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Aphyosemion teugelsi (Cyprinodontiformes: Nothobranchiidae), a new species from a remote locality in the southern Democratic Republic of the Congo

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Abstract

Aphyosemion teugelsi is described from specimens collected in a small creek in the upper Wamba River basin in the southwest of the Democratic Republic of the Congo not far from the Angolan border. This is ~400 km outside the known distribution area of the genus. It is distinguished from all other members of the genus *Aphyosemion* by the combination of broad black margins on all fins in males, a robust lower jaw, a more convex back, a large head with large eyes, a more anterior position of the dorsal fin relative to anal fin, and absence of extensions on the upper and lower caudal fin.

Key words: Congo basin, Kwango province, killifish, systematics, taxonomy

Resumé

Aphyosemion teugelsi est décrit à partir de spécimens récoltés dans une petite crique du bassin de la haute Wamba, sud-ouest de la République Démocratique du Congo, non loin de la frontière angolaise. Ceci est de l'ordre de 400km en dehors de la zone de distribution connue pour le genre. Elle se distingue de tous les autres membres du genre *Aphyosemion* par la combinaison de larges marges noires sur toutes les nageoires chez les mâles, d'une robuste mâchoire inférieure, d'un dos plus convexe, d'une large tête à grands yeux, d'une position plus antérieure de la nageoire dorsale par rapport à l'anale et de l'absence d'extensions aux lobes supérieur et inférieur de la nageoire caudale.

Introduction

The genus *Aphyosemion* Myers, 1924 is widespread in the Congo basin with 14 recognized species belonging to a single group, the *Aphyosemion elegans* species group, which represents the subgenus *Aphyosemion* (Collier 2007; Wildekamp 1993; Huber 2007; Murphy & Collier 1999; Van der Zee & Huber 2006). In the northwestern part of the basin *Raddaella splendidum* (Pellegrin, 1930) is present, whilst *Aphyosemion labarrei* Poll, 1951 is restricted to the Inkisi River basin (Lower Congo), both species do not belong to the subgenus *Aphyosemion* according to morphology and molecular data (Collier 2007; Huber 2007; Murphy & Collier 1999; Wildekamp 1993, 1996). Other nothobranchiids in the Congo basin belong to the genus *Epiplatys* (six species), *Nothobranchius* (two species), *Aphyoplatys* (one species), and *Fenerbahce* (one species), a comparatively small number of nothobranchiid species compared with the diversity found for example in smaller countries such as Cameroon, Gabon, or the Republic of the Congo (Huber 2007; Wildekamp 1993, 1996).

In the past only very few collections of nothobranchiid killifishes were made in the large southern tributaries of the middle Kasai River in the southern Democratic Republic of the Congo (DRC). Here the Kwango and Kwilu Rivers border a triangular region (Fig. 1) from which currently only two species are known: *Aphyosemion congicum* (Ahl, 1924) (Fig. 2) and *A. cognatum* Meinken, 1951 (Fig. 3), both species living in the northwestern part of the triangle (Radda 1986; Wildekamp 1993).

On February 22nd 1939 M. Bequaert, at that time head of the Archaeological Department of the Royal Museum for Central Africa (MRAC) in Tervuren, collected eight specimens of an *Aphyosemion* species in a small creek called Lukula, 10 km north of “Poste de Panzi (Ruisseau Lukula 10 km N. de Poste de Panzi)”. Panzi is located in the extreme south of the Kwango Province in southwestern DRC, approximately 100 km north of the Angolan border. The specimens were sent to Belgium and added to the MRAC collection. During the study of the killifish fauna from the Congo basin by the first author, these specimens turn out to represent an unknown species and are formally described here.

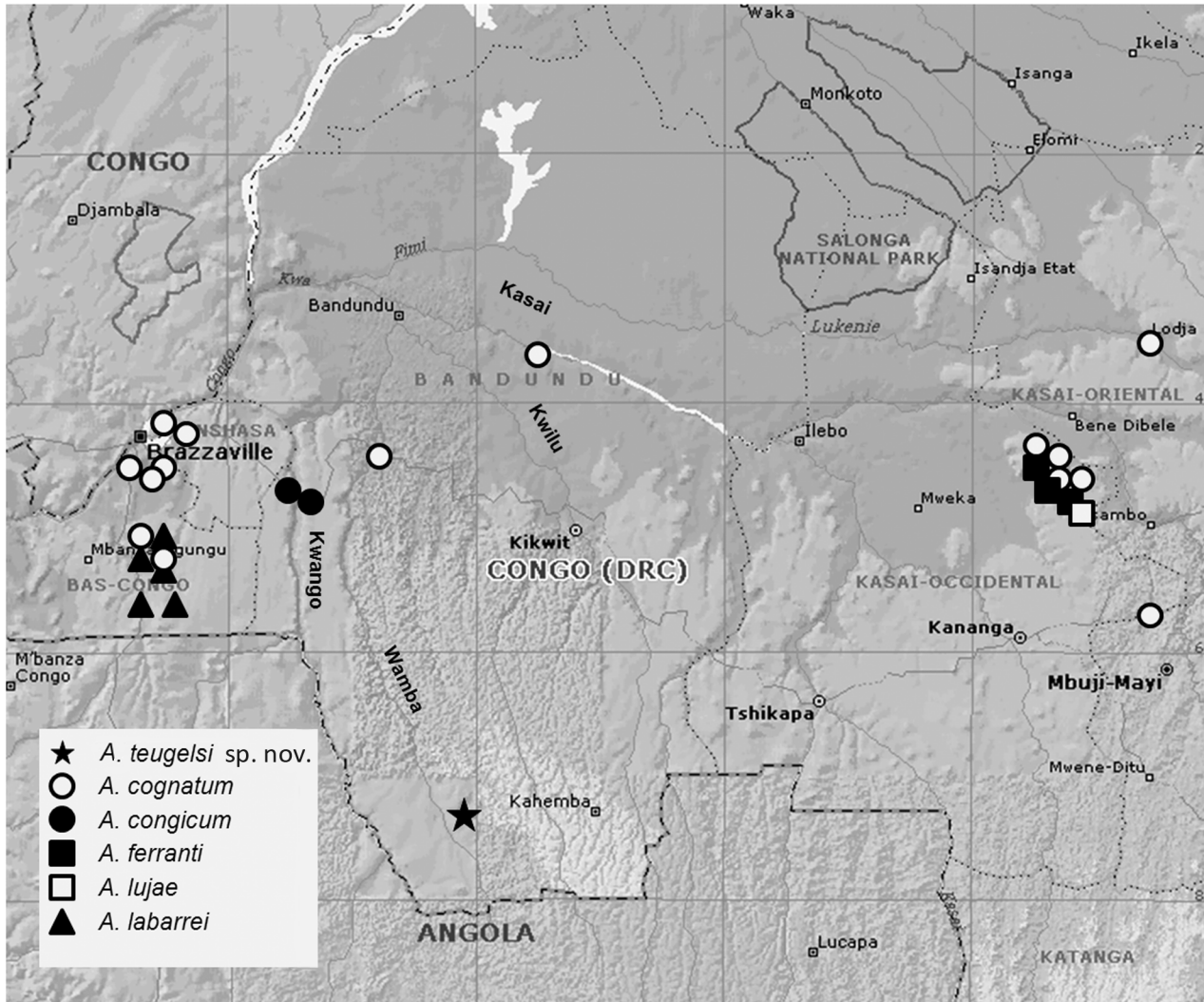


FIGURE 1. Map showing the type locality of *Aphyosemion teugelsi*, **sp. nov.**, and the distribution of other *Aphyosemion* species in the southern Congo basin.

Material and methods

Morphometric measurements were taken by means of a micrometer and compass, partly under a dissecting microscope, and rounded to the nearest 0.1 mm. Counts and methods follow Amiet (1987). Measurements, including subunits of head, are presented as percentages of standard length (SL). The number of all visible rays of dorsal, anal, caudal, pelvic, and pectoral fins were counted, the abbreviation D/A means the relative position of the first dorsal fin ray with regard to the opposite anal fin ray. Count of scales on the mid-longitudinal series is the number of scales between the upper attachment of the opercular membrane and the caudal fin base. Excluded are the scales posterior to the hypural junction, which were counted separately. Nomenclature for the neuromast system on the head follows Scheel (1968) and Van Bergeijk and Alexander (1962), and that for supraorbital (frontal) squamation follows Hoedeman (1958).

Head skeleton of the male paratype and additional specimens of the comparative material were studied by a μ CT scan prepared with a Scanco viva CT40 at the Max-Planck-Institute for Evolutionary Biology in Plön. Postcranial bones of the paratype and additional specimens were studied by digital X-ray images done with a Faxitron LX-60 Digital Specimen Radiography System at the Zoologisches Forschungsmuseum Alexander Koenig (ZFMK) in Bonn. Dorsal height was measured on the X-ray images in a perpendicular line from the centre of the vertebrae to the dorsal edge at vertebrae 1, 5, 10, 15, 20, and 25.

The approximate live colour pattern of the new species was derived by examination of the remaining pigmentation pattern of the types based on the experience with other species of nothobranchiid fishes, for which live and preserved colouration pattern is known. Red pigmentation pattern, after preservation in formalin and transfer in ethanol, leaves corresponding patterns of lighter areas than the body colouration, yellow (e.g., in fins), turns white and areas which were black turn into dark brown. Depending on the initial preservation conditions and long-term storage, these patterns are more or less visible and fade with time. These colourations remain could give an estimation of the species live colour pattern.

Following the proposal published by one of the authors on the usage of generic names in nothobranchiids (Sonnenberg 2007), we suggest to refer only to the monophyletic species group containing the generic type of *Aphyosemion*, *A. castaneum*, i.e. the *A. elegans* species group, as *Aphyosemion* and to the remaining species groups either with their published genus level names or, in the case of unnamed species groups, within parentheses as '*Aphyosemion*'. The new nothobranchiid species is here described within *Aphyosemion* to follow ICZN Article 5.3, but will appear as '*Aphyosemion*' *teugelsi* **sp. nov.** in a latter paragraph on its relationship because its phylogenetic placement within this genus is currently not clear.

Comparative material examined. *Aphyosemion castaneum* Myers, 1924: MRAC 89-043-P-547–612 (labelled as *Aphyosemion christyi* [Boulenger, 1915]), River Libuku, L. de Vos & M. Katembo, April 1988, Democratic Republic of Congo; Personal collection JvdZ, 56 km E of Procure de Mission Kisangani to Bafwassende, collection code HZ 85-13, W. Grell, J. Pap & W. Stenglein, January 1985, Democratic Republic of Congo; *Aphyosemion christyi* (Boulenger, 1915): MRAC 91-079-P-456–460, Epulu, small forest rivulet, T. Roberts, 24.07.1986, Democratic Republic of Congo; Personal collection JvdZ, 6 km W of Epulu, collection code HZ 85-14, W. Grell, J. Pap & W. Stenglein, January 1985, Democratic Republic of Congo; *Aphyosemion cognatum* Meinken, 1951: MRAC 117968–117972 Kinsuka, Brien *et al.*, 1957, Democratic Republic of Congo; MRAC 77395, Environs de Leopoldville (Stanley Pool), A. Dubois, 1951, Democratic Republic of Congo; Personal collection JvdZ, 3 km W of Kinshasa International Airport, collection code Z91-3, P. De Waegeneer, L. Van den Berg & B. Vlym, July 1991, Democratic Republic of Congo; *Aphyosemion congicum* (Ahl, 1924): ZMB 12420, lectotype, ZMB 31487, paralectotypes; MRAC 77-13-P-26–27, aquarium import 1971; Personal collection JvdZ, aquarium material (2003), offspring from specimens caught by A. C. Radda at Takundi in 1982, Democratic Republic of Congo; *Aphyosemion elegans* (Boulenger, 1899): MRAC 993–994, types, Bikoro, P. Delhez, Democratic Republic of Congo; MRAC 37840–37843, Flandria, R. P. Hulstaert, 15.08.1931, Democratic Republic of Congo; '*Aphyosemion*' *ferranti* (Boulenger, 1910): MRAC 15325–15328, Sankuru River at Kondue, E. Luja, 1908, Democratic Republic of Congo; MRAC 79-008-P-283–286, River Kalubukua, Bena Tshiadi, T. S. Robertson, 24.07.1977, Democratic Republic of Congo; '*Aphyosemion*' *labarrei* Poll, 1951: MRAC 74865, Ngufu River near Kiowa-Kingwambe, C. La Barre, 1950, Democratic Republic of Congo; *Aphyosemion lefiniense* Woeltjes 1984: MRAC 2004-046-P-0079–0080 Louna river, V. Mamonekene, E. Vreven & A. Ibala Zamba, 03.10.2004, Republic of Congo; '*Aphyosemion*' *lujae* (Boulenger, 1911): MRAC 3419–3430 Sankuru River at Kondue, E. Luja, Democratic Republic of Congo. MRAC 3431–3433, types, Sankuru River at Kondué, E. Luja, Democratic Republic of Congo; MRAC 2737–2747, Sankuru River at Kondué, E. Luja, Democratic Republic of Congo; MRAC 2748–2758, Sankuru River at Kondué, E. Luja, Democratic Republic of Congo; MRAC 2759–2769, Sankuru River at Kondué, E. Luja, Democratic Republic of Congo; MRAC 2770–2779, Sankuru River at Kondué, E. Luja, Democratic Republic of Congo; *Aphyosemion schoutedeni* (Boulenger, 1920): MRAC 21641 (labelled as *Aphyosemion christyi* [Boulenger, 1915]), Medjé, H. Schouteden, Democratic Republic of Congo; *Aphyosemion polli* Radda & Pürzl, 1987: Personal collection JvdZ, aquarium specimens originating from Kapou, collection code RCA 91-1, W. Harz, June 1991, Central African Republic; *Mesoaphyosemion cameronense* (Boulenger, 1903): ZFMK 41503–41514, small creek in the forest at the road Kribi-Ebolowa, east Akom, U. Kämpf, R. Sonnenberg & A. Tränkner, 18.01.2000, Cameroon; *Mesoaphyosemion etsamense* (Sonnenberg & Blum, 2005): ZFMK 39832–39842 paratypes, small river at the village Etsam I, crossing the road N5 from

Medoneu to Koungoueu, T. Blum, G. Fleck & R. Sonnenberg, 29.07.2002, Gabon; *Raddaella batesii* (Boulenger, 1911) BMNH 1909.7.9.73–77, types, Bumba River at Assobam, G. L. Bates, Cameroon; ZFMK 41515–41535, Kolé River, near Malassa, east of Mekambo, T. Blum, G. Fleck & R. Sonnenberg, 20.07.2002, Gabon.

***Aphyosemion teugelsi*, sp. nov.**

(Figs. 4–6, Tables 1–3)

Holotype. MRAC 62053, male, 24.2 mm SL; Democratic Republic of Congo, Bandundu Province, Lukula Creek, 10 km north of Panzi, (7° 07' S, 17° 57' E), 779 m altitude, southwestern Congo basin, M. Bequaert, 22 February 1939.

Paratypes. MRAC 62054–57, 3 females, 16.5–19.5 mm SL, and 1 male, 20.3 mm SL, collected with the holotype. MRAC 62058–60, 1 damaged female and 2 juvenile males, collected with the holotype, not measured.

Diagnosis. *Aphyosemion teugelsi* is placed within the Nothobranchiinae and Aphyosemioninae by the open frontal or nasal neuromast system with two separate grooves and the preopercular neuromast system with 6 pores. A closer relationship with *Aphyosemion* and not with *Fundulopanchax* is indicated by the number of circumpenduncular scales (11 or 12), and the more posterior placement of the dorsal fin relative to the anal fin.

Aphyosemion teugelsi is distinguished from all other species of the subgenus *Aphyosemion* by the more anterior insertion of the dorsal fin over the anal fin (D/A 6–8 versus D/A 8–13) and the longer base of the dorsal fin (13.8–15.3 % SL in *A. teugelsi* versus 8.6–12.1 % SL in the subgenus *Aphyosemion*). It differs from all species of the subgenus *Aphyosemion* in having a larger head (head length 29.3–32.0 % SL in *A. teugelsi* versus 18.9–27.8 % SL in *Aphyosemion*), and a larger eye diameter (9.1–10.3 % SL in *A. teugelsi* versus 6.9–8.7 % SL in *Aphyosemion*). *Aphyosemion teugelsi* has a higher and more convex back than the species of the subgenus *Aphyosemion* (dorsal height in *A. teugelsi* is 8.0–12.5 % of the length of the spinal column versus 6–10 % in *Aphyosemion*).

Males of *A. teugelsi* are distinguished by members of the subgenus *Aphyosemion* except *A. congium* (Fig. 2) and '*A. ferranti*' by the absence of fin streamers on the edges of the caudal fin. With the exception of *A. congium*, '*A. labarrei*', '*A. ocellatum*', and '*A. passeroi*', *A. teugelsi* males can be distinguished from other *Aphyosemion* males by the dark brown, in live most probably black, margin of all fins versus fins with a light blue, white, yellow, orange, or reddish margin.

Males can be distinguished from *A. congium* populations from the adjacent Kwango basin by dark fin margins in all fins versus dark margin only in unpaired fins; dorsal fin with a dark margin and centre with spots versus almost completely black and, if with spots, only on the fin base; anal fin with broad black margin in *A. teugelsi* versus very narrow or no black margin in *A. congium*; caudal fin without spots in *A. teugelsi* and spotted in *A. congium*; pectoral fin with black margin in *A. teugelsi* versus white, light yellow, or bluish margin in *A. congium*. *Aphyosemion teugelsi* can be distinguished from '*A. labarrei*' by several characters: flanks with a small number of small light spots, probably red in live, on anterior side in male versus a dense pattern of large red spots, forming an irregular band in '*A. labarrei*', and by the following scale counts: lateral line scales 28 or 29, circumpenduncular scales 11 or 12 in *A. teugelsi* versus 30–32 lateral line and 13 or 14 circumpenduncular scales in '*A. labarrei*'.

From the two species of the '*Aphyosemion*' *coeleste* species group, '*A. ocellatum*' and '*A. passeroi*', *A. teugelsi* can be separated by the absence of a dark blotch on mid of side slightly posterior to the insertion of pectoral fin versus presence of a blotch in '*A. ocellatum*', the black margin on upper and lower border of caudal fin versus completely dark bordered caudal fin in '*A. passeroi*', and from both species by the presence of traces of red dots in nearly regular rows, the dark margin of the pectoral fin, and extended posterior dorsal and anal fin rays versus nearly complete absence or irregular distribution of red pigmentation on side, no dark pectoral fin borders, and only slightly extended posterior dorsal and anal fin rays from both species.

Description. See Figures 4–6 for general appearance and Tables 1–3 for morphometric and meristic data of the type series. *Aphyosemion teugelsi* shows strong sexual dimorphism, males more colourful, unpaired fins larger, dorsal and anal fin with posterior fin rays extended. A slender, laterally slightly compressed species; dorsal profile slightly convex, greatest body depth approximately at pelvic fin. Ventral profile slightly convex from head to end of anal fin, concave on caudal peduncle. Snout slightly rounded, mouth directed upwards, lower jaw very robust and longer than upper jaw. Dentary bears an outer row of large and inner irregular rows of smaller unicuspid, curved teeth; the premaxilla bears some larger and several smaller unicuspid and curved teeth.



FIGURE 2. *Aphyosemion congicum*, male, 39 km east of the Lufimi River, collection locality Z 82-17, F3 of the specimens collected in the wild, not preserved. Photographed by T. Woeltjes.



FIGURE 3. *Aphyosemion cognatum*, male, 11 km east of Kengé, Wamba River drainage, F1 of specimens collected by Radda, Pürzl & Hofmann, August 1982, not preserved. Photographed by T. Woeltjes.

Frontal (after Scheel 1968) or nasal (after van Bergeijk & Alexander 1962) neuromasts in two separated grooves, the preopercular canal with six pores.

Scales cycloid, entirely scaled except ventral surface of head; frontal squamation of G-type; scales on mid-longitudinal series 28 or 29, with 2 or 3 scales posterior to the hypural plate; 7 or 8 transversal scales, 11 or 12 scales around the caudal peduncle.

Small dorsal fin with 10–13 fin rays, first dorsal fin ray inserts above the 6–8th anal fin ray; anal fin with 14 or 15 rays; posterior 4 or 5 dorsal and anal fin rays elongated in males, even in juveniles of 13.5 and 14 mm SL. Caudal fin rounded, 23–25 rays, no extensions on upper and lower fin rays. Pectoral fin with 14 or 15, pelvic fin with 5 or 6 rays. Male paratype with 29 vertebrae, 14 with haemal spines.

TABLE 1. Morphometrics of *Aphyosemion teugelsi*, **sp. nov.**, (2 males (♂) and 3 females (♀)). All measurements in percentages of standard length, standard length in mm.

	Holotype (♂)	Paratype (♂)	Paratype (♀)	Paratype (♀)	Paratype (♀)
standard length	24.2	20.1	19.5	17.3	16.5
body depth	21.1	20.1	17.2	16.6	21.2
head length	29.3	32.0	31.3	30.6	31.5
head width	18.2	20.2	19.5	18.5	20.0
eye diameter	9.1	9.3	9.2	9.8	10.3
interorbital width	12.4	12.8	11.3	12.1	12.1
snout length	4.1	4.4	4.1	4.0	5.4
predorsal length	68.2	68.0	68.7	70.5	66.0
preanal length	62.8	59.2	62.3	61.2	60.1
dorsal fin base	15.3	15.3	13.8	13.9	14.5
anal fin base	19.4	20.7	17.4	18.5	18.8
caudal peduncle depth	12.4	12.3	12.3	12.7	12.1

TABLE 2. Meristics of *Aphyosemion teugelsi*, **sp. nov.**, for the 7 intact specimens. Numbers indicate observed values, numbers in parentheses frequency of occurrence; values found for the holotype are indicated by an asteriks.

meristic count	values (frequency)
dorsal fin rays	10 (3*), 11 (3), 13 (1)
anal fin rays	14 (1), 15 (6*)
D/A	+6 (2), +7 (4*), +8 (1)
caudal fin rays	23 (2*), 24 (2), 25 (3)
pelvic fin rays	5 (6), 6 (1*)
pectoral fin rays	14 (4*), 15 (3)
lateral line scales	28 (5), 29 (2*)
transversal row scales	7 (4*), 8 (3)
circumpenduncular scales	11 (1), 12 (3*)

Colour in ethanol and approximation of live colouration. Males (Fig. 4–6). Flanks light brown with abrupt transition to light ventral side. Twenty to thirty small light spots mainly concentrated on anterior flanks in interrupted rows. In comparison with other species, of which live and preserved colour pattern is known, former red pigmentation in live specimens turned into light areas in formalin preserved specimens.

All paired and unpaired fins bordered with a dark brown margin; dorsal fin with small light spots, which were in live fish probably red, on darker background. Anal fin transparent, no spots, with broad dark margin. Caudal fin transparent with broad dark upper and lower margins, pectoral and pelvic fins transparent with narrow dark margins. From comparison with other species, dark margins in preserved specimens usually correspond to dark brown to black margins in live colouration.

Females (Fig. 5). Flanks light brown without markings except for the dark scale edges, forming a reticulated pattern. All unpaired fins and pelvic fins completely covered with a dense pattern of very small dark spots. Pectoral fins completely transparent.

TABLE 3. Comparison of the morphometric values for *Aphyosemion teugelsi*, **sp. nov.**, and members of the subgenus *Aphyosemion*. Abbreviations used in the table: CAS = *A. castaneum*, CHR = *A. christyi*, COG = *A. cognatum*, CON = *A. congium*, LEF = *A. lefiniense*, MEL = *A. melanopteron*, POL = *A. polli*, TEU = *A. teugelsi*, E = eye diameter, I = inter orbital width, BD = body depth, HL = head length, HW = head width, pD = pre dorsal fin distance, pA = pre anal fin distance, DB = dorsal fin base, AB = anal fin base, CD = caudal peduncle depth, sd = standard deviation.

species	location	sex	SL	E	I	BD	HL	HW	pD	pA	DB	AB	CD
COG	Z 91/3,	♂	33.5	8.0	11.0	22.9	18.9	15.8	67.1	62.2	11.5	21.9	14.3
	Kinshasa	♀	34.3	7.9	10.5	21.0	19.7	16.4	70.2	59.0	11.2	20.2	13.7
CHR	HZ 85/14,	♂	29.1	7.9	9.3	18.4	21.9	16.5	65.7	59.0	11.6	19.6	11.2
	Epulu	♀	31.2	7.8	9.3	17.1	22.1	16.3	64.5	58.7	11.3	19.9	10.9
POL	RCA 91/1,	♂	36.0	7.5	10.6	22.5	23.3	17.2	68.3	59.4	12.1	21.7	13.1
	Kapou	♀	29.1	6.9	8.2	23.6	22.7	18.1	67.0	61.9	11.7	19.9	12.6
CON	type of MEL	♂		7.8	9.5	21.6	27.8	18.6	67.3	61.5	12.1	20.9	13.4
CAS	HZ 85/13	♂	20.8	7.7	13.4	20.4	20.2	13.5	70.2	53.8	12.0	22.1	11.1
		♀	19.4	7.7	11.9	20.8	19.8	14.0	68.3	52.1	11.5	20.0	12.3
LEF	Lonna river	♂	23.1	8.7	12.1	19.0	24.1	14.3	66.6	54.9	7.0	13.0	9.6
		♀	19.2	8.3	11.4	21.0	23.6	17.7	69.9	57.0	8.6	16.2	11.8
mean				7.8	10.6	20.8	22.2	16.2	67.7	58.1	11.0	19.6	12.2
sd				0.5	1.4	2.0	2.6	1.7	1.9	3.4	1.6	2.7	1.4
range				6.9–	8.2–	17.1–	18.9–	13.5–	64.5–	52.1–	8.6–	13.0–	9.6–
				8.7	13.4	23.6	27.8	18.6	70.2	62.2	12.1	22.1	14.3
TEU													
mean				9.5	12.1	19.2	30.9	19.3	68.3	61.1	14.6	19.0	12.4
sd				0.5	0.5	2.2	1.0	0.9	1.6	1.5	0.7	1.2	0.2
range				9.1–	11.3–	16.6–	29.3–	18.2–	66.0–	59.2–	13.8–	17.4–	12.1–
				10.3	12.8	21.2	32.0	20.2	70.5	62.8	15.3	20.7	12.7

Distribution. *Aphyosemion teugelsi* is currently only known from its type locality, the Lukula Creek 10 km north of Panzi, a tributary of the Wamba River in the southwestern part of the Democratic Republic of Congo. This is the highest known elevation for a killifish in the Congo basin as the type locality is probably situated near the only road in this area that lies at an elevation of approximately 1000 meters. *Aphyosemion teugelsi* is also the southernmost occurring species of *Aphyosemion s.l.*

Relationship. Within the genus *Aphyosemion* only one species shares the broad black fin margins and an almost unspotted anal fin in males: *A. congium*. *Aphyosemion congium* (Type locality “Kongo”) and *A. melanopteron* Goldstein & Ricco, 1970 (Type locality unknown) are supposed to be conspecific (Seegers, 1988), with the latter as a junior synonym. However, Huber (2007, online version www.killi-data.org) noticed a significant difference in the number of spots on the flanks. In the description of *A. congium* Ahl (1924) mentioned: “whole body provided with a large number of irregularly distributed carmine red spots”. All known *A. melanopteron* populations show 25–40 red spots that are not considered as high numbers for *Aphyosemion*. *Aphyosemion* species can show up to 130 red spots on one flank (e.g. in *A. rectogoense* Radda & Huber, 1977). In his descriptions Ahl usually mentioned “a number of red spots” when no particular low or high numbers were meant. This suggests that in *A. congium* a higher number of spots could be present than in *A. melanopteron*, unfortunately the type material of *A. congium* did not show any traces of colour pattern remains any more. It is possible that *A. congium* and *A. melanopteron* represent two different phenotypes of the same species but due to the lack of densely collected samples from the distribution range it can not be excluded that the two taxa represent two different species. However, both share the same pattern of dark fin margins and can be distinguished from '*A.*' *teugelsi* by the same diagnostic characters.

'*Aphyosemion*' *teugelsi* differs from species of *Aphyosemion* by a more anterior position of the dorsal fin, the absence of fin streamers in the caudal fin, a more convex back, and the more robust lower jaw, therefore we exclude it at the moment from this group.

Other species with a southern distribution in the Congo basin are '*Aphyosemion ferranti*' and '*A. lujae*', which are currently only known from preserved material, and their taxonomic placement is not well studied. These species have distinctive colour patterns (*i.e.*, a horizontal dark band on rear body, and a caudal fin with spots or stripes, and no dark margins on unpaired fins) that distinguish them from the new species and none of them shows black fin margins. '*Aphyosemion ferranti*' shares with '*A. teugelsi*' a more robust lower jaw and the rounded caudal fin without fin extensions. However, for a final conclusion about a closer relationship of these three 'southern' species, detailed morphological and, with suitable samples, DNA studies are needed.

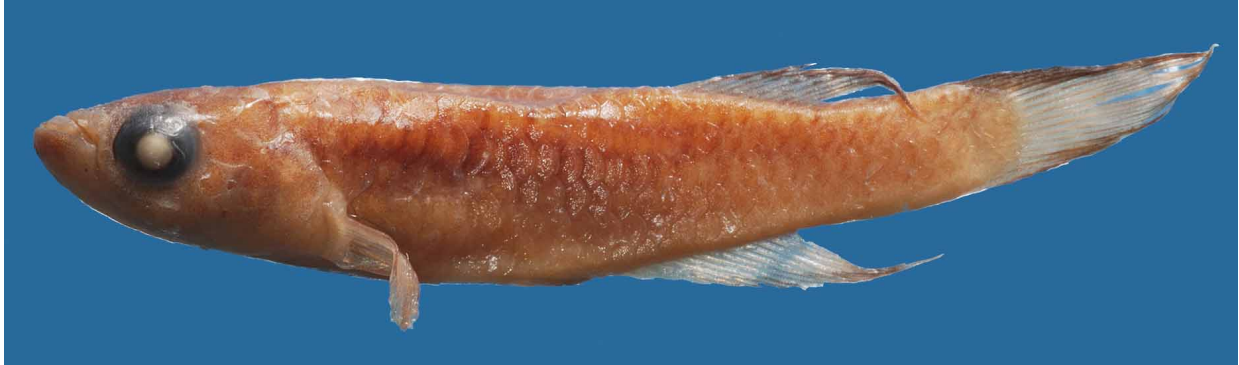


FIGURE 4. *Aphyosemion teugelsi*, **sp. nov.**, male, 24.2 mm SL, MRAC 62053, holotype.



FIGURE 5. *Aphyosemion teugelsi*, **sp. nov.**, above male, 20.3 mm SL, below female, 19.5 mm SL, MRAC 62054–62057, paratypes.

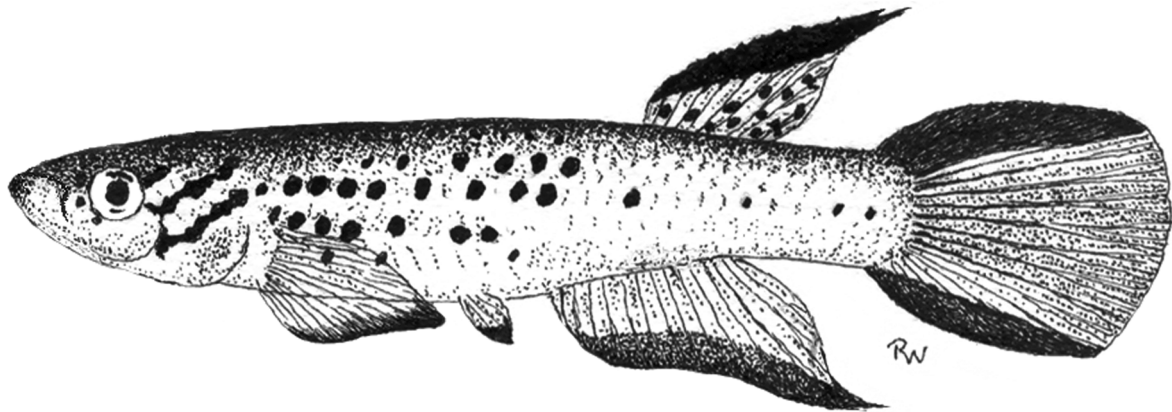


FIGURE 6. Sketch of the approximated colour pattern of *Aphyosemion teugelsi*, **sp. nov.** Drawing by R. H. Wildekamp.

Currently no comprehensive and detailed comparative morphological study of the African nothobranchiids is available and for most species groups and genera robust diagnostic characters are not known. Whereas species groups are easily recovered by DNA studies (Murphy & Collier 1999), it is often difficult to unambiguously assign preserved specimens by external morphological characters (Scheel 1968).

In order to check phylogenetic relationships, a small sample of body tissue was collected and several extraction methods were tested to get DNA from '*A.* *teugelsi*'. Unfortunately no detectable amount of DNA could be recovered and also PCRs attempts with primer combinations for short fragments (ca. 200–500 bp) gave no results. Therefore we hesitate here to assign '*A.* *teugelsi*' into one of the currently established species groups, subgenera, or genera (Sonnenberg 2007), due to its divergent morphology, and the absence of clear diagnostic characters.

Etymology. The species is dedicated to the late Guy Teugels (Royal Museum for Central Africa, Tervuren, Belgium) who died at 50 years of age in 2003. Guy was renowned worldwide for his contribution of the knowledge of African freshwater fishes, especially for his expertise in clariid catfishes, his favorite group. He was not only characterized by an impressive scientific productivity but also by his affection for the African continent and its people. Guy was an enthusiastic coach for the first author at the Zoology department of the museum for many years.

Discussion

The discovery of an *Aphyosemion s.l.* species in the southern part of the Congo basin, far outside the currently known distribution range, indicate that this large and insufficiently sampled region most probably will harbour additional scientifically new species of nothobranchiids if the often small distribution areas of nothobranchiid species and the topologically complex structure, with many parallel but isolated river basins, are taken into account. It is possible, that this species might be more widespread in the tributaries of the upper reaches of the Wamba River and maybe even found in southern tributaries of the Kwango River in southern Congo and northern Angola. Both rivers run north through an approximately 150 km broad and 500 km long isolated southern extension of the rainforest. This forest strip is isolated from other, more eastern, strips by savannah. As *Aphyosemion s.l.* species are almost always obligate forest dwellers (Brosset 1982, 2003; Brosset & Lachaise 1995; Kamdem Toham & Teugels 1997, 1998, 1999), these savannah strips will likely pose severe dispersal obstacles. Many southern tributaries of the Kasai River are under cover of such isolated forest strips that might harbor more scientifically unknown species.

As discussed above, with the currently available data it is difficult to assign '*A.* *teugelsi*' to one of the known species groups, so new sampling efforts to collect additional material in the future will certainly contribute to the solution of this problem. The differences between '*A.* *teugelsi*' and the species of the geographically close *Aphyosemion* indicate that it probably belongs to a currently unknown supraspecific taxon living in the southern tributaries of the Kasai River.

Acknowledgements

We wish to thank the following individuals for their help in realizing this paper: the late G. G. Teugels (MRAC, Tervuren) for his unlimited hospitality and his advice; E. Vreven and J. Snoeks (MRAC) for their kind hospitality and support; M. Parrent (MRAC) for his services and ad hoc help during research at the museum, O. Crimmen, J. McLaine, and P. Campbell (BMNH, London) for their kind support, P. Bartsch (ZMB, Berlin) for the loan of specimens under his care, F. Herder (ZFMK, Bonn) for access to the X-ray device, M. Van Steenberge (MRAC) for his assistance in adding some counts, R. Wildekamp (Gemert, The Netherlands) for drawing the idealized sketch of a male 'A.' *teugelsi*, T. Woeltjes (Nijmegen, The Netherlands) for providing literature and photographs, W. Eigelshofen (Sprockhövel, Germany) for photographs and support during the preparation of the final figures, and J.-H. Huber (Paris, France) for his advice to exclude this description from an earlier publication. The authors also thank two anonymous reviewer and J. Friel for comments and corrections on an earlier version of the manuscript.

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