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Additional new species of *Hypostomus* Lacépède, 1803, from Surinam; with remarks on the apparent „*gymnorhynchus*-complex" (Siluriformes, Loricariidae)

M. BOESEMAN

ABSTRACT

Two new Surinam species of *Hypostomus* Lacépède are described, and their relationship is discussed; a group of three forms from eastern Surinam and (French) Guyane (*gymnorhynchus*-complex) is reconsidered; the species *H. plecostomus* (Linnaeus) is reported to hitherto survive in the lacustrine environment of the Brokopondo Lake.

INTRODUCTION

After having completed a review of the Surinam representatives of the genus *Hypostomus*, based on the collections in the Leiden Museum, I received a collection of 217 examples of Hypostomids collected in Surinam by Drs. H. Nijssen (Zoölogisch Museum, Amsterdam) during the years 1966 and 1967. While a considerable part of this material proved to belong to species newly described in my previous paper (Boeseman, 1968), and are listed there in an addendum, the remaining specimens are discussed here, including two new species collected in rivers hitherto not or hardly surveyed.

To facilitate consultation of the present paper, the explanatory figure for the various measurements published previously (1968) is here reproduced (fig. 1) showing the characters (A-S) indicating the various measurements as used in the diagrams and tables. For more detailed or extensive general remarks, the paragraphs "Measurements and methods" and "Miscellaneous remarks" in my previous review should be consulted (Boeseman, 1968 : 25—28). Moreover, I retained the (sub)species enumeration previously used (1—15), numbering the present new species 16 and 17.

As both new species evidently belong to the *watwata*-group (Boeseman,

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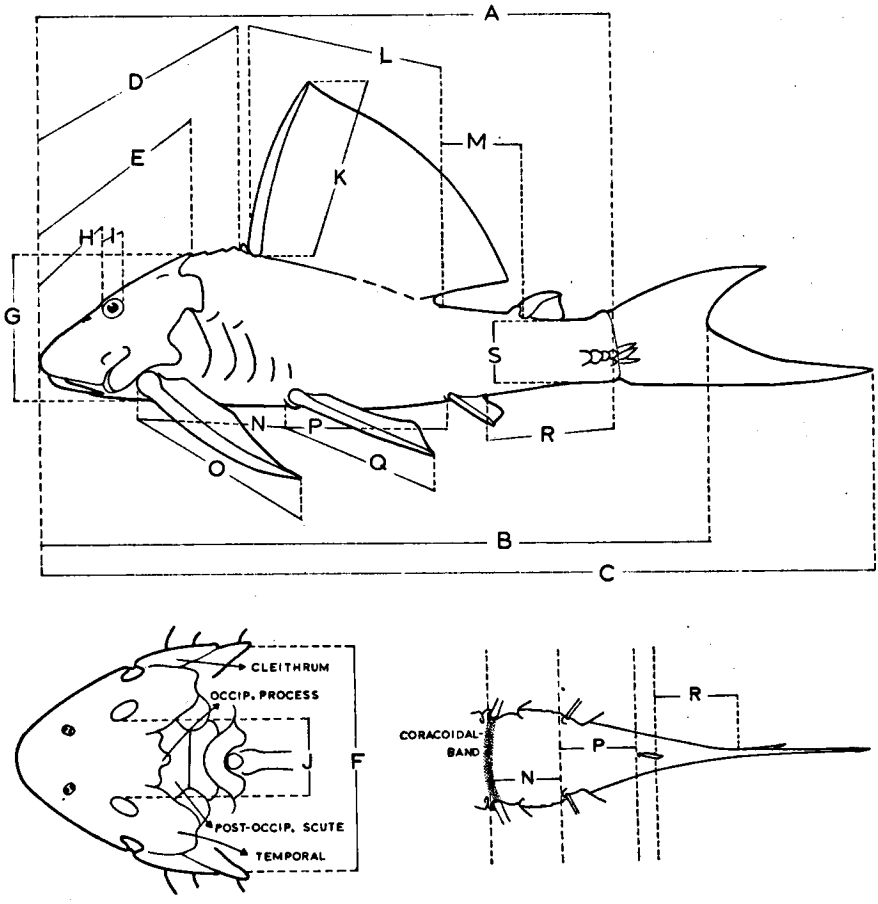


FIG. 1. Measurements and terminology. A, standard length; B, axial length; C, total length; D, predorsal length; E, length of head; F, cleithral width; G, depth of head; H, length of snout; I, orbital diameter; J, interorbital width; K, length of dorsal spine; L, length of base of first dorsal fin; M, interdorsal length; N, thoracic length along median line; O, length of pectoral spine; P, abdominal length along median line; Q, length of first ventral ray; R, post-anal peduncular length; S, depth of caudal peduncle.

1968 : 18 & 19), the *plecostomus*-group is omitted in the diagrams. The accompanying map (fig. 2) also records the localities given in the addendum to my previous paper. Unless indicated otherwise, all specimens belong to the Amsterdam Museum.

ADDITIONAL SURINAM SPECIES

16. **Hypostomus coppenamensis** nov. spec. (fig. 3, table I)

Material. — ZMA 105.856, L. tributary of Left Coppename River (3° 54'N, 56° 46'W), Surinam, 9 May 1967, leg. H. Nijssen (Brokopondo Research 1966/67), 1 ex., 125 mm (holotype); ZMA 106.143, same data, 1 ex., 112 mm (paratype).

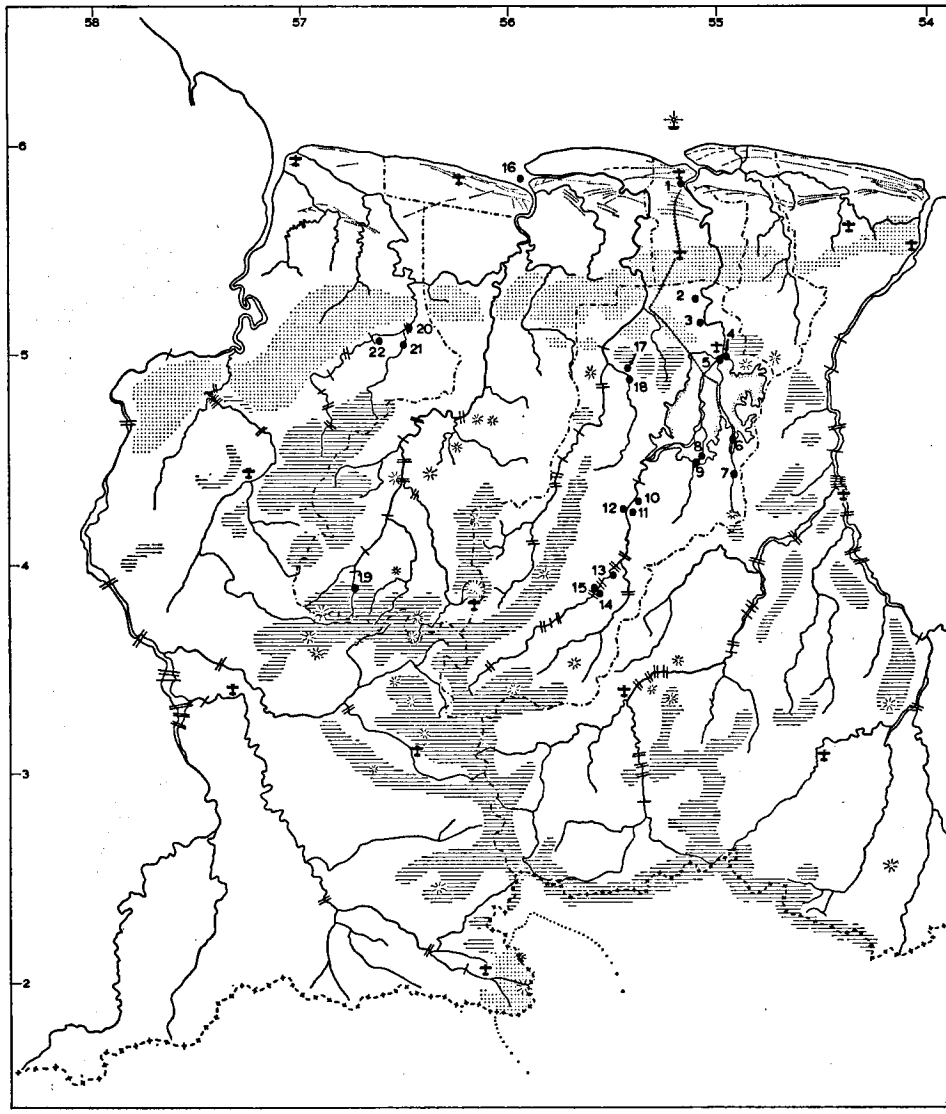


FIG. 2. Collecting localities of Nijssen's specimens: 1, Paramaribo; 2, Maréchal Creek; 3, Mama Creek; 4, N-shore of Brokopondo Lake, E of Afobaka; 5, N Brokopondo Lake near Afobaka barrage; 6, Sara Creek, about 5 km S of Dam; 7, Sara Creek, about 27 km S of Dam; 8, Gran Creek (= Marowijne Creek), about 55 km S of Afobaka; 9, Gran Creek, about 63 km S of Afobaka; 10, Jenjee Creek, about 7.5 km N of Botopasi; 11, Awara Creek, about 1.5 km S of Botopasi; 12, Parwapa (= Pabo) Creek, about 2.5 km N of Botopasi; 13, Gran Mau, about 1 km NE of Dombai (Bendi Watra); 14, R. tributary of Gran Rio, about 4 km NE of Awaradam Falls; 15, L. tributary of Gran Rio, about 3 km NE of Awaradam Falls; 16, outlet of Saramacca- and Coppename Rivers; 17, R. tributary of Kleine Saramacca, about 11 km from outlet; 18, Kleine Saramacca, about 14 km from outlet; 19, L. tributary of Left Coppename River; 20, Stondansie Falls, Nickerie River; 21, Fallawatra River, about 5 km SSW of Stondansie Falls; 22, R. tributary of Nickerie River, about 12 km WSW of Stondansie Falls.

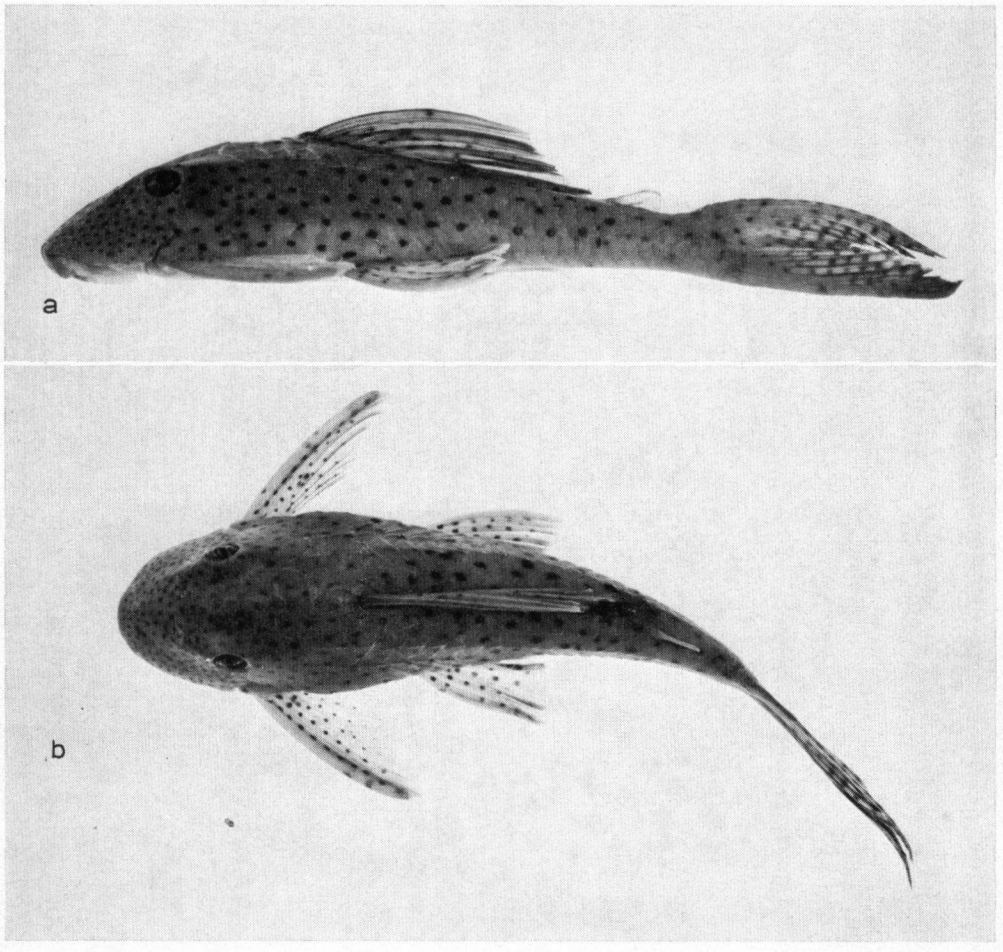


FIG. 3. a, b, *Hypostomus coppenamensis* nov. spec., holotype (ZMA 105.856), stan dard length 125 mm, in lateral and dorsal view.

Diagnosis. — Depth of caudal peduncle in interdorsal length 2.4—2.5 (average 2.45), the species therefore referred to the *watwata*-group; mandibular ramus in interorbital width 2.5—2.6, the limited number of specimens not allowing recognition of any allometric growth; deflated first dorsal fin falling distinctly short of spine of second dorsal fin; except on belly, wholly covered with small to moderate, round, very intense dark spots, smaller than but comparable with those on *H. paucimaculatus* Boeseman (species 7) which, however, is a much more stoutly built species belonging to the *plecostomus*-group.

Description. — A slender species with a very moderate peduncular depth, the head in dorsal view with ovate outline, more ogival with a median point in the smaller example.

Tabulated morphological data

The meaning and usage of the characters A-S is explained in fig. 1; holotypes areindicated by asteriscs; some of the trends are merely suggested.

TABLE I. *Hypostomus coppenamensis* nov. spec. - (species 16)

Reg. no.	A	B	C	D (A)	E (A)	F (E)	G (E)	H (E)	I (E)	J (E)	K (A)	L (A)	M (A)	N (A)	O (A)	P (A)	Q (A)	R (A)	S (A)	S(M)
*105.856	125	153	178	47.8 (2.6	40.8 (3.05)	34.2 (1.2)	22.9 (1.8)	24.2 (1.7)	7.8 (5.2)	16.4 (2.5)	42.6 (2.95)	33.9 (3.7)	25.5 (4.9)	31.5 (3.95)	40.1 (3.1)	27.0 (4.6)	33.0 (3.8)	40.5 (3.1)	10.1 (12.3)	2.5
106.143	112	133	158	44.2 (2.55)	37.5 (3.0)	31.9 (1.2)	20.5 (1.8)	22.6 (1.65)	7.4 (5.05)	15.8 (2.4)	39.6 (2.85)	33.9 (3.3)	23.0 (4.85)	28.2 (3.95)	38.0 (2.95)	24.7 (4.5)	29.0 (3.85)	35.6 (3.15)	9.6 (11.7)	2.4
Range of ratios :				2.55-2.6	3.0-3.05	1.2	1.8	1.65-1.7	5.05-5.2	2.4-2.5	2.85-2.95	3.3-3.7	4.85-4.9	3.95	2.95-3.1	4.5-4.6	3.8-3.85	3.1-3.15	11.7-12.3	2.4-2.5
Average of ratios:				2.55	3.0	1.2	1.8	1.65	5.1	2.45	2.9	3.5	4.85	3.95	3.0	4.55	3.85	3.15	12.0	2.45

TABLE II. *Hypostomus nickeriensis* nov. spec. - (species 17)

Reg. no.	A	B	C	D (A)	E (A)	F (E)	G (E)	H (E)	I (E)	J (E)	K (A)	L (A)	M (A)	N (A)	O (A)	P (A)	Q (A)	R (A)	S (A)	S(M)
106.142	170	203	225	64.0 (2.65)	53.5 (3.15)	48.6 (1.1)	31.0 (1.7)	35.0 (1.5)	10.0 (5.35)	19.5 (2.75)	45.0 (3.7)	48.0 (3.55)	32.5 (5.2)	42.0 (4.05)	50.0 (3.4)	40.0 (4.25)	41.5 (4.1)	51.0 (3.35)	16.0 (10.6)	2.05
*105.765	168	203	212	65.0 (2.6)	54.0 (3.1)	48.3 (1.1)	32.0 (1.7)	35.0 (1.55)	10.0 (5.4)	20.5 (2.65)	54.0 (3.1)	48.0 (3.5)	32.5 (5.15)	40.0 (4.2)	57.0 (2.95)	39.0 (4.3)	46.0 (3.65)	50.0 (3.35)	16.1 (10.4)	2.0
RMNH 25982	160	195	220	62.5 (2.55)	53.0 (3.0)	45.0 (1.2)	29.8 (1.8)	35.0 (1.5)	9.6 (5.5)	18.3 (2.9)	57.0 (2.8)	46.5 (3.45)	31.5 (5.1)	38.0 (4.2)	54.0 (2.95)	37.0 (4.3)	44.0 (3.6)	48.0 (3.35)	15.3 (10.5)	2.05
106.142	158	192	220	62.3 (2.55)	51.7 (3.05)	45.0 (1.15)	29.0 (1.8)	33.0 (1.55)	9.5 (5.4)	18.2 (2.85)	59.5 (2.65)	45.0 (3.5)	31.5 (5.0)	37.0 (4.25)	52.0 (3.05)	34.5 (4.55)	44.0 (3.6)	46.0 (3.45)	15.3 (10.4)	2.05
106.142	145	172	197	53.3 (2.7)	45.7 (3.15)	39.6 (1.15)	25.7 (1.8)	29.0 (1.6)	8.9 (5.25)	17.5 (2.6)	50.0 (2.9)	40.6 (3.55)	26.7 (5.4)	35.0 (4.15)	44.8 (3.25)	30.0 (4.8)	39.0 (3.7)	43.0 (3.35)	13.4 (10.8)	2.0
105.767	137	170	188	54.5 (2.5)	45.0 (3.05)	39.8 (1.15)	25.5 (1.75)	28.5 (1.65)	8.9 (5.05)	16.1 (2.8)	40.5 (3.4)	41.5 (3.3)	26.5 (5.2)	35.0 (3.9)	42.5 (3.25)	31.0 (4.4)	37.0 (3.7)	41.0 (3.35)	12.8 (10.7)	2.05
106.142	136.5	166	184	54.0 (2.55)	45.5 (3.0)	39.6 (1.15)	25.4 (1.8)	29.0 (1.55)	9.0 (5.2)	17.0 (2.7)	51.5 (2.65)	42.0 (3.25)	27.0 (5.05)	33.0 (4.15)	46.5 (2.95)	29.5 (4.6)	39.5 (3.45)	42.5 (3.2)	13.5 (10.1)	2.0
106.142	136	166	180	54.0 (2.5)	45.0 (3.0)	39.2 (1.15)	25.0 (1.8)	28.5 (1.6)	8.9 (5.1)	16.2 (2.8)	51.5 (2.65)	39.3 (3.45)	26.5 (5.15)	33.0 (4.1)	44.5 (3.05)	30.0 (4.55)	38.0 (3.55)	42.5 (3.2)	13.0 (10.4)	2.05
106.142	130	156	177	51.0 (2.55)	43.0 (3.0)	38.0 (1.1)	24.4 (1.75)	27.0 (1.6)	8.6 (5.0)	15.8 (2.7)	46.0 (2.8)	38.5 (3.35)	26.0 (5.0)	32.0 (4.05)	42.0 (3.1)	27.0 (4.8)	33.0 (3.95)	39.0 (3.35)	12.5 (10.4)	2.05
106.142	124	148	170	49.5 (2.5)	41.5 (3.0)	35.0 (1.2)	23.6 (1.75)	25.0 (1.65)	8.2 (5.05)	14.6 (2.85)	46.5 (2.65)	37.5 (3.3)	24.0 (5.2)	32.0 (3.9)	41.5 (3.0)	26.5 (4.7)	34.0 (3.65)	37.0 (3.35)	11.6 (10.7)	2.05
105.767	118	141	164	48.5 (2.45)	41.5 (2.85)	34.7 (1.2)	22.3 (1.85)	27.0 (1.55)	8.3 (5.0)	14.9 (2.95)	45.0 (2.6)	36.3 (3.25)	23.5 (5.0)	28.6 (4.1)	38.7 (3.05)	25.0 (4.7)	33.5 (3.55)	36.0 (3.3)	11.0 (10.7)	2.1
105.767	112	134	157	44.8 (2.5)	37.7 (2.95)	31.7 (1.2)	20.9 (1.8)	23.5 (1.6)	7.7 (4.9)	13.7 (2.75)	? (-)	32.0 (3.5)	21.0 (5.3)	28.5 (3.9)	36.0 (3.1)	23.5 (4.75)	30.0 (3.75)	34.0 (3.3)	10.6 (10.6)	2.0
105.767	110	135	154	45.0 (2.45)	38.2 (2.85)	31.6 (1.2)	20.4 (1.9)	24.0 (1.6)	7.8 (4.9)	14.2 (2.7)	38.2 (2.9)	32.5 (3.4)	21.3 (5.2)	28.0 (3.9)	36.3 (3.05)	23.0 (4.8)	30.7 (3.6)	33.0 (3.35)	10.2 (10.6)	2.1
106.142	110	135	148+	46.0 (2.4)	39.5 (2.8)	33.0 (1.2)	20.8 (1.9)	24.0 (1.65)	7.7 (5.1)	13.6 (2.9)	44.0 (2.5)	35.5 (3.1)	22.0 (5.0)	29.0 (3.8)	38.0 (2.9)	22.0 (5.0)	32.0 (3.45)	34.0 (3.25)	10.7 (10.3)	2.05
105.767	102	122	146	42.0 (2.45)	35.2 (2.9)	28.6 (1.25)	18.2 (1.95)	21.5 (1.65)	7.3 (4.8)	12.5 (2.8)	? (-)	29.5 (3.45)	19.3 (5.3)	26.0 (3.95)	34.5 (2.95)	21.5 (4.75)	28.7 (3.55)	32.0 (3.2)	9.2 (11.1)	2.1
105.767	101	120	140+	41.0 (2.45)	34.7 (2.9)	29.2 (1.2)	18.7 (1.85)	21.4 (1.6)	7.3 (4.75)	12.8 (2.7)	? (-)	30.0 (3.35)	19.3 (5.2)	24.5 (4.1)	33.5 (3.0)	21.0 (4.8)	27.6 (3.65)	30.0 (3.35)	9.4 (11.0)	2.05
105.767	100	120	131+	40.8 (2.45)	34.5 (2.9)	28.5 (1.2)	18.0 (1.9)	21.3 (1.6)	7.4 (4.65)	11.7 (2.95)	35.0 (2.85)	29.9 (3.35)	19.4 (5.15)	24.5 (4.05)	31.3 (3.2)	21.8 (4.6)	27.0 (3.7)	29.8 (3.35)	9.2 (10.8)	2.1
105.767	99	118	139	39.0 (2.55)	34.0 (2.9)	28.2 (1.2)	17.0 (2.0)	20.2 (1.7)	7.2 (4.7)	12.0 (2.85)	33.0 (3.0)	29.0 (3.4)	18.6 (5.3)	24.0 (4.1)	32.0 (3.1)	22.0 (4.5)	26.2 (3.8)	30.0 (3.3)	9.0 (11.0)	2.05
106.142	97	119	136	39.5 (2.45)	33.2 (2.9)	27.8 (1.2)	17.2 (1.95)	20.0 (1.65)	7.0 (4.7)	12.4 (2.7)	40.0 (2.4)	27.0 (3.6)	18.5 (5.2)	24.5 (3.95)	33.0 (2.95)	21.0 (4.6)	27.5 (3.5)	28.0 (3.45)	9.2 (10.5)	2.0
105.767	95	115	128	38.8 (2.45)	33.8 (2.8)	27.1 (1.25)	17.1 (2.0)	20.0 (1.7)	7.1 (4.75)	11.5 (2.95)	33.7 (2.8)	29.0 (3.3)	17.8 (5.35)	23.4 (4.05)	31.0 (3.05)	21.0 (4.5)	26.0 (3.65)	28.8 (3.3)	8.8 (10.8)	2.0
RMNH 25982	90	110	125+	36.5 (2.45)	31.5 (2.85)	25.5 (1.25)	15.5 (2.05)	18.5 (1.7)	6.8 (4.65)	11.1 (2.85)	37.5 (2.4)	25.5 (3.5)	16.5 (5.45)	23.5 (3.8)	31.0 (2.9)	17.5 (5.15)	25.0 (3.6)	27.0 (3.35)	8.3 (10.8)	2.0
106.012	85	102	120+	33.5 (2.55)	29.4 (2.9)	23.5 (1.25)	15.2 (1.95)	17.6 (1.7)	6.5 (4.5)	10.1 (2.9)	33.0 (2.6)	22.8 (3.7)	15.2 (5.6)	20.2 (4.2)	25.8 (3.3)	17.0 (5.0)	23.5 (3.6)	26.0 (3.25)	7.5 (11.3)	2.05
105.767	82	98	115+	32.6 (2.5)	28.2 (2.9)	22.5 (1.25)	14.4 (1.95)	16.7 (1.7)	6.4 (4.4)	9.6 (2.95)	? (-)	23.5 (3.5)	16.0 (5.1)	20.4 (4.0)	25.3 (3.25)	16.5 (4.95)	22.6 (3.6)	26.4 (3.1)	7.5 (10.9)	2.1
105.767	79	96	104+	31.8 (2.5)	28.2 (2.8)	22.3 (1.25)	14.0 (2.0)	17.0 (1.65)	6.3 (4.5)	9.6 (2.95)	28.8 (2.75)	23.0 (3.45)	15.1 (5.25)	20.0 (3.95)	25.0 (3.15)	15.6 (5.1)	21.5 (3.65)	24.7 (3.2)	7.2 (11.0)	2.1
105.767	69	85	92+	28.2 (2.45)	25.0 (2.75)	20.1 (1.25)	12.0 (2.1)	14.7 (1.7)	5.8 (4.3)	8.4 (3.0)	22.1 (3.1)	20.0 (3.45)	13.5 (5.1)	17.0 (4.05)	22.0 (3.15)	14.0 (4.95)	18.7 (3.7)	21.0 (3.3)	6.3 (11.0)	2.0
106.012	69	85	108	27.8 (2.5)	25.0 (2.75)	19.6 (1.3)	12.4 (2.0)	14.0 (1.8)	5.6 (4.45)	8.4 (3.0)	26.0 (2.65)	20.1 (3.45)	11.7 (5.8)	15.9 (4.35)	21.6 (3.2)	14.4 (4.8)	19.0 (3.65)	21.2 (3.25)	5.9 (11.7)	2.0
105.767	67	81	93+	27.0 (2.5)	23.5 (2.85)	19.0 (1.25)	11.5 (2.05)	13.7 (1.7)	5.5 (4.3)	7.8 (3.0)	24.8 (2.7)	19.1 (3.5)	12.2 (5.5)	16.0 (4.15)	20.6 (3.25)	13.2 (5.05)	17.6 (3.8)	20.0 (3.35)	5.05 (11.2)	2.05
106.142	44	52	60	17.7 (2.5)	16.3 (2.7)	12.2 (1.35)	7.5 (2.15)	8.7 (1.85)	3.9 (4.3)	5.2 (3.15)	14.5 (3.05)	11.5 (3.8)	7.2 (6.1)	11.0 (4.0)	14.0 (3.15)	8.0 (5.5)	12.0 (3.65)	12.5 (3.5)	3.6 (12.2)	2.0
106.012	38	44	51	16.3 (2.35)	14.0 (2.7)	10.4 (1.35)	6.5 (2.15)	7.5 (1.85)	3.2 (4.35)	4.4 (3.2)	? (-)	9.2 (4.1)	6.0 (6.3)	8.4 (4.5)	9.5 (4.0)	6.8 (5.6)	8.6 (4.4)	10.5 (3.6)	3.0 (12.6)	2.0
Range of ratios :				2.35-2.7	2.7-3.15	1.1-1.35	1.7-2.15	1.5-1.85	4.3-5.5	2.6-3.2	2.4-3.1(3.7)	3.1-4.1	5.0-6.3	3.8-4.5	2.9-3.4(4.0)	4.25-5.6	3.45-4.4	3.1-3.6	10.1-12.6	2.0-2.1
Average of ratios:				2.5	2.9	1.2	1.9	1.65	4.85	2.85	2.8	3.45	5.3	4.05	3.15	4.75	3.7	3.3	10.85	2.05
Allometric trend :				-	-	+	+	+	-	+	=	=	+	=	+	+	+	=	+	=

Depth of head at tip of occipital process 5.45 (both ex.), width at cleithra 3.5—3.65 (average 3.55), both in standard length. Diameter of orbit 3.05—3.1 in snout, 2.1—2.15 in interorbital width, the two specimens notwithstanding their limited size difference giving an indication of the usual relative decrease with age (or size). Additional measurements, ratios, and averages are given in table 1.

Scutes in longitudinal lateral series 27/28 (holotype) and 27/27 (paratype), neglecting the elongate scute on caudal base. There are 7 interdorsal scutes, 3 between second dorsal and caudal, and 11 or 12 post-anal, while one or two small additional scutes cover the origins of these fins. The post-occipital scute is single. The belly of the paratype shows a rather well developed coracoidal band, lateral scutes, and some scutes almost wholly in a single series along the median line; on the holotype, the belly shows a distinct coracoidal band and stronger developed lateral and median longitudinal bands. Lower head in paratype with a very fragmentary patch before both branchial apertures, leaving the throat widely naked, and the lower snout with two narrow projections from the upper snout cover curving around the anterior margin on both sides of the narrowly naked tip; the lateral dorsal scutes also curve around the margins, forming a narrow marginal cover on the lower surface of the head. In the holotype, the patches before the branchial apertures are more strongly developed, roughly triangular, with some scutelets approaching the naked throat, while there are two very small additional patches on the lower snout slightly before the mouth angles.

The number of mandibular teeth counted on each ramus varies between 38 and 40, with apparently few (if any) hidden by the gums.

The deflated first dorsal fin in both examples falls distinctly short of the base of the spine of the second dorsal fin, about reaching the anterior margin of the basal scute of that spine.

The colour markings are very characteristic. The specimens both show a rather light, beige-brownish ground colour, except on the lower surface wholly covered with small or moderate dark round spots, the interspaces being much larger than the spot diameters. The spots are slightly smaller on the head, considerably smaller on snout and fins, and all irregularly distributed, or situated along rays on paired fins and caudal.

Habitat. — The river at the type locality was described by Nijssen as having a width of 4 metres, a depth of 30—150 cm, and a bottom of sand and loam with rocks. The specimens were collected with fish-poison in flowing water.

Remarks. — If the high ratio between peduncular depth and interdorsal length were neglected or considered aberrant, the present species might easily be identified as *H. corantijni* Boeseman when using the key for Surinam species I previously published (1968 : 29 & 30). And, indeed, there can be little doubt that *H. coppenamensis* is very closely related to that species, differing only from *H. corantijni* by its considerably higher ratio between peduncular depth and interdorsal length (see diagram 19), its different colour markings (compare present plate 1 with plate 4 of my 1968

review), and apparently by a relatively (slightly) shorter first dorsal spine.

Etymology. — Named after the Coppename River, to which it appears to be restricted.

17. **Hypostomus nickeriensis** nov. spec. (fig. 4, table II)

Material. — ZMA 105.765, Stondansie Falls, Nickerie River, Surinam, 5 April 1967, leg. H. Nijssen (Brokopondo Research 1966/67), 1 ex., 168 mm (holotype); ZMA 105.767, rapids in Fallawatra River, 5 km SSW of Stondansie Falls, Nickerie River basin, Surinam, 6.4.1967, leg. H. Nijssen (Brokopondo Research 1966/67), 14 ex., 23—137 mm (paratypes); ZMA 106.012, R. tributary of Nickerie River, about 12 km WSW of Stondansie Falls, Nickerie River basin, Surinam, 5 April 1967, leg. H. Nijssen (Brokopondo Research 1966/67), 5 ex., 25—85 mm (paratypes); ZMA 106.142, Stondansie Falls, Nickerie River, Surinam, 5 April 1967, leg. H. Nijssen (Brokopondo Research 1966/67), 10 ex., 44—170 mm (paratypes); RMNH 25982, Stondansie Falls, Nickerie River, Surinam, 5 April 1967, leg. H. Nijssen (Brokopondo Research 1966/67), 2 ex., 160 & 90 mm (paratypes), both taken from the type locality series.

Diagnosis. — Depth of caudal peduncle in interdorsal length 2.0—2.1 (average 2.05), the species thus belonging to the *watwata*-group; mandibular ramus in interorbital width 2.1—2.3, apparently without allometric trend; deflated first dorsal fin falling distinctly short to (occasionally) hardly short of base of spine of second dorsal fin; except on belly, wholly covered with small, roundish, dark spots, occasionally slightly oblong on body, usually distinct and well defined against a variably dark ground colour.

Description. — A moderately slender species but with the peduncle in adults often rather wide and, with the hardly emarginate caudal fin, giving the impression of a more stout peduncle than usual in the group; the head in dorsal view rounded ovate in outline.

Depth of head at tip of occipital process 5.25—5.9 (average 5.5), width at cleithra 3.35—3.65 (av. 3.5), in standard length. Diameter of orbit 2.2—3.5 in snout, 1.35—2.05 in interorbital width, the relative size considerably decreasing with age (or size). Additional measurements, ratios, averages and allometric trends are given in table 2.

Scutes in longitudinal lateral series 26/26 (2 ex.), 26/27 (4 ex.), or 27/27 (25 ex.), not counted in a few juveniles with the armature still incompletely developed, all excluding the elongate scute on caudal base. There are usually 6 interdorsal scutes, 2 between second dorsal and caudal, and 12 post-anal, neglecting one or two small additional scutes which cover the origins of these fins. The post-occipital scute is single, except usually in small juveniles up to a size of about 50 mm, possibly more, where the armature is still incompletely developed. The belly is naked up to a size of at least 44 mm, covered with a few lateral scutes only at a size between 69 and about 100 mm, coracoidal scutes begin to develop at a size of more than 100 mm, scattered median scutes at 110—125 mm, but these are occasionally lacking in specimens up to 136 mm; the median scutes become more widely scattered

on anterior belly at about 140 mm, in still larger examples they wholly cover about the anterior half of the belly but remain more or less scattered or lacking on the posterior half. The lower head is naked in the small juveniles, even the two prolongations from the dorsal cover bordering the naked snout tip lacking up to a size of about 100 mm or even more; at about 110 or 120 mm, the patches before the branchial apertures begin to develop, at 165 mm a median patch on the lower snout begins to develop; at about 170 mm, the triangular patches before the branchial apertures are well developed, though the throat remains naked, the lateral margins are covered by parts of the dorsal armature curving around the edge but the lateral snout margins remain widely naked as can usually be seen even from above, only the two projections bordering the snout tip curving around the anterior margin; the lower surface of the snout is now partly covered by a series of three patches which possibly form a transverse band before the upper lip in larger specimens than now available.

The number of mandibular teeth on each ramus varies between 30 and 47, occasionally being even fewer in juveniles, but the low numbers may at least partly be accounted for by probably overlooked additional teeth hidden in the gums; the usual number appears to be about 35 to 45.

The deflated first dorsal fin may fall very distinctly short of the base of the spine of the second dorsal fin (7 ex.), usually falls slightly but distinctly short of that spine, but in some specimens it almost reaches the spine base (5 ex.).

The ground colour is usually rather dark, but occasionally much lighter, beige-brownish, on which the intensely dark round or suboblong spots stand out distinctly. The spots, covering the whole animal except the lower surface and part of the fins, are rather small in adults, especially on the head, but seem quite large on juveniles, where they show about the same size as in large specimens and are much less numerous. In adults, the small spots on the first dorsal fin border the rays and the posterior spine margin, while usually none are found on the membranes which may still show a reddish-brown pigmentation; the apex of the fin is more or less dusky, without any distinct spots. In the smallest example, there is a hyaline band along the base, proximally bordered by some dark pigmention, while in slightly larger juveniles the hyaline band separates two series of dark spots along the fin base; at about 40 mm, additional whitish spots may develop, while in still larger specimens the spots become more restricted to the spine and rays. The spots on the first dorsal may even in larger examples remain arranged in more or less regular transverse series. The caudal fin is covered with numerous small dark spots, usually more or less arranged in transverse series, but in juveniles the number of spots is much reduced, with an irregular distribution, or even lacking in the smallest examples; the lower half, or lower lobe in juveniles, is dusky. The paired fins also are covered with small spots situated on the rays and pectoral spines, usually in cross-bands or in series in adults, less regularly arranged in juveniles. Especially in small specimens, the fin membranes often still show a rather reddish colouration.

Habitat. — All specimens were collected in flowing water, the bottom

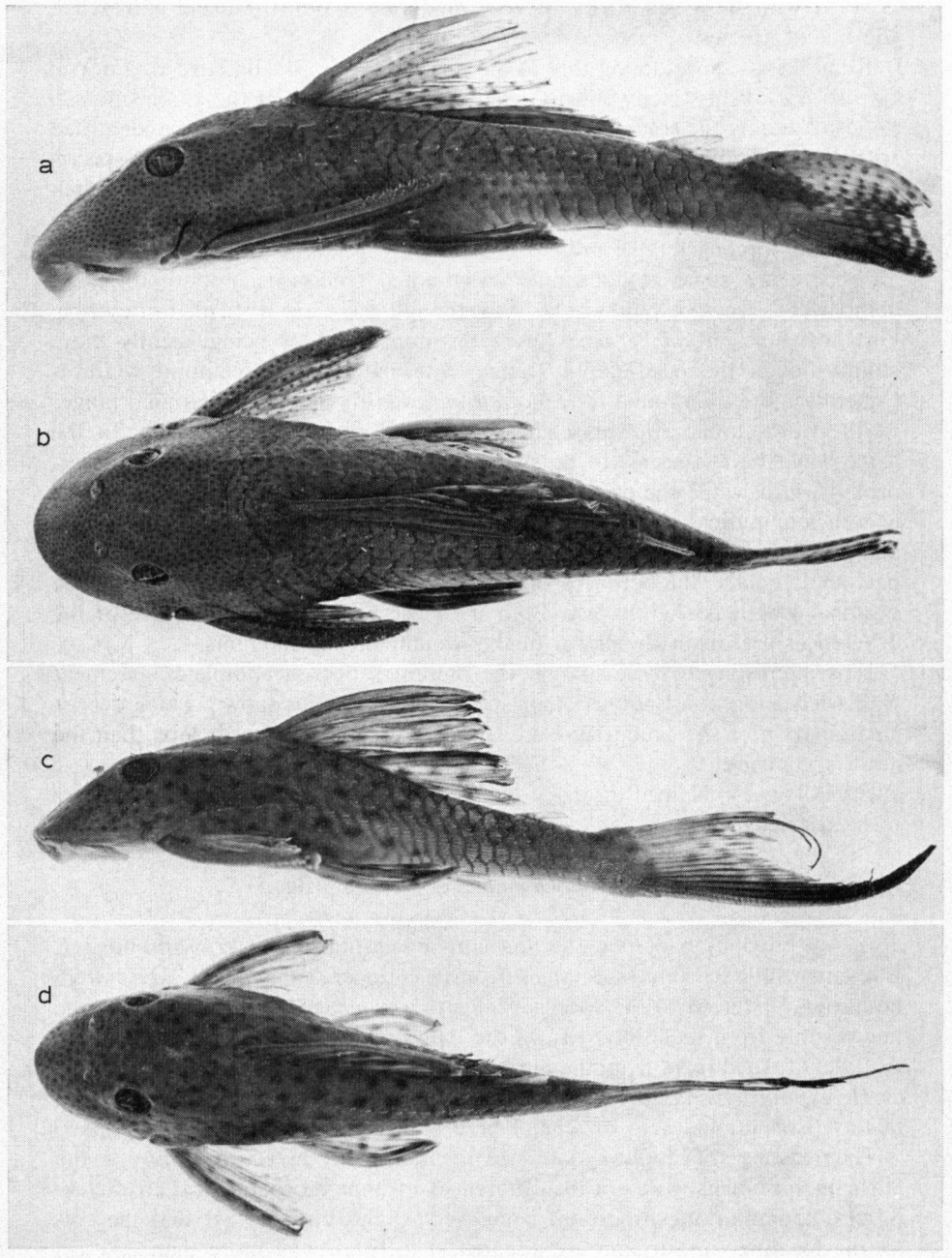


FIG. 4. a, b, *Hypostomus nickeriensis* nov. spec., holotype (ZMA 105.765), standard length 168 mm; c, d, paratype (ZMA 106.012), standard length 68 mm; both in lateral and dorsal view.

covered with sand and rocks, at very moderate depth, the usual habitat for the inland species.

Remarks. — Considering that in the present species the deflated first dorsal fin usually falls distinctly short of the base of the spine of the second dorsal, almost reaching the spine base in only 5 examples, it might easily be identified with *H. corantijni* Boeseman when consulting my key for the Surinam species of *Hypostomus* (Boeseman, 1968 : 29 & 30). I must confess that, as often in this intricate genus, the differences are very slight and there might be some arguments to consider the present form merely a subspecies of *H. corantijni*. But there are some obvious differences when specimens of both forms of comparable sizes are put side by side, though these are difficult to describe. On the whole, *H. nickeriensis* gives the impression of being slightly more stout; though the head depth seems somewhat less, the cleithral width is evidently more than found in *H. corantijni*, even though the variational ranges of the ratios found for this character show a considerable overlap. In the same way, the eye seems to be slightly larger in comparison with the interorbital width, while the occasional deviation from the usual number of scutes (27) in longitudinal lateral series is to the opposite direction (26 against 28), and there are fewer scutes between second dorsal and caudal fins as well as post-anal; finally, the depth of the caudal peduncle is slightly more, and the postanal length is slightly less. Both the close resemblance and some of the differences are distinctly shown in the accompanying diagrams.

It is interesting to note that in the present series, in complete agreement with what I found in various other species, the juveniles show a much deeper emargination of the caudal fin and a far more elongated lower lobe than the adult specimens.

Etymology. — Named after the Nickerie River (basin), to which it appears to be restricted.

THE "*gymnorhynchus*-COMPLEX" (fig. 5)

In my previous paper on the Surinam representatives of *Hypostomus* (cf. Boeseman, 1968), some specimens from the upper Tapanahoni River were hesitatingly referred to the species *H. gymnorhynchus* (Norman), at that time known only from its holotype from the Approuague River, (French) Guyane. A closely related form from the Surinam River was, also tentatively, described as *H. gymnorhynchus occidentalis* Boeseman, occupying the occidental limit of the distributional area of what I here name the *gymnorhynchus*-complex.

The reasons for doubting an identification with *gymnorhynchus* of the Surinam specimens were not the differences in some morphological characters or in colour markings, these all being very slight, but the fact that the collecting localities in Surinam are situated at a distance of more than 200 km from the Approuague River, while all Surinam species known at the time from inland Surinam appeared to be restricted to only a single river basin or, in one case, to two adjacent river systems.

On the other hand, there were a few arguments favouring an identification

of the Surinam specimens with *H. gymnorhynchus*: a. the species was originally based on a single specimen and additional examples never seem to have been assembled, so the lack of variational information and the possiblity that the holotype might be slightly aberrant diminished the importance of the few small differences I found; b. the intermediate region has hardly been explored as to its ichthyological fauna; and c. the Tapanahoni River is part of the large Marowijne River basin, including the Inini River which originates quite near the sources of the Approuague River.

However, with the two Surinam species here newly described, 13 out of 14 of the now known Surinam inland forms are restriced to a single river basin or (one species) to two adjacent river systems, and the identification of the single exception, the Tapanahoni *H. gymnorhynchus*, has thereby become even less acceptable. I am inclined to consider the Tapanahoni River specimens to represent (at least) a separate subspecies, for which I propose the name *H. gymnorhynchus* **tapanahoniensis** nov. subsp. As holotype of the new subspecies I indicate a specimen in sample RMNH 25476 (upper Tapanahoni River, Surinam, 27 November 1965, leg. Dr. G. F. Mees (Brokopondo Research 1965/66), measuring 156 mm; the remainder of the Tapanahoni River specimens, as previously listed (Boeseman, 1968 : 42, 43), become paratypes.

As I did not provide a figure of an adult Tapanahoni River specimen, I correct this omission by adding to the present paper photographs of all three *H. gymnorhynchus* forms now distinguished. Whether these forms really represent subspecies or, more likely, good species, remains a problem only to be solved after adequate additional material becomes available.

The three photographs showing the representatives of the *gymnorhynchus*-complex in lateral view, clearly illustrate the difficulties encountered when distinguishing three so closely related forms, but also show some of the apparent differences already discussed in my previous paper (1968 : 44 & 45), the principal being found in the distances between the deflated first dorsal fin and the base of the spine of the second dorsal fin, and in the colour markings (caudal fin !).

Additional remarks

The material collected by Nijssen also contains some specimens of the well known coastal species *Hypostomus plecostomus* (Linnaeus) and *Hypostomus watwata* Hancock. The following list of these examples concludes my review of the Surinam species of "wara-wara" (= bush-negro and carib vernacular name for *Hypostomus* species).

1. **Hypostomus plecostomus** (Linnaeus, 1758).

Material. — ZMA 105.023, Mama Creek, about 1½ km N of Berg-en-Dal, Surinam River basin, Surinam, 2 May 1966, leg. H. Nijssen (Brokopondo Research 1966/67), 2 ex., 100 & 110 mm; ZMA 105.026, Mama Creek, about 1½ km N of Berg-en-Dal, Surinam River basin, Surinam, 17 May 1966, leg. H. Nijssen (Brokopondo Research

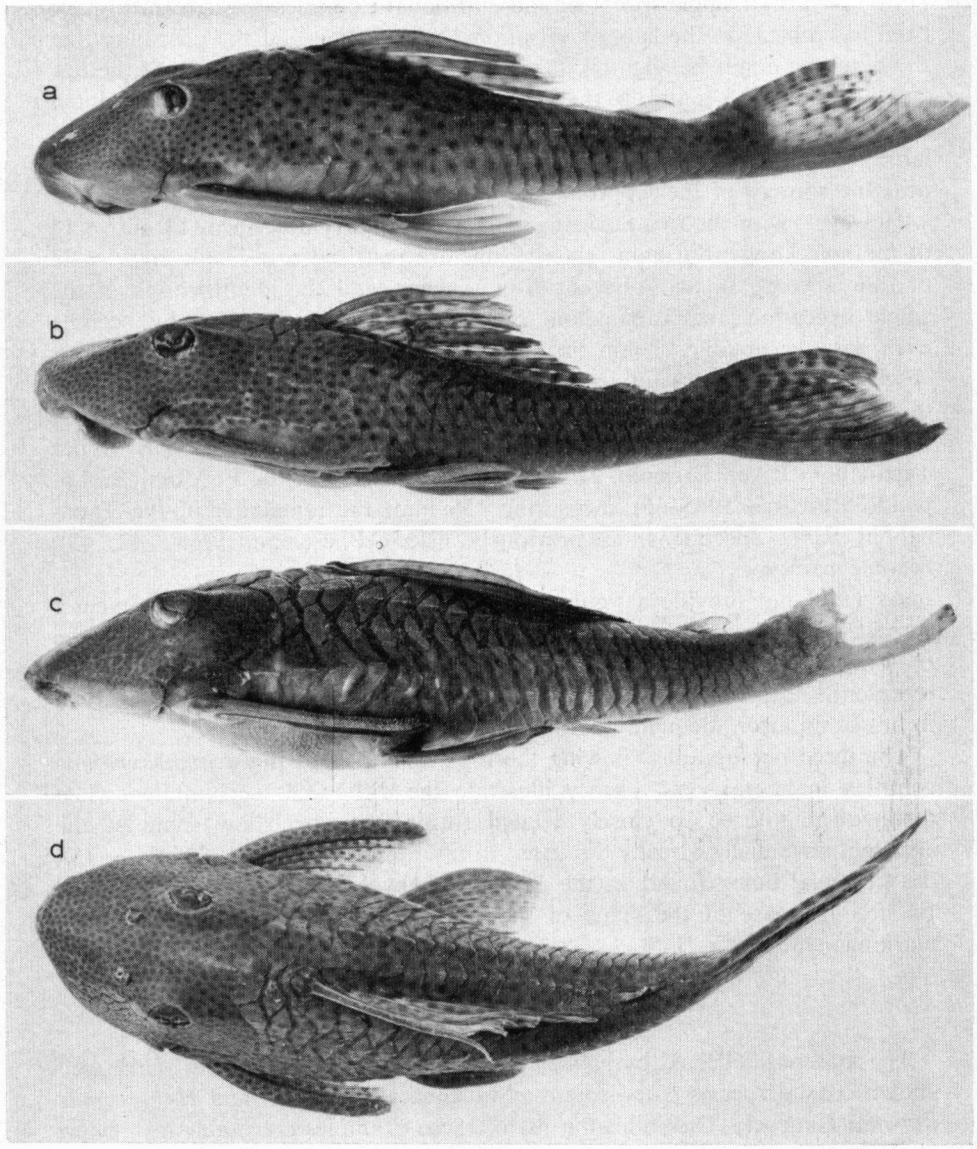


FIG. 5. a, *Hypostomus gymnorhynchus* (Norman), holotype (BM 1926.3.2 : 74), standard length 145 mm; b, *Hypostomus gymnorhynchus tapanahoniensis* nov. subspec., holotype (RMNH 25476), standard length 156 mm; c, *Hypostomus gymnorhynchus occidentalis* Boeseman, holotype (RMNH 25520), standard length 146 mm; all in lateral view. d, *Hypostomus gymnorhynchus tapanahoniensis* nov. subspec., holotype (RMNH 25476), in dorsal view.

1966/67), 1 ex., 110 mm; ZMA 105.306, Maréchal Creek, E of road Paranam-Afobaka, Surinam River basin, Surinam, 8 December 1966, leg. H. Nijssen (Brokopondo Research 1966/67), 8 ex., 45—110 mm; ZMA 105.308, ditches in Cultuurtuin, Paramaribo, Surinam, 12 December 1966, leg. H. Nijssen (Brokopondo Research 1966/67), 2 ex., 100 & 190 mm; ZMA 105.352, Brokopondo Lake, at about 500 m S of western extremity of Afobaka barrage, Surinam River basin, Surinam, 7 September 1966, leg. H. Nijssen (Brokoponda Research 1966/67), 1 ex., 40 mm; ZMA 105.550, N shore Brokopondo Lake at Afobaka, Surinam River basin, Surinam, 15 February 1967, leg. H. Nijssen (Brokopondo Research 1966/67), 1 ex., 71 mm; ZMA 106.014, N shore of Brokopondo Lake, E of Afobaka barrage, Surinam River basin, Surinam, 10 December 1966, leg. H. Nijssen (Brokopondo Research 1966/67), 2 ex., 55 & 59 mm.

Remarks. — Most interesting appear to be the few young specimens collected in the Brokopondo Lake, as they indicate that the species must have occurred in the Surinam River basin slightly farther inland than I previously presumed, probably having inhabited the lower Sara Creek before the lake took shape. Actually, this is not surprising even for a species not confined to rapids, as in the Surinam River the first rapids of any importance were situated slightly above the Sara Creek outlet, the Brokopondo rapids having been of minor importance and easily passable at least during part of the year. Also these specimens seem to confirm my opinion (Boeseman, 1968: 33) that the present species may be able to survive in lacustrine conditions, but the problem still remains if in such circumstances they will reach the adult stage, large specimens hitherto only having been found in the lower reaches of the main rivers, and if they will propagate in the new environment.

Among the listed specimens, a few showed aberrant characters: in ZMA 105.023, one of the specimens shows a few vague spots on the belly; in ZMA 105.306, two specimens have 28 scutes in longitudinal lateral series; in ZMA 105.308, the large example even has 28/29 scutes in longitudinal lateral series, while its spots are remarkably small (for the species) and distinct.

The Brokopondo Lake specimens were collected in shallow water (depth 100—150 cm) with a loamy bottom, creek specimens in flowing shallow water, and the Paramaribo specimens in stagnant water with a depth of about 100 cm.

15. **Hypostomus watwata** Hancock, 1828

Material. — ZMA 105.022, outlet of Saramacca- and Coppename Rivers, Surinam, 23 June 1966, leg. H. Nijssen (Brokopondo Research 1966/67), 4 ex., 113—193 mm.

Remarks. — Two of the specimens have an exceptionally low ratio between peduncular depth and interdorsal length: 1.9 and 1.95; the number of scutes in longitudinal lateral series are 26/26 (2 ex.) and 27/27 (2 ex.).

DIAGRAM 1. The range of variation of the ratio between standard length and predorsal length in the Surinam representatives of the *watwata*-group, including: (2) *Hypostomus corantijni* Boeseman, (4) *H. gymnorhynchus tapanahoniensis* nov. subsp., (5) *H. gymnorhynchus occidentalis* Boeseman, (11) *H. sipaliwinii* Boeseman, (12) *H. surinamensis* Boeseman, (15) *H. watwata* Hancock, (16) *H. coppenamensis* nov. spec., (17) *H. nickeriensis* nov. spec.

DIAGRAM 2. The range of variation of the ratio between standard length and length of head in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

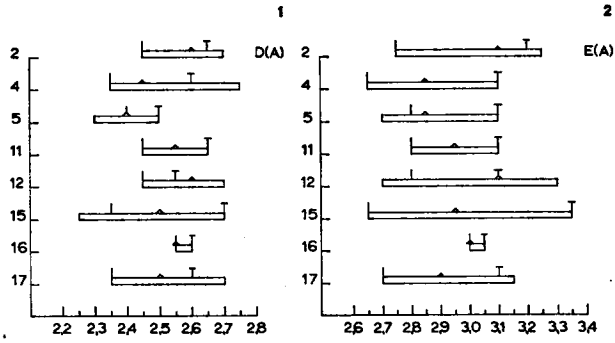


DIAGRAM 3. The range of variation of the ratio between standard length and cleithral width in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

DIAGRAM 4. The range of variation of the ratio between standard length and depth of head in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

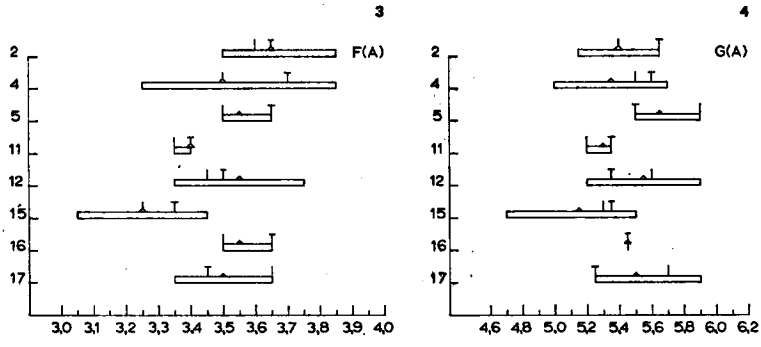


DIAGRAM 5. The range of variation of the ratio between head length and cleithral width in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

DIAGRAM 6. The range of variation of the ratio between head length and depth of head in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

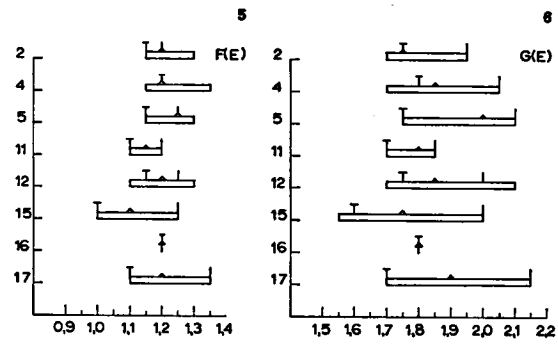


DIAGRAM 7. The range of variation of the ratio between head length and length of snout in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

DIAGRAM 8. The range of variation of the ratio between head length and orbital diameter in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

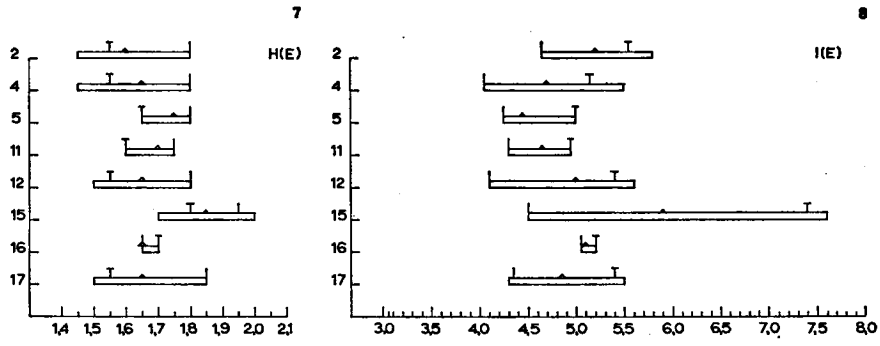


DIAGRAM 9. The range of variation of the ratio between head length and interorbital width in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

DIAGRAM 10. The range of variation of the ratio between standard length and length of dorsal spine in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

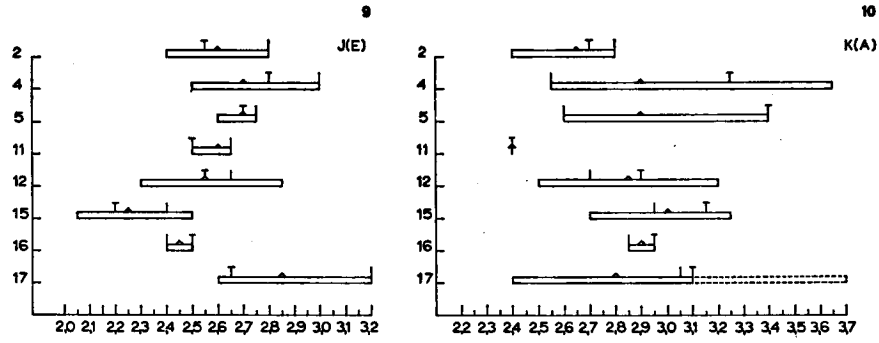


DIAGRAM 11. The range of variation of the ratio between standard length and length of base of first dorsal fin in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

DIAGRAM 12. The range of variation of the ratio between standard length and interdorsal length in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

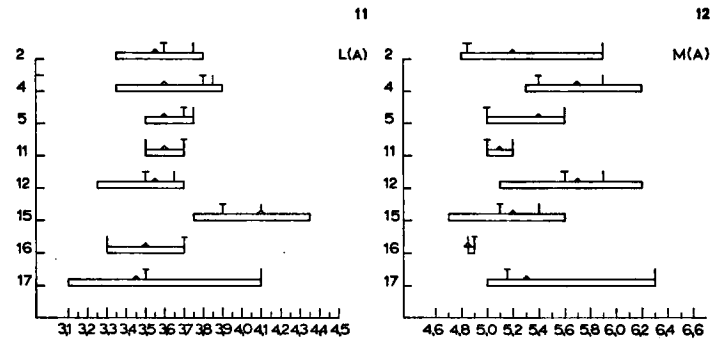


DIAGRAM 13. The range of variation of the ratio between standard length and thoracic length in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

DIAGRAM 14. The range of variation of the ratio between standard length and length of pectoral spine in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

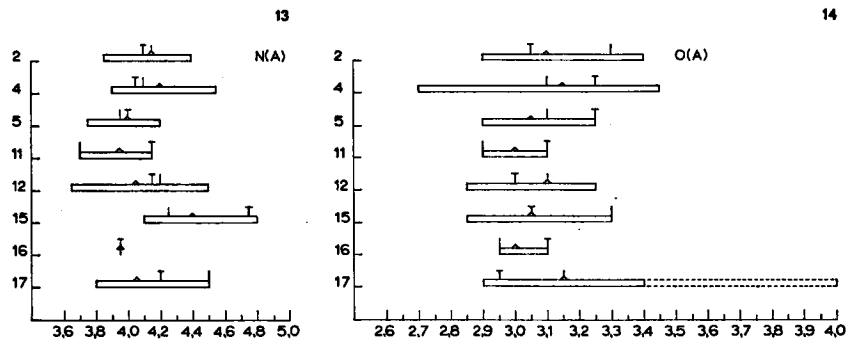


DIAGRAM 15. The range of variation of the ratio between standard length and abdominal length in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

DIAGRAM 16. The range of variation of the ratio between standard length and length of first ventral ray in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

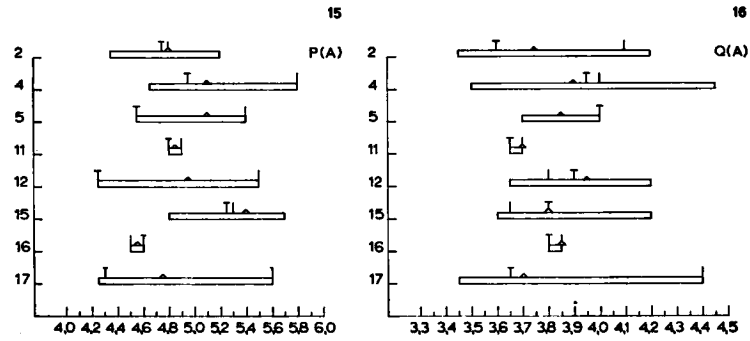


DIAGRAM 17. The range of variation of the ratio between standard length and post-anal length in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

DIAGRAM 18. The range of variation of the ratio between standard length and depth of caudal peduncle in the Surinam representatives of the *watwata*-group, as listed for diagram 1.

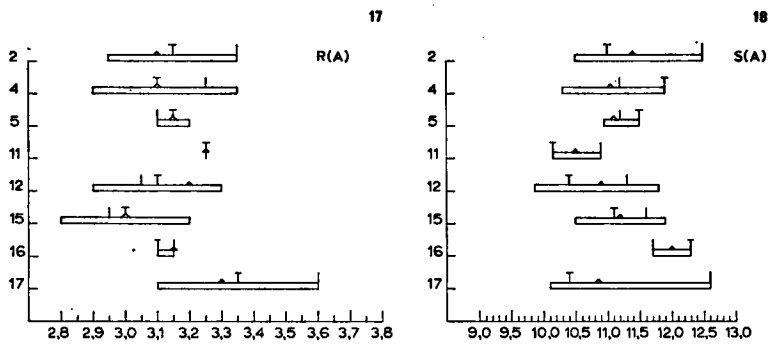
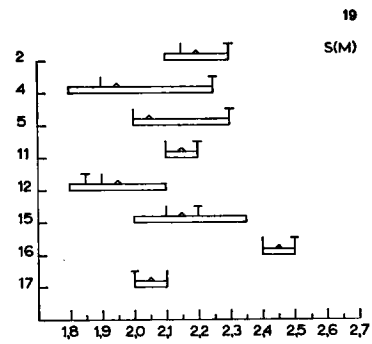


DIAGRAM 19. The range of variation of the ratio between interdorsal length and depth of caudal peduncle in the Surinam representatives of the *watwata*-group, as listed for diagram 1.



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BOESEMAN, M.

1968 The genus Hypostomus Lacépède, 1803, and its Surinam representatives ,Siluriformes, Loricariidae). — Zool. Verhand. Leiden **99**: 1—89, 6 figs., 20 tables, 19 diagrams, 18 pls.

Dr. M. BOESEMAN
Rijksmuseum van Natuurlijke Historie
Raamsteeg 2a
Leiden — The Netherlands