

# A NEW SPECIES OF *VARICORHINUS* (OSTARIOPHYSI: CYPRINIDAE) FROM WEST-CENTRAL AFRICA

by

Abebe GETAHUN (1), Melanie L.J. STIASSNY (2) & Guy G. TEUGELS (3)

**ABSTRACT.** - A new *Varicorhinus* species, *V. axelrodi* n.sp., is described from the Kouilou (Republic of Congo-Brazzaville) and the Nyanga and Ngounie in Gabon. *V. axelrodi* differs from all congeners by the combination of the following characters: absence or extreme reduction of barbels, last simple dorsal fin ray weak and flexible, and mouth opening more-or-less straight. Prior to the present study three species (*V. sandersi*, *V. steindachneri* and *V. tornieri*) were known from the inland waters of Gabon and the Republic of Congo-Brazzaville.

**RÉSUMÉ.** - Une nouvelle espèce de *Varicorhinus* (Ostariophysi: Cyprinidae) de l'Afrique centrale de l'Ouest.

Une espèce nouvelle de *Varicorhinus*, *V. axelrodi* n.sp., est décrite du Kouilou (République du Congo-Brazzaville), du Nyanga et du Ngounie (Gabon). *V. axelrodi* se distingue des autres espèces du genre par la combinaison des caractères suivants : absence de barbillons ou barbillons extrêmement réduits, dernier rayon simple de la dorsale mou et flexible, et bouche étroite. Avant cette étude, trois espèces (*V. sandersi*, *V. steindachneri* et *V. tornieri*) étaient connues des eaux douces du Gabon et de la République du Congo-Brazzaville.

Key words. - Cyprinidae - *Varicorhinus* - West-Central Africa - Lower Guinea - New species.

Some 36 species of the cyprinid genus *Varicorhinus* Rüppell, 1836 are recognized from African inland waters (Lévêque and Daget, 1984; Tweddle and Skelton, 1998). The genus is problematic in that there are currently no unambiguously derived features that diagnose it and Tweddle and Skelton (1998) discuss the possibility that *Varicorhinus* may be a polyphyletic grade rather than a monophyletic taxon. Whatever its ultimate taxonomic status, all species presently assigned to the genus are readily distinguished by the possession of a strongly keratinized, horny, cutting edge to the lower jaw that is exposed by the absence of a well developed lower lip, a feature shared by the new species described herein. The majority of African *Varicorhinus* are distributed throughout Western, Central and Southern Africa, while one species (*V. beso* Rüppell, 1836) is recorded from Eastern Africa and another (*V. maroccanus* Günther, 1902) from Northern Africa. In the Lower Guinean ichthyofaunal province (*sensu* Roberts, 1975) that includes the inland waters of Cameroun, Equatorial Guinea, Gabon and the Republic of Congo-Brazzaville 7 species have been previously recognized. An eighth species, *Varicorhinus axelrodi* n.sp., was discovered during a review of *Varicorhinus* materials of the Lower Guinean region. Prior to the present study two species, *V. steindachneri* Boulenger, 1910 and *V. tornieri* Steindachner, 1906, were known from Gabon and two

species, *V. sandersi* Boulenger, 1912 and *V. steindachneri*, from the Republic of Congo-Brazzaville.

## ABBREVIATIONS AND COMPARATIVE MATERIALS

Institutional abbreviations are: AMNH, American Museum of Natural History, New York; BMNH, Natural History Museum, London; CU, Cornell University, Ithaca, NY; MNHM, Muséum national d'Histoire naturelle, Paris; MRAC, Musée Royal de l'Afrique Centrale, Tervuren; NMW, Natural History Museum, Vienna.

In addition to the type series of the new species, 82 type specimens of 20 species: *V. altipinis* Banister & Poll, 1973, *V. ansorgii* Boulenger, 1906, *V. brauni* Pellegrin, 1935, *V. capoetoides* Pellegrin, 1938, *V. ensifer* Boulenger, 1910, *V. fimbriatus* Holly, 1936, *V. iphthimostoma* Banister & Poll, 1973, *V. jaegeri* Holly, 1930, *V. latirostris* Boulenger, 1910, *V. leleupanus* Matthes, 1959, *V. macrolepidotus* Pellegrin, 1928, *V. mariae* Holly, 1926, *V. sandersi*, *V. semireticulatus* Pellegrin, 1924, *V. steindachneri*, *V. stenostoma* Boulenger, 1910, *V. tornieri* Steindachner, 1906, *V. varicostoma* Boulenger, 1910, *V. wernerii* Holly, 1929, *V. wittei* Banister & Poll, 1973), and an additional 244 non-type specimens from

(1) Department of Biology, Addis Ababa University, P.O. Box 1176, Addis Abeba, ETHIOPIA.

(2) Department of Ichthyology, American Museum of Natural History, Central Park West at 79th St., New York, NY 10024, USA. [mljs@amnh.org]

(3) Musée Royal de l'Afrique Centrale, Laboratoire d'Ichtyologie, B-3080 Tervuren and KU Leuven, Laboratory of Comparative Anatomy and Biodiversity, B-3000 Leuven, BELGIUM.

Lower Guinea and adjacent regions (deposited in the above listed museums) were examined as comparative materials. Counts and measurements follow Tweddle and Skelton (1998).

**VARICORHINUS AXELRODI, N. SP.**

(Fig. 1A, B)

*Varicorhinus sandersi* Boulenger, 1912 (in part, specimens from localities 22 and 41): Teugels *et al.*, 1991: 116.

*Varicorhinus sandersi* Boulenger, 1912: Mamonekene and Teugels, 1993: 29, fig. 17.

**Material**

*Holotype*. - MRAC 91-68-P-1132, 132 mm standard length (SL); male; rivière Loukoula, lieu-dit "Porte du Mayo-mbe", 9 km en aval de Mpounga, Congo Brazzaville (4°20'S-12°26'E), coll. G. Teugels and V. Mamonekene.

*Paratypes*. - Total of 30 specimens, 38.0-160 mm SL. - MRAC 90-057-P-1297-1300, rivière Louvumou près de Béna I, route Kayes-Béna I, 3 km avant la Loundji, Congo-Brazzaville (4°02'S-11°48'E), coll. G. Teugels *et al.* - AMNH 232315, 1, rivière Louvumou près de Béna I, route Kayes-Béna I, 3 km avant la Loundji, Congo-Brazzaville (4°02'S-11°48'E), coll. G. Teugels *et al.* - MRAC 90-057-P-1314-1327, rivière Louba, affluent du Kouilou à Louba, à environ 12 km de Kakamoeka, et environ 10 km de Sounda, route Kakamoeka-Sounda, Congo-Brazzaville (4°06'S-12°06'E), coll. G. Teugels *et al.* - AMNH 232907, 3, rivière Louba, affluent du Kouilou à Louba, à environ 12 km de Kakamoeka, et environ 10 km de Sounda, route Kakamoeka-Sounda, Congo-Brazzaville (4°06'S-12°06'E), coll. G. Teugels *et al.* - CU 87041, 1, rivière Louba, affluent du

Kouilou à Louba, à environ 12 km de Kakamoeka, et environ 10 km de Sounda, route Kakamoeka-Sounda, Congo-Brazzaville (4°06'S-12°06'E), coll. G. Teugels *et al.* - MRAC 99-55-P-249, 1 specimen, Dousséoussou between Tchibanga and Difounda, southwest of Tchibanga, Gabon, coll. A. Kamdem Toham. - MRAC 99-55-P-246-247, rivière Situei à environ 1 km du village Duano, direction Tchibanga, Gabon, coll. A. Kamdem Toham. - AMNH 233184, 1, rivière Situei à environ 1 km du village Duano, direction Tchibanga, Gabon, coll. A. Kamdem Toham. - MRAC 99-90-P-459-461, Louetsi River at Bongolo just above falls and dam, Basin Ngounie, tributary of Ogooue, Gabon; coll. J. Sullivan *et al.* - CU 88131, 1, Louetsi River at Bongolo just above falls and dam, Basin Ngounie, tributary of Ogooue, Gabon, coll. J. Sullivan *et al.*

**Differential diagnosis**

*Varicorhinus axelrodi* is readily distinguished from all congeners by the unique combination of an absence, or reduction to vestigial nubs, of barbels (versus well-developed barbels), a flexible last simple ray in the dorsal fin (versus a rigid and heavily ossified last simple ray), and a mouth opening more-or-less straight or slightly curved (versus a strongly curved, crescentic mouth opening).

**Description**

Morphometric data for the holotype and 30 paratypes are given in table I. Eyes laterally placed, not visible from below. Mouth inferior, with a weakly curved or straight-edged opening (Fig. 1B), usually with no barbels, some specimens with small vestigial nub-like barbels discernible but these are never well-developed, and with no papillae. Angle of mouth not reaching level of anterior eye border. Nostrils small, situated in front of upper part of eye, about

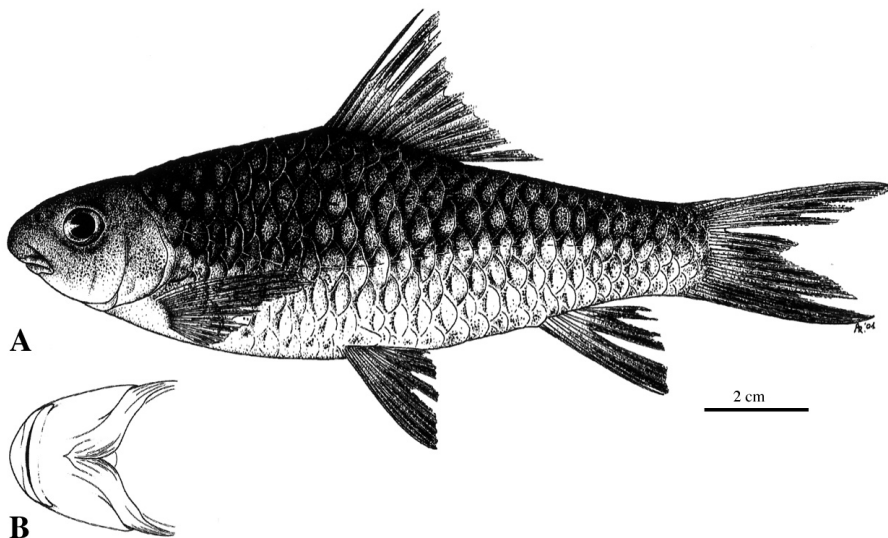


Figure 1. - **A:** Lateral view of the holotype of *Varicorhinus axelrodi* n.sp.; **B:** Ventral view of the head of the holotype of *Varicorhinus axelrodi* n.sp.

SL (mm)	Holotype	Paratypes				
	132.0	38.0-160.0				
		N	Mean	Min.	Max.	SD
% standard length						
Head length	25.0	30	25.1	22.5	28.9	2.02
Predorsal length	47.7	30	47.4	42.9	51.2	2.38
Dorsal fin length	28.0	30	26.5	21.8	29.5	1.92
Pelvic fin length	21.9	30	20.1	18.2	21.9	1.20
Pectoral fin length	24.2	30	21.9	18.2	25.2	1.81
Anal fin length	21.2	30	20.5	18.9	22.3	1.07
Body depth	34.1	30	31.3	27.3	34.9	2.64
Body width	15.9	30	15.5	13.2	18.4	1.59
Caudal peduncle length	17.4	30	18.7	14.6	23.5	2.11
Caudal peduncle depth	13.6	30	12.7	11.8	13.8	0.78
% head length						
Head depth	78.8	30	84.5	72.7	95.8	6.62
Snout length	33.3	30	37.5	31.3	43.8	3.34
Orbit diameter	21.2	30	31.0	21.2	40.0	4.22
Post-orbit length	36.4	30	38.8	36.0	45.5	2.60
Interorbital width	42.4	30	39.7	33.3	50.0	4.42
Mouth width	42.4	30	36.6	25.0	45.8	7.52

Table I. - Morphometric data for the type series of *Varicorhinus axelrodi* n. sp.

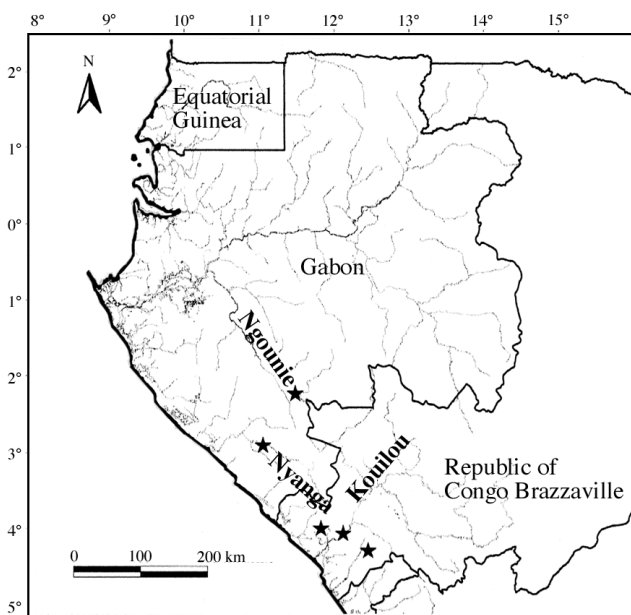


Figure 2. - Known geographical distribution of *Varicorhinus axelrodi* n.sp.

halfway between tip of snout and anterior eye border. Lower jaw with strongly keratinized scraping edge, upper lip thin. Snout rounded, small round tubercles on snout. Head moderately long (about four times in SL). Body relatively deep (body depth three to four times in SL). Dorsal fin equidistant between tip of snout and base of caudal fin; predorsal length 42.9-51.2% SL. Dorsal fin IV 10-11 (length of base 21.8-29.5% SL); last simple dorsal fin ray weak and flexible. Anal fin III 5 (length of base 18.9-22.3% SL). Pelvic fin I 8; inserted below anterior part of dorsal fin (length 18.2-21.9% SL). Longest pectoral ray not reaching pelvic fin origin and hardly reaching level of dorsal fin origin. Caudal fin deeply forked; caudal peduncle longer than deep.

Scales cycloid with rounded free edges and in regular rows. Lateral line complete, decurved and low on body, rising to mid-line in mid-caudal peduncle. Twenty six to 28 scales in lateral line; 4.5 scales from lateral line to dorsal fin origin; 2.5 scales from lateral line to pelvic fin insertion, and 3.5 to origin of anal fin. Ten to 12 circumpeduncular scales.

#### Coloration

In preserved specimens dorsum of head and body is dark brown, a little lighter ventrally.

**Distribution** (Fig. 2)

Currently *Varicorhinus axelrodi* is known only from the type series collected in tributaries of the Lower and Central Kouilou (Republic of Congo-Brazzaville) and the Tchibanga region of Gabon (Nyanga and Ngounie Rivers). Neither region, nor the intervening territory, has been well sampled and it is probable that further collecting efforts will extend the known range of this species.

**Etymology**

Named for Herbert Axelrod in recognition of his continuing generous support for ichthyological research and exploration.

**Comparisons**

Among the other *Varicorhinus* of the region, *V. axelrodi* resembles *V. sandersi* and *V. fimbriatus* in the absence (or extreme reduction in the case of some individuals of *axelrodi*) of barbels. Moreover, in both *V. axelrodi* and *V. fimbriatus* the last simple dorsal fin ray is weak and flexible (versus thickened and rigid in *V. sandersi*). However, as noted previously *V. axelrodi* has a more-or-less straight mouth opening versus a markedly crescent-shaped one in *V. fimbriatus*. Regarding the phylogenetic affinities of these taxa little can be added here. As noted by Tweddle and Skelton (1998) a thorough revision, possibly including consideration of the Asian species will be necessary before the monophyly of the genus can be tested and the intrarelationships of the species determined. While such a study is beyond the scope of the present work it is a future task of importance for a full understanding of cyprinid intrarelationships (Getahun, 2000).

**Acknowledgments.** - We are grateful for the following institutions and individuals for loan of specimens and hospitality during study visits: Oliver Crimmen and James MacLaine (BMNH, London); Patrice Pruvost and Dr. Guy Duhamel (MNHN, Paris); Dr. Ernst Mikschi and Helmut Wellendorf (NHM, Vienna). We are also indebted to Dr. Emmanuel Vreven for his assistance during the visits of the senior author to MRAC. Funding from the Axelrod Research Curatorship (MLJS) provided financial support for the senior author enabling study visits to European and North American museums to examine materials for this study.

**REFERENCES**

- GETAHUN A., 2000. - Systematic studies of the African species of the genus *Garra* (Pisces: Cyprinidae). Ph.D. Dissertation, 478 p. City Univ. New York.
- LÉVÊQUE C. & J. DAGET, 1984. - Cyprinidae. *In*: Check-List of the Freshwater Fishes of Africa (CLOFFA) (Daget J., Gosse J.P. & D.F.E Thys van den Audenaerde, eds), Vol. I, 410 p. Tervuren, Paris: MRAC, ORSTOM.
- MAMONEKENE V. & G.G. TEUGELS, 1993. - Faune des poissons d'eaux douces de la Réserve de la Biosphère de Dimonika (Mayombe, Congo). *Ann. Mus. Roy. Afr. Centr.*, 272: 1-126.
- ROBERTS T.R., 1975. - Geographical distribution of African freshwater fishes. *Zool. J. Linn. Soc.*, 57: 249-319.
- TEUGELS G.G., SNOEKS J., DE VOS L. & J.C. DIAKANOU-MATONGO, 1991. - Les poissons du bassin inférieur du Kouilou (Congo). *Tauraco Res. Rep.*, 4: 109-139.
- TWEDDLE D. & P.H. SKELTON, 1998. - Two new species of *Varicorhinus* (Teleostei: Cyprinidae) from the Ruo River, Malawi, Africa, with a review of other Southern African *Varicorhinus* species. *Ichthyol. Explor. Freshw.*, 8(4): 369-384.

Reçu le 3 septembre 2002.

Accepté pour publication le 29 mars 2003.