad. Wiss. Wien, 46, 1883, p. 7 (Rio Huallaga).

Ancistrus leucostictus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 48 (Coary, Tabatinga, Jutahy); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 447 (localities as before); — idem, Proc. U.S. Nat. Mus., 14, 1891, p. 43 (name only).

Chaetostomus alga Cope, Proc. Acad. Nat. Sc. Phil., 1871, p. 287, pl. 15 fig. 3 (Ambyiacu).

Chaetostomus malacops Cope, Proc. Acad. Nat. Sc. Phil., 1871, p. 287, pl. 5 fig. 2 (Ambyiacu); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 46 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 443 (name only); — idem, Proc. U. S. Nat. Mus., 14, 1891, p. 43 (name only).

Chaetostomus tectirostris Cope, Proc. Acad. Nat. Sc. Phil., 1871, p. 288, pl. 15 fig. 2 (Ambyiacu); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 46 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 442 (name only); — idem, Proc. U. S. Nat. Mus., 14, 1891, p. 43 (name only).

? *Ancistrus cirrhosus* Ribeiro, Arch. Mus. Nac. Rio de Janeiro, 16, 1911, p. 31 and 411, pl. 22 fig. 1 (without locality).

Museum Amsterdam:

Rupununi Pan, British Guiana Exp., 1908, Grant, 1 ex., 63 mm.

Body and head depressed, the caudal peduncle somewhat compressed. Length of the head less than 3 in the standard length, the depth at the tip of the occipital $5^1/_2$ in the total length. The width of the head $1^1/_4$ in its length, the interorbital about $2^1/_4$ in this length. The mandibular ramus 3 in the interorbital.

Eye $2^1/_2$ in the snout, $4^1/_2$ in the length of the head and 2 in the interorbital.

Greatest width of the naked area on the snout $^1/_4$ of the distance from tip of snout to the posterior margin of the eye along the median line. Some little tentacles on the said area. On the tip of the snout 2 bifid tentacles.

Interoperculum with spines, hooked at the tip, the number cannot be counted because some are broken off.

Lateral series with 23 scutes, 3 pairs between the occipital and the dorsal, 7 between dorsal and adipose and 11 between anal and caudal fin.

Base of the dorsal equal to the distance from the base of the last ray to the tip of the spine of the adipose, when the latter is laid back. Length of the dorsal spine $1^1/_4$ in the length of the head. The last dorsal ray, when laid back, reaching beyond the base of the spine of the adipose. Caudal obliquely truncate, the lower caudal ray much longer than the upper. Ventrals rounded. Pectoral spine reaching to $^1/_3$ of the ventrals.

Colour black, dorsal and caudal fin dark with scattered white spots. The upper part of the caudal margin light.

D. I/7. A. I/4. V. I/5. P. I/5.

Ancistrus temminckii (Cuv. & Val.)

Hypostomus temminckii Cuvier & Valenciennes, Hist. Nat. Poiss. 15, 1840, p. 380 (Cayenne).

Ancistrus temminckii Bleeker, Silures de Suriname, 1864, p. 11, pl. I fig. 3, pl. II fig. 2 (Surinam); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 48 (Cudajas, Gurupa, Lake Hyanuary, Teffé, Iça, Rio Trombetas, Jutahy, Serpa, Rio Madeira, Ueranduba, Tabatinga); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 448 (localities as before).

Ancistrus dolichopterus Kner, Denkschr. Akad. Wiss. Wien, 7, 1853, p. 274 (Barra do Rio Negro).

Chaetostomus dolichopterus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 249 (copied); — Vaillant, Bull. Soc. Philom. (7), vol. 4, 1880, p. 155 (Calderon).

Museum Leiden:

No. 3123, Surinam, Dieperink, 1 ex., 102 mm.
No. 3132, Surinam, Dieperink, 1 ex., 140 mm.

Body short, depressed; head broad, flattish, $2^3/_4$ in the standard length, its width $1^1/_4$ in its length, its depth 2 in its length. Occipital without a process, margined by 3 nuchal plates. The snout of the two male specimens is naked, with numerous broadly based tentacles. The median tentacles are at first placed in a single row, posteriorly diverging into two series. The interoperculum with 10-12 hooked spines, the largest of which has a length of 2 diameters of the eye.

Eye 6-7 in the snout, 8-10 in the length of the head and $4^1/_2$-5 in the interorbital.

The lateral series with 23-24 scutes, 3 between the occipital and the dorsal, 6 between the dorsal and the adipose and 11 between anal and caudal.

The distance between the tip of the snout and the base of the dorsal spine equals the distance from the latter to the base of the caudal. The length of the spine is $^3/_4$ of the length of the head. Caudal truncate, the outer rays are not produced, the lower lobe longer. These characters concern the specimen no. 3132 only, because no. 3123 has a completely damaged caudal fin.

Anal with a small base, rather long. The ventrals are reaching beyond the base of the anal. The spines are strong and spinous. The pectoral spine is strong and curved, with strong teeth on its margins, when laid back, to half the length of the ventrals.

Colour of body and fins dark brown.

D. I/7. A. I/4. V. I/5. P. I/6.

Ancistrus stigmaticus Eigenm. & Eigenm.

Ancistrus stigmaticus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 47, footnote, and p. 48 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 446 (Sao Matheos, Goyaz); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 411 (name only).

Xenocara stigmatica Regan, Trans. Zool. Soc. London, 17, 1904, p. 259 (Rio Mogyguassu about 250 miles inland of Santos).

Museum Amsterdam:

Joinville, Brazil, 1 ♀, 121 mm.

Body broad and depressed, tapering to the caudal peduncle, which is somewhat compressed in its posterior part. Depth of the body 5, length of the head $2^1/_2$ in the standard length. Head $1^1/_5$ times as long as broad and $2^1/_3$ as long as deep. Snout with tentacles, which are simple and not flattened; this is a character of a female.

Eye $4^1/_4$ in the snout, 10 in the length of the head and $3^1/_2$ in the interorbital.

The snout nearly 2 in the length of the head, the interorbital $2^1/_2$ times. The length of the mandibular ramus 2 in the interorbital width. Interoperculum armed with 20 spines at the left and 25 at the right side of the head. The longest spine 4 in the length of the head.

Lateral series with 24 scutes, 6 between dorsal and adipose and 12 between anal and caudal.

The length of the base of the dorsal nearly equal to its distance from the adipose fin. The dorsal spine $^3/_4$ of the length of the head, the tip of the spine, when laid back, separated by one scute from the adipose fin. Caudal obliquely truncate, the lowest ray is the longest, about $^3/_4$ of the length of the head. Ventrals long, reaching the tip of the anal fin. Pectorals with a strong spinous spine, which reaches the middle of the ventral spine.

Colour dark, with light spots on the head. The fins blackish with some light spots.

D. I/7. A. I/4. V. I/5. P. I/6.

Xenocara Regan

Xenocara Regan, Trans. Zool. Soc. London, 17, 1904, p. 251 (part.).
Xenocara Eigenmann, Science, 31, 1905, p. 704.

Type: *Ancistrus gymnorhynchus* Kner.

Interoperculum freely movable, with spines. Snout with a naked margin without tentacles. Mouth narrow, the length of the mandibular ramus considerably less than the interorbital width. Teeth in both jaws equal in number.

Xenocara gymnorhynchus (Kner)

?*Hypostomus nudiceps* Müller & Troschel in Schomburgk, Reisen in Brit. Guiana, 3, 1838, p. 631.

Ancistrus gymnorhynchus Kner, Denkschr. Akad. Wiss. Wien, 7, 1854, p. 275 (Puerto Cabello).

Chaetostomus gymnorhynchus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 249 (copied); — Lütken, Vid. Medd. Nat. Hist. For. Kjöbenhavn, 13, 1873, p. 204 (Puerto Cabello); — Eigenmann & Eigenmann, Proc. Cal. Acad. Nat. Sc. (2), vol. 2, 1889, p. 46 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 444 (name only).

Xenocara gymnorhynchus Regan, Trans. Zool. Soc. London, 17, 1904, p. 254 (copied); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 410 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 236 (Gluck Island).

?*Chaetostomus nudiceps* Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 249 (copied); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 46 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 443 (name only).

Hypostomus korsteni Kröyer MS.

Museum Leiden:

No. 3128, Amérique Meridional, from Museum Paris, 1 ex., 105 mm.

No. 3134, Buenos Ayres, from Museum Paris 1835, 2 ex., 80 and 85 mm, without caudal.

Head and body depressed. The length of the head $2^1/_2$-3, the depth at the occipital process $4^1/_2$-5 in the standard length. The interorbital slightly more than 2-$2^1/_5$ in the length of the head; the width of the head less than its length. The orbital almost round, its diameter almost 5 in the length of the head. The snout with a naked area, the greatest width of which is $^1/_3$ of the distance from tip of snout to the posterior margin of the eye, measured along the median line. No tentacles on the snout; one of the here described specimens, however, has a couple of tiny accessories which might be called tentacles. The width of the mandibular ramus slightly more than 2 in the interorbital.

The lateral series with 23 scutes; 6 plates between dorsal and adipose, and 10 behind the anal.

The length of the base of the dorsal is nearly equal to its distance from the tip of the spine of the adipose. The length of the dorsal spine is not known, because the dorsals of the three specimens are very badly damaged. The ventral is reaching beyond the base of the anal. The pectoral reaches beyond the base of the ventral.

The colour is dark brown with faint lighter spots. The specimens were for more than a hundred years preserved in alcohol.

D. I/7. A. I/4.

These specimens obtained from the Museum Paris in 1842, are said to be from Buenos Aires. They deviate, as I have noticed, in some respects from the type of *Hypostomus nudiceps* from Guiana, collected by Schomburgk, at present in the Berlin Museum, and also from the one specimen from Gluck Island described by Eigenmann (1912 b, p. 236).

On the label of the specimens of the Leiden collection is written "*Anastrus mic ...*"; obviously is meant *Ancistrus microps* = *Chaetostomus microps* Günther, but then the label is incorrect.

Pseudacanthicus Bleeker

Hypostomus Cuvier & Valenciennes, Hist. Nat. Poiss., XV, 1840 (*serratus*).
Pseudacanthicus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 79 (*serratus*).
Hemiancistrus Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sci., I, 1890, p. 417.

Type: *Hypostomus serratus* Cuv. & Val.

Body somewhat depressed. Praemaxillaries united, much shorter than the dentaries and with a smaller number of teeth. Interoperculum with long movable spines.

Pseudacanthicus serratus (Cuv. & Val.)

Hypostomus serratus Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 372 (Surinam).

Pseudacanthicus serratus Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 79 (name only); — idem, Silures de Suriname, 1864, p. 13, pl. I fig. 2 and pl. III fig. 1 (Surinam); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 260 (Surinam); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 412 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 66 (name only).

Chaetostomus serratus Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 241 (without locality).

Hemiancistrus serratus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 43 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 417 (name only).

Museum Leiden:

No. 3125, Surinam, Dieperink, 1 ex., 210 mm. This specimen is the type of *Hypostomus serratus* Cuv. & Val.

No. 6915, Surinam, from coll. Bleeker, 1 ex., 320 mm.

Head large, depressed, longer than broad, its length 3 in the standard length. The snout broad with a triangular naked area at the tip. Occipital with a broad triangular process, covered with spines at the tip. Interorbital nearly flat.

Eye rather small, 4-5 1/4 in the snout, 6-8 1/2 in the length of the head, 2-3 in the interorbital.

Snout covered with small spinous plates, the largest spines on the margin. The mouth with 10-14 teeth on each side in the lower jaw. The interoperculum with a bunch of 14 slender spines, the largest of these are as long as the orbit and are not extending beyond the gill-opening.

The lateral series with 24-25 scutes, each with 2-3 spines in the middle, 7 scutes between the dorsal and the adipose, 3 azygous plates between adipose and caudal. Thorax and belly naked.

The length of the base of the dorsal equal to its distance from the caudal. The dorsal spine soft at the tip, the anterior margin spinous. The caudal is emarginate, the outer rays are thick and very spinous. Small spines on all the caudal rays; the lower lobe of the caudal not much longer than the upper. Anal fin long, when laid back reaching till $^3/_4$ of the distance between anal and caudal. The ventrals are reaching beyond the base of the anal, they have a very strong spine. The pectorals are reaching beyond the base of the ventrals, the spine with strong recurved hooks on its outer margin, the largest at the tip.

Colour brownish to black, the fins are dusky.

D. I/8. A. I/5. V. I/5. P. I/6.

Otocinclus Cope

Otocinclus Cope, Proc. Acad. Nat. Sc. Phil., 1871, p. 283 (*vestitus*); — Vaillant, Bull. Soc. Philom. Paris (7), vol. 4, 1879-1880, p. 145.

Type: *Otocinclus vestitus* Cope.

This genus is distinguished from all other Loricardiidae by its perforated temporal plate and the large ventral plate.

"These characters are of generic value in themselves and exclude from *Otocinclus* all the species not possessing them, however they may resemble it otherwise." (Eigenmann & Eigenmann, 1890 b, p. 392).

Otocinclus affinis Steind.

Otocinclus affinis Steindachner, Sitz. Ber. Akad. Wiss. Wien, 76, 1877, p. 221, pl. II fig. 1 (Santa Cruz); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 41 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 392 (Santa Cruz, Dom Pedro II); — Vaillant, Bull. Soc. Philom. Paris (7), vol. 4, 1879-1880, p. 145 (Amazon); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 267 (Santa Cruz); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 412 (name only).

Museum Leiden:

No. 17199, from an aquarium, Leiden, Stol, 11-VII-1941, 1 ex., 38 mm.

The body is heavily compressed, everywhere deeper than wide. The occipital is terminating into an elevated triangular process with strong, small spines. The sides of the head are vertical. The temporal plate is

perforated. From the nares forward to the point of the snout runs a shallow groove. The snout is pointed.

Eye lateral, its diameter 2 in the snout, 4 in the length of the head and $2^1/_2$ in the interorbital.

Lateral series with 23 plates. All the plates on the head, on the lateral and ventral part of the body and on the caudal peduncle are hispid. The ventral surface between the coracoids and the ventrals is covered with 3 series of plates ending at the narrow base of a long, pointed, triangular plate between the ventrals. A Y-shaped naked area is henceforth formed, at the end of which the vent is situated. The lower surface of the head is naked. The clavicles and the coracoids are covered with spines.

Distance from the dorsal fin to the tip of the snout $2^1/_4$ in the standard length. The caudal is emarginate. The pectoral spine extends somewhat beyond the base of the ventrals, these do not reach the anal fin.

Colour brown, a narrow dusky bar extending from eye to caudal. A black spot on the base of the caudal.

D. I/6. A. I/5. V. 6. P. I/6.

The here described specimen differs in some characters from *Otocinclus affinis,* in others it reminds of *Otocinclus vestitus,* having the dorsal I/6.

The characters of *Otocinclus vestitus* Cope correspond to a large extent with those of *Otocinclus affinis.* It may therefore be that *Otocinclus vestitus* and *Otocinclus affinis* are synonyms. The species *Otocinclus maculicauda* Steind., not mentioned by Eigenmann & Eigenmann, is so closely related to *Otocinclus affinis* that, in my opinion, these two are identical too.

Lithoxus Eigenmann

Lithoxus Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 412 (name only); — Eigenmann. Mem. Carn. Mus., 5, 1912, p. 242 (*lithoides*).

Type: *Lithoxus lithoides* Eigenmann.

Body much depressed. Premaxillaries not united, much shorter than the dentaries and with fewer teeth, 2-3 on each side. Preoperculum with a bunch of spines, which are curved at their tips.

Lithoxus lithoides Eigenmann

Lithoxus lithoides Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 412 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 242, pl. 29 fig. 1-4 (Amatuk, Warraputa, Konawaruk, Crab Falls); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 235 (Warraputa).

Museum Amsterdam:

Amatuk, Lower Potaro, British Guiana Exp., 1908, Eigenmann, 3 ex., co-types, 2 ♂ ♂, 54 and 63 mm, 1 ♀ 52 mm.

Body heavily depressed, the greatest width $3^1/_2$ in the standard length. The head is flat, without keels, its width nearly equal to its length, which is $3^1/_4$ in the standard length. The occipital is bordered by three plates; two or three plates between the occipital and the small Y-shaped dorsal plate.

Eye in the posterior half of the head, its diameter 3 in the snout, 6 in the length of the head and $1^1/_2$ in the interorbital.

The mandibular ramus $2^1/_2$ in the interorbital, with few teeth. The oral disk largely covered with warts.

The lateral series with 23 scutes, 5 plates between dorsal and adipose and 10 behind the anal. The plates without keels, but with ridges.

The origin of the dorsal about halfway from tip of snout to spine of adipose. The dorsal placed in a deep wide groove, which reaches posteriorly to the adipose.

Adipose long, the membrane extending to near the base of the caudal. Caudal truncate, the lower lobe longer, its length equal to the length of the snout plus orbit. Anal minute. Ventrals rounded, reaching the middle of the anal. The pectorals are reaching the base of the ventrals in the female, till the half of the ventral spine in the male specimens. In the male the pectoral spine is covered with long recurved hooks, which have a length equal to the diameter of the orbit.

The body is sand-coloured, mottled with dark. All the fins are more or less barred.

D. I/7. A. I/3-4. V. I/5. P. I/6.

LORICARIINAE

Loricaria L.

Loricaria Linnaeus, Systema Naturae, ed. 10, I, 1758, p. 307; — Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 80 (*dura*).

Pseudohemiodon Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 81 (*platycephalus*).

Type: *Loricaria dura* L. = *Loricaria cataphracta* L.

Tail long, depressed, with a single series of plates along the sides. Teeth in the jaws in small or moderate number, not setiform. Orbital with a more or less distinct notch. Snout rounded or pointed, not produced.

Loricaria cataphracta L.

Loricaria dura Linnaeus, Mus. Adolphi Fred., 1754, p. 79, pl. 29 figs. 1 and 2; — Bleeker, Silures de Suriname, 1864, p. 18 (Surinam).

Loricaria cataphracta Linnaeus, Syst. Nat., ed. 10, I, 1758, p. 459 (America); — Bloch, Ausl. Fische, 8, 1795, p. 76, pl. 75 fig. 3 and 4; — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 330 (Surinam, Cayenne); — Muller & Troschel in Schomburgk, Reisen, 3, 1848, p. 631 (Rupununi); — Kner, Denkschr. Akad. Wiss. Wien, 6,

1854, p. 77 (Cubaja, Guaporé); — Günther, Cat. Fish. Brit. Mus. 5, 1864, p. 255 (Surinam); — Peters, M. B. Akad. Wiss. Berlin, 1877, p. 471 (Calabozo); — Cope, Proc. Amer. Phil. Soc., 17, 1878, p. 681 (Marañon, Peru); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 36 (Vigia, Sao Gonçallo, Cameta, Manaos, Para, Rio Negro, Coary, Villa Bella, Gurupa, Rio Preto, Tajapuru, Porto do Moz, Teffé, Marañon, Ucayala, Obidos); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 382 (localities as before); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 415 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 243 (Creek in Mora Passage, Mud-flats Demerara, Crab Falls); — Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 241 (Surinam).

Loricaria cirrhosa Bloch & Schneider, Syst. Ichthyol., 1801, p. 125, pl. 34.

Loricaria setifera Lacépède, Hist. Nat. Poiss., 5, 1803, p. 140 (South America).

Loricaria carinata Castelnau, Anim. Amer. Sud, 1855, p. 46, pl. 23 fig. 3 (Amazon).

Plecostomus flagellaris Gronow, Cat. Fish., ed. Gray, 1854, p. 158.

Museum Leiden:

The length of all the specimens is given without caudal.
No. 3113, Surinam, Dieperink, 1 ex., 136 mm.
No. 3114, Surinam, Dieperink, 2 ex., 103 and 125 mm.
No. 3116, Surinam, Dieperink, 1 ex., 299 mm.
No. 14794, Surinam, from Museum Cambridge, Mass., 1934, 1 ex., 186 mm.
No. 1914, Surinam, Dieperink, stuffed specimen, 312 mm.
No. 1915, Surinam, Dieperink, stuffed specimen, 310 mm.
No. 1916, Surinam, Dieperink, stuffed specimen, 339 mm.

Museum Amsterdam:

The length of all the specimens is given without caudal.
South America, 5 ex., 1 adult and 4 young, 126-315 mm.
Surinam-Brazil ?, 1 ex., 145 mm.

All the specimens in the collection of the Leiden Museum and of the Museum Amsterdam have the caudal mutilated. Of one specimen a small part of the elongated upper caudal ray is only left.

Body slender, depressed, the depth $1^1/_2$ in the width. The caudal peduncle flat and broad, its depth $3^1/_2$ in its width. The head is pointed, the tip of the snout and its margin rough. The length of the head 5 in the standard length, the width of the head $1^1/_5$ in its length. Occipital with two keels ending in rather strong spines posteriorly. Anteriorly the said ridges do not run parallel any more; they become blunt, and separate in such a way that they form the borders of an oval space; they meet again above the posterior nares. There are two series of bicarinate nuchal plates. The dorsal plate has one keel in the middle. The temporal plate with a low ridge, which runs up and on across the first 3 lateral plates. Occipital margined by 3 nuchal plates.

Eye with a shallow notch. The diameter of the eye 3-$3^1/_2$ in the snout, $5^1/_2$-$7^1/_2$ in the length of the head and 1-$1^3/_5$ in the interorbital. Eigenmann gives eye and interorbital 6 in the length of the head, which is incorrect.

Eigenmann mentions three long teeth on each side of the upper jaw. In the specimens of the Leiden Museum and those of the collection of the Museum Amsterdam this character cannot be verified, because some teeth have disappeared. A close examination of the upper jaw, however, induces me to presume that in any case more than 3 teeth stood on each side, in all probability 4 or 5. The lips have numerous long tentacles. The free portion of the barbel is much longer than the diameter of the eye, its tip reaches the base of the pectoral fin.

Scutes in the lateral line 17 + 16 — 18 + 15, the keels remaining distinct as far as the caudal. Eigenmann's account of 8 + 15 scutes in the lateral line is no doubt a misprint. I have noticed in some specimens, that the number of scutes on the right side and that of the left side may be different. The lower surface of the head is naked. The anal plate is composed of 3-4 plates. The ventral buckler consists of about 17 plates. The breast and belly are covered with plates in the old specimens, in the young the breast is almost naked and there is a naked area between the lateral plates on the anterior part of the belly.

The length of the first anal ray (and not the width as said by Eigenmann) 3 in its distance from the caudal. The ventrals have a prolonged outer ray, which is reaching to beyond the base of the last anal ray. The pectorals slightly emarginate, reaching beyond the origin of the ventrals. The upper caudal ray must be greatly prolonged, to more than $1^1/_2$ times the standard length; as mentioned above, unfortunately not one of the specimens in the collection has the caudal complete; so this character can not be verified.

The colour, as mentioned by Eigenmann, of the upper surface of the body and the fins is reddish bronwn, the caudal filament is banded.

D. I/7. A. 6. V. I/5. P. I/6.

Loricaria maculata Bloch

Loricaria maculata Bloch, Ausl. Fische, 8, 1794, p. 73, pl. 375 fig. 1; — Lacépède, Hist. Nat. Poiss., 5, 1803, p. 140 (South America); — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 350 (without locality); — Kner, Denkschr. Akad. Wiss. Wien, 6, 1854, p. 80, pl. 375 fig. 1-2 (Rio Guaporé, Matto Grosso, Surinam); — Günther, Cat. Fish. Brit. Mus., V, 1864, p. 257 (Brazil, British Guiana, Surinam); — Vaillant, Bull. Soc. Philom. (7), 4, 1880, p. 157 (Calderon); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 38 (Coary, Santarem, Iça, Hyavary, Obidos, Teffé, Jutahy); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 377 (localities as before); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 286 (Amazon, Guiana); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 414 (name only).

Loricaria cirrhosa var. *maculata* Bloch & Schneider, Syst. Ichthyol., 1801, p. 125.

Plecostomus maculatus Swainson, Class. of Fish. Amph. and Rept., 2, 1839, p. 304.

Loricaria amazonica Castelnau, Anim. Amer. Sud, 1855, p. 46, pl. 23, fig. 2 (Amazon).

Plecostomus cataphractus Gronow, Cat. Fishes, ed. Gray, 1854, p. 158.

Loricariichthys maculatus Bleeker, Silures de Suriname, 1864, p. 16 (Surinam).

Parahemiodon typus Bleeker, Silures de Suriname, 1864, p. 20, pl. VI fig. 1, pl. XIII fig. 1 (Surinam).

Loricaria typus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 37 (name only); — idem, Occ. Pap. Cal. Acad. Sc. vol. 1, 1890, p. 373 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 373 (name only); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 286 (Surinam, Amazon, Rio Paraguay); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 415 (name only).

Loricaria parahemiodon Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 258 (copied).

Loricaria valenciennesi Vaillant, Bull. Soc. Philom. (7), vol. 4, 1880, p. 157 (Calderon).

Loricaria stubelii Steindachner, Denkschr. Akad. Wiss. Wien, 46, 1882, p. 7, pl. III fig. 2 (Rio Huallaga); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 37 (Santarem, Hyavary, Teffé, Rio Preto, Rio Puty); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 370 (localities as before).

Loricariichthys typus Fowler, Proc. Acad. Nat. Sc. Phil., 1915, p. 238 (Surinam).

Museum Leiden:

No. 3115, Surinam, Dieperink, 1 ex., 198 mm.
No. 3118, Mexico, from Museum Berlin, 1843, 2 ex., 105 and 145 mm.
No. 3121, Surinam, 1 ex., 195 mm. This specimen is the holotype of *Parahemiodon typus* Bleeker.
No. 6916, Surinam, Bleeker, 1879, 2 ex., 115 and 205 mm.
No. 10722, Berbice River, New Amsterdam, Young, 2 ex., 167 and 185 mm.
No. 10723, Berbice River, New Amsterdam, Young.
No. 17252, Surinam, Bolten, 1 ex., 240 mm.
No. 17253, Botanical Garden, Paramaribo, 17-III-1939, Cossee, 1 ex., 215 mm.
No. 1913, Surinam, Dieperink, 1824, stuffed specimen without caudal, 131 mm.

Body slender, caudal portion of the body depressed. Head long, depressed, its length 4-4$^1/_5$ in the standard length, its depth about 1$^4/_5$ in its width. The upper surface of the head without keels. Occipital bordered by 3 plates, interorbital slightly concave. Snout depressed, somewhat pointed, its margin slightly turned upwards. The length of the snout 2-2$^1/_2$ in the length of the head.

Eye 2$^1/_2$-3 in the snout, 5-7$^4/_5$ in the length of the head and 1-1$^3/_4$ in the interorbital.

The lower surface of the head is naked except a narrow marginal band. A few minute teeth, 4-8 in the upper jaw, 6-10 in the lower jaw. The margin of the upper lip is slightly fringed; the lower lip is rounded and has two muscular warts.

In the specimens no. 3121 and 10723 the lower lip is much larger than in the others. Bleeker has brought the specimen 3121 to a new species, called *Parahemiodon typus,* but I think that the difference is due to sexual variation; that their fins are longer and broader has, in my opinion, the same

reason. In no. 10723 the first spine of the dorsal, pectorals, ventrals and anal is somewhat prolonged and stronger than in the other specimens; also the ventral buckler is larger and heavier. In the specimen described by Bleeker this was impossible to state, because the fins are badly damaged.

I have, therefore, brought *maculata* and *typus* to the same species. The anal plate is pointed in front and margined by 2-3 plates. The belly with 2 series of plates between the lateral plates.

The lateral series with 17-19 + 13-15 scutes, the lateral keels prominent, remaining distinct to the 17th-19th scute. In one specimen there is a difference between the series on the right and on the left side of the body, right 19 + 13, left 18 + 14.

The distance from the dorsal fin to the tip of the snout about 3 in the standard length. The caudal fin is emarginate, the upper lobe slightly produced. The anal is about as high as the ventrals, which are higher than the pectorals. The ventrals are reaching beyond the origin of the base of the anal, whereas in the probably male specimens in question, the ventrals reach beyond the end of the base of the anal; so do the pectorals in regard to the ventrals.

There is no distinction of colours. The specimens are all plain brown.

Eigenmann & Eigenmann (1890b, p. 377) say that *Loricaria maculata* has the back with five dark cross bands, the dorsal spotted, the spots extending upon the membranes in front of each ray. The tips of the fins are dusky. The margin of the lower caudal lobe is blackish, the base of the caudal is dusky.

D. I/7. A. I/5. V. I/5. P. I/6.

Loricaria laeviuscula Cuv. & Val.

Loricaria laeviuscula Cuvier & Valenciennes, Hist. Nat. Poiss., 5, 1840, p. 352 (without locality); — Kner, Denkschr. Akad. Wiss. Wien, 6, 1854, p. 81, pl. 3 (Barra do Rio Negro, Rio Branco, Marabitanos); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 256 (River Capin); — Vaillant, Bull. Soc. Philom. (7), vol. 4, 1880, p. 156 (Calderon); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 37 (Rio Madeira, Rio Trombetas, Coary, Jutahy, Porto do Moz, Fonteboa, Gurupa, Manaos, Lake José Assu, Silva, Lake Saracca, Xingu, Tonantins, Hyavary); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 380 (localities as before); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 284 (River Amazon); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 414 (name only).

Museum Leiden:

No. 3119, Rio Negro, Natterer, 1856, 1 ex., 240 mm.

Boy slender, depressed, the caudal portion with a median dorsal depression. The posterior part of the head is depressed, the anterior part with a steep descending profile. The snout is pointed. The typical character of

the species is the large eye, which in the described specimen is $5^3/_4$ in the length of the head, and the narrow interorbital which is $9^1/_5$ in this length. The upper surface of the head is evenly convex, without keels, the supraorbital edges are very slightly raised, the orbit with a broad shallow notch. The occipital is bordered by 2 nuchal plates. The lips are covered with very small papillae, the upper lip is narrow, with moderate tentacles, the lower lip is broad with an emarginate border. The free portion of the barbel is less than the diameter of the eye. Although the teeth in both jaws of the specimen here described are lost, it was possible to determine the number as about 10 on each side.

Eye $2^1/_2$-4 in the snout, 5-7 in the length of the head and 2-3 times the width of the interorbital.

The lateral series with 24 + 10 scutes, the lateral keels united posteriorly. The scutes are not distinctly carinate. The lower surface of the head is naked up to a line between the origin of the pectorals. The abdomen with 6 series of plates between the lateral series, the anterior plates smaller and more numerous, extending to the level of the outer angle of the gillopenings. The anal plate bordered laterally and anteriorly by a number of plates of moderate size. Of the lateral plates the most posterior ones are the largest.

The spines of the fins of the described specimen are all broken off, except those of the ventrals, the first spine of which is slightly elongate and reaches the base of the anal fin.

There are small round spots on head, body and fins except on the anal. The spots on the side of the body are large and form 2 longitudinal series.

D. I/7-8. A. 6. V. I/5. P. I/6.

Loricaria apeltogaster Boulenger

Loricaria apeltogaster Boulenger, Proc. Zool. Soc. London, 1895, p. 528 (Paraguay); — Trans. Zool. Soc. London, 14, 1898, p. 33 (Paraguay); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 292 (Paraguay).

Museum Amsterdam:

Parana River, Rosario de Santa Fé, Capt. Noordraven, SS. Drechterland, 1 ex., 313 mm.

Body slender, heavily depressed. The head is flat and broad, its width equal to its length. The length of the head nearly 5 in the standard length. The snout acutely pointed, feebly projecting beyond the upper lip. The plates of the head are strongly spinulose, the spines forming fine lateral ridges over the whole surface of the head. The occipital with two closely approximated, parallel keels. The two following nuchal plates bicarinate,

the third plate, the last before the dorsal, with one median keel. The orbit without a distinct notch.

The diameter of the eye 4 in the snout, $7^1/_2$ in the length of the head and $1^1/_2$ in the interorbital.

The upper lip narrow with long fringes along the whole margin, the lower lip rather large, covered with papillae and fringed; the barbel is long and reaches nearly the gill-opening. The teeth are all bifid, 3 in the upper jaw and in the lower jaw 7 on each side.

The lateral series with 33 scutes, with two spinulose ridges, not completely joined on the 19th. There are 22 scutes between the dorsal and the caudal and 19 between the anal and the caudal. Breast and belly with small stellate shields and 11 transverse shields, on both sides of the base of the ventrals, the first ray greatly produced, the fin somewhat longer than the head. Caudal fin deeply forked, the outer rays strong. The lower ray slightly produced; the strength of the upper ray makes it probable that this ray may be produced too; this cannot be confirmed though, because it is broken off. The anal fin is long, the first ray strong and spinulose. The ventral also long, the first ray thick, rounded, produced, the greater part of the spine soft, covered with thorns, reaching beyond the middle of the anal fin. The pectoral fin with a long produced spine is reaching far beyond the tip of the anal. The tips are broken off, but the remainder of one of the spines is still there.

Of the colourmarks only the dots on the finrays and the blackish marks on the pectoral fins can be seen.

D. I/7. A. I/5. V. I/5. P. I/6.

Boulenger (1895, p. 528) has seen 4 specimens from Paraguay. Regan (1904, p. 292) has also seen one specimen from Paraguay. The specimen here described agrees with the description given by Boulenger as well as that by Regan, except concerning the characters of the dorsal and pectoral spine. They do not mention the producing of the spine in any of their specimens. It may be possible that this producing is a character of the male, but more material and the type must be examined to state whether this character is a sexual one.

Loricaria lima Kner

Loricaria lima Kner, Denkschr. Akad. Wiss. Wien, 6, 1854, p. 89, pl. VI fig. 1a, 1b (Brazil); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 260 (copied); — Hensel, Wiegmann's Archiv Nat. Gesch., 1868, p. 366 (stony brooks near Santa Cruz); — Lütken, Overs. Dansk. Vid. Selsk., 1875, p. 138 (Rio das Velhas); — Steindachner, Denkschr. Akad. Wiss. Wien, 44, 1881, p. 6, pl. 1 (Rio Parahyba, Rio Macacos, Rio Preto, Rio Quenda, Rio das Velhas); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 35 (Mendez, Santa Cruz, Rio Quenda, Rio Parahyba, Campos, Rio Macacos);

— idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 368 (localities as before); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 282 (Eastern Brazil).

Loricaria strigilata Hensel, Wiegmann's Archiv Nat. Gesch., 1868, p. 368 (stony brooks near Santa Cruz).

Hemiloricaria caracassensis Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 81 (Caracas).

Museum Leiden:

No. 17331, La Plata River, Beckers, 1 ♂, 121 mm.

No. 17299, Port Real, Rio de Janeiro, Hardy du Dréneuf, 1890, 1 ♀, 101 mm.

No. 3120, Caracas, Lansberge, 1843, 1 ex., 87 mm, with a caudal filament of 25 mm. This specimen is the type of *Hemiloricaria caracassensis* Bleeker.

Body depressed, elongate, the depth about 2 in the width. The head long, tapering, its length $4^1/_5$ in the standard length, width of the head $1^1/_3$ in the length. The cheeks of the male are thickly covered with bristles, those of the female hispid. The upper surface of the head with longitudinal series of small serrae. The occipital with two X-shaped ridges, widening backwards and continued upon the nuchal plates. The occipital truncate behind, margined by three plates. Between the occipital and the dorsal plate two nuchal plates with a deep median depression. Orbital margins raised, the interorbital concave. The orbit with a rather large notch.

Eye $3^1/_2$ in the snout, 7 in the length of the head and $1^3/_4$ in the interorbital.

Teeth few, well developed in both jaws. Margin of the lips fringed, short cirri covering the surface. Free portion of the barbel equal to the orbital diameter.

Lower surface of the head naked. Lateral series 15 + 14 scutes, with keels which are coalesced, starting from the 16th. All the scutes in front of the dorsal weakly carinate, the lateral keels obtuse. Abdomen with 3 series of plates between the posterior 4 plates of the lateral series. The anterior plates of the abdomen smaller and more numerous, extending to the middle of the gill-openings. The anal plate is bordered by 3 plates, these again by 5.

Distance from dorsal fin to tip of snout $3^1/_4$ in the standard length, the first dorsal ray as long as the head. Caudal emarginate, the upper ray produced into a filament, its length $2^1/_3$-3 in the standard length. Ventrals not produced, not reaching the anal, rounded, the second branched ray the longest. The pectoral spine extending to the base of the ventrals.

The specimens preserved in alcohol during a long time have a brown colour with 4 dark cross bands. The upper part of the dorsal is blackish. The caudal is black at the base and at the posterior margin.

D. I/7. A. 6. V. I/5. P. I/6.

No. 3120 of the Leiden Collection is the type of *Hemiloricaria caracas-*

sensis Bleeker. The description of this species based on his single known specimen is so unadequate, that all authors give it as not classifiable.

Bleeker describes the species as follows: "Velum labiale vise fimbriatum postice latum, antice angustum. Dentes utraque maxilla conspicui. Cristae occipitales vel nuchales dentatae nullae. Scuta trunco carina dentata. Regio subthoracico-analis scutata. Pinna dorsalis supra ventralis incipiens". The characters of the specimen no. 3120 are without any doubt those of a young female of *Loricaria lima* Kner.

Loricaria grisea Eigenmann

Loricaria griseus Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 414 (name only).

Loricariichthys griseus Eigenmann, Mem. Carn. Mus., 5, 1912, p. 246, pl. XXX fig. 2, pl. XXXII fig. 2 (Konawaruk, Bartica sandbank Essequibo River); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 274 (Rupununi).

Museum Amsterdam:

Bartica, Essequibo, British Guiana Exp., 1908, Eigenmann, 1 ex., co-type, 78 mm, without caudal.

Body slender, greatly depressed. Head without keels or ridges, its length 5 in the standard length, its width $1^1/_2$ in its length. A very obscure groove is continued in the first pair of nuchal plates.

Eye without distinct notch, its diameter 2 in the snout, $3^3/_4$ in the length of the head and 2 in the interorbital.

Snout pointed. The upper lip well developed, papillose and margined with tentacles at the sides only, not in the middle. Lower lip broad, nearly reaching the lower edge of the gill-opening. The surface of the lip with minute warts, the warts more conspicuous on the posterior part; the margin of this lip emarginate. The edge of the lip with minute tentacles and a barbel, of which the free portion has a length of $^1/_3$ of the diameter of the eye.

The distance between the tip of the snout and the base of the dorsal 3 in the standard length. The caudal fin is partly broken off. The anal fin is long; its length is equal to the length of the head. The ventrals are reaching the base of the anal. The pectorals are truncate, the spine not prolonged, reaching a little beyond the base of the ventrals.

The lateral series with 18 + 11 plates, the lateral keels remaining separate all along. The anal plate is enlarged and bordered by four plates. There are two series of plates between the lateral plates of the belly, the plates becoming gradually more numerous towards the front. The anterior border of the ventral armature is a straight line between the origins of the bases of the ventrals; a group of little scales situated in front of this line does not

belong to the said ventral armature, and therefore cannot make the border in question emarginate.

Colour brownish, the back spotted all over, cross-bars are not to be seen. The caudal is spotted, darker near the tip. The anal fin is hyaline, the dorsal also; but with brown spots on the rays, forming transversal bands.

D. I/6. A. 5. V. 6. P. I/6.

Loricaria brunnea Hancock

Loricaria brunnea Hancock, Zool. Journ., 4, 1828, p. 247 (Demerara); — Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 353 (copied); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 260 (copied); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 370 (name only); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 415 (name only).

Loricariichthys brunneus Eigenmann, Mem. Carn. Mus., 5, 1912, p. 247, pl. XXX fig. 3, pl. XXXI fig. 4 (Maduni, Demerara, Christianburg Canal, Wismar, Kumaka, Malali, Gluck Island, Rockstone, Tumatumari, Rupununi).

Museum Amsterdam:

Maduni Creek, British Guiana Exp., 1908, Eigenmann, 1 ex., 125 mm.
Christianburg, Demerara, British Guiana Exp., 1908, Eigenmann, 1 ex., 105 mm.

Body slender, caudal peduncle very long and slender, depressed. Length of the head $5^1/_2$ in the standard length, its width $1^1/_4$ in its length. The head without keels, two obscure ridges on the occipital, which are diverging and continued on the first two nuchal plates. The supra-orbital edges raised.

Eye with a notch, its diameter $2^1/_2$ in the snout, 5 in the length of the head and equal to the interorbital.

In both jaws 6 teeth on each side. The upper lip is interrupted in the middle. The lips are both fringed along their whole margin, the surface of the lower lip is papillose. The snout pointed, its whole surface, the margin included, covered with bristles.

The distance between the tip of the snout and the base of the dorsal $3^1/_2$ in the standard length. The dorsal fin obliquely truncate. The first ray the longest, its length $1^1/_4$ times the length of the head. The caudal fin of the described specimen misses the elongate portion of its upper ray. The anal fin as long as the head. The spines of the ventrals are elongate, reaching to $^1/_4$ of the length of the anal. The pectoral spine is somewhat elongate, reaching till $^1/_3$ of the ventral.

The lateral series with 13 + 15 scutes, the keels posteriorly entirely united. The anal plate is bordered by 3 plates, which are margined by 5 plates. 3 series of plates between the lateral series of the belly, but they are joined to form one single transverse scute. The breast armature has

developed as far as the anterior angle of the gill-openings. All the plates of the body are spinose.

Colour of the dorsal surface brown, marbled with darker brown and with five dark transversal bands behind the dorsal fin. The fins are spotted. On the head black pores, and a black spot in front of the dorsal. A dark blotch on the base of the caudal fin.

D. I/7. A. I/5. V. I/5. P. I/6.

Harttia Steindachner

Harttia Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1876, p. 668 (*loricariformis*).
Oxyloricaria Bleeker, Nederl. Tijdschr. Dierk., I, 1683, p. 81 (orthotype of *Loricaria barbata* Kner).
Oxyloricaria Regan, Trans. Zool. Soc. London, 17, 1904, p. 298 (*platystoma*).

Type: *Harttia loricariformis* Steindachner.

This genus is to be distinguished from *Loricaria* by the short, broad body. Snout not produced into a rostrum. Teeth numerous, setiform, in about equal numbers in both jaws. No adipose fin. The lateral plates are not distinctly keeled. The dorsal is inserted opposite the ventrals. A series of broad paired plates behind the dorsal fin.

Harttia loricariformis Steind.

Harttia loricariformis Steindachner, Sitz. Ber. Akad. Wiss. Wien, 74, 1874, p. 669, pl. VI fig. 2, 2a, 2b (Rio Parahyba); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 39 (Rio Parahyba, Itabapuana, Muriahe); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 386 (localities as before); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 412 (name only).
Oxyloricaria loricariformis Regan, Trans. Zool. Soc. London, 17, 1904, p. 298 (South-Eastern Brazil).

Museum Leiden:

No. 11001, Surinam, Coppename Exp., Aug.-Sept. 1901, Boon, 1 ex., 82 mm.

Body slender, depressed. Head flat in the adult, but in the here described young specimen the sides of the head and the snout are steeper. The supra-orbital edges slightly raised. Snout of moderate length, pointed, in the adult the snout is more rounded. The length of the head $5^1/_4$-6 in the standard length. The mouth is broad, its width $2^1/_2$ in the length of the head. The scutes of the head and body smooth.

The upper lip well developed, the lower lip semi-circular and of moderate width, papillose, the margin slightly fringed and with a minute barbel near the corner of the mouth. Teeth very fine, about 50 on each side in the upper and 40 in the lower jaw. The series of the upper jaw occupies nearly the whole width of the mouth.

The orbit is nearly circular, without notch. Eye 3-3 1/2 in the snout, 6 in the length of the head and 4 in the interorbital.

Lateral series with 29 scutes, the keels approximate from the 21st scute. The lateral keels very weak and obtuse, the scutes otherwise not carinate. The lower surface of the head naked except for a granular plate in front of the gill-cleft. The abdomen is covered with numerous small plates, arranged in 8-10 irregular series between the lateral plates. The posterior plates somewhat larger and less in number. A pair of rather large anal plates.

The origin of the dorsal nearly opposite to that of the ventrals. The spine and the first soft ray of the dorsal very long, nearly 1 1/2 times the length of the head. The other rays much shorter, the length of the last 3 in the length of the spine. The caudal is deeply emarginate, the upper lobe somewhat longer. The anal with a short base. The rays are rapidly decreasing in length, the 6th ray half the length of the first. The ventrals are prolonged, reaching the base of the anal. The pectorals are very long, the first and second ray reaching the middle of the ventral fins.

Colour brown with obtuse dark spots on the body, on the head the spots are more conspicuous. The dorsal light with dark spots in transversal rows, the caudal with a dark blotch along its posterior margin.

D. I/7. A. 6. V. I/5. P. I/5.

Harttia platystoma (Günther)

Loricaria platystoma Günther, Proc. Zool. Soc. London, 1868, p. 236, figs. 4 & 5 (Surinam); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 385 (name only).

Oxyloricaria platystoma Regan, Trans. Zool. Soc. London, 17, 1904, p. 298 (Surinam); — Fowler, Proc. Acad. Nat. Sc. Phil., 1914, p. 274 (Rupununi); — idem, Acad. Nat. Sc. Phil., 1915, p. 241 (Warraputa Falls, British Guiana).

Harttia platystoma Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 415 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 251, pl. XXX fig. 6, pl. XXXI fig. 1-2 (Rockstone, Konawaruk, Warraputa).

Museum Leiden:

No. 17332, Lucy River, Corantyne Exp., 1910, Hulk, 2 ex., 116 and 181 mm.

Museum Amsterdam:

Warraputa Falls, Essequibo River, British Guiana Exp., 1908, Eigenmann, 1 ex., 79 mm.

Body broad, greatly depressed, depth about 2 1/2 in the width. The length of the head 4 in the standard length. The head is also broad and depressed, as broad as long, and nearly 3 times as long as deep, the snout is rounded, the occiput flattish and the interorbital slightly concave. A low crest from the tip of the snout to between the anterior part of the interorbital. The

tip of the snout is naked, the margin of the head shows very fine movable bristles.

The diameter of the eye 2 in the snout, 4 in the length of the head (the specimen is young) and equal to the interorbital.

Lateral series with 24 + 4 scutes, none of the scutes distinctly carinate. The underneath part of the head naked, except for a granular plate in front of the gill-cleft. Abdomen naked except for a lateral series of 7 plates and a pair of anal plates.

The first dorsal ray is as long as the head. The pectoral spine is covered with bristles reaching beyond the base of the ventrals. The ventrals are reaching beyond the base of the anal fin. The caudal is emarginate.

The colour of the back is blackish, marbled with white. The fins are spotted.

D. I/7. A. 6.

Hemiodontichthys Bleeker

Hemiodontichthys Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 81 (*acipenserinus*).

Type: *Hemiodon acipenserinus* Kner.

This genus is characterised by its long expanded snout, which is armed at the tip. The armature of the lateral keels is more marked than in most of the other genera. This genus differs from *Acestra* in the position of the dorsal fin.

Hemiodontichthys acipenserinus (Kner)

Hemiodon acipenserinus Kner, Denkschr. Akad. Wiss. Wien, 6, 1853, p. 82, pl. 7 fig. 2 (Rio Guaporé, Matto Grosso).

Loricaria acipenserina Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 260 (copied); — Vaillant, Bull. Soc. Philom. (7), vol. 4, 1880, p. 159 (Calderon).

Hemiodontichthys acipenserinus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 34 (Manacapurú, Hyavary); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 359 (localities as before); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 296 (without locality); — Eigenmann, Ann. Carn. Mus., 4, 1907, p. 120, pl. 35 fig. 1 (Corumba); — idem, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 415 (name only); — idem, Mem. Carn. Mus., 5, 1912, p. 250 (Gluck Island).

Museum Leiden:

No. 2991, Matto Grosso, Natterer, 1856. The specimen is missing the posterior part of the caudal portion of the body, so it is impossible to give the length and some other characters.

Head and body greatly depressed, the depth 2 in its width. Head broad and flat, its depth less than half the length of the snout. Occipital with two distinct keels, which are continued on the nuchal plates, but end in a diffuse way on the dorsal plate in a median keel. The occipital plate is margined by three plates. The entire upper surface of the head with

longitudinal series of serrae. The margin of the head with 3 series of rather large hooks, those of the lower series the largest and the strongest. The humeral plate with radially arranged interrupted canals.

Snout exceedingly long and narrow, $2^1/_2$ times as long as the postorbital part of the head. The tip is slightly turned upwards, expanded, its extremity naked, the upper and lower surfaces with series of serrae, its margin near the tip with several strong hooks. Teeth minute, only present in the lower jaw. Lips narrow. Barbels well developed, their free portion nearly equal to the diameter of the eye.

Orbit with a deep notch behind, diameter of the eye $4^1/_2$ in the snout, 8 in the length of the head and equal to the interorbital.

The lateral keels very strong, approximated on the 12th scute. The region between the pectorals with 5 regular scutes, 2 on each side, and one somewhat larger in the middle. 3 series of scutes on the belly. Anal plate longer than broad, margined by 3 scutes, a little one in front and a larger one on each side, till half way the side. The anal plate is joined to the postanal plates, leaving only a narrow naked area.

The dorsal fin is much higher than long, inserted behind the vertical from the last ventral ray. The ventrals reaching the base of the anal. The pectoral spine stout, somewhat curved, its inner margin serrate, the outer margin with numerous small spines.

Colour light brown, with a dark bar across the eyes and across the occiput.

D. 8. A. 6. V. I/5. P. I/6.

Farlowella Eigenm. & Eigenm.

Acestra Kner, Denkschr. Akad. Wiss. Wien, 6, 1854, p. 93 (preoccupied in Catalogo Metodico dei Pesci Europei, C. L. P. Bonaparte, 1846, p. 91).

Farlowella Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 32 (*acus*).

Type: *Acestra acus* Kner.

Very slender, elongate, snout narrow, produced. Dorsal fin inserted at least over the ventrals. Six or more large plates between the occipital and the dorsal. The species of this genus are the extremes in slenderness and in the prolongation of the snout.

Farlowella acus (Kner)

?*Loricaria scolopacina* Filippi, Rev. and Mag. Zool., 1853, p. 156.

Acestra acus Kner, Denkschr. Akad. Wiss. Wien, 6, 1854, p. 93, pl. VIII fig. 1 (Caracas); — Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 261 (copied).

Farlowella acus Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 34 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 358 (name only).

Museum Leiden:

No. 3127, Caracas, Van Lansberge, 1842, 2 ex., 1 ♀, 165 mm and 1 ♂, 179 mm.

Body little depressed. The length of the head in the male specimen $4^1/_6$, in the female not yet 4 in the total length. Distance from occipital to the base of the first dorsal ray $4^3/_4$ in the standard length. The length of the produced part of the snout in the male is 4, in the female $3^1/_2$ times in the distance from the tip of the snout to the anus. The width of the head in the male $3^1/_2$, in the female 4 in its length.

Diameter of the eye nearly 20 in the length of the head, the interorbital width $4^1/_4$-$4^3/_4$ in the length of the head.

The male is characterized by the strongly bristled sides of the head.

The lateral series with 15-16 + 16-17 scutes. 8 scutes between occipital and dorsal. Abdomen without a median series of plates, except 3 anteriorly.

The female specimen has the lower caudal ray produced. The upper caudal ray and the caudal rays of the male are mutilated.

The specimens have no colourmarks.

D. I/6. A. I/5.

Farlowella amazonum (Günther)

Acestra amazonum Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 261 (Santarem).

Farlowella amazona Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 34 (name only); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 358 (name only).

Farlowella amazonum Regan, Trans. Zool. Soc. London, 17, 1904, p. 305 (without locality); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 416 (name only).

Farlowella carinata Garman MS.; — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 2, 1889, p. 32 (Santarem, Teffé, Gurupa, Obidos, Jutahy, Tabatinga); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 356 (localities as before).

Museum Leiden:

No. 14763, Obidos, Brazil, from Museum Cambridge, Mass., May 1934, 1 ex., 169 mm.

The species brought to the genus *Farlowella* will prove to be mere synonyms, according to the description (Eigenmann & Eigenmann, 1890b, p. 358). The characters of the specimen in the Leiden Museum, mentioned above, prove that *Farlowella carinata* (Garman) and *amazonum* (Günther) are synonyms.

The body is somewhat compressed, subterete, the tail is much depressed. Snout exceedingly long (greatly varying in length in specimens from various localities, Eigenmann). Distance from the gill-opening to the tip of the snout equal to that from the former to the posterior end of the base of the dorsal fin. Margin of the snout with finely granular plates, each of

which with a granular knob in its centre. The temporal plate with vermiculating ridges. Interorbital flattish. Length of the head 3 in the standard length. Interorbital flattish. Orbit 3 in the interorbital. From the occipital, which is obscurely tumid, there are two parallel ridges on the nuchal plates. Soft parts of the mouth in an oval depression, teeth fine, numerous. Barbels obsolete.

Sides of the body covered with two series of 34 indistinctly keeled plates, the keels coalescing behind the anal. 7 paired plates between dorsal and occipital, 22 plates between dorsal and caudal. Dorsal plate elongate, separating two pairs of plates. The region between mouth and pectoral with marginal plates, between these some irregular polygonal plates; this is a character of the adult. The young has marginal plates only (Eigenmann). Belly with two series of plates, with a median keel. The anal plate is arrow-shaped, a small unpaired plate before it.

Whether the outermost caudal rays are elongated, as Eigenmann says, is not to be seen in the described specimen because the caudal is damaged.

Colour light brown, the fins barred with darker brown.

D. I/6. A. 6. V. 5. P. I/6.

Günther mentions *Farlowella gladiolus* (Günther) as occurring in the River Cupai. As this name probably is a synonym of *Farlowella amazonum*, the latter species may occur in Surinam.

ARGIINAE

Siluroidei astroblepiformes Bleeker, Nederl. Tijdschr. Dierk., I, 1863, p. 110 (part.).
Siluridae proteropodes Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 4 (part.).
Argiidae Gill, Arrangement of Families of Fishes, 1872, p. 19; — Eigenmann & Eigenmann, Am. Naturalist, July, 1888.

Mouth inferior, lower lip very broad. Teeth bicuspid, in a narrow band in each jaw. Body entirely naked. Maxillary barbels two. No mental or nasal barbels. Dorsal placed over the ventrals.

Arges Cuv. & Val.

Arges Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 242, pl. 444 (*sabalo*).
Brontes Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 254, pl. 445 (*prenadilla*).

Type: *Arges sabalo* Cuv. & Val.

The principal difference in characters of *Arges* and *Cyclopium* concerns the adipose fin. This fin is a long low fold of skin, which gradually merges into the dorsal profile anteriorly and posteriorly, with or without a spine.

Arges longifilis Steind.

Arges longifilis Steindachner, Denkschr. Akad. Wiss. Wien, 46, 1883, p. 19, pl. V fig. 3, 3a and 3b (Rio Huambo? probably must be Huamango); — Eigenmann & Eigenmann, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 349 (name only); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 413 (Rio Totora, Peru).

Museum Leiden:

No 15314, Peru, De Voogd, Nov. 1934, 1 ex., 182 mm.

Body plump, somewhat depressed, caudal part compressed. The length of the head $4^1/_3$, its depth $5^1/_2$ in the standard length. Mouth between the rictus 3 in the length of the head. Head narrowing before the eyes in such a way that the snout obtains the shape of an ellipse. The intermaxillary with 5 rows of teeth. The outer series is composed of small teeth, which are inclined to bend backwards, being concave posteriorly. The teeth are broad at the top. The other teeth of the intermaxillary and those of the dental at their base are forked in two diverging branches. The teeth are placed in a thick mucuous skin, covering them nearly to the top. Maxillary barbels nearly to the gill-opening. Nares round, with a skinflap between them. The lower lip is broad, papillose, rounded.

Eyes on the upper surface of the head, directed upwards, on $^2/_3$ of the length of the head. Interorbital $3^1/_2$ in the length of the head.

The distance from the dorsal to the adipose equal to the length of the dorsal base. The insertion of the first dorsal ray nearly above that of the ventrals. The dorsal spine rough, elongate, nearly as long as the head. The adipose fin is very long, its length 2 in the standard length. The fin is thick and fleshy, reaching the caudal and covering the accessory rays. Caudal emarginate, the outer rays elongate, enlarged and covered with little spines. Anal with 7 rays, the first ray enlarged and spinous. The first ventral spine is broad, flat, thick and covered with rows of little spines. The pectoral spine is very long, its length $3^1/_2$ in the standard length and reaching till $^3/_4$ of the ventral.

Colour brown with dark spots. On the base of the caudal a large dark spot. On the caudal dim dots in transversal rows; the other fins yellow. The ventrals yellow-brown.

D. I/6. A I/6. V. I/4. P. I/11.

Cyclopium Swainson

Pimelodus Humboldt, Obs. Zool., I, 1811, p. 21 and 24, pl. VII.
Arges Cuvier & Valenciennes, Hist. Nat. Poiss., 5, 1840, p. 247 (sp.),
Cyclopium Swainson, Nat. Hist. Fish., 2, 1839, p. 305 (*humboldtii* = *cyclopum*).
Stygogenes Günther, Cat. Fish. Brit. Mus., V, 1864, p. 223 (*humboldtii* = *cyclopum*).

Type: *Pimelodus cyclopum* Humboldt.

Adipose short, with a short spine, situated near the caudal. Eye small, on the upper surface of the head. Teeth small, those of the mandibles and the inner ones of the intermaxillary broadened and notched at the tip.

Cyclopium cyclopum (Humboldt)

Pimelodus cyclopum Humboldt, Observ. Zool., I, 1811, p. 21 and 24, pl. 7 (Cotopaxi, Imbaburu, Cargueirazo, Tungaraga); — Orton, The Andes and the Amazon, 3rd ed., 1875, p. 143 (San Plabo Lake, at the base of the Caragueirazo).

Arges cyclopum Cuvier & Valenciennes, Hist. Nat. Poiss., 15, 1840, p. 253 (copied); — Regan, Trans. Zool. Soc. London, 17, 1904, p. 311 (locality unknown).

Stygogenus cyclopum Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 224 (copied).

Cyclopium cyclopum Putnam, Amer. Naturalist, 1871, p. 694 (Quito); — Eigenmann & Eigenmann, Proc. Cal. Acad. Sc. (2), vol. 1, 1888, p. 164 (Quito); — idem, Occ. Pap. Cal. Acad. Sc., vol. 1, 1890, p. 350 (Quito); — Evermann & Kendall, Proc. Biol. Soc. Washington, 18, 1905, p. 92, fig. 1, 2 (Ecuador); — Eigenmann, Repts. Princeton Univ. Exp. Patagonia, 3, 1910, p. 417 (name only).

Cyclopium humboldtii Swainson, Nat. Hist. Fish., 2, 1839, p. 305 (copied).

Stygogenes humboldtii Günther, Cat. Fish. Brit. Mus., 5, 1864, p. 223 (locality unknown); — Boulenger, Proc. Zool. Soc. London, 1887, p. 276, pl. XXI fig. 2 (Canelos).

Museum Leiden:

No. 14784, Palmira Pass, Ecuador, headwaters of a branch of the Amazon River, Davis, from Museum Cambridge, Mass., May 1934, 1 ♀, 61 mm.

Body elongate, depressed in front, somewhat compressed behind. Head short and broad, its length nearly $4^1/_2$ in the standard length, width equal to the length of the head, depth 2 in this length.

Eyes very small, covered with transparent skin, situated at $^3/_5$ of the length of the head, close together, directed upwards. Interorbital 3 in the length of the head.

Nostrils placed forward near the swollen upperlip. The anterior and posterior nares close together, only separated by a conspicuous velum. Two maxillary barbels, $^1/_2$ of the length of the head, reaching the gill-opening. Lower lip broad, rounded, without a median cleft, but with a median fold. Teeth in bands in both jaws. In the intermaxillary those of the outer series simple, conical; those of the inner series at the tip many times as wide as at their base, deeply notched. In the lower jaw the teeth all deeply notched, the outer ones much larger. The gill-opening does not reach as far as the eye.

The anterior region of the body with a median series of conspicuous pores.

The first ray of all the fins simple, thickened but flexible, not spine-like, covered with backwards directed bristles. Distance from dorsal fin to tip of snout 3 in the standard length. The adipose with a small pungent spine, is covered with thick skin, so it is hardly to be seen and not comparable

with the adipose in the figure given by Von Humboldt and by Boulenger. Anal rays closely set. Ventral fins inserted slightly in front of the vertical from the dorsal, the outer ray as long as the head. The pectoral spine is as long as the ventral fin, reaching its base.

Colour dark olive with black spots.

D. I/7. A I/6. V. I/4. P. I/8.

In the figure by Boulenger the ventrals are slightly too much approximated.

The description of *Pimelodus cyclopum* by Von Humboldt (1811, p. 21 and 24) makes an absolute indification impossible, but the figure agrees with the specimen in the Leiden Museum, but for the adipose, which in the latter is very obscure, Von Humboldt did not mention the spine of the adipose, he probably overlooked that.

Cyclopium cyclopium Putnam is a synonym of *Pimelodus cyclopum* Humb. as stated by Putnam (1871, p. 694).

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Showing the variation in some specimens of *Rhamdia quelen* (Quoy & Gaimard) in the Leiden collection

TABLE I

SPECIMENS AND LOCALITIES	3064 Surinam	3065 Surinam	3066 Surinam	3067 Surinam	3067 Surinam	3067 Surinam	3067 Surinam	3068 Surinam	3068 Surinam	6884 Surinam	10728 Berbice river	10728 Berbice river	11056 Surinam	16063 Brazil	17245 Brazil	17261 Surinam	17262 Surinam	17312 Surinam	17313 Upper Sarramacca	17314 Surinam	14753 Rio de Janeiro	14753 Rio de Janeiro	17315 Port Reaal	17315 Port Reaal	17315 Port Reaal
Length	300	210	178	276	210	192	187	190	130	220	252	250	205	280	238	188	210	170	230	225	190	138	235	202	215
Standard length	242	175	140	215	171	158	152	152	99	172	213	206	165	230	198	150	172	136	195	180	156	112	190	166	180
Depth of body in standard length	4 1/3	5	5 1/2	5	5 1/3	6	6	5 1/4	4 1/2	4 1/4	5	5	4 5/7	6 1/2	5 1/2	5 1/3	5	4 1/2	5	4 1/2	6	5 1/3	6	5 1/5	5
Length of head in standard length	4	4	4	4 1/4	4	4 1/2	4 2/3	4 1/3	4	4 1/4	4 1/2	4 1/2	4 1/3	4 1/2	4 9/10	4	4	4	4 1/4	4	4	4	3 4/5	3 1/2	4
Width at the rictus in length of head	2 1/3	2	2	2 1/3	2	2	2	2	2	2	1 3/4	2	2	2	2	2	2	2	2 1/4	2 1/4	2 1/4	2	2 1/3	2 1/3	2
Depth of the head in length of the head	1 1/2	1 2/3	1 2/5	1 1/2	1 1/2	1 3/4	1 3/5	1 1/2	1 3/4	1 1/3	1 1/3	1 1/2	1 1/2	2	1 1/6	1 1/3	1 2/7	1 2/5	1 1/3	1 2/7	1 1/2	1 2/3	1 2/3	1 2/3	1 2/3
Distance from tip of snout to origin of adipose in standard length	2	2	2	2	2	2 1/4	2	2	2	2	2	1 9/10	2 1/10	1 2/3	2	2	2	2	1 3/4	2	2	2	1 5/8	1 4/5	2
Eye in snout	2	3	2 1/3	2 1/2	2	2 1/3	2	2 1/2	2	2 1/2	2	2 1/2	2	2 1/2	2	2	2	2	2	2 1/2	2	2	2	2 1/2	3
Eye in head	7 1/2	7	6	6 1/2	5	5	5	6	5	5	6	6	6 1/3	7	5 1/2	5 1/2	5 1/2	5	5	5 1/2	5 1/2	6	6 1/4	6 1/2	6 1/2
Eye in interorbital	2 1/3	2 1/3	2	2	2	2	2	2 1/2	2	2 1/4	2 1/2	2 1/4	2 1/3	2 1/2	2	2	2 1/4	2	2	2 1/2	2	2	2 1/4	2 1/2	2 1/2
Maxillary barbels reaching to	1/2 of adipose	4/5 of adipose	beyond the end of adipose	1/3 of adipose	origin of adipose	origin of adipose	2/3 of adipose	2/3 of adipose	origin of adipose	2/3 of adipose	2/3 of adipose	3/4 of adipose	beyond the end of adipose	not to origin of adipose	1/2 of adipose	2/3 of adipose	3/4 of adipose	beyond base of caudal	5/7 of adipose	2/3 of adipose	origin of adipose	4/5 of adipose	1/4 of adipose	origin of adipose	2/3 of adipose
Dorsal	I/6	I/7	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6
Anal	12	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Pectoral	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8	I/8

Showing the variation in some specimens of *Pimelodus clarias* (Bloch) in the Leiden collection

TABLE II

MUSEUM LEIDEN LOCALITY	3069 ♀ —	3070 —	3071 —	3072 —	16146 ♂ —	17302 La Plata	17302 La Plata	17303 Surinam	17303 Surinam	17303 Surinam	17479 young Surinam	17333 Surinam	17333 Surinam	17334 Surinam	17255 Surinam	17255 Surinam	17255 Surinam	17255 Surinam	17255 Surinam	17255 Surinam	17255 Surinam	17255 Surinam	17255 Surinam	17304 Surinam	17304 Surinam	17304 Surinam
Length	220 mm	164	190	120	282	124	138	131	87	70	58	290	291	—	—	—	106	119	—	—	140	128	110	90	206	107	104
Standard length	184 mm	125	150	98	205	95	101	96	77	53	45	235	235	325	141	149	87	90	152	97	115	96	87	77	148	94	84
Head length in standard length	3	3	3	$2^4/_5$	3	$2^2/_3$	3	$2^3/_4$	3	3	3	4	4	$4^4/_5$	$3^2/_3$	$3^2/_3$	$3^3/_8$	$3^3/_5$	$3^1/_3$	$3^3/_4$	$3^2/_3$	$3^1/_2$	$3^2/_3$	$3^1/_2$	$2^3/_4$	$2^2/_3$	$2^5/_8$
Head depth in length of the head	$1^2/_3$	$1^2/_3$	$1^2/_3$	$1^1/_2$	$1^1/_2$	$1^5/_7$	$1^1/_2$	$1^2/_3$	$1^5/_7$	$1^4/_5$	$1^2/_3$	$1^1/_3$	$1^1/_3$	$1^1/_4$	1	$1^1/_2$	$1^1/_3$	$1^1/_2$	$1^1/_2$	$1^1/_3$	$1^1/_2$	$1^2/_5$	$1^1/_3$	$1^3/_4$	$1^1/_2$	$1^2/_3$	$1^3/_5$
Head width in length of the head	$1^3/_4$	2	2	$1^3/_4$	$1^1/_2$	$1^9/_{10}$	$1^1/_2$	$1^4/_5$	2	$1^4/_5$	2	$1^1/_4$	$1^1/_4$	$1^1/_{10}$	$1^1/_4$	$1^1/_3$	$1^1/_2$	$1^1/_4$	$1^1/_3$	$1^1/_2$	$1^1/_2$	$1^2/_5$	$1^1/_2$	$1^1/_2$	$1^5/_8$	$1^3/_4$	2
Base occip. process in length of the head	$1^1/_4$	$1^1/_4$	$1^1/_2$	$1^1/_2$	$1^1/_4$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_4$	$1^1/_2$	$1^1/_2$	2	$1^3/_4$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_2$
Length of maxillary barbels	beyond the tip of the caudal	beyond the tip of the caudal	beyond the tip of the caudal	beyond the tip of the caudal	not to tip of caudal	to tip of caudal	to tip of caudal	to tip of caudal	scarcely to tip of caudal	beyond tip of caudal	beyond tip of caudal	to middle of caudal	to tip of caudal	to beyond adipose	to tip of caudal	to base of caudal	to tip of caudal	beyond tip of caudal	to base of adipose	to tip of caudal or beyond	to tip of caudal	mutilated	mutilated	beyond tip of caudal	to tip of caudal	to tip of caudal	not to tip of caudal
Postmental barbels	beyond base of ventrals	beyond base of ventrals	beyond base of ventrals	beyond base of ventrals	beyond base of ventrals	to base of ventrals	beyond base of ventrals	reaching tip of ventrals	scarcely to tip of ventrals	beyond base of ventrals	beyond base of ventrals	beyond base of ventrals	beyond base of ventrals	to base of pectorals	beyond base of ventrals	beyond base of ventrals	beyond base of ventrals	beyond base of ventrals	beyond base of ventrals	beyond base of ventrals	beyond base of ventrals	beyond base of ventrals	beyond base of ventrals	beyond base of pectorals	beyond base of pectorals	beyond base of pectorals
Mental barbels	beyond tip of pectorals	beyond tip of pectorals	beyond tip of pectorals	beyond tip of pectorals	far beyond tip of pectorals	to tip of pectorals	beyond tip of pectorals	not to tip of pectorals	not to tip of pectorals	to base of ventrals	beyond tip of pectorals	beyond tip of pectorals	beyond tip of pectorals	beyond tip of pectorals	beyond tip of pectorals	to base of ventrals	beyond tip of pectorals	beyond tip of pectorals	to base of pectorals	beyond base of pectorals	beyond base of pectorals	beyond tip of pectorals	beyond tip of pectorals	beyond tip of pectorals	beyond base of ventrals	beyond base of ventrals
Eye in snout	2	2	$1^2/_3$	$1^5/_7$	$2^1/_2$	$2^1/_3$	$2^1/_2$	$1^5/_7$	$1^5/_7$	$1^1/_2$	1	$2^1/_3$	2	$2^1/_2$	$2^1/_4$	$2^1/_3$	2	2	2	$1^2/_3$	2	$1^2/_3$	2	2	$2^1/_2$	$1^2/_3$	2
Eye in head	6	6	$5^2/_3$	5	7	6	6	5	5	$4^1/_2$	$3^1/_2$	$4^3/_4$	$4^3/_4$	5	5	$4^1/_2$	4	$4^1/_6$	5	$3^1/_2$	4	4	4	$4^1/_2$	$6^3/_4$	6	$6^1/_2$
Eye in interorbital	$1^3/_5$	$1^1/_2$	$1^1/_2$	$1^1/_3$	2	$1^1/_2$	$1^1/_2$	1	$1^1/_5$	1	1	2	2	2	2	$1^2/_3$	$1^1/_3$	$1^1/_2$	$1^2/_3$	1	1	1	$1^1/_3$	$1^1/_2$	$1^3/_4$	$1^1/_3$	$1^1/_2$
Mouth in length of head	$3^1/_3$	$3^1/_2$	nearly 4	$3^1/_2$	$3^1/_2$	$3^1/_2$	3	4	$3^1/_2$	$3^1/_2$	4	$2^1/_2$	$2^1/_2$	$2^1/_2$	3	$2^2/_3$	$2^2/_5$	$2^1/_2$	3	3	3	3	3	3	$3^1/_2$	$3^1/_2$	$3^1/_2$
Teeth in the lower jaw	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, interrupted in the middle	band tapering to the rictus, not interrupted in the middle	idem	idem	idem	idem	idem	idem	idem	idem	idem	idem	idem	idem	idem
Teeth in the upper jaw	in a broad band, not interrupted	in a broad band, not interrupted	in a broad band, not interrupted	in a broad band, not interrupted	in a broad band, not interrupted	band narrow, not interrupted	band broader than the lower, not interrupted	band broad, not interrupted	band broad, not interrupted	band broad, not interrupted	band broad, not interrupted	band broad, not interrupted	band broad, not interrupted	band broad, not interrupted	idem	idem	idem	idem	idem	idem	idem	idem	idem	idem	idem	idem	idem
Teeth in vomer	teeth in a minute patch	teeth in a minute patch	teeth in a minute patch	teeth in a minute patch	teeth in a minute patch	small patches	a minute patch	a minute patch	a minute patch	a minute patch	a minute patch	some teeth	some teeth	none	some teeth	some teeth	none	none	some teeth	minute patch	small patch	minute patch	minute patch	small patch	very minute patches	small patch	small patch
Teeth in pterygoid	teeth in a long patch	teeth in a long patch	teeth in a long patch	teeth in a long patch	teeth in a long patch	none	none	none	none	none	none	teeth in a long patch	none	none	none	some teeth	none	none	some teeth	none	small patch	none	long patch	small patch	small patches	small patch	small patch
Dorsal fin	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6	I/6
Dorsal spine: in the length of head	$1^1/_4$	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_4$	$1^3/_4$	$1^3/_4$	$1^1/_3$	$1^3/_4$	$1^1/_2$	$1^3/_4$	1	1	$1^1/_5$	1	1	1	1	1	$1^1/_5$	$1^1/_2$	$1^1/_3$	$1^1/_5$	$1^1/_4$	$1^1/_2$	$1^1/_2$	$1^1/_2$
Dorsal spine: anterior margin	rough	rough	rough	rough	some teeth at the tip	smooth	smooth	some teeth at the tip	some teeth at the tip	some teeth at the tip	smooth	smooth	smooth	granular	smooth	smooth, some teeth at the tip	smooth	smooth, some teeth at the tip	smooth, some teeth at the tip	smooth	smooth	smooth	smooth	smooth	smooth, some teeth at the tip	smooth, some teeth at the tip	smooth, some teeth at the tip
Dorsal spine: posterior margin	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	upper half serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate
Adipose in standard length	5	$4^1/_2$	$4^5/_8$	$4^9/_{10}$	$4^1/_2$	4	4	$4^1/_3$	$5^1/_2$	$5^1/_4$	5	$5^1/_2$	$5^1/_2$	$6^1/_2$	$5^1/_3$	5	5	5	$5^1/_4$	5	5	$5^1/_3$	5	$4^1/_2$	nearly 5	$5^1/_2$	5
Caudal	forked to base	forked to base	forked to base	forked not to base	forked to base, upper lobe longer	forked not to base, upper lobe longer	forked not to base	forked to base	forked to base	forked to base	forked to base, upper lobe longer	forked to base, upper lobe longer	forked to base, upper lobe longer	mutilated	mutilated	mutilated	forked to base	forked to base	mutilated	mutilated	forked to base	forked to base	mutilated	mutilated	forked to base, upper lobe longer	forked not to base	forked to base
Anal	12	11	11	11	12	12	11	11	11	12	11	11	11	12	11	12	11	11	12	12	11	11	11	11	12	11	12
Ventrals	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Pectorals: Rays	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9	I/9
Pectorals: outer margin of the spine	serrate	serrate	serrate	serrate	serrate	roughened	serrate in bony ridge	serrate	serrate	serrate	serrate	smooth	smooth	smooth	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	outer margin a bony ridge, teethimbedded	teeth imbedded	teeth imbedded
Pectorals: inner margin of the spine	strongly serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	strongly serrate	serrate	strongly serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate	serrate
Colour	no colour marks	no colour marks	no colour marks	no colour marks	no colour marks	3 rows of dark blotches along the sides	brown with a light lateral line	no colour marks	no colour marks	no colour marks	no colour marks	no colour marks	no colour marks	no colour marks	no colour marks	two dark bands	two dark bands	two dark bands	two dark bands	two dark bands	no colour marks	two dark bands	two dark bands	two dark bands	a dark patch at base of dorsal	no colour marks	no colour marks

TABLE III

Showing the characters of *Pterygoplichthys multiradiatus*, *etentaculatum*, *pardalis* and *lituratus*

CHARACTERS	*Pterygoplichthys etentaculatum* (Spix)	described specimen of *Pt. multiradiatus* (Hancock)	*Pterygoplichthys multiradiatus* (Hancock)	*Pterygoplichthys pardalis* (Castelnau)	*Pterygoplichthys lituratus* (Kner)
Depth of body in the standard length. .	$4^1/_3$	$4^1/_2$–4	$4^2/_3$	$5^1/_3$	$4^1/_2$
Length of head in the standard length .	3	$3^1/_2$–$3^3/_4$	3	$3^2/_3$	3
Width of head in its length	$1^1/_6$	slightly longer	$1^1/_6$	$1^1/_6$	slightly longer
Depth of head in its length	$1^1/_2$	$1^1/_2$–$1^2/_5$	$1^3/_5$	$1^2/_3$	$1^3/_5$
Diameter of the eye in the length of the head	8	$8^2/_3$	$6^1/_2$–10	$5^1/_2$–9	$5^1/_2$–$8^1/_2$
Interorbital in the length of the head. .	$2^1/_4$	$2^1/_4$–$2^1/_3$	2	2–$2^1/_4$	$2^1/_6$
Snout in the length of the head. . . .	$1^5/_6$	$1^3/_4$–2	2	2	$1^4/_5$
Mandibular ramus in the interorbital . .	$3^3/_4$	4	$3^1/_2$–4	$3^1/_2$	$3^3/_5$
Snout	narrowed anteriorly	idem	idem	idem	idem
Occipital	with a median ridge, bordered posteriorly by a single scute	low median ridge, bordered posteriorly by 3 scutes	low median ridge, bordered posteriorly by 3 scutes	low median ridge, bordered posteriorly by 3–4 scutes	strongly elevated median ridge, bordered posteriorly by 3 scutes
Supra-orbital	edges slightly raised	idem	idem	idem	scarcely raised
Temporal plates	carinate	carinate	carinate	carinate	carinate
Scutes in the lateral series.	28 lateral scutes, spinous, carinate; 6 between dorsal and adipose, 12 between anal and caudal, 2 series of scutes between nuchal and humeral series	29 lateral scutes, carinate; 6 between dorsal and adipose, 13 between anal and caudal, 2 series of scutes between nuchal and humeral series	28–30 lateral scutes, carinate; 6 between dorsal and adipose, 11–13 between anal and caudal, 3–4 series of scutes between nuchal and humeral series	28 lateral scutes, carinate; 6 between dorsal and adipose, 11 between anal and caudal, 3 series of scutes between nuchal and humeral series	28–29 lateral scutes; 6–7 between dorsal and adipose, 13 between anal and caudal, 3 series of scutes between nuchal and humeral series
Lower surface of the body.	completely covered with granular scales	idem	idem	idem	idem
Dorsal fin	I/11; length of base $1^1/_3$ in the distance from the caudal	I/11; length of base $1^1/_3$–$1^3/_8$ in the distance from the caudal	I/12–13; length of base $1^1/_6$ in the distance from the caudal	I/11–13; length of base $^1/_3$ in the distance from the caudal	I/12–13; length of base $1^3/_5$ in the distance from the caudal
Anal fin	I/4	I/4	I/4	I/4	I/4
Pectoral spine	extending to $^3/_4$ of the ventrals	extending to $^3/_5$–$^4/_5$ of the ventrals	extending to $^1/_3$ of the ventrals	extending to $^1/_2$ of the ventrals	extending to $^3/_4$ of the ventrals
Caudal fin	emarginate; caudal peduncle, depth 3 in length	emarginate; produced; caudal peduncle 3–$3^1/_3$ in length	emarginate; produced; caudal peduncle 3 in length	emarginate; produced; caudal peduncle $3^1/_2$ in length	emarginate; caudal peduncle $2^2/_3$ in length
Interoperculum.	10–12 slender spines, longest 7 in the head	with a few small spines	not notably spinous	not conspicuously spinous	12–15 spines, longest $1^1/_2$ in the diameter of the eye
Colour	irregular spots on head and body, fins dark with reticulating light lines	light to dark brown with light vermiculations on body and fins	dark spots or vermiculations on the sides; fins with dark cross-bars or spots	head and throat with vermiculations; spots on the body; fins with large spots	dark brown, with light spots and vermiculations on head, body and fins