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Description of a New Mastacembelid Species (Synbranchiformes; Mastacembelidae) from the Zaïre River Basin in Africa

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Aethiomastacembelus robertsi **(Mastacembelidae) is described from the Lower and Middle Zaïre River basin in Africa. The new species, morphologically close to *A. congicus* and *A. marchei*, is diagnosed by its reduced eye size and its unique coloration. The generic assignment is discussed based on the most recent phylogenetic analysis of the family. It is shown that the synapomorphies used in this analysis to define *Aethiomastacembelus* and *Caecomastacembelus*, the two known genera of Afromastacembelinae, are, at least in part, not correctly defined.**

MASTACEMBELIDAE or spiny-eels are slender, eel-like fishes with a peculiar rostral appendage and a series of separate spines along the back in front of the soft dorsal fin. Spiny-eels are found in a variety of freshwater habitats in tropical Africa and Asia. In spite of their eel-like appearance, they are not related to the Anguilliformes but are regarded as highly advanced fishes, arranged in the Synbranchiformes (Gosline, 1983; Travers, 1984a, 1984b).

Four genera of Mastacembelidae are presently recognized (Travers, 1984b; 1988): two of them, *Mastacembelus* Scopoli, 1777, and *Ma-*

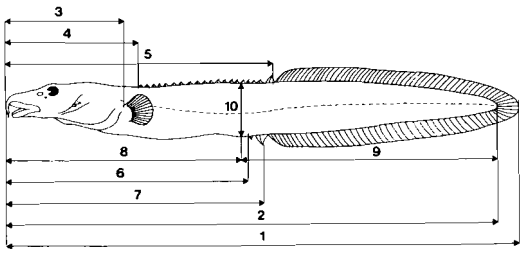

Fig. 1. Schematic illustration of measurements taken on the body of mastacembelid specimens: (1) total length (TL); (2) standard length (SL); (3) head length (HL); (4) snout to first dorsal spine; (5) snout to last externally visible dorsal spine; (6) snout to first anal spine; (7) snout to last externally visible anal spine; (8) preanal length; (9) postanal length; (10) body depth at anus.

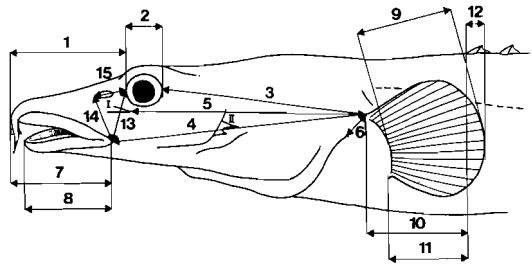

Fig. 2. Schematic illustration of measurements and counts taken on the head and pectoral region of mastacembelid specimens: (1) snout length; (2) eye diameter; (3) postorbital length; (4) postjaw angle length; (5) post-preorbital spine length; (6) gill slit to pectoral-fin origin; (7) upper jaw length; (8) lower jaw length; (9) pectoral-fin length; (10) dorsal edge of pectoral-fin base to first dorsal spine; (11) ventral edge of pectoral-fin base to first dorsal spine; (12) posterior edge pectoral fin to first dorsal spine; (13) angle of jaws to eye; (14) mouth corner to posterior external nare; (15) posterior external nare to eye; (I) preorbital spine; (II) preopercular spines.

crognathus Lacépède, 1800, are widely distributed in Southeast Asia, (one *Mastacembelus* species in the Middle East); the other two, *Caecomastacembelus* Poll, 1958, and *Aethiomastacembelus* Travers, 1988, are endemic to Africa.

As part of an ongoing revision of the alpha-level taxonomy of the African spiny-eels, examination of unidentified mastacembelid material from the Lower Zaïre River basin housed in the collection of the Musée Royal de l'Afrique Centrale, Tervuren (Belgium) revealed the presence of two specimens clearly differing from all mastacembelid species currently known.

In their paper on the fishes in the rapids of the Lower Zaïre, Roberts and Stewart (1976) tentatively referred a number of specimens to *Mastacembelus marchei* Sauvage, 1879, emphasizing, however, the difference in coloration in so far that they suspected their specimens to represent an as yet undescribed species, probably endemic to the Zaïre River basin. A comparison between our two unidentified specimens and the questionable *M. marchei* specimens of Roberts and Stewart (1976) showed them to be conspecific and different from *M. marchei*. The study of this material led to the description of a new species given herein.

Methods

In mastacembelid literature, no detailed definitions for measurements and meristic counts are available. A brief description of some meristic counts is given in Roberts and Stewart (1976) and Roberts (1980, 1989). For some measurements, a brief description is given in Skelton (1976). A more complete description of the meristic counts and morphometric characters examined is given below.

Measurements.—Total length (TL; Fig. 1): from anterior end of snout (= anterior edge of premaxillae), with rostral appendage folded downward, to posterior end of caudal fin. Standard length (SL; Fig. 1): from anterior end of snout, with rostral appendage folded downward, to caudal-fin base. Head length (HL; Fig. 1): from anterior end of snout, with rostral appendage folded downward, to dorsal edge of pectoral-fin base. Snout length (Fig. 2): from anterior end of snout, with rostral appendage folded downward, to anterior edge of eye. Eye diameter (Fig. 2): distance between anterior and posterior edges of eye. Minimum interorbital distance: minimum distance between the two orbits (the calipers must be tightened). Rostral appendage length: from anterior tip of rostral appendage to anterior edge of snout. Postorbital length (Fig. 2): from posterior edge of eye to dorsal edge of pectoral-fin base. Postjaw angle length (Fig. 2): from angle of jaws to dorsal edge of pectoral-fin base. Post preorbital spine length (Fig. 2): from posterior tip of preorbital spine to dorsal edge of pectoral-fin base. Gill slit to pectoral-fin base (Fig. 2): from upper tip of gill slit to dorsal edge of pectoral-fin base. Upper jaw length (Fig. 2): from anterior edge of premaxillae to angle of jaws. Lower jaw length (Fig. 2): from anterior edge of dental bone to angle of jaws. Pectoral-fin length (Fig. 2): from base of median pectoral-fin rays to posterior edge of pectoral fin. Dorsal edge of pectoral-fin base to first dorsal spine (Fig. 2): from the dorsal

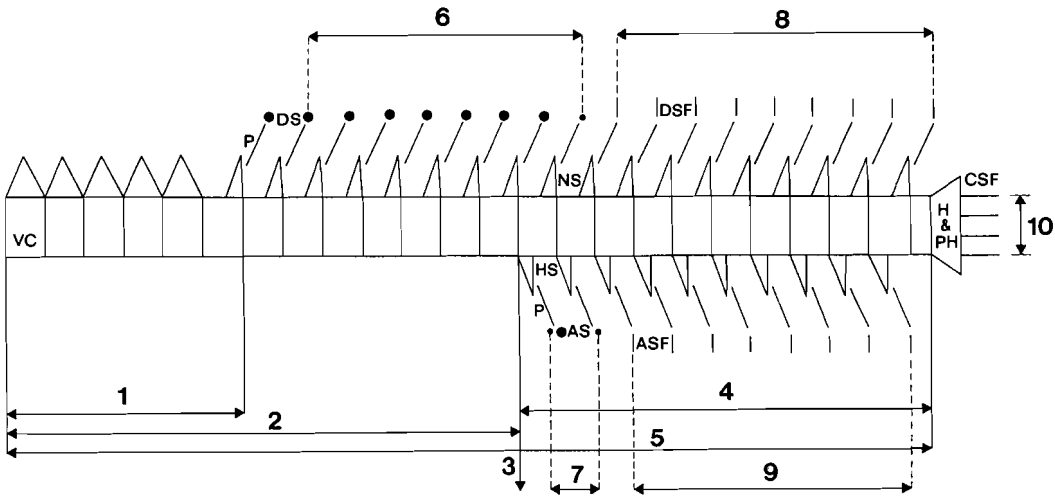

Fig. 3. Schematic illustration of some meristic counts taken on mastacembelid specimens: (1) predorsal vertebrae; (2) abdominal vertebrae; (3) vertebrae between dorsal and anal spine supporting pterygiophores; (4) caudal vertebrae; (5) total number of vertebrae; (6) dorsal spines; (7) anal spines; (8) dorsal-fin rays; (9) anal-fin rays; (10) caudal-fin rays. Abbreviations: AS = anal spine; ASF = anal soft fin ray; CSF = caudal soft fin ray; DS = dorsal spine; DSF = dorsal soft fin ray; H = hypural; HS = haemal spine; NS = neural spine; P = pterygiophore; PH = parhypural; VC = vertebral center.

edge of pectoral-fin base to anterior base of first dorsal spine. Ventral edge of pectoral-fin base to first dorsal spine (Fig. 2): from the ventral edge of pectoral fin to anterior base of first dorsal spine. Posterior edge pectoral fin to first dorsal spine (Fig. 2): indicated "+" when anterior base of first dorsal spine lies behind posterior edge of pectoral fin; indicated "−" when anterior base of first dorsal spine lies before posterior edge of pectoral fin. Angle of jaws to eye (Fig. 2): from angle of jaws to anterior edge of eye. Angle of jaws to posterior external nare (Fig. 2): from angle of jaws to anterior border of posterior external nare. Posterior external nare to eye (Fig. 2): from anterior border of posterior external nare to anterior border of eye. Snout to first dorsal spine (Fig. 1): from anterior end of the snout to anterior base of first dorsal spine. Snout to last externally visible dorsal spine (Fig. 1): from anterior end of snout to posterior tip of last externally visible dorsal spine, this spine in declined position (this spine is followed by a minute, often not externally visible, spine); Skelton (1976) described and illustrated this aspect fully. Snout to first anal spine (Fig. 1): from anterior end of snout to anterior base of first anal spine. Snout to last externally visible anal spine (Fig. 1): from anterior end of snout to posterior tip of the last externally visible anal spine, this spine in declined position (this spine is followed by a little, often not externally visible, spine); Skelton (1976) described and illustrated this aspect fully. Preanal length (Fig. 1): from anterior end of snout, with rostral appendage folded downward, to anus. Postanal length (Fig. 1): from anus to caudal-fin base. Body depth at anus (Fig. 1): depth of dorsal fin not included.

Meristic counts.—Predorsal vertebrae (Fig. 3): number of vertebrae from skull to first vertebra (included) whose neural spine supports pterygiophore of first dorsal spine. Abdominal vertebrae (Fig. 3): number of vertebrae from skull to vertebra (not included) whose haemal spine supports pterygiophore of the first anal spine. Vertebrae between dorsal and anal spine supporting pterygiophores (Fig. 3): number of vertebrae between vertebra whose neural spine supports pterygiophore of last externally visible dorsal spine and first anal pterygiophore supporting vertebra. Indicated "+" when the former lies before the latter; indicated "−" by reversed sequence; and indicated "0" when former and the latter are one and the same vertebra or two successive vertebrae. Caudal vertebrae (Fig. 3): number of vertebrae from first anal pterygiophore supporting vertebra to last vertebra (the last vertebra is defined here as the one who supports the hypural bones and the parhypural bone). Total number of vertebrae (Fig. 3). Dorsal spines (Fig. 3). Anal spines (Fig. 3). Dorsal-fin rays (Fig. 3). Anal-fin rays (Fig. 3). Caudal-fin rays (Fig. 3): all fin rays in contact with the hypural bones and the parhypural bone. Preorbital spine (Fig. 2): presence or absence

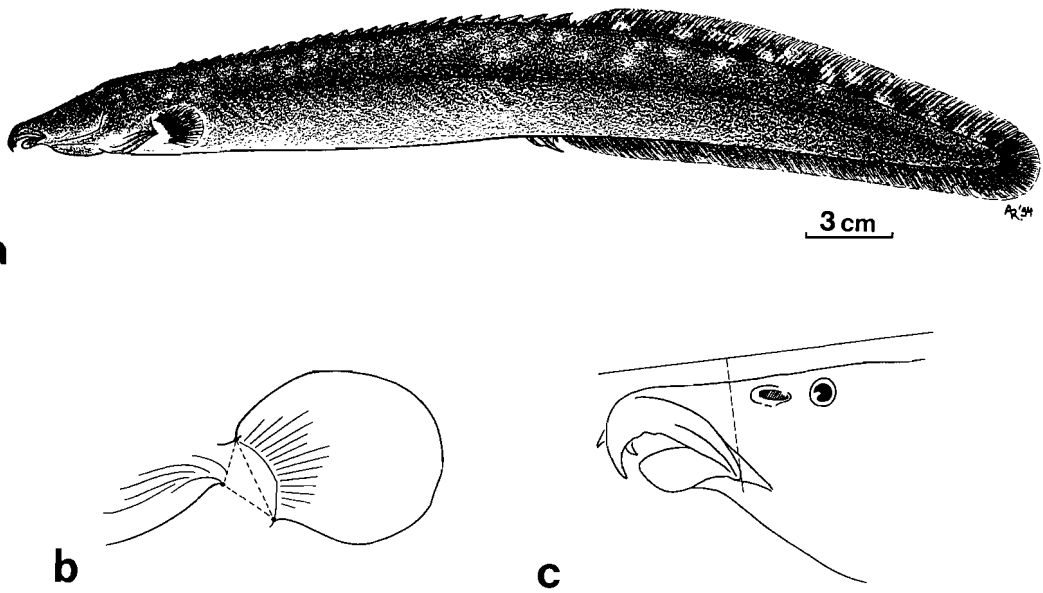

Fig. 4. *Aethiomastacembelus robertsi* n. sp., holotype, 358 mm TL, from the Stanley-Pool, Zaïre (MRAC 177695) (a) lateral view; (b) detail of the gill slit region. The upper tip of the gill slit, the dorsal edge of the pectoral-fin base and the ventral edge of the pectoral-fin base are connected by dashed lines. Note the anterior and clearly superior position of the upper tip of the gill slit compared to position of the ventral edge of the pectoral fin base. (c) Position of the fleshy angle of the closed mouth to the posterior external nare and the eye determined by drawing an imaginary vertical tangent perpendicular to a horizontal line parallel with the upper surface of the head.

of a preorbital spine is noted. Preopercular spines (Fig. 2): presence and number of preopercular spines are noted. Radiographs were used for meristic counts. Institutional abbreviations are listed in Leviton et al. (1985).

Aethiomastacembelus robertsi n. sp.
Figure 4

Holotype.—MRAC 177695, 358 mm TL, Stanley-Pool, Kinshasa (Zaïre) (± 4°06'S, 15°15'E), P. Brichard, 23 March 1967.

Paratypes.—MRAC 177696, 307 mm TL, same data as holotype. MCZ 48418, 3 specimens, 102–159 mm TL, River Koto at Kembe, mostly rapids (Central African Republic) (± 4°36'N, 21°54'E), T. R. Roberts, 23 May 1971. MCZ 48419, 240 mm TL, Bangui fish market (Central African Republic) (± 4°22'N, 18°35'E), T. R. Roberts, May 1971. MCZ 50316, 3 specimens, 294–343 mm TL, Zaïre River mainstream near Tadi, near Kibunzi (Zaïre) (± 5°14'S, 13°56'E), T. R. Roberts and D. J. Stewart, 21 July 1973. MCZ 50398, 2 specimens, 329–352 mm TL, Zaïre River a few km NE of Kinganga (Zaïre) (± 5°16'S, 13°47'E), T. R. Roberts and D. J. Stewart, 12 July 1973. MCZ 50560, 8 specimens, 140–325 mm TL, Zaïre River mainstream near Inga hydroelectric dam (Zaïre) (± 5°35,5'S, 13°37,5'E), T. R. Roberts and D. J. Stewart, 4 Aug. 1973. MCZ 50590, 14 specimens, 133–230 mm TL, River Mbomou at Gozobangui, mostly rapids (Central African Republic) (± 4°24'N, 22°36'E), T. R. Roberts, 29 May 1971.

Diagnosis.—*Aethiomastacembelus robertsi* can be distinguished from all other African mastacembelid species by the following combination of characters: small eyes (4.1–10.3 % HL); anterior border of first dorsal spine situated before, above, or just behind posterior edge of pectoral fin; 22 + 1 to 26 + 1 (median 25 + 1) dorsal spines; generally uniform color pattern.

Description.—Measurements and meristic counts for holotype and paratypes are given in Tables 1 and 2. *Aethiomastacembelus robertsi* has a pointed snout. Fleshy angle of jaws situated before, or just above, anterior border of the posterior external nare. Upper tip of gill slit and dorsal edge of the pectoral-fin base at same level, anterior to ventral edge of the pectoral-fin base. Upper part of the pectoral-fin base situated above upper tip of gill slit. Upper jaw length

TABLE 1. MEASUREMENTS TAKEN ON HOLOTYPE AND PARATYPES OF *Aethiomastacembelus robertsi* n. sp.

	Holotype	Paratypes			Holo- and paratypes	
		Min	Max	n	Mean	SD
Standard length, SL (mm)	338	96	339	32	197	
% of HL						
Snout length	32.4	30.4	34.3	32	32.3	1.0
Eye diameter	5.5	4.1	10.3	32	7.4	1.8
Minimum interorbital distance	6.6	4.2	7.3	32	5.4	1.0
Rostral appendage length	11.6	6.6	11.5	32	9.7	1.4
Postorbital length	65.6	60.0	67.6	32	63.3	1.8
Post jaw angle length	77.7	70.9	80.7	32	75.1	2.1
Post preorbital spine length	73.4	66.0	73.7	32	68.2	2.1
Gill slit to pectoral-fin origin	8.7	6.4	10.8	32	8.6	1.0
Upper jaw length	21.6	19.7	28.0	32	23.7	1.9
Lower jaw length	18.5	17.3	23.5	32	20.3	1.8
Pectoral-fin length	26.0	20.3	29.4	32	24.7	2.0
Dorsal edge of pectoral-fin base to first dorsal spine	27.6	22.6	35.0	32	28.4	3.7
Ventral edge of pectoral-fin base to first dorsal spine	20.7	15.4	28.3	32	21.2	3.5
Posterior edge pectoral-fin to first dorsal spine	−7.3	−9.7	4.3	32	−3.6	3.5
Angle of jaws to eye	16.6	13.7	18.3	32	15.5	1.1
Angle of jaws to posterior external nare	13.7	10.4	15.4	32	12.8	1.1
Posterior external nare to eye	9.1	7.2	9.4	32	8.0	0.6
% of SL						
Head length	13.0	12.8	18.3	32	15.4	1.5
Snout to first dorsal spine	17.2	16.7	23.0	32	19.9	1.7
Snout to last externally visible dorsal spine	56.7	53.7	62.7	32	58.6	2.4
Snout to first anal spine	50.2	48.7	55.9	32	52.9	1.7
Snout to last externally visible anal spine	54.3	53.3	61.4	32	57.7	2.2
Preanal length	47.1	46.2	53.0	32	50.2	2.0
Postanal length	51.5	45.8	52.8	32	48.5	2.0
Body depth at anus	11.5	7.2	11.8	32	9.9	1.3

longer than lower jaw. Rostral appendage medium sized (6.6–11.5% HL). Eyes small (4.1–10.3% HL). A scatterplot of eye diameter (in % HL) against head length for *A. robertsi* n. sp compared to that of *A. marchei* and *A. congicus* is given in Figure 5.

Preanal length in specimens from ± 100 to ± 200 mm SL longer than postanal length; in larger specimens (± 250 to ± 350 mm SL) postanal length longer than preanal length. Distance from snout to last dorsal spine generally equals distance from snout to last anal spine. Hence, preanal length and distance from snout to first anal spine are shorter than distance from snout to last dorsal spine. First dorsal spine situated before, above, or just behind the posterior edge of the pectoral fin.

Dorsal spines 22 + 1 to 26 + 1, increasing in size from first to last externally visible spine. The latter is followed by a very short spine, hidden under the skin, and situated anteriorly to the first dorsal soft fin-ray base.

Anal spines 2 + 1. First anal pterygiophore is well developed and bears first and second anal spine. It is the only pterygiophore supporting two spines. As for the dorsal spines, the last spine is very short and hidden under the skin.

In 17 of the 33 specimens examined, the neural spine supporting the pterygiophore of the last, externally visible, dorsal spine and the haemal spine supporting the pterygiophore of the first anal spine are situated on two different, successive vertebrae. In the others, they are situated on the same vertebra. In the first group, the vertebra with the haemal spine supporting the pterygiophore of the first anal spine is sit-

TABLE 2. MERISTIC COUNTS FOR HOLOTYPE AND PARATYPES OF *Aethiomastacembelus robertsi* n. sp.

	Holotype	Paratypes			Holo- and paratypes	
		Min	Max	n	Median	Frequency
Predorsal vertebrae	5	5	6	32	5	5(21) 6(12)
Abdominal vertebrae	31	27	31	32	30	27(1) 28(3) 29(9) 30(14) 31(6)
Vertebrae between dorsal and anal spine supporting pterygiophores	0	0	0	32	0	0(33)
Caudal vertebrae	47	44	52	31	47	44(1) 45(3) 46(7) 47(5) 48(5) 49(2) 50(6) 51(2) 52(1)
Vertebrae total	78	74	82	31	77	74(5) 75(3) 76(5) 77(4) 78(3) 79(3) 80(6) 81(1) 82(2)
Dorsal spines	26+1	22+1	26+1	32	25+1	22+1(1) 23+1(4) 24+1(11) 25+1(12) 26+1(5)
Anal spines	2+1	2+1	2+1	32	2+1	2+1(33)
Dorsal-fin rays	78	66	92	31	77	66(1) 67(2) 68(1) 70(1) 71(1) 72(1) 73(2) 74(2) 75(2) 76(1) 77(3) 78(3) 79(2) 80(1) 81(1) 82(1) 83(2) 85(1) 87(2) 88(1) 92(1)
Anal-fin rays	76	63	92	31	75	63(1) 65(2) 68(2) 69(4) 71(2) 72(2) 73(1) 74(1) 75(1) 76(3) 77(1) 78(2) 79(2) 80(1) 81(3) 82(2) 87(1) 92(1)
Caudal-fin rays	11	9	13	31	12	9(1) 10(1) 11(11) 12(14) 13(5)

uated in front of the vertebra of which the neural spine supports the pterygiophore of the last, externally visible, dorsal spine.

All specimens have one preorbital spine, which is hidden under the skin in larger specimens. Number of preopercular spines ranging from 1–3 on left side and from 2–3 on right side with the following frequencies: (1l, 2r) (1); (2l, 2r) (22); (2l, 3r) (4); (3l, 2r) (2) and (3l, 3r) (4). The preopercular spines are hidden under the skin and small in larger specimens.

Coloration in alcohol.—Most specimens with head and body uniformly colored, light yellow or brownish dorsally and on sides, lighter on lips, cheek, lower side of head, belly, and abdomen. Pectoral fins uniformly light colored and transparent. In some specimens, basal part of pectoral fins darker than distal margin. Median fins always darker, brownish at base with light margin. Several specimens with a series of light-colored, circular spots on base of dorsal fin and, though less pronounced, on dorsal midline.

Distribution.—Specimens of *A. robertsi* have been collected from various localities on the Lower and Middle Zaïre River basin (Fig. 6). The species is probably endemic to the Zaïre River basin.

Habitat.—The holotype and one paratype (MRAC 177696) of *A. robertsi* were collected at Pool Malebo (formerly Stanley-Pool) without any further information on habitat. For some of the other paratypes, a few details on the habitat are available. Specimens from Mbomou and Koto rivers were mostly collected from the rapids; for the specimens of the Lower Zaïre River basin (mainstream), Roberts and Stewart (1976) provided the following data: water temperature 24.7–29.0 C; air temperature 23.3–30.0 C; dis-

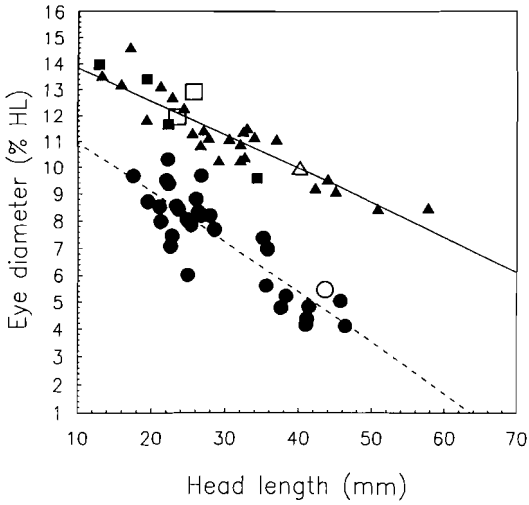

Fig. 5. Scatterplot of eye diameter (in % HL) against head length for *Aethiomastacembelus robertsi* n. sp. (●), *A. marchei* (■) and *A. congicus* (▲). Open symbols refer to type specimens. Heavy and dashed lines are regression lines for *A. congicus* and *A. robertsi*, respectively. No regression was calculated for *A. marchei* because only six specimens were available for study. References of the specimens represented in this figure are given in the list of the additional material examined.

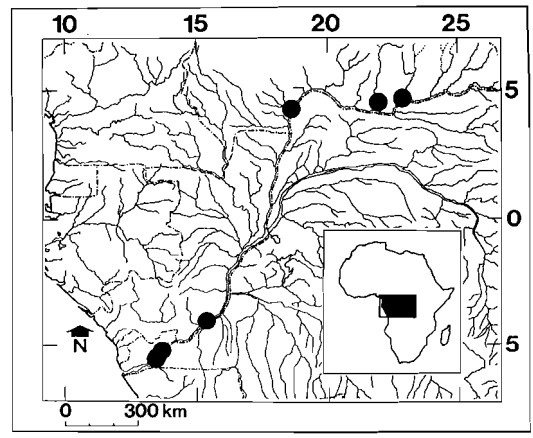

Fig. 6. Geographical distribution of *Aethiomastacembelus robertsi* n. sp. based on the localities of the specimens examined.

solved oxygen 8.0 mg/l; pH. 7.0–7.5 and alkalinity 2–3 [total (Methyl Orange) alkalinity in grains/gal $CaCO_3$]. The same authors also mentioned that the light penetration is generally poor due to turbidity and humic coloring substances.

Etymology.—Named for Tyson R. Roberts who collected part of the type material and who first suggested that this species might well be new to science.

Comment on generic assignment.—Travers (1984a, 1984b) revised the suborder Mastacembeloidei. He divided the family Mastacembelidae in two subfamilies: the Mastacembelinae occurring in Asia and the Afromastacembelinae in Africa. Travers recognized two genera in the latter subfamily: *Caecomastacembelus* Poll, 1958 (type species *C. brichardi* Poll, 1958), and *Afromastacembelus* Travers, 1984b (type species *Mastacembelus tanganicae* Günther, 1893). In 1988, Travers mentioned that the types of *M. tanganicae*, in fact, display the generic characters of *Caecomastacembelus*; he did not, however, present further supporting arguments. Thus, Travers (1988) synonymized *Afromastacembelus* with *Cae-*

TABLE 3. CHARACTER STATEMENT IN THE DIAGNOSIS OF THE AFROMASTACEMBELINAE GENERA FOLLOWING TRAVERS (1988, 1992a, 1992b).

Aethiomastacembelus Travers, 1988 type species: *Mastacembelus marchei* Sauvage, 1879	*Caecomastacembelus* Poll, 1958 type species: *Caecomastacembelus brichardi* Poll, 1958
1. less than 95 anal-fin rays and tendency to have more dorsal- than anal-fin rays;	1. usually more than 100 anal- and 100 dorsal-fin rays and tendency to have more anal- than dorsal-fin rays;
2. 10–12 principal caudal-fin rays;	2. 8–10 principal caudal-fin rays;
3. tendency to have a pointed snout;	3. tendency to have a blunt snout;
4. jaw cleft extending beyond posterior nasal;	4. jaw cleft below or anterior to posterior nasal;
5. origin of first dorsal spine, dorsal or just posterior to pectoral fin when flat against lateral wall of body;	5. origin of first dorsal spine, posterior to pectoral fin when flat against lateral wall of body;
6. 4–7 predorsal vertebrae;	6. 8–12 predorsal vertebrae;
7. body depth greatest midway along length;	7. body height even for most of length;
8. median fins of even height.	8. median fins low and fleshy, increase in height caudally.

TABLE 4. MERISTIC COUNTS FOR HOLOTYPE AND TWO PARATYPES [ONE OF THE PARATYPES (MRAC no. 118994) IS SERIOUSLY DAMAGED AND, THEREFORE, IS NOT REPRESENTED IN THIS TABLE] of *CAECOMASTACEMBELUS BRICHARDI* AND FOR THE TWO SYNTYPES OF *Mastacembelus marchei*. * A negative score refers to the position of the first anal pterygiophore supporting vertebra, situated before the vertebra of which the neural spine supports the pterygiophore of the last externally visible dorsal spine. ** The neural and haemal vertebral spines belong to two successive vertebrae (see text).

	C. brichardi			*M. marchei*	
	Holotype MRAC 118574	Paratype MRAC 118992	Paratype MRAC 118993	Type MNHN A.895	Type MNHN A.895
Predorsal vertebrae	4	4	4	5	5
Abdominal vertebrae	29	29	29	28	28
Vertebrae between dorsal and anal spine supporting pterygiophores	−1*	−2*	−1*	0**	0**
Caudal vertebrae	43	43	44	46	46
Vertebrae total	72	72	73	74	74
Dorsal spines	27+1	27+1	27+1	23+1	23+1
Anal spines	2+1	2+1	2+1	2+1	2+1
Dorsal-fin rays	54	57	53	74	72
Anal-fin rays	58	61	56	69	72
Caudal-fin rays	10	9	/	11	13

comastacembelus. For the other species previously allocated to *Afromastacembelus*, a new genus, *Aethiomastacembelus*, was described; and a new type species, *Mastacembelus marchei* Sauvage, 1879, was designated. It is important to note that Travers (1984a) originally placed *A. marchei* in the genus *Caecomastacembelus* on the basis of the lack of a toothplate on the ventral surface of pharyngobranchial 2, a character shared with *C. brichardi*, the type species of *Caecomastacembelus*. Travers never justified the transfer of *M. marchei* from the genus *Caecomastacembelus* to *Aethiomastacembelus*. Table 3 gives the character statement of both genera as given in the diagnosis by Travers (1988, 1992a, 1992b). Travers (pers. comm.) mentioned that they should be considered as a suite of characters; if used separately they could prove unreliable.

Our study of the type material of the type species revealed inaccuracies and contradictions in the diagnosis of both genera. In Table 4, meristic counts for the holotype and paratypes of *C. brichardi* and the types of *A. marchei* are given. The *C. brichardi* types have 53–57 dorsal-fin rays and 56–61 anal soft fin rays contrary to the generic diagnosis of *Caecomastacembelus* in which usually more than 100 anal and more than 100 dorsal soft fin rays are given. We also counted only 4 predorsal vertebrae instead of 8–12 as given in the diagnosis. Hence, for these two characters, *C. brichardi* corresponds better with the definition of the genus *Aethiomastacembelus* rather than with that of the genus *Caecomastacembelus*.

For the morphometric characters, the following differences with the diagnosis were found. For *A. marchei*, the origin of the first dorsal spine is situated anterior to the posterior edge of the pectoral fin when flat against the body; the fleshy angle of jaws (jaw cleft) is situated anterior to the anterior edge of the posterior external nasal pore and the dorsal fin tends to be higher than the anal one. For *C. brichardi*, the origin of the first dorsal spine is also situated anterior to the posterior edge of the pectoral fin when flat against the body. It should be noted that a low number of predorsal vertebrae, as found in *C. brichardi*, implies that the first dorsal spine is closer to the posterior edge of the head and hence is situated anteriorly, above or just posterior to the posterior edge of the pectoral fin when flat against the body. Table 5 gives a summary of those diagnostic characters of the type species that are not in accordance with the diagnoses of the genera as defined by Travers (1988, 1992a, 1992b). In conclusion, we believe that the synapomorphies given by Travers (1988, 1992a, 1992b) to define *Caecomastacembelus* and *Aethiomastacembelus* species are, at least in part, not correctly defined. Moreover, at present, we are unable to evaluate whether these characters are or are not synapomorphies. This is the subject of our further research.

Premature decisions and changes on the genus level can only further harm the stability of zoological nomenclature, which for African Mastacembelidae is already rather confusing. Further research is necessary to eliminate the

TABLE 5. DIAGNOSTICAL CHARACTERS OF THE TYPE SPECIES OF *Caecomastacembelus* AND *Aethiomastacembelus* WHICH ARE NOT IN ACCORDANCE WITH THE GENERIC DEFINITION AS GIVEN BY TRAVERS (1988, 1992a, 1992b).

Aethiomastacembelus Travers, 1988 type species: *M. marchei* Sauvage, 1879	*Caecomastacembelus* Poll, 1958 type species: *C. brichardi* Poll, 1958
	1. 53–57 dorsal-fin rays and 56–61 anal-fin rays.
2. 11–13 principal caudal-fin rays.	
4. jaw cleft anterior to the posterior nasal.	
	5. anterior origin of first dorsal spine anterior to posterior end of pec toral fin when flat against lateral wall of body.
	6. 4 predorsal vertebrae.
8. dorsal median fin higher than anal one.	

current confusion, but to do this properly, a revision of all the African species is necessary. Such a revision is the subject of our present research. In spite of the problems on the generic level, we prefer, however, to publish the description of the new species.

We realize that the character statement of *A. robertsi* does not totally fit the diagnosis of *Aethiomastacembelus*. The following differences are noted: *A. robertsi* has 9–13 caudal-fin rays; the jaw cleft lies before or opposite of the anterior border of the posterior external nare; and the dorsal fin is deeper than the anal. In all other characters, however, our new species fits the diagnosis of *Aethiomastacembelus* as given by Travers (1988, 1992a, 1992b).

Affinities.—Morphologically, *A. robertsi* seems to be most close to *A. congicus* (Boulenger, 1896), known from the Zaïre River, and *A. marchei*, known from the Middle Zaïre and Ogowe River basins. The overall morphology is similar, though the eyes of *A. robertsi* are smaller compared to those of *A. congicus* and *A. marchei* (Fig. 5). Furthermore, the color pattern of *A. marchei* and *A. congicus* is clearly different from that of *A. robertsi*. *Aethiomastacembelus congicus* is characterized by a series of dark colored V-or X-shaped blotches on the flanks which are absent from *A. robertsi*. The color pattern of preserved juvenile *A. marchei* specimens is uniformly brownish, becoming lighter and more yellow on lips, cheek, lower side of head, belly, and abdomen. Lateral sides of head have a dark band passing through the eye and continuing on side with a series of yellowish spots inside. Dorsal, caudal, and anal fins are uniformly light colored with a series of black roundish spots on outer margin. The color pattern is not completely comparable to that described and illustrated by Sauvage (1880) which shows a series of more X-shaped blotches on the lateral side of the body. The color pattern of preserved adult *A. marchei* (MRAC 91-68-P-2559) is uniformly brownish, becoming lighter on lips, cheek, lower side of head, belly, and abdomen. Dorsal, caudal, and anal fins are characterized by a light colored basal part; the medial part is black; the outer margin is light. This pattern corresponds to that described for living specimens of *A. marchei* by Mamonekene and Teugels (1993), except for the light colored basal part of the median fins which is yellowish.

Additional material examined.—*Aethiomastacembelus marchei*: MNHN 4-895; 2 syntypes, 142–150 mm TL, falls at Doume, land of Adouma, Upper Ogowe River (Gabon) (± 0°50 and 1°01'S, 12°56'E and 13°11'E), M. Marche. MRAC 96355, 67 mm TL, surroundings of Leopoldville (Zaïre) (± 4°18'S, 15°18'E), A. Van de Weyer, 1954. MRAC 177700, 138 mm TL, Stanley-Pool, Kinshasa (Zaïre) (± 4°18'S, 15°18'E), P. Brichard, 1967. MRAC 91-68-P-2559, 217 mm TL, Loubomo River, 4 km of Moukondo, toward River Makongo (Congo) (± 4°09'S, 12°35'E), G. Teugels and V. Mamonekene, 15 Oct. 1991. MRAC 92-125-P-0621, 116 mm TL, Kiadi River, affluent of Mpoulou, at confluence with Mpoulou (Congo) (± 4°02'S, 12°21'E), V. Mamonekene, 8 Sept. 1992. *Aethiomastacembelus congicus*: BMNH 1896-3-9:4, holotype, 252 mm TL (with mutilated tail), Upper Congo, some 50 miles south of Mangala (Zaïre) (± 4°10'S, 27°29'E), J. H. Weeks, 1896? ISNB 21223, 220 mm TL, Lower Zaïre, Massif of Bangu, Marvete River (Zaïre) (coordinates and collector not found). ISNB 21224, 2 specimens, 184–212 mm TL, Lower Zaïre, Massif of Bangu, Luenda River (Zaïre) (± 6°34'S, 21°03'E) (collector not found). MCZ 50484, 396 mm TL, Zaïre River near Inga (Zaïre) (5°27,5'S, 13°36'E), T. R. Roberts and D. J. Stewart, 1 Aug, 1973. MCZ 50561, 3 specimens, 111–197 mm TL, Zaïre River mainstream near Inga hydroelectric dam (Zaïre) (5°31,5'S, 13°37,5'E), T. R. Roberts and D. J. Stewart, 4 Aug. 1973. MRAC 19075, 213 mm TL, Boma (Zaïre) (5°50'S, 13°03'O), H. Schouteden. MRAC 19150, 287 mm TL, Kidada

(Zaïre) (± 5°22'S, 14°32'E), H. Schouteden. MRAC 78147–148, 1 of 2 specimens, 336 mm TL, Leopoldville (Zaïre) (± 4°18'S, 15°21'E), M. H. Pierret, 1951. MRAC 103305–306, 2 specimens, 229–236 mm TL, Kingabwa, Leopoldville (Zaïre) (± 4°19'S, 15°21'E), J. Mandeville, 8 Sept. 1955. MRAC 104001–002, 2 specimens, 234–365 mm TL, Stanley-Pool (Zaïre) (± 4°06'S, 15°15'E), A. Werner, June 1955. MRAC 118246, 68 mm TL, Stat. 35, Stanley-Pool, River Nsele (Zaïre) (5°45'S, 15°32'E), Mission Brien-Poll-Bouillon, 4 Oct. 1957. MRAC 118914, 156 mm TL, Stanley-Pool (Zaïre) (± 4°06'S, 15°15'E), P. Brichard, 1956. MRAC 177560, 131 mm TL, Kinsuka Rapids, Kinshasa (Zaïre) (4°20'S, 15°13'E), P. Brichard, 1964. MRAC 177698–699, 2 specimens, 179–198 mm TL, Stanley-Pool, Kinshasa (Zaïre) (± 4°06'S, 15°15'E), P. Brichard, 1967. MRAC 73-22-P-5039 and 5041, 2 specimens, 89–100 mm TL, Stanley-Pool, between archipel Mbamu (Zaïre) (± 4°06'S, 15°15'E), J. Mandeville, 20 Oct. 1957. MRAC 73-22-P-5042-5043 and 5044, 3 specimens, 123–155 mm TL, Stanley-Pool, River Nsele (Zaïre) (5°45'S, 15°32'E), J. Mandeville, 30–31 Oct. 1957. MRAC 73-22-P-5045, 261 mm TL, Stanley-Pool (Zaïre) (± 4°06'S, 15°15'E), J. Mandeville, 1 Aug. 1958. MRAC 73-22-P-5047, 450 mm TL, Stanley-Pool (Zaïre) (± 4°06'S, 15°15'E), J. Mandeville, 23 April 1958.

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