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NOTES ON THE GUIANA SPECIES OF *CORYDORAS* LACÉPÈDE, 1803, WITH DESCRIPTIONS OF SEVEN NEW SPECIES AND DESIGNATION OF A NEOTYPE FOR *CORYDORAS PUNCTATUS* (BLOCH, 1794) — (PISCES, CYPRINIFORMES, CALLICHTHYIDAE)

by

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With 4 text-figures and 5 plates

Abstract

The present paper deals with the species *Corydoras punctatus* (Bloch, 1794), for which a neotype is designated; *C. melanistius* Regan, 1912, *C. spilurus* Norman, 1926, and *C. griseus deweyeri* Meinken, 1957, for which lectotypes are designated; *C. aeneus* (Gill, 1858), *C. potaroensis* Myers, 1927, *C. bondi* Gosline, 1940, *C. osteocarus* Böhlke, 1951, *C. bicolor* nov. spec., *C. boesemani* nov. spec., *C. dubius* nov. spec., *C. oxyrhynchus* nov. spec., *C. nanus* nov. spec., *C. sanchesii* nov. spec., and *C. wotroi* nov. spec.

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Mr. H. H. Mittelberg made the photographic illustrations for this paper, Mr. J. Ruting and the senior author made the drawings.

INTRODUCTION

The first species that has been recorded from the Guianas is *Corydoras punctatus* (Bloch), from Surinam. Bloch's original description (*Cataphractus punctatus* Bloch, 1794) is not very satisfactory, and it is not evident how many specimens he had at his disposal. It has for long been accepted that the type(s?) got lost, but fortunately there is a rather good drawing in Bloch's atlas (1794: 90, pl. 377 fig. 2). A reproduction in black and white of the originally coloured plate is given here (pl. 1 fig. 1).

Various later misconceptions are no doubt due to the controversial description of Bloch, which attributed nine soft rays next to the spine in the dorsal fin (1794: 90, formula; drawing on his pl. 377 fig. 2), while contrary to this he wrote in the text "... in der erste Rückenflosse (zählt man) neun (Strahle)..." of which "Der erste Strahl in ... beiden Rückenflossen ist hart". Bloch's original statement that his fish has "... rothen Punkte am Kopfe und auf den Flossen" is emended in Bloch ed. Schneider (1801: 108) by "C. corpore nigro punctato, ...".

The generic name *Corydoras* was proposed by Lacépède (1803: 147) for his new species *C. geoffroy*, afterwards emended to *geoffroyi*. As Myers (1940: 11-12) already pointed out, Lacépède's description is too defective to make it possible to recognize his species from other members of the genus. The description of the general morphology is mainly irrelevant, and most crucial characters are omitted. Only the remarks "la tête couverte de pièces larges et dures" and "Les lames qui garantissent chaque côté de cet osseux sont disposées sur deux rangs; elles sont de plus très-larges et hexagones" fully agree with, and are characteristic of, callichthyid fishes. On the other hand, information like "Le premier rayon de chaque pectorale est hérissé de très-petites pointes. Le second rayon de la première nageoire du dos est dentelé d'un seul côté. Le premier de cette même nageoire n'offre pas de dentelure; il est même très-court" provides general features found in many genera of different siluroid families. Lacépède's remark "Une membrane assez longue sépare les deux rayons qui soutiennent la seconde nageoire du dos" is not correct, since there is only a single frontal spine in the adipose fin; Valenciennes (in Cuvier & Valenciennes, 1840) presumed that Lacépède may have studied his specimen without removing it from the jar!

If *Corydoras geoffroyi* is identical with *Cataphractus punctatus* Bloch, Lacépède made exactly the same error as Bloch by stating that his *C. geoffroyi* has "... neuf rayons articulés à la première nageoire du dos", a character agreeing with Bloch's formula and drawing, but differing from our specimens of *Corydoras punctatus* (Bloch), and from the other species of the genus. This seems to suggest that Lacépède may have been influenced by Bloch, but no references to Bloch's species occur in Lacépède's *Corydoras* paragraphs; in fact, Lacépède recorded Bloch's species elsewhere (:127).

Myers (1940: 11) made an error stating that the type of *C. geoffroyi* came "from an unknown locality" and "had been lost even at the time Valenciennes searched for it". In fact, Valenciennes recorded to have found Lacépède's type: "nous nous sommes convaincus que c'est l'individu sans taches ... qui a été l'objet de son article sur le genre *corydoras*", while the information provided by both Lacépède and Valenciennes proves that the specimen came from Surinam.

The first author who connected *Cataphractus punctatus* Bloch, 1794, with *Corydoras geoffroyi* Lacépède was Valenciennes (in Cuvier & Valenciennes, 1840). The fact that one of his specimens (from Montevideo) was erroneously included and probably should be referred to *Corydoras paleatus* (Jenyns, 1842), is of little importance, as will be discussed further on.

Swainson (1838: 336), apparently not aware of Lacépède's congeneric *Corydoras geoffroyi*, proposed the generic name *Hoplisoma*, emended to

Hoplosoma by Agassiz (1846: 186) and by Gill (1858: 402), designating *Cataphractus punctatus* Bloch, 1794, as its type species, and retaining the name *Cataphractus* for his *C. depressus* based on Bloch's pl. 377 fig. 1 (= *Callichthys callichthys* (Linnaeus)). In fact, the generic name *Cataphractus* Bloch was already preoccupied, e.g., by Edwards (in Catesby, 1771) (Pisces).

As Myers (1940: 11-12) mentioned in his paper on the generic name *Corydoras*, Bleeker (1863: 83; 1864: 27, not 1862b of Myers' references) pertinently designated *Corydoras* as the generic name for *Cataphractus punctatus* Bloch, regarding *Corydoras geoffroyi* as a junior synonym of *C. punctatus*.

Günther (1864: 225, 229) partly followed Bleeker by regarding *Corydoras* as a subgenus of *Callichthys*. Furthermore, he synonymized *Corydoras geoffroyi* Lacépède and *Callichthys punctatus* Valenciennes with *Cataphractus punctatus* Bloch, 1794, even including *Callichthys punctatus* Valenciennes (in d'Orbigny, 1847) from Montevideo (probably identical with *Corydoras paleatus* (Jenyns, 1842)). It is interesting to note that the two specimens recorded by Günther served Regan (1912: 216) as types for a new species, *Corydoras melanistius*.

It is obvious that *C. punctatus* Valenciennes (in d'Orbigny, 1847) and the locality Montevideo were included by Günther because both were recorded in Valenciennes' chapter on *Callichthys punctatus*. However, the major description evidently has been based only on Valenciennes' Surinam example, which he records as "provenu du Cabinet du Stadhouder" (Stadtholder of Holland), the same as Lacépède's holotype of *C. geoffroyi* euphemistically recorded as "donnée par la Hollande à la France". Of the Montevideo specimen, only a few differential characters are mentioned, and a rather extensive description of its colouration, which makes it of minor importance for a correct evaluation of *C. punctatus* Valenciennes. Since the two specimens used by Valenciennes appear to be lost (Blanc, in litt., December 16, 1965; concerning reg. nos. 4288, 4289), we have to accept Valenciennes' synonymy and must consider *C. geoffroyi* Lacépède and *C. punctatus* Valenciennes identical with *C. punctatus* Bloch, 1794.

The *Corydoras punctatus* material recorded by Eigenmann et al. (1888, 1890, 1903, 1912, etc.) and Ellis (1913) appears to consist of both *C. melanistius* Regan, 1912, and *C. potaroensis* Myers, 1927 (cf. Myers, 1927: 126). Also the material mentioned by Van der Stigchel (1946: 126) clearly does not belong to *C. punctatus*; we could identify his three specimens as one example of *C. melanistius* and two of *C. potaroensis* (topotypes). From his references we conclude that Van der Stigchel rather indiscriminately followed

Eigenmann; e.g., he removed *C. punctatus* Valenciennes to the synonymy of *C. paleatus*. We still have to verify whether or not *Corydoras melanistius* is a junior synonym of *C. ambiacus* Cope, 1872, since Eigenmann et al., and Van der Stigchel, placed this name in the synonymy of their *C. punctatus*.

Hoedeman (1952: 14, fig. 9) recorded a subspecies of *Corydoras*, which he named *Corydoras punctatus punctatus*, from Surinam. This nominate subspecies he distinguished from the presumed subspecies *C. p. julii* Steindachner, *C. p. reticulatus* Fraser-Brunner, and *C. p. funnelli* Fraser-Brunner. He proposed to consider his specimens as topotypes, and selected a 'neotype' from it. We have re-examined this specimen, which is present in the fish collections of the Amsterdam Museum, labelled as neotype. Hoedeman supposed that this material was collected in the surroundings of Paramaribo during the Blijdorp Expedition to Surinam. We have examined numerous samples collected by various other expeditions to the same region, but these never contained specimens identical with Hoedeman's species. Certain details in the manner of labelling and preservation of the so-called 'Paramaribo' material induced us to believe that these were imported aquarium fishes and that the locality was incorrectly given.

After having checked the specimen RMNH 23865 of *C. punctatus*, described by Boeseman (1954: 20), and after comparison with the original description by Bloch (1794: 90), we are of the opinion that Hoedeman's neotype does not belong to the species *C. punctatus*. Hundreds of specimens, recently collected in Surinam by Dr. Boeseman and Dr. Mees, confirmed our opinion.

Apart from the incorrect identification by Hoedeman, his designation of the neotype is invalid according to article 75c of the International Code of Zoological Nomenclature (1964: 81) since (1) no statements are given on characters differentiating Hoedeman's specimen from closely related species; (2) a description is missing and the drawing resembles more the original drawing of Bloch than the specimen justifies; (3) the author gives no evidence that the type(s?) of *Cataphractus punctatus* Bloch, 1794, has (have) been lost; (4) the specimen does not fully correspond with Bloch's description; (5) although the specimen(s?) of Bloch came from Surinam, the locality of Hoedeman's specimen is doubtful, as explained above.

The name *C. punctatus* was employed by Weitzman (1956: 411). He used a photograph by Mr. G. J. M. Timmerman in his publication. The same photograph appeared in papers by Hoedeman (1952: 17), describing a new subspecies *C. melanistius longirostris*, and by Stoye (1952: 53), who regarded the specimen as "*Corydoras?*".

Boeseman (1954: 22) referred to this photograph supposing a possible

hybridization between *C. punctatus* and *C. melanistiis* or an undescribed species. Unfortunately the specimen used for this photograph is neither registered in the collection of ZMA nor in that of RMNH. It is evident that it does not represent *C. punctatus*.

THE GENERIC NAME CORYDORAS

We have already mentioned that the name *Corydoras* was proposed by Lacépède. Following Bleeker, this name is generally used for a genus in the family Callichthyidae.

Myers (1940: 11-12) gave Spix (1829: 14, not seen by us) as the only author who considered *Corydoras* a member of the doradid family. But we found that Kner (reprint, 1853: 1-10) in his "Erklärung der Abbildungen" gave the following names: *Doras (Corydoras) ophthalmus*, *Doras (Corydoras) punctatus*, *Doras (Corydoras) brevis*, all three new species, as well as *Doras (Corydoras) dorsalis* Cuvier & Valenciennes. These names were not accompanied by descriptions of complete fishes, but only by a drawing and explanation of their swimming bladders. It appears from Kner (1855: 112-151) that he found some of these names in a manuscript by Heckel, who used the name *Corydoras* in the full generic sense for his new species *C. loricatus*, *C. brevis*, *C. humeralis*, *C. stenopeltis*, and *C. ophthalmus*. It may be noted that Kner in his first paper (1853) failed to report that the names were copied from Heckel's manuscript, while giving Heckel all responsibility for the synonymy in his second paper (1855) without any record of his own omission in 1853.

In addition to these, Hyrtl (1859: 17) considered *Doras punctatus* Kner, 1855, a member of the genus *Corydoras* in the sense of Spix, Heckel, and Kner, 1853 (cf. Günther, 1864: 207).

It seems justified therefore — in the light of these old confusions — (1) to have the generic name *Corydoras* Lacépède, 1803, type species, by monotypy, *Corydoras geoffroyi* Lacépède, 1803, placed on the Official List of Generic Names in Zoology; (2) to consider the specific name *geoffroyi* Lacépède, 1803, as published in the binomen *Corydoras geoffroyi* Lacépède, 1803, a junior synonym of *Cataphractus punctatus* Bloch, 1794; (3) to place the specific name *punctatus* Bloch, 1794, as published in the binomen *Cataphractus punctatus* Bloch, 1794, on the Official List of Specific Names in Zoology in the quality of being currently considered to be the oldest available name for the type species of the genus *Corydoras* Lacépède, 1803.

METHODS USED IN RECORDING DATA

All counts were obtained using a binocular dissecting microscope. Measure-

ments were carefully taken with vernier callipers and expressed in the text up to one-tenth of a mm. The measurements were taken directly. In the following descriptions of species, figures in parentheses are proportional, in comparison with standard length (s.l.) or with head length (hd) as explained in the list of abbreviations below.

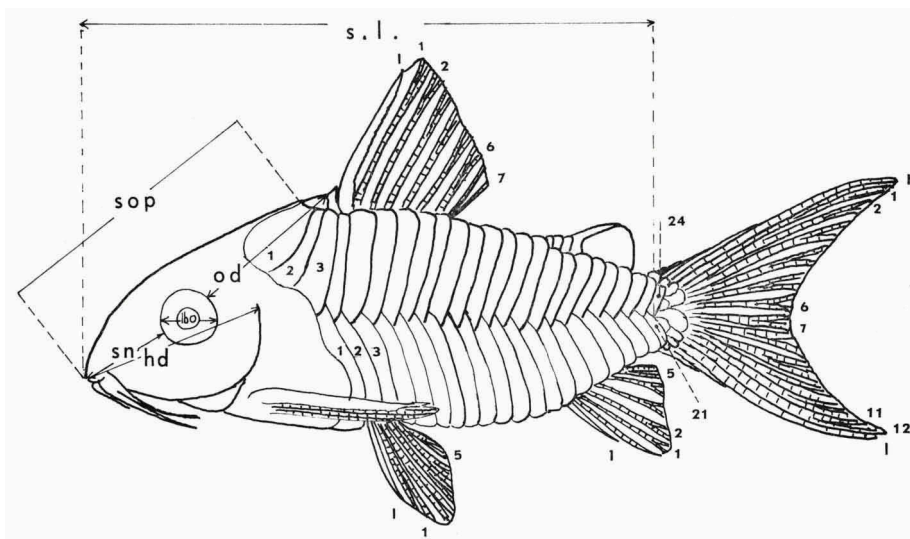


Fig. 1. Sketch of a *Corydoras* showing some methods applied for taking data.

ABBREVIATIONS APPLIED AND DEFINITIONS OF TERMS (fig. 1)

- aa = distance between anus and anal fin origin (in s.l.).
- cp = distance between inferior-most margins of coracoid processes (in hd).
- dcp = least depth caudal peduncle (in hd).
- gbd = greatest body depth, the height at anterior base of dorsal fin (in s.l.).
- gbw = greatest body width, the width at pectoral fin insertions (in s.l.).
- hd = head length (in s.l.).
- ils = number of inferior lateral body scutes, except small scutes at end of peduncle.
- lbo = length of bony orbit (in hd).
- lds = length of dorsal spine (in s.l.).
- llb = length of the longest (rictal) barbel (in hd).
- lps = length of pectoral spine (in s.l.).
- od = least distance between bony orbit and anterior base of dorsal fin (in hd).
- pas = number of pre-adipose middorsal scutes.
- pi = distance between pectoral insertions (in hd).
- s.l. = standard length, measured to junction of posterior edges of last counted lateral body scutes.
- sls = number of superior lateral body scutes, except small scutes at end of peduncle.
- sn = snout length (in hd).
- sna = distance between snout and anus (in s.l.).
- snd = distance between snout and anterior base of dorsal fin (in s.l.).

- snp = distance between snout and pectoral fin insertions (in s.l.).
 snv = distance between snout and ventral fin insertions (in s.l.).
 sop = distance between snout and hinder edge or point of occipital process
 (in s.l.).
 wi = least width of interorbital (in hd).

BMNH = British Museum (Natural History), London.

NMW = Naturhistorisches Museum, Wien.

RMNH = Rijksmuseum van Natuurlijke Historie, Leiden.

SMF = Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt.

ZMA = Zoölogisch Museum, Amsterdam.

ZMB = Institut für Spezielle Zoologie und Zoologisches Museum, Berlin.

ZMH = Zoologisches Staatsinstitut und Zoologisches Museum, Hamburg.

***Corydoras punctatus* (Bloch, 1794)**

(fig. 2, 3a-c, plate 1 fig. 1, 2)

Surinam:

Neotype. — RMNH 25301, 42.7 mm s.l., Surinam, Compagnie Creek, coll. G. F. Mees, 18-X-1965.

RMNH 25302, ninety-four specimens, 21.6 to 45.6 mm s.l., right tributary middle course Gran Creek, near future shore Brokopondo Lake, coll. M. Boeseman, 30-VII-1964 (coll. nr. 256); ZMA 104.600, twelve specimens, 30.2 to 41.5 mm s.l., same data as RMNH 25302; RMNH 25303, one specimen, 28.5 mm s.l., creeks between Kabel and Lombé (Jabokai- and Witi Creek), coll. M. Boeseman, 18-II-1964 (coll. nr. 121); RMNH 25304, two specimens, 38.6 to 42.0 mm s.l., Amanipari Creek, right tributary Sara Creek between Locus Creek outlet and Dam, coll. M. Boeseman, 24-II-1964 (coll. nr. 126); RMNH 25305, one hundred and four specimens, 24.1 to 43.5 mm s.l., little tributary of Gran Creek near Bofroedèdè, coll. M. Boeseman, 5-III-1964 (coll. nr. 131); ZMA 104.597, twelve specimens, 26.2 to 42.4 mm s.l., same data as RMNH 25305; RMNH 25306, four specimens, 29.5 to 31.0 mm s.l., rapids in Gran Creek, about four km above outlet, stagnant water, coll. M. Boeseman, 6-III-1964 (coll. nr. 136); ZMA 104.598, two specimens, 29.6 and 29.6 mm s.l., same data as RMNH 25306; RMNH 25307, one specimen, 34.3 mm s.l., stagnant basins in Suriname River near Brokopondo, coll. M. Boeseman, 3-VI-1964 (coll. nr. 207); RMNH 25308, twelve specimens, 14.2 to 21.1 mm s.l., about halfway Kabel-Brownsveg, along swamped railroad, coll. M. Boeseman, 7-VII-1964 (coll. nr. 232); ZMA 104.599, five specimens, 15.8 to 21.1 mm s.l., same data as RMNH 25308; RMNH 25311, two specimens (in bad condition), about halfway Kabel-Brownsveg, along swamped railroad, coll. M. Boeseman, 27-VII-1964 (coll. nr. 249); RMNH 25309, twenty-two specimens, 12.5 to 35.3 mm s.l., little tributaries Gran Rio between Ligolio and Awaradam Falls, coll. M. Boeseman, 15-VIII-1964 (coll. nr. 266); ZMA 104.601, ten specimens, 13.3 to 35.0 mm s.l., same data as RMNH 25309; RMNH 25310, eight specimens, 15.0 to 22.3 mm s.l., little creek below Moe-soembaprati Falls, coll. M. Boeseman, 21-VIII-1964 (coll. nr. 269); ZMA 104.602, three specimens, 15.8 to 22.0 mm s.l., same data as RMNH 25310; RMNH 25321, one hundred and twenty-eight specimens, 34.5 to 47.1 mm s.l., Afobaka, coll. G. F. Mees, 31-VII-1965; ZMA 104.634, twelve specimens, 39.0 to 46.8 mm s.l., same data as RMNH 25321; RMNH 25322, thirteen specimens, 34.6 to 45.1 mm s.l., Compagnie Creek, coll. G. F. Mees, 18-X-1965 (neotype series); ZMA 104.635, six specimens, 35.0 to 44.4 mm s.l., same data as RMNH 25301 and RMNH 25322; RMNH 25323, one specimen, 30.7 mm s.l., between Kabel and Abontjeman, coll. G. F. Mees, 14-VI-1965; RMNH 25324, one specimen, 38.5 mm s.l., Afobaka, coll. G. F. Mees, 9-VIII-1965; RMNH 25325, one specimen, 17.0 mm s.l., shore of lake at Kabel-Brownsveg rail-

road, coll. G. F. Mees, 5-VIII-1965; RMNH 25336, two specimens, 32.8 to 34.0 mm s.l., Gansee, Brokopondo Lake, coll. G. F. Mees, 8-IV-1965; RMNH 23865, one specimen, 23.5 mm s.l., neighbourhood of Paramaribo, coll. Mrs. Biervliet and Moesai during the Blijdorp Zoo Exp. Surinam 1951/1952, III-1952: this specimen was already mentioned by Boeseman (1954: 20); RMNH 23879, one specimen, about 25.0 mm s.l., badly damaged, same data as RMNH 23865; ZMA 104. 446, one specimen, 27.9 mm s.l., said to originate from surroundings of Paramaribo, collecting date probably after 1960, leg. F. de Graaf; NMW 46791, one specimen, 35.0 mm s.l., damaged, Surinam, coll. K. Heller, 1915, det. F. Steindachner.

Meristic data of the neotype. — S.l. 42.7 mm; gbd 16.8 mm (2.5); lds 9.5 mm (4.5); gbw 11.8 mm (3.6); lps 12.4 mm (3.4); sop 19.3 mm (2.2); hd 13.6 mm (3.1); sn 7.1 mm (1.9); od 12.6 mm (1.1); lbo 3.9 mm (3.5); wi 6.3 mm (2.2); cp 5.7 mm (2.4); dcp 6.0 mm (2.3); aa 14.0 mm (3.1); sna 22.7 mm (1.9); snd 21.8 mm (2.0); snp 12.4 mm (3.4); snv 20.0 mm (2.1); pi 9.1 mm (1.5); llb 6.9 mm (2.0); D. I, 7; A. I, 6; V. I, 5; P. I, 8; C. I, 12, I; pas 3; sls/ils 24/21.

Colour in alcohol. — The ground-colour of body and head is pale yellow. The unossified ventral region is whitish. Small black spots are present all over the body and head. The largest spots are those on the upper side of the head, diminishing in size in all directions. The smallest are those beneath the lateral line while spots are missing on the ventral half of the inferior lateral body scutes. Near the junction of superior and inferior lateral body scutes the spots are larger. Each scute is bordered with black posteriorly and becomes paler ventrally.

A dark brown patch is present on the humeral shields. On the first three inferior lateral body scutes an indistinct dot is visible. The superior rictal barbels are brownish.

The upper part of the dorsal fin is black up to and including the fourth soft ray. On the lower part of the last three soft rays and on the membranes between them, there are some small dark spots. The base of the dorsal fin shows dark spots of indefinite shape. The adipose fin has a dark elongate spot in the centre of the membrane and some smaller ones posteriorly. The caudal fin bears spots on the rays, forming six black irregular vertical bands. The anal fin shows a few small spots on the rays. The ventral fins are whitish. The pectoral fins are mostly white with a few small scattered spots next to the spine. A close-set mosaic of irregular scales covers the area between the coracoid processes.

Variability. — The proportions and counts of nineteen specimens, 21.6-45.6 mm s.l. (RMNH 25302; ZMA 104.600) are as follows: gbd (2.1-2.7); lds (3.5-5.1); gbw (3.5-4.2); lps (3.1-4.4); sop (1.9-2.3); hd (2.9-3.4); sn (1.8-2.2); od (1.0-1.2); lbo (3.0-3.7); wi (2.0-2.7); cp (2.1-2.7); dcp

(1.9-2.2); D. I, 7; A. I-II, 5-6; V. I, 5-6; P. I, 7-8; C. I, 12, I; pas 2-4; sls/fils 23-24/20-21.

Sometimes the circular spots on the head are transformed into patches of indefinite shape. The intensity of pigmentation varies even in specimens from the same locality. In specimens originally preserved in formol, the dots on the opercles (not present in the neotype) and on the humeral shields are dark, while those preserved in alcohol have the same area silver coloured (cf. Bloch's original colour plate). The markings on the adipose fin are variable (fig. 2). The number of vertical bands on the caudal fin varies from six to eight. The number of soft rays in the dorsal fin is generally seven. We found, however, in a series of one hundred and six specimens (RMNH 25302 and ZMA 104.600), one specimen having six and one specimen having eight soft rays next to the spine.



Fig. 2. *Corydoras punctatus*. Some variations in adipose fin pattern.

In juvenile specimens up to about 20 mm s.l., the ossification has not yet been completed. There are fewer spots on body and snout, while a dark mask surrounds the eyes. The pigmentation of the fins is the same as in the adults.

Differential characters. — *C. punctatus* differs from *C. dubius* new species, in having a smaller body width and in having a different colour pattern. In *C. punctatus* the pigmentation near the junctions of the lateral body scutes never forms a line as in *C. dubius*. *C. dubius* never shows circular spots on the head, which occur always in *C. punctatus*.

C. punctatus differs from *C. multimaculatus* Steindachner, 1907 (from which we have seen ZMW 46783, 'type'), in having a dark blotch on the dorsal fin and in a different pigmentation on body and fins. *C. multimaculatus* is known from Rio Preto, Brazil.

A difference between *C. punctatus* and *C. julii* Steindachner, 1906 (ZMW 46740, and RMNH 7975, three syntypes, seen), is that *C. punctatus* misses unpigmented areas on either side of the junctions of the lateral body scutes. *C. julii* is known from Rio Parahim and from the surroundings of Victoria, Brazil.

Corydoras aeneus (Gill, 1858)
(fig. 3d, plate 1 fig. 3)

Surinam:

RMNH 25312, five specimens, 42.2 to 50.0 mm s.l., Gojo Creek above Posoegroenoe, tributary of Saramacca River, coll. M. Boeseman, 7-IV-1964 (coll. nr. 171); ZMA

104.622, two specimens, 44.6 to 47.6 mm s.l., same data as RMNH 25312; RMNH 25313, eight specimens, 37.3 to 46.2 mm s.l., tributary of Gran Creek near Bofroedèdè, coll. M. Boeseman, 5-III-1964 (coll. nr. 131); ZMA 104.623, four specimens, 39.7 to 44.5 mm s.l., same data as RMNH 25313; RMNH 25314, two specimens, 30.7 to 34.2 mm s.l.,

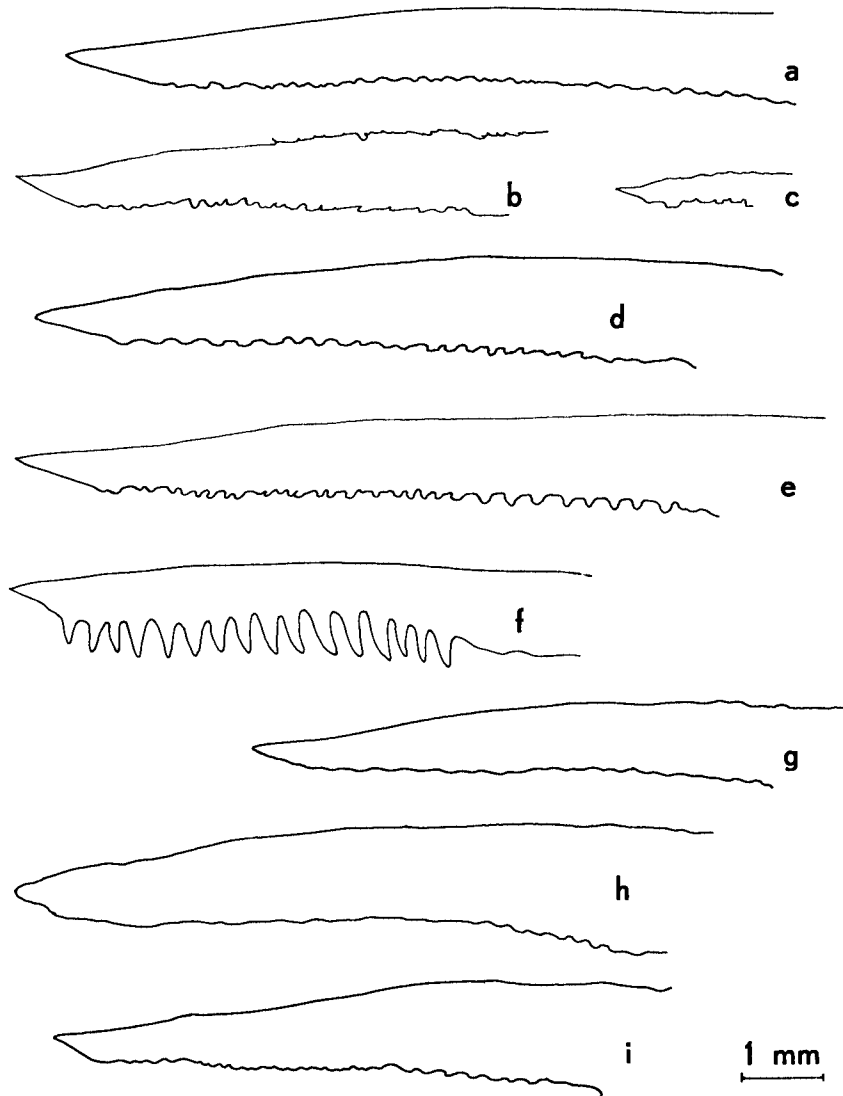


Fig. 3. Outline of right pectoral spine in a. *Corydoras punctatus*, 42.5 mm standard length; b. *C. punctatus*, 29.9 mm s.l.; c. *C. punctatus*, 16.3 mm s.l.; d. *C. aeneus*, 44.5 mm s.l.; e. *C. melanistius*, lectotype, 35.6 mm s.l.; f. *C. spilurus*, paralectotype, 48.4 mm s.l.; g. *C. potaroensis*, topotype, 34.2 mm s.l.; h. *C. bondi*, 39.6 mm s.l.; i. *C. osteocarus*, 35.7 mm s.l.

little tributaries of Gran Rio between Ligolio and Awaradam Falls, coll. M. Boeseman, 15-VIII-1964 (coll. nr. 266); ZMA 104.624, one specimen, 32.9 mm s.l., same data as RMNH 25314; RMNH 25315, two specimens, 17.5 to 20.7 mm s.l., about halfway Kabel-Brownsweg, along swamped railroad, coll. M. Boeseman, 7-VII-1964 (coll. nr. 232); RMNH 25318, one specimen, 38.4 mm s.l., little tributary of Gran Creek, about 12 km from outlet of Gran Creek, coll. M. Boeseman, 21-VII-1964 (coll. nr. 242), specimen figured in present paper (pl. 1 fig. 3); RMNH 25326, twelve specimens, 27.7 to 36.4 mm s.l., lake shore at Kabel-Brownsweg railroad, coll. G. F. Mees, 5-VIII-1965; ZMA 104.636, five specimens, 28.2 to 35.0 mm s.l., same data as RMNH 25326; RMNH 25327, sixteen specimens, 36.3 to 53.0 mm s.l., surroundings Langetabbetje, upper course Sara Creek, coll. G. F. Mees, 12/14-XII-1965; ZMA 104.637, seven specimens, 39.4 to 50.8 mm s.l., same data as RMNH 25327; NMW 46726, one specimen, 38.1 mm s.l., Surinam, coll. K. Heller, 1910 (labelled as *C. eques* Steindachner, 1877, by Dr. F. Steindachner, Vienna).

French Guiana:

SMF 4889, thirteen specimens, 20.9 to 29.7 mm s.l., pond near Gaa Kaba, coll. J. Géry, 20-XI-1957; SMF 4969, two specimens, 43.2 and 43.9 mm s.l., Comté near Degrad Cacao, coll. J. Géry, 10-XI-1957.

Trinidad:

RMNH 21541, two specimens, 47.1 to 50.0 mm s.l., topotypes, Aripo River, Waller Field, 31-IV-1954; same specimens as recorded by Boeseman (1960: 108).

Variability. — The proportions and counts of twenty specimens, 30.3-50.0 mm s.l. (RMNH 21541, 25312, 25313, 25314, 25318; ZMA 104.622, 104.623, 104.624), are as follows: gbd (2.5-2.9); lds (4.8-5.8); gbw (3.6-4.0); lps (3.7-4.7); sop (2.1-2.6); hd (3.1-3.5); sn (1.9-2.1); od (0.9-1.1); lbo (3.5-4.3); wi (2.0-2.2); cp (2.2-3.6); dcp (1.9-2.1); D. I, 7; A. II, 5; V. I, 5; P. I, 7-10; C. I, 12, I; pas 2-5; sls/ils 23-24/20-22.

Corydoras melanistius Regan, 1912

(fig. 3e, plate 2 fig. 1)

British Guiana:

Lectotype. — BMNH 1864.I.21.86, 35.6 mm s.l., British Guiana, Essequibo, Mr. Ehrhardt's Collection.

Paralectotype. — BMNH 1864.I.21.87, 39.7 mm s.l., same data as lectotype.

Surinam:

ZMA 104.631, two specimens, 35.3 to 39.2 mm s.l., surroundings of Paramaribo, coll. Mr. Brassier and D. C. Geijskes, 1956; ZMA 104.650, one specimen, juvenile, 19.9 mm s.l., surroundings of Paramaribo, coll. Mrs. Biervliet and Moesai, Blijdorp Zoo Exp. Surinam 1951/1952, 12-X-1951.

Meristic data of the lectotype. — S.l. 35.6 mm; gbd 14.1 mm (2.5); lds 11.6 mm (3.1); gbw 9.8 mm (3.6); lps 12.1 mm (2.9); sop 16.9 mm (2.1); hd 11.8 mm (3.0); sn 6.2 mm (1.9); od 10.5 mm (1.1); lbo 3.5 mm (3.4); wi 4.8 mm (2.5); cp 4.5 mm (2.6); dcp 5.6 mm (2.1); aa 11.1 mm (3.2); sna 19.0 mm (1.9); snd 18.5 mm (1.9); snp 10.5 mm (3.4); snv 17.4 mm

(2.0); pi 7.8 mm (1.5); llb 5.5 mm (2.1); D. I, 7; A. II, 5; V. I, 5; P. I, 8; C. I, 12, I; pas 4; sls/ils 23/20.

Variability. — The proportions and counts of the paralectotype and three specimens, 19.9-39.2 mm s.l. (ZMA 104.650, 104.631) are as follows: gbd (2.5-2.8); lds (3.2-3.4); gbw (3.6-3.8); lps (3.0-3.6); sop (2.0-2.2); hd (2.8-3.1); sn (2.0-2.3); od (1.1-1.2); lbo (2.9-3.4); wi (2.4-2.7); cp (2.5-4.2); dcp (2.1-2.3); D. I, 7; A. II, 5; V. I, 5; P. I, 8; C. I, 12, I; pas 3-4; sls/ils 22-23/20.

Corydoras spilurus Norman, 1926

(fig. 3f, plate 2 fig. 2)

French Guiana:

Lectotype. — BMNH 1926.3.2.738, 47.1 mm s.l., French Guiana, Iponcin Creek, into Approuage River, coll. C. Ternetz.

Paralectotype. — BMNH 1926.3.2.739, 48.4 mm s.l., same data as lectotype. (Six paralectotypes not seen; in BMNH).

Surinam:

RMNH 25337, one specimen, 46.8 mm s.l., Surinam River and creeks near Brokopondo, coll. M. Boeseman, 5-I-1964 (coll. nr. 57); RMNH 25338, four specimens, juvenile, 20.6 to 25.2 mm s.l., Compagnie Creek (North of Brokopondo), coll. G. F. Mees, 18-X-1965; ZMA 104.655, two specimens, juvenile, 24.2 to 24.7 mm s.l., same data as RMNH 25338; RMNH 25339, one specimen, juvenile, 20.7 mm s.l., Compagnie Creek, coll. G. F. Mees, 5-IX-1965.

Meristic data of the lectotype. — S.l. 47.1 mm; gbd 16.8 mm (2.8); lds 9.6 mm (4.9); gbw 10.7 mm (4.4); lps 10.6 mm (4.4); hd 15.2 mm (3.1); sn 10.3 mm (1.5); od 10.7 mm (1.4); lbo 3.6 mm (4.2); wi 4.3 mm (3.5); dcp 6.6 mm (2.3); aa 12.2 mm (3.9); sna 24.9 mm (1.9); snd 23.1 mm (2.0); snp 13.7 mm (3.4); snv 22.1 mm (2.1); pi 9.1 mm (1.7); llb 9.6 mm (1.6); D. I, 7; A. II, 5; V. I, 5; P. I, 10; C. I, 12, I; pas 3; sls/ils 25/22.

Variability. — The proportions of one of the paralectotypes (s.l. 48.4 mm) and a second specimen, 46.8 mm s.l. (RMNH 25337), are as follows: gbd (2.6-2.8); lds (4.7-4.8); gbw (4.2-4.4); lps (4.5-4.8); hd (3.0-3.1); sn (1.5-1.5); od (1.4-1.5); lbo (4.3-4.5); wi (3.5-3.8); dcp (2.3-2.4); D. I, 7; A. II, 5; V. I, 5; P. I, 10; C. I, 12, I; pas 3-4; sls/ils 24-25/22.

The largest specimen from Surinam does not show faint vertical bands on the caudal fin, while these are present in the type specimens. The juvenile specimens show some faint dots on the caudal fin.

Corydoras potaroensis Myers, 1927

(fig. 3g)

British Guiana:

ZMA 104.449, two specimens, 31.9 to 34.2 mm s.l., creek below Potaro Landing, lower Potaro River, coll. C. H. Eigenmann, Exp. British Guiana, 1908; ZMB 17948, three specimens, 33.0 to 34.2 mm s.l., same data as ZMA 104.449.

Variability. — The proportions and counts of five topotypes, 31.9-34.2 mm s.l. (ZMA 104.449; ZMB 17948), are as follows: gbd (2.7-2.9); lds (3.2-4.0); gbw (3.5-4.1); lps (3.3-3.6); sop (2.2-2.3); hd (3.0-3.2); sn (2.0-2.2); od (1.2-1.3); lbo (2.7-3.2); wi (2.6-2.8); cp (2.6-3.0); dcp (2.2-2.3); D. I, 7; A. II, 5; V. I, 5; P. I, 7-10; C. I, 12, I; pas 3-4; sls/fils 24/21-22.

Corydoras bondi Gosline, 1940
(fig. 3h, plate 2 fig. 3)

Surinam:

ZMA 104.278, thirteen specimens, 24.5 to 42.3 mm s.l., Sipaliwini River, coll. H. P. Pijpers, 25-I-1961/6-II-1961 (station 7).

British Guiana:

SMF 6759, one specimen, 35.1 mm s.l., Rupununi River, coll. H. Axelrod, XI-1962.

Variability. — The proportions and counts of the thirteen specimens, 24.5-42.4 mm s.l. (ZMA 104.278), are as follows: gbd (2.5-2.9); lds (2.8-3.7); gbw (3.4-3.9); lps (3.0-3.6); sop (2.0-2.3); hd (3.0-3.4); sn (1.9-2.2); od (1.0-1.2); lbo (2.9-3.3); wi (2.4-2.7); cp (2.7-3.0); dcp (1.9-2.1); D. I, 7; A. II, 5; V. I, 5; P. I, 7-9; C. I, 12, I; pas 3-5; sls/fils 24-25/21-22.

The specimens examined differ from the original description by Gosline (1940: 20) in having 24 to 25 superior lateral body scutes and 21 to 22 inferior scutes, while Gosline mentioned 22-21/20-19. Our specimens show dark brown vertical bands on the caudal fin. A dark brown patch colours the dorsal spine, the first soft ray and the membrane between them. Furthermore there are some brown dots present on the other dorsal fin rays.

Discussion. — Three of the series of thirteen specimens from Surinam were used by Hoedeman (1965: 87, fig. 46) for an illustration, without any description, but bearing the caption *C. punctatus sipaliwini* n.n. Since this name fails to satisfy the conditions of art. 13a of the Code of Nomenclature, it must be considered an unavailable name. The specimens on which Hoedeman based his new name are moreover identical with *C. bondi* Gosline, 1940, which has priority.

Corydoras osteocarus Böhlke, 1951
(fig. 3i, plate 3 fig. 1)

Surinam:

RMNH 25335, three specimens, 29.0 to 35.7 mm s.l., Avanavero Falls (Kabalebo River), coll. G. F. Mees, 13-IX-1965; ZMA 104.654, one specimen, 33.3 mm s.l., same data as RMNH 25335.

Variability. — The proportions and counts of four specimens, 29.0-35.7 mm s.l. (RMNH 25335; ZMA 104.654), are as follows: gbd (2.7-3.0);

lds (3.1-3.5); gbw (3.6-3.9); lps (3.2-3.6); sop (2.2-2.3); hd (3.2-3.4); sn (2.0-2.4); od (1.0-1.2); lbo (2.5-3.4); wi (2.4-2.9); cp (2.1-2.5); dcp (1.9-2.1); D. I, 7; A. II, 5; V. I, 5; P. I, 7-8; C. I, 12, I; pas 3; sls/ils 22-24/20-21.

Corydoras griseus deweyeri Meinken, 1957

(fig. 4a, plate 3 fig. 2)

British Guiana:

Lectotype. — ZMH 1186, 38.3 mm s.l., British Guiana, leg. Firma Aquaria Antwerpen (Van de Weyer).

Paralectotype. — ZMH 1187, 34.8 mm s.l., same data as ZMH 1186.

Meristic data of the lectotype. — S.l. 38.3 mm; gbd 13.3 mm (2.9); lds 9.9 mm (3.9); gbw 8.5 mm (4.6); lps 9.5 mm (4.0); sop 17.4 mm (2.2); hd 12.8 mm (3.0); sn 6.6 mm (1.9); od 9.2 mm (1.4); lbo 4.0 mm (3.2); wi 4.5 mm (2.8); cp 4.1 mm (3.1); dcp 5.2 mm (2.5); D. I, 7; A. II, 5; V. I, 5; P. I, 8; C. I, 12, I; pas 2; sls/ils 25/22.

Meristic data of the paralectotype. — S.l. 34.8 mm; gbd 12.5 mm (2.8); lds 10.7 mm (3.3); gbw 8.8 mm (4.0); lps 10.4 mm (3.3); sop 16.5 mm (2.1); hd 11.2 mm (3.1); sn 5.9 mm (1.9); od 9.3 mm (1.2); lbo 3.7 mm (3.0); wi 3.9 mm (2.9); cp 3.8 mm (2.9); dcp 5.0 mm (2.2); D. I, 7; A. II, 5; V. I, 5; P. I, 8; C. I, 12, I; pas 3; sls/ils 24/21.

Discussion. — Having seen the types of *C. g. deweyeri*, we are of the opinion that this 'subspecies' is identical with *C. griseus* Holly, 1940, s. str. We found that some different characters recorded by Meinken, e.g. the number of dorsal and ventral rays, the body depth and the interorbital width, agree with the meristic data mentioned by Holly for *C. g. griseus*. After our experiences in measuring *Corydoras* specimens, we believe that the differences given (Holly, 1958 or 1959: 1124-1125), will fall within the range of variation, when more specimens become available.

Unfortunately the only specimen of *C. g. griseus*, the one on which Holly's description was based, seems to have got lost in the second world war, so that the proposed synonymy cannot be proved. An additional complication is that the data concerning the localities of both 'subspecies' are missing. It seems strange that Meinken published a subspecies without knowing its geographical distribution. Meinken also did not check material of *C. g. griseus*, while describing *C. g. deweyeri*.

After having compared topotypes of *C. potaroensis* Myers, 1927, with *C. g. deweyeri*, we do not agree with the suggestion of Weitzman (1960: 146) that the two are identical.

Corydoras bicolor new species

(fig. 4b, plate 3 fig. 3)

Surinam:

Holotype. — ZMA 104.627, a specimen 25.9 mm s.l., Sipaliwini River, coll. H. P. Pijpers, 25-I-1961/6-II-1961 (station 7).

Paratypes. — ZMA 104.628, thirty-six specimens, 22.0 to 26.4 mm s.l., same data as ZMA 104.627; ZMA 104.629, six specimens, 21.6 to 30.2 mm s.l., surroundings Paramaribo, pool with *Lotus* species at road to Kwatta, coll. H. P. Pijpers, VIII-1959 (station 34).

Meristic data of the holotype. — S.l. 25.9 mm; gbd 10.4 mm (2.5); lds 9.5 mm (2.7); gbw 7.5 mm (3.5); lps 7.7 mm (3.4); sop 11.0 mm (2.4); hd 8.8 mm (2.9); sn 4.1 mm (2.1); od 7.2 mm (1.2); lbo 2.6 mm (3.4); wi 3.6 mm (2.4); cp 3.4 mm (2.6); dcp 4.4 mm (2.0); aa 7.0 mm (3.7); sna 14.4 mm (1.8); snd 13.4 mm (1.9); snp 8.1 mm (3.2); snv 13.0 mm (2.0); pi 6.2 mm (1.4); llb 4.9 mm (1.8); D. I, 7; A. II, 5; V. I, 5; P. I, 8; C. I, 12, I; pas 4; sls/ils 23/21.

Colour in alcohol. — The general colour of body and head is yellowish brown. The ventral region is whitish. A large dark brown patch is situated beneath the dorsal fin from the nuchal plate towards the upper side of the eighth superior lateral body scute. The patch is connected with the pigmentation on the dorsal fin, decreasing in intensity upwards. A dark mask surrounds the eyes. Each scute is posteriorly bordered with brown. The other fins and the rictal barbels are colourless. The area between the coracoid processes is naked.

Variability. — The proportions and counts of nineteen paratypes, 21.6-30.2 mm s.l. (ZMA 104.628, 104.629), are as follows: gbd (2.3-2.5); lds (2.6-3.3); gbw (3.4-3.7); lps (2.7-3.5); sop (1.9-2.1); hd (2.8-3.1); sn (1.9-2.3); od (1.1-1.3); lbo (2.8-3.5); wi (2.2-2.8); cp (2.2-2.8); dcp (1.8-2.2); D. I, 7; A. II, 4-5; V. I, 5; P. I, 7-10; C. I, 12, I; pas 3-5; sls/ils 21-23/20-21.

No variation in colour pattern is worth mentioning.

Differential characters. — *C. bicolor* differs from *C. concolor* Weitzman, 1961, in having a different snout/head ratio. The dark brown patch situated beneath the dorsal fin and the dark mask around the eyes, present in *C. bicolor*, are lacking in *C. concolor*. *C. concolor* is known from Rio Parguaza, Venezuela.

Derivation of the name. — The specific name *bicolor* was given because the colour pattern of body and head consists of two main colours.

Discussion. — One of the paratypes of *C. bicolor* was used by Hoedeman (1965: 137, fig. 84) for an illustration without description, but bearing the

caption *Corydoras melanistius sipaliwini* n.n. Since this name fails to satisfy the conditions of art. 13a of the Code of Nomenclature, it is unavailable.

Corydoras boesemani new species

(fig. 4c, plate 4 fig. 1)

Surinam:

Holotype. — RMNH 25316, a specimen 35.3 mm s.l., little tributaries of Gran Rio between Ligolio and Awaradam Falls, coll. M. Boeseman, 15-VIII-1964 (coll. nr. 266).

Paratypes. — RMNH 25317, thirteen specimens, 30.0 to 42.0 mm s.l., same data as RMNH 25316; ZMA 104.625, six specimens, 35.4 to 40.8 mm s.l., same data as RMNH 25316; RMNH 25328, two specimens, 39.0 to 41.0 mm s.l., creek near Kajana (near Ligolio), Gran Rio basin, coll. G. F. Mees, 16-VII-1965; ZMA 104.638, one specimen, 39.9 mm s.l., same data as RMNH 25328; RMNH 17283, two specimens, juvenile, 20.2 to 23.7 mm s.l., Lucy River, coll. J. F. Hulk, Corantijn Exp. 1910/11, 30-IX-1910; ZMA 104.626, one specimen, 21.6 mm s.l., same data as RMNH 17283, formerly part of this sample.

Meristic data of the holotype. — S.l. 35.3 mm; gbd 12.5 mm (2.8); lds 9.7 mm (3.6); gbw 9.2 mm (3.8); lps 10.7 mm (3.3); sop 15.3 mm (2.3); hd 10.0 mm (3.5); sn 5.7 mm (1.8); od 9.6 mm (1.0); lbo 3.6 mm (2.8); wi 4.6 mm (2.2); cp 4.7 mm (2.1); dcp 5.4 mm (1.9); aa 10.0 mm (3.5); sna 18.8 mm (1.9); snd 17.5 mm (2.0); snp 10.1 mm (3.5); snv 16.5 mm (2.1); pi 8.0 mm (1.3); llb 6.6 mm (1.5); D. I, 7; A. II, 5; V. I, 5; P. I, 8; C. I, 12, I; pas 4; sls/sils 24/22.

Colour in alcohol. — The ground-colour of body and head is pale yellow. The ventral region is whitish. Along the midst of the sides, from the fifth superior lateral body scute to the tail, there is a broad black stripe, connected with three black patches on the upper sides of the first three inferior lateral body scutes. A dark mask surrounds the eyes. There are black blotches on the nuchal plate and on the upper parts of the second up to and including the fifth, on the eighth up to and including the tenth, and on the sixteenth up to the nineteenth superior lateral body scutes. There are some small dots between them, around the first two lateral pores and on the upper part of the base of the caudal fin. There is a greyish pigmentation on the snout, the occipital region, the opercles, and the humeral shields. The rictal barbels are white.

A black blotch covers the dorsal spine, the first soft ray, and the membranes following them. From the fourth soft ray onwards, there are black lines on the middles of the membranes. The adipose fin is hyaline with some pigmentation on its base. The caudal fin bears one broad black vertical band, caused by pigmentation on the rays. There are also black patches on both fin lobes and on the two inferiormost rays near the caudal fin base.

The anal fin shows pigmentation on the rays near the base. The ventral fins are whitish. The pectoral spine is greyish and the remaining part of the fin is whitish with a scattered pigmentation. The area between the coracoid processes is naked.

Variability. — The proportions and counts of twenty paratypes, 23.1-42.0 mm s.l. (RMNH 17283, 25317; ZMA 104.625), are as follows: gbd (2.6-2.9); lds (2.8-4.2); gbw (3.5-4.0); lps (3.0-4.2); sop (2.1-2.4); hd (3.0-3.4); sn (1.8-2.5); od (1.1-1.2); lbo (2.8-3.2); wi (2.2-2.8); cp (2.0-2.7); dcp (1.9-2.3); D. I, 7-8; A. II, 5; V. I, 5; P. I, 8; C. I, 12, I; pas 3-5; sls/sils 22-25/20-22.

The position of the black patches on the upper parts of the superior lateral body scutes is strongly variable. In most paratypes the rictal barbels are greyish, while the first soft ray of the dorsal fin is conspicuously longer than the spine. The shape of the black vertical band on the caudal fin is variable. Sometimes a second band is visible, while the black patches vary in position. In some paratypes a row of small black blotches is present in the centres of the anteriormost inferior lateral scutes to the anal fin. Juvenile specimens (from Lucy River, Surinam), have the same colour pattern.

Differential characters. — *C. boesemani* differs from *C. bondi* Gosline, 1940, in having a wider area between the coracoid processes, and in the colour pattern. *C. boesemani* shows a deep black pattern on the body, whereas the pattern of *C. bondi* is dark brown. The pigmentation differs considerably. The caudal fin of *C. boesemani* bears at least one broad black vertical band, contrary to *C. bondi*, which has (at least in the Surinam specimens) slender bands in a higher number. *C. bondi* was originally described from Rio Yuruari and Rio Carichapo, Venezuela.

Derivation of the name. — This species is named in honour of Dr. M. Boeseman, who collected most of the specimens recorded in this paper.

Discussion. — The three juvenile paratypes from Lucy River were recorded by Van der Stigchel (1946: 129) as *Corydoras paleatus* (Jenyns, 1842).

***Corydoras dubius* new species**

(fig. 4d, plate 4 fig. 2)

Surinam:

Holotype. — ZMA 104.632, a specimen 37.8 mm s.l., said to be from Surinam, surroundings of Paramaribo, coll. Mrs. Biervliet and Moesai, Blijdorp Zoo Exp. Suriname 1951/1952, III-1952 (labelled as neotype for *Corydoras punctatus* (Bloch, 1794) by J. J. Hoedeman), uncertain locality.

Paratypes. — ZMA 104.633, fifteen specimens, 27.2 to 38.3 mm s.l., same data as ZMA 104.632 (labelled as neotype series by J. J. Hoedeman).

Meristic data of the holotype. — S.l. 37.8 mm; gbd 16.8 mm (2.3); lds 9.2 mm (4.1); gbw 12.5 mm (3.0); lps 11.1 mm (3.4); sop 19.9 mm (1.9); hd 13.2 mm (2.9); sn 6.5 mm (2.0); od 11.8 mm (1.1); lbo 4.2 mm (3.1); wi 6.6 mm (2.0); cp 5.2 mm (2.5); dcp 6.1 mm (2.2); aa 11.3 mm (3.3); sna 20.4 mm (1.9); snd 21.1 mm (1.8); snp 11.8 mm (3.2); snv 18.5 mm (2.0); pi 10.5 mm (1.3); llb ?(damaged); D. I, 7; A. II, 5; V. I, 5; P. I, 8; C. I, 12, I; pas 4; sls/fils 23/20.

Colour in alcohol. — The ground-colour is pale yellow, exactly as the ventral region. Irregular black spots are present on the superior lateral body scutes, the lowermost parts of which are without pigment. On the junctions of superior and inferior lateral body scutes pigment is concentrated, forming an irregular line, clearly visible from the tenth to the twenty-first superior scute. Most of the lateral scutes and all preadipose scutes are distinctly bordered with black posteriorly, that of the lateral ones decreasing ventrally. Irregularly shaped short black lines are present on the head, as is shown in pl. 4 fig. 2. The upper parts of the damaged superior rictal barbels are black, the lower parts yellowish.

The pigmentation on the damaged dorsal fin indicates that there was a large dark blotch. The membrane of the adipose fin shows two dark spots. The caudal fin rays are partly coloured with black, forming three irregular vertical bands. The anal fin shows some black pigment. The ventral fins are yellowish, just like the pectoral fins, of which the spines show scattered pigmentation. A close-set mosaic of irregular scales covers the area between the coracoid processes.

Variability. — The proportions and counts of the fifteen paratypes, 27.2-38.3 mm s.l. (ZMA 104.633), are as follows: gbd (2.3-2.6); lds (3.2-4.3); gbw (3.3-3.6); lps (2.7-3.6); sop (2.0-2.2); hd (2.8-3.2); sn (2.0-2.2); od (1.0-1.2); lbo (3.0-3.3); wi (2.0-2.3); cp (2.4-3.3); dcp (1.9-2.2); D. I, 7; A. II, 5; V. I, 5; P. I, 7-8; C. I, 12, I; pas 2-4; sls/fils 21-24/20-22.

In most paratypes the irregular black line on the junctions of the lateral body scutes is well developed from the humeral shields to the caudal base, in many cases zig-zagging along the junctions. Of most specimens the posterior edges of the inferior lateral body scutes have black pigment only in the centre, forming a row of dark spots running parallel to the zig-zag midline. On either side the zig-zag line is bordered by a broad unpigmented band. The caudal fin shows a maximum of four vertical bands. The irregularly shaped short black lines on the head are variable, never forming circular spots. The dark blotch on the dorsal fin covers the upper part of

the first five soft rays and the membranes between them. The pigmentation on the adipose fin is variable.

Differential characters. — The features in which *C. dubius* differs from *C. punctatus* are mentioned in the paragraph "differential characters" of *C. punctatus*. *C. dubius* seems to be closely related to *C. julii*, but differs in

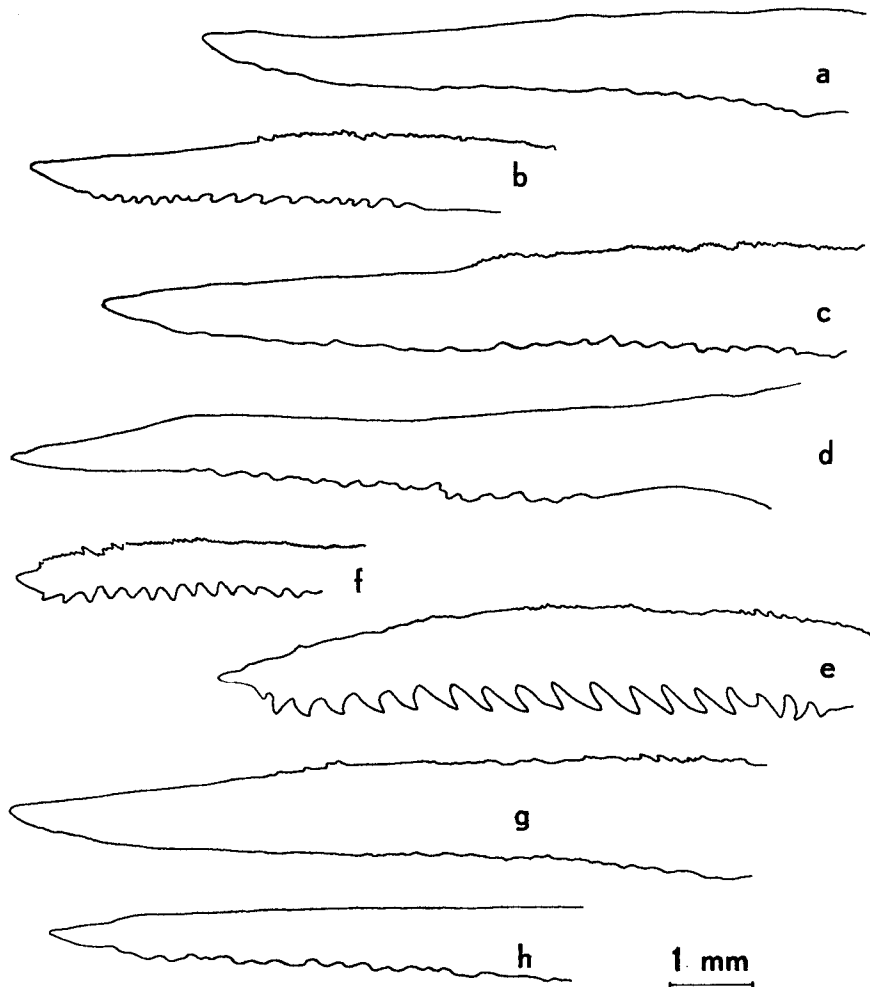


Fig. 4. Outline of right pectoral spine in a. *Corydorax griseus deweyeri*, paralectotype, 34.8 mm s.l.; b. *C. bicolor*, paratype, 23.7 mm s.l.; c. *C. boesemani*, paratype, 38.0 mm s.l.; d. *C. dubius*, paratype, 38.3 mm s.l.; e. *C. oxyrhynchus*, paratype, 47.6 mm s.l.; f. *C. nanus*, paratype, 21.5 mm s.l.; g. *C. sanchesi*, paratype, 41.0 mm s.l.; h. *C. wotroi*, paratype, 27.2 mm s.l.

more distinct pigmentation, especially on the head. Unfortunately we had only juvenile syntypes of *C. julii*, without a distinct colour pattern, at our disposal.

Derivation of the name. — The specific name *dubius* is chosen for the following reasons: Hoedeman regarded this material as a neotype series for *C. punctatus*. The locality is doubtful. *C. dubius* may eventually be found to represent a subspecies of *C. julii*. Material providing complete data for both these forms is not available at the moment.

Corydoras nanus new species

(fig. 4 f, plate 5 fig. 1)

Surinam:

Holotype. — RMNH 25333, a specimen 23.0 mm s.l., little tributaries of Gran Rio between Ligolio and Awaradam Falls, coll. M. Boeseman, 15-VIII-1964 (coll. nr. 266).

Paratypes. — RMNH 25334, four specimens, 18.8 to 24.3 mm s.l., same data as RMNH 25333; ZMA 104.642, two specimens, 21.4 to 21.5 mm s.l., same data as RMNH 25333.

Meristic data of the holotype. — S.l. 23.0 mm; gbd 7.0 mm (3.3); lds 4.2 mm (5.5); gbw 6.0 mm (3.8); lps 5.6 mm (4.1); sop 9.0 mm (2.6); hd 6.9 mm (3.3); sn 2.9 mm (2.4); od 6.9 mm (1.0); lbo 1.7 mm (4.1); wi 3.2 mm (2.2); cp 3.0 mm (2.3); dcp 4.0 mm (1.7); aa 6.1 mm (3.8); sna 12.4 mm (1.9); snd 11.3 mm (2.0); snp 6.9 mm (3.3); snv 11.8 mm (1.9); pi 5.2 mm (1.3); llb 3.1 mm (2.2); D. I, 7; A. II, 5; V. I, 5; P. I, 9; C. I, 12, 1; pas 4; sls/ils 23/20.

Colour in alcohol. — The ground-colour of the body is pale yellow, exactly as the ventral region. Two parallel lateral brown stripes run along the body, the broad, uppermost stripe running from the nuchal plate to the caudal base, and the narrower one along the midst of the side from the humeral shields to the caudal base. On the upper parts of the first five inferior lateral body scutes small dark brown spots occur, joining the narrow stripe posteriorly. A row of dark brown blotches covers the centres of the inferior lateral body scutes. Between the dorsal and adipose fins a slender brown line runs straight along the back. The upper part of the head and the area around the eyes are dark, not forming a mask. The rictal barbels are dark brown.

The entire dorsal fin is reddish brown, just like the adipose fin and the ventral fins. The other fins have a greyish pigment. The yellow area between the coracoid processes is naked.

Variability. — The proportions and counts of the six paratypes, 18.8-24.3 mm s.l. (RMNH 25334; ZMA 104.642), are as follows: gbd (2.8-3.1); lds (5.2-6.0); gbw (3.6-4.1); lps (3.5-4.5); sop (2.4-2.6); hd (3.2-3.6); sn (2.1-2.6); od (0.9-1.1); lbo (3.2-4.1); wi (2.0-2.3); cp (2.2-2.8); dcp

(1.6-1.9); D. I, 7; A. II, 5; V. I, 5; P. I, 8-10; C. I, 12, I; pas 3-5; sls/ils 23-24/20-21.

The caudal fin of the largest specimen shows four or five indistinct vertical bands.

Derivation of the name. — The specific name *nanus* was given, since it appears to be the smallest known species of the genus *Corydoras* in the Guianas.

***Corydoras oxyrhynchus* new species**

(fig. 4e, plate 4 fig. 3)

Surinam:

Holotype. — RMNH 25329, a specimen 47.8 mm s.l., Gojo Creek above Posoegroenoe, tributary of Saramacca River, coll. M. Boeseman, 7-IV-1964 (coll. nr. 171).

Paratypes. — RMNH 25330, one specimen, 50.8 mm s.l., same data as RMNH 25329; ZMA 104.640, one specimen, 47.6 mm s.l., same data as RMNH 25329.

Meristic data of the holotype. — S.l. 47.8 mm; gbd 16.6 mm (2.9); lds 11.3 mm (4.2); gbw 11.0 mm (4.4); lps 11.3 mm (4.2); sop 20.6 mm (2.3); hd 15.4 mm (3.1); sn 9.0 mm (1.7); od 11.2 mm (1.4); lbo 4.1 mm (3.8); wi 4.5 mm (3.4); cp 4.9 mm (3.1); dcp 6.8 mm (2.3); aa 13.8 mm (3.5); sna 24.9 mm (1.9); snd 23.2 mm (2.1); snp 12.8 mm (3.7); snv 22.0 mm (2.2); pi 9.1 mm (1.7); llb 9.9 mm (1.6); D. I, 7; A. II, 5; V. I, 5; P. I, 9; C. I, 12, I; pas 4; sls/ils 25/23.

Colour in alcohol. — The general colour of body and head is greyish. The unossified ventral region is whitish. A slight scattered pigmentation is present all over the body, head, and fins. The pigmentation is more intensive on the head, dorsal fin (especially at the implantation of the spine), adipose fin, pectoral spines, the distal ends of the pectoral fin rays, the orbital region, and on the four rictal barbels. Each scute is posteriorly bordered with black. The opercles and humeral shields are silver coloured. The caudal fin bears seven grey vertical bands. The area between the coracoid processes is covered with minute spines.

Variability. — The proportions and counts of the two paratypes, 47.6-50.8 mm s.l. (RMNH 25330; ZMA 104.640), are as follows: gbd (2.7-2.8); lds (4.7-4.8); gbw (4.1-4.1); lps (4.2-4.3); sop (2.2-2.3); hd (2.9-3.0); sn (1.6-1.7); od (1.4-1.4); lbo (4.1-4.2); wi (3.6-3.6); cp (3.0-3.5); dcp (2.4-2.4); D. I, 7; A. II, 5-6; V. I, 5; P. I, 9; C. I, 12, I; pas 4; sls/ils 25-26/23.

In one of the paratypes (RMNH 25330) a small greyish patch is present on the superior lateral body scutes just beneath the insertion of the dorsal spine. In the other paratype (ZMA 104.640), the interorbital area is dark grey.

Differential characters. — *C. oxyrhynchus* belongs to a group of species with long snouts, which includes forms as *C. acutus* Cope, 1872, *C. treitlii* Steindachner, 1906, *C. spilurus* Norman, 1926, *C. fowleri* Böhlke, 1950, and *C. cervinus* Rössel, 1962. *C. oxyrhynchus* differs from these species in having a different snout/head ratio and in having a different colour pattern.

C. acutus is known from Rio Ampiyacu (= Rio Ambyiacu), Peru; *C. treitlii* from Rio Parnahyba, Brazil; *C. spilurus* from Rio Approuage, French Guiana; *C. fowleri* from Chancho Caño, Peru; and *C. cervinus* from Rio Guaporé, Brazil.

Derivation of the name. — The specific name *oxyrhynchus* is used because of the remarkably long snout.

Corydoras sanchesi new species

(fig. 4g, plate 5 fig. 2)

Surinam:

Holotype. — RMNH 25319, a specimen 34.6 mm s.l., Gojo Creek above Posoegroenoe, tributary of Saramacca River, coll. M. Boeseman, 7-IV-1964 (coll. nr. 171).

Paratypes. — RMNH 25320, twelve specimens, 28.6 to 41.0 mm s.l., same data as RMNH 25319; ZMA 104.630, five specimens, 32.1 to 39.0 mm s.l., same data as RMNH 25319.

Meristic data of the holotype. — S.l. 34.6 mm; gbd 13.1 mm (2.6); lds 10.5 mm (3.3); gbw 9.2 mm (3.8); lps 10.7 mm (3.2); sop 16.4 mm (2.1); hd 10.7 mm (3.2); sn 5.1 mm (2.1); od 10.2 mm (1.1); lbo 3.8 mm (2.8); wi 4.3 mm (2.5); cp 4.4 mm (2.4); dcp 5.1 mm (2.1); aa 9.2 mm (3.8); sna 18.3 mm (1.9); snd 19.9 mm (1.7); snp 10.0 mm (3.5); snv 16.0 mm (2.2); pi 7.4 mm (1.4); llb 4.2 mm (2.5); D. I, 7; A. II, 5; V. I, 5; P. I, 8; C. I, 12, I; pas 3; sls/ils 23/21.

Colour in alcohol. — The general colour of the body is greyish, brownish on the head and on the upper side of the superior lateral body scutes. A dark blotch covers the dorsal spine, the first two soft rays and the membranes between them. Each scute is faintly bordered with brown posteriorly. The opercles and humeral shields are silver coloured. The superior rictal barbels are greyish.

Spines and rays of pectoral, anal, and caudal fins, and the adipose fin, bear a slight greyish pigmentation. The whitish area between the coracoid processes is naked.

Variability. — The proportions and counts of seventeen paratypes, 28.6-41.0 mm s.l. (RMNH 25320; ZMA 104.630), are as follows: gbd (2.5-2.9); lds (3.2-4.0); gbw (3.5-4.1); lps (3.1-3.8); sop (2.1-2.3); hd (3.1-3.3); sn (1.9-2.2); od (1.0-1.2); lbo (2.7-3.6); wi (2.3-2.9); cp (2.0-

2.8); dcp (2.0-2.4); D. I, 7-8; A. II, 5; V. I, 5; P. I, 8-9; C. I, 12, I; pas 2-4; sls/ils 23-24/20-22.

In some paratypes the dark blotch on the dorsal fin is restricted to the membrane between the spine and the first soft ray.

Differential characters. — *C. sanchesi* differs from *C. griseus deweyeri* in having different proportions for body width, in having a different distance between bony orbit and anterior base of dorsal fin, and in having a different colour pattern. The black blotch on the dorsal fin of *C. sanchesi* is missing in *C. g. griseus* and in *C. g. deweyeri*. The type localities of *C. griseus* s. str. and *C. g. deweyeri* are scarcely known since both are described from imported aquarium specimens, said to be collected in the surroundings of the Amazon River and in British Guiana, respectively.

Derivation of the name. — This species is named in honour of Mr. G. H. Sanches, formerly Commissioner of Brokopondo District, for his valuable assistance during Dr. Boeseman's survey.

Corydoras wotroi new species

(fig. 4h, plate 5 fig. 3)

Surinam:

Holotype. — RMNH 25331, a specimen 26.8 mm s.l., outlet Kleine Saramacca, along and between sand banks, coll. M. Boeseman, 10-IV-1964 (coll. nr. 168).

Paratypes. — RMNH 25332, two specimens, 24.7 to 27.2 mm s.l., same data as RMNH 25331; ZMA 104.641, one specimen, 26.0 mm s.l., same data as RMNH 25331.

Meristic data of the holotype. — S.l. 26.8 mm; gbd 10.2 mm (2.6); lds 7.2 mm (3.7); gbw 7.3 mm (3.7); lps 8.8 mm (3.0); sop 12.6 mm (2.1); hd 8.6 mm (3.1); sn 4.0 mm (2.2); od 8.3 mm (1.0); lbo 2.5 mm (3.4); wi 3.7 mm (2.3); cp 3.4 mm (2.5); dcp 4.3 mm (2.0); aa 7.0 mm (3.8); sna 15.0 mm (1.8); snd 13.6 mm (2.0); snp 8.2 mm (3.3); snv 12.8 mm (2.1); pi 6.8 mm (1.3); llb 5.0 mm (1.7); D. I, 7; A. II, 5; V. I, 5; P. I, 7; C. I, 12, I; pas 3; sls/ils 23/20.

Colour in alcohol. — The ground-colour of body and head is pale yellow-brown. The ventral region is dirty white. An indistinct brown blotch, running from the nuchal plate up to and including the upper part of the fifth superior lateral body scute, is visible, continued on the spine of the dorsal fin. Small irregular brown spots are present all over the body, decreasing in size and number to the ventral region. A dark mask occurs across the eyes and part of the opercles.

Irregular brown pigment spots cover the dorsal fin, both the rays and the membranes between the spine and the third soft ray. The 'adipose' spine is brown and the fin shows a few spots. Four indistinct, irregular vertical

bands are visible on the partly damaged caudal fin. The anal fin carries a few brown spots. The ventral fins are whitish. The spine of the pectoral fin is grey-brown and a scattered pigmentation is present on the rays. The superior rictal barbels are greyish. The humeral shields and a large part of the opercles are silver coloured. The area between the coracoid processes is naked.

Variability. — The proportions and counts of the three paratypes, 24.7-27.2 mm s.l. (RMNH 25332; ZMA 104.641), are as follows: gbd (2.5-2.6); lds (3.3-3.7); gbw (3.5-3.7); lps (3.1-3.3); sop (2.1-2.2); hd (2.9-2.9); sn (2.1-2.3); od (1.2-1.2); lbo (3.2-3.8); wi (2.5-2.5); cp (2.6-3.0); dcp (2.1-2.2); D. I, 7-8; A. II, 5; V. I, 5; P. I, 7-9; C. I, 12, I; pas 3; sls/ils 23/20-21.

No variation in colour pattern is worth mentioning.

Differential characters. — *C. wotroi* differs from *C. osteocarus* Böhlke, 1951, in having different measurements for body depth, head length, depth of the caudal peduncle, and in possessing a different colour pattern. The dorsal, adipose, caudal, and anal fins show pigmentation in *C. wotroi*, while this is lacking in *C. osteocarus*. *C. osteocarus* was originally described from the Rio Orinoco, Venezuela.

Derivation of the name. — It is a pleasure to name this species after the Netherlands Foundation for the Advancement of Tropical Research (WOTRO), the sponsoring authority of several recent expeditions to Surinam.

Corydoras species

The following specimens we are not able to identify at the moment:

Surinam:

RMNH 18499, one specimen, 28.0 mm s.l., Toegoemoetoe, upper course of Saramacca River, coll. P. J. de Kock, Saramacca Exp. 1902/1903, 23-II-1903. Recorded as “? *Corydoras punctatus* (Bloch, 1794)” by Boeseman (1954: 21), but certainly not identical with that species.

French Guiana:

SMF 4893, fourteen specimens, juvenile, 16.6 to 24.7 mm s.l., Maroni Basin, Tampoc Creeks, coll. J. Géry, 30-XI-1957; ZMA 104.277, ten specimens, juvenile, 16.4 to 26.8 mm s.l., same data as SMF 4893; SMF 5003, one specimen, 30.4 mm s.l., Mana, Sant Cariacon, coll. J. Géry, 14-X-1957; SMF (no reg. nr.), eleven specimens, juvenile, 16.5 to 28.4 mm s.l., Compté Creeks, near Degrad Cacao, coll. J. Géry, 10-XI-1957.

GENERAL REMARKS

After the last revision of the genus *Corydoras* by Gosline (1940), at least thirty-five new specific names were introduced. Unfortunatly, Gosline's revision is not accompanied by habitus figures of any species. Moreover, it

is rather difficult to recognize some species from old descriptions, which mostly are without figures; this makes a survey of the genus a delicate task. Furthermore, from time to time descriptions of new species appear with adequate figures, but with poor descriptions and without locality data, mostly concerning imported aquarium material.

After 1940 eight descriptions of new species or subspecies, based on a single specimen, were published: *C. griseus* Holly, 1940; *C. pestai* Holly, 1940; *C. grafi* Holly, 1940; *C. melanistius brevirostris* Fraser-Brunner, 1947; *C. fowleri* Böhlke, 1950; *C. melanistius longirostris* Hoedeman, 1952; *C. sychri* Weitzman, 1960; and *C. evelynae* Rössel, 1963. Moreover the neotype of *C. reticulatus* Fraser-Brunner, 1938, was designated by Weitzman in 1961 also after a single available specimen.

Type material of the following species and subspecies seems to be lost: *C. punctatus* (Bloch, 1794); *C. geoffroyi* Lacépède, 1803; *C. acutus* Cope, 1872; *C. reticulatus*, *C. griseus*, *C. pestai*, *C. grafi*, *C. schultzei* all of Holly, 1940; and *C. melanistius longirostris* Hoedeman, 1952.

Accurate type localities of the following species, described after 1940, are unknown: *C. griseus*, *C. pestai*, *C. grafi*, *C. schultzei* Holly, 1940, all from "in kleinen und kleinsten Wasserläufen in der Nähe des Amazonenstromes"; *C. funnelli* Fraser-Brunner, 1947, holotype from "Amazon(?)", the sole paratype an aquarium specimen; *C. melanistius longirostris* from "Amazon", aquarium specimen; *C. griseus deweyeri* Meinken, 1957, lectotype and paralectotype from British Guiana, aquarium specimens; *C. sychri* Weitzman, 1960, aquarium specimen without locality; *C. haraldschultzi* Knaack, 1962, from "Brazil"; *C. sterbai* Knaack, 1962, from "Brazil".

We were rather surprised to learn that all paratypes of *C. haraldschultzi*, *C. sterbai*, and *C. guapore* Knaack, 1961, were living aquarium fishes. The type specimen of *C. melanistius longirostris* was in all probability also a not-preserved aquarium fish.

Making an allowance for the variability in most species, descriptions of new species based on a single specimen without locality cannot be considered a contribution to ichthyology. It seems strange that Fraser-Brunner, Hoedeman, and Meinken defined their subspecies without accurate locality data of their specimens, whilst the geographical distribution of closely related species is insufficiently known.

While working on the genus *Corydoras*, we received a lot of freshly preserved specimens of this genus, brought in by two aquarium fish importers in Amsterdam. Some new, still undescribed species are present now in the collections of the Zoological Museum, Amsterdam, but we do not feel inclined to describe them, since accurate data are missing.

After what we said in preceding lines, it may seem strange that we describe a new species, *C. dubius*, and state that its locality has to be regarded doubtful. But the curious circumstances of these specimens (ex neotype series, see introduction) induced us to give its description simultaneously with the redescription of *C. punctatus*.

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Explanation of the plates

Pl. 1

Fig. 1. Inverse reproduction of Bloch's original drawing (1794, pl. 377 fig. 2) of *Cataphractus punctatus*; fig. 2. *Corydoras punctatus* (Bloch, 1794), neotype, from Compagnie Creek, Surinam, 42.7 mm standard length; fig. 3. *Corydoras aeneus* (Gill, 1858), from a small tributary of the Gran Creek, Surinam, 38.4 mm standard length.

Pl. 2

Fig. 1. *Corydoras melanistiuis* Regan, 1912, lectotype, from Essequibo, British Guiana, 35.6 mm standard length; fig. 2. *Corydoras spilurus* Norman, 1926, lectotype, from Iponcin Creek, French Guiana, 47.1 mm standard length; fig. 3. *Corydoras bondi* Gosline, 1940, from Sipaliwini River, Surinam, 39.1 mm standard length.

Pl. 3

Fig. 1. *Corydoras osteocarus* Böhlke, 1951, from Avanavero Falls, Surinam, 35.7 mm standard length; fig. 2. *Corydoras griseus deweyeri* Meinken, 1957, lectotype, from British Guiana, 38.3 mm standard length; fig. 3. *Corydoras bicolor* new species, holotype, from Sipaliwini River, Surinam, 25.9 mm standard length.

Pl. 4

Fig. 1. *Corydoras boesemani* new species, holotype, from tributary of Gran Rio between Ligolio and Awaradam Falls, Surinam, 35.3 mm standard

length; fig. 2. *Corydoras dubius* new species, holotype, from Surinam? (locality uncertain), 37.8 mm standard length; fig. 3. *Corydoras oxyrhynchus* new species, holotype, from Gojo Creek, Surinam, 47.8 mm standard length.

Pl. 5

Fig. 1. *Corydoras nanus* new species, holotype, from tributary of Gran Rio between Ligolio and Awaradam Falls, Surinam, 23.0 mm standard length; fig. 2. *Corydoras sanchesii* new species, holotype, from Gojo Creek above Posoegroenoe, Surinam, 34.6 mm standard length; fig. 3. *Corydoras wotroi* new species, holotype, from outlet Kleine Saramacca, Surinam, 26.8 mm standard length.

