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Nanochromis sabinae, a new cichlid species (Teleostei, Cichlidae) from the Upper Congo River area and Northeast Gabon

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Abstract

Nanochromis sabinae, a new cichlid species, is described from central and northeast Congo (Brazzaville) and southeast Gabon. It is differs from congeners in a combination of morphological characters and coloration patterns; e.g. anterior region of upper lateral line clearly separated from the dorsal-fin base; posterior nape scaled; one or two rows of cheek scales; a black longitudinal band from the eye to the end of the caudal peduncle, visible in both sexes in some behavioural situations but not extended into the caudal fin; females with some silvery colored scales around the genital papilla.

Key words: Teleostei, Cichlidae, *Nanochromis*, new species, Congo

Introduction

The genus *Nanochromis* was originally erected by Pellegrin (1904) for *Nanochromis nudiceps* (Boulenger, 1899), with the main character of an extremely elevated upper lateral line. In his revision of the genus *Pelmatochromis*, Thys van den Audenaerde (1968) suggested the inclusion of *Nanochromis* as a subgenus of *Pelmatochromis* sensu lato, for species within the genus with 12 scale rows around the caudal peduncle. *Nanochromis* was resurrected as a genus by Trewavas (1973, 1974). Roberts & Stewart (1976) characterized *Nanochromis* sensu stricto as having one half or more of the upper lateral line adjacent to the base of the dorsal fin, rather than separated from it by one or more rows of scales without tubules, and added four new species. Greenwood (1987) recognized two groups within the genus: a smaller group with the two species *N. dimidatus* and *N. squamiceps*, characterised by having about less than the half pored scales of the upper lateral-line contiguous with the dorsal-fin base, a completely scaled belly and nape, a partially scaled chest and cheek, and the presence of a single, reduced and comma-shaped supraneural bone. The

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second group contains all remaining species, characterised by the posterior half, or slightly more, of the upper lateral line contiguous with the dorsal-fin base, a naked nape, cheek and belly, and by the absence of a supraneural bone in most individuals.

In 1996 the German aquarist Rainer Sawatzky collected a *Nanochromis* in Congo (Brazzaville) near the city of Makoua which corresponded well to some other material from Congo (Brazzaville) and Gabon, deposited in MRAC and MNHN as well as with specimens presented in aquarist literature and which clearly was an undescribed species of the *dimidiatus*-group. It is the aim of this paper to describe this new species.

Material and methods

External counts and measurements follow Barel et al. (1977). All measurements were taken on the left side of the specimens with digital callipers with an accuracy of +/- 0.03 mm.

X-rays were produced for the AMNH material. Material with SL < 25 mm was not included in the statistics. Description of coloration of live specimens from photographs made by R. Sawatzky of wild caught and tank raised specimens. Abbreviations used are: AMNH, American Museum of Natural History, New York; MCZ, Museum of Comparative Zoology, Oxford; MNHN, Muséum National d´Histoire Naturelle, Paris; MRAC, Musée Royal de l´Afrique Centrale, Tervuren; NMW, Naturhistorisches Museum, Wien; SL, standard length; HL, head length.

Nanochromis sabinae, new species
(Figs. 1–4)

Nanochromis sp. “Makoua” — Lamboj 2004, 164; *Nanochromis* sp. “Genema” — Linke & Staeck, 2002, 115, 125, 126; — Lamboj 2004, 164; *Nanochromis* sp. Linke & Staeck, 2002, 115; *Nanochromis* sp. aus Makoua, Sawatzky, 1996; *Nanochromis* sp. “Bamanja-Gelbwangen”, Freyhof, 1996

Holotype. NMW 94839, male, 50.4 mm SL; Congo, (Brazzaville): Loubi River, tributary of the Likoula River (Congo system), SW of Makoua, nearby the village of Lengui; 0° 0´ S, 15° 38´ E, R. Sawatzky, Mar 1996.

Paratypes. NMW 94840, 1 male, 1 female, 52.1+38.6 mm SL, same as holotype. — AMNH AMNH 235651-2 1 male, 1 female, 48.2+37.4 mm SL, same as holotype. — MRAC 20479-20481, 2 males, 1 undet, 21.9–30.2 mm SL, Congo Français: Riv. Sangha. — MRAC 2396-044-P-0196-0197, 2 males, 52.5+32.5 mm SL, Congo (Brazzaville): Ruisseau pres d´Olombo, route de l´ouest, 3 km avant la Komo, J. Huber, Jul 1978. — MRAC 96-044-P-0198-0199, 2 undet., 16.0+20.6 mm SL, Congo (Brazzaville): mares 50

km N d´Obouya, pres du pont sur la Vouma, J. Huber, Jul/Aug 1978. — MRAC 096-044-P-0200-0201, 2 undet., 13.2+16.0 mm SL, Congo (Brazzaville): apres le bac de Makoua, dans les mares de la foret Nionde, J. Huber, Jul/Aug 1978. — MRAC 96-044-P-0202, 1 undet., 28.2 mm SL, Congo (Brazzaville): petit ruisseau 3 km E de Louenk, J. Huber, Jul/Aug 1978. -— MNHN 1930-60, 1 male, 3 females, 33.5–46.2 mm SL, Gabon: Liboumba, (Ogowe system) Baudon, 1930.

FIGURE 1. *Nanochromis sabinae*, NMW 94839, holotype, male, 50.4 mm SL; Congo (Brazzaville): Loubi River.

In addition 10 pairs of descendents of the material collected by Sawatzky (F3–F5) were used for behavioural observations, but not included in the anatomical or type series.

Diagnosis. A species of *Nanochromis* with the following combination of characters: Body moderately elongated, steep and rounded front profile, snout rounded, caudal fin rounded. One tubular infraorbital bone. Nape and opercle scaled, cheek with 1 or 2 scale rows, at least on the posterior part. Females with a few, silvery colored scales around the genital papilla. A black longitudinal body stripe, not extended into the caudal fin.

Description. Measurements and meristic counts for holotype and 13 paratypes in Table 1.

Sexual dimorphism and dichromatism well-developed. First ray of pelvic fin longest in both sexes, but always more produced in males than in females. Tips of pelvic fin not reaching origin of anal fin in either sex. Caudal fin rounded. Caudal peduncle short, from slightly longer than deep to slightly deeper than long.

Osteology and dentition. Infraorbital bones series with lachrymal and one tubular element; lachrymal with four openings of laterosensory system. 24–25 vertebrae, of which are 13–14 abdominal and 11 caudal.

Premaxilla and dentary with 2–3 rows of unicuspid teeth. Anteriorly in the lower jaw a few teeth orientated posteriorly, not buccally. Lower pharyngeal bone triangular, with teeth shouldered unicuspid (lateral parts of the bone) or asymmetric bicuspid (central field).

TABLE 1. Morphometrics and meristics of the holotype and 13 paratypes of *Nanochromis sabinae*.

	holotype	mean	SD	range
Standard length	50.4	40.6		28.2 – 52.5
% of standard length				
Body depth	32.8	30.9	2.9	23.3 – 33.4
Head length	31.4	31.1	2.4	23.4 – 32.8
Caudal peduncle length	12.9	14.2	1.2	11.5 – 16.0
Caudal peduncle depth	16.0	14.6	1.1	11.9 – 16.0
Lenght of dorsal-fin base	66.3	60.1	5.3	46.1 – 67.0
Length of anal-fin base	19.4	17.3	1.5	13.8 – 19.4
Predorsal distance	24.4	26.4	3.0	18.2 – 32.0
Preanal distance	68.4	67.5	5.2	49.9 – 70.7
Prepectoral distance	33.1	33.6	3.1	23.4 – 36.2
Prepelvic distance	34.2	36.3	3.4	26.2 – 40.0
% of head length				
Head depth	65.4	63.6	3.9	57.5 – 71.2
Snout length	29.7	27.9	3.7	21.0 – 34.3
Eye diameter	29.5	30.4	2.1	26.2 – 33.4
Postorbital distance	40.8	41.7	2.4	37.5 – 45.7
Interorbital distance	23.8	23.5	2.0	16.5 – 26.8
Cheek depth	29.4	28.1	2.7	21.2 – 31.1
Lower jaw length	38.7	36.2	3.3	30.9 – 41.3
Preorbital distance	17.7	16.9	1.7	13.7 – 19.7
% of caudal peduncle depth				
Caudal peduncle length	80.5	93.5	11.1	80.5 – 119.6
Meristics		median		
Upper lateral-line scales	20	17		15 – 20
Lower lateral-line scales	6	5		4 – 7
Total lateral-line scales	31	27		25 – 31
Circumpeduncular scales	12			12
Dorsal-fin spines	18	18		16 – 18
Dorsal-fin rays	8	8		6 – 9
Anal-fin spines	3	3		3
Anal–fin rays	6	6		5 – 7
Pectoral-fin rays	12	12		12 – 13
Gill rakers on lower limb of first arch	8	8		6 – 9
Total gill rakers on first arch	14	13		11 – 15

Gill rakers on first gill arch. Six-9 tuberculate gill rakers on ceratobranchial, 3–7 pointed gill rakers on epibranchial. Well developed hanging pad on roof of the pharynx.

Scales. Cycloid, 1–2 rows of scales on cheek, often only on the posterior edge; 3–4 horizontal rows on operculum. Dark spot on outer edge of opercle unscaled. Chest-scales normally absent, no scales or a few dispersed scales between pectoral and pelvic fin. A single aberrant specimen (MRAC 96-044-P-0202) with small, deeply embedded scales on chest and 5 scale-rows between pectoral and pelvic fin .

Upper lateral line always with some non-pored scales in the row separated from dorsal-fin base anteriorly by 3 scales, at the 8th pored scale by ½-1 scales, at last pored scale by 0-½ scales. End of upper lateral line never overlapping lower lateral line.

About ¼ –$^{1}/_{3}$ of caudal fin covered with scales; other fins unscaled.

Coloration. Live specimens of both sexes (Figs. 2–4): Head and body middle brown to reddish brown. Dark scaleless spot on the outer edge of opercle, only poorly visible in some behavioural situations. Lips orange to brown. Dark longitudinal stripe sometimes visible on sides (in stressed, submissive, breeding and guarding individuals), at about height of lower lateral line, from posterior edge of the eye to end of caudal peduncle, but not extending into caudal fin. Dark bar from the anterior edge of the eye to the middle of upper lip. Body darker dorsally than rest of body, in extremely stressed individuals 7 black blotches below dorsal fin base visible. Upper edge of eye red.

Male specific coloration. Posterior half of dorsal fin with white margin, followed by a thin red submargin in some specimens. Dorsal fin pale reddish brown anteriorly, orange to reddish brown posteriorly, often with some small reddish and pale blue maculae in soft parts. Caudal fin clear to hyaline, with 6–8 rows of red to reddish-brown and pale blue maculae, normally pale or absent on lower edge. Posterior half of upper edge of fin with thin white margin and broader red submargin in some individuals. Anal fin bluish to violet, with some rows of red and pale blue maculae and dark violet to black outer edge. Anterior edge of pelvic fins whitish, other parts of fin pale reddish to pale violet. Pectoral clear to pale orange.

Body scales with greyish margins.

Opercle, throat, ventral parts of the flanks and chest rosy to orange.

Female specific coloration. Dorsal fin with thin black to grey margin, followed by a white to silvery submargin. Rest of fin with orange to red coloration, with pale blotches and/or small black spots in soft parts of some individuals. Caudal fin with pale orange to red coloration, more intensive in upper parts, without patterns or marks. Anal fin clear to slightly yellow. Pectoral fin pale yellow to pale orange. Pelvic fin with whitish anterior edge, rest of fin pale orange to violet. Lachrymal, cheeks, opercles orange to red. Flanks and belly region, from the posterior edge of the origin of the pectoral fin to origin of the anal fin, up to about mid-body or higher in some individuals, pale rosy to dark rosy or violet in ripe females. A silvery genital spot, covering about 2–3 scales on each side around genital papilla. Dorsum of ripe females often with orange flush.

Juveniles of both sexes exhibit a pattern of unregular dark spots on mid-brown coloration, up to a size of about 10 mm. With increasing size, sex-specific coloration is seen.

FIGURE 2. *Nanochromis sabinae*, male, aquarium specimen, not preserved, submissive coloration.

FIGURE 3. *Nanochromis sabinae*, male, aquarium specimen, not preserved, aggressive coloration.

FIGURE 4. *Nanochromis sabinae*, female, aquarium specimen, not preserved, aggressive coloration.

Preserved specimens (Fig. 1): General coloration of both sexes: Head and body brown, darker dorsally. Cheek, throat, pre-pelvic and pre-pectoral regions of flanks and chest pale light brown. Upper lips, forehead, lachrymal region dark to black, same with dorsal-fin base. Dark spot on outer edge of opercle. A dark longitudinal stripe visible in some individuals, reaching from posterior edge of eye to end of caudal peduncle, but not extending into the caudal fin.

Male specific coloration. Dorsal fin dusky to dark brown anteriorly, pale to clear posteriorly, with numerous dark spots in soft parts. Caudal fin pale to clear, with 6–8 vertical rows of dark spots, more intensive distally, lower, outer edge of fin without spotting. Anal fin anteriorly dusky to dark, dark outer edge and pale to clear posteriorly, with rows of dark spots. Pelvic and pectoral fin pale to clear.

Female specific coloration. Belly dark to black. Dorsal fin with dark base, and dark outer edge, with pale regions between. Some dark spots in dorsal soft in some specimens. Caudal fin, anal fin, pelvic and pectoral fins pale to clear, with some disperse, very small and dusky dots in some individuals.

Breeding behaviour. In aquaria, a monogamous, pair bonding, cave spawner. The eggs are normally guarded by the female, with no participation of the male. Hatching occurs after three day post-spawn. Wrigglers are normally hung on the roof of the cave. Juveniles are swimming free 8–9 days post-spawn, guarded by both parents for a duration of about 5–6 weeks. Breeding and guarding individuals of both sexes exhibit a pale, unspectacular coloration, with a dark, longitudinal stripe visible in most cases.

Distribution (Fig. 5, 6). Congo (Brazzaville), central regions west of the Upper Congo River and in the northwestern parts of Gabon; according to aquarist literature (e.g. Linke & Staeck, 2002; Freyhof 1996) the species also seems to occur in most northern parts of the Democratic Republic of the Congo (around the towns of Genema and Bamanya (Riv.

Bondele)). Type locality (Loubi River, fig.6) is a small river, with maximum depth of c. 1.20 m, 2–3 m wide, within a forested region, with many trees and bushes around. Water dark red-brown, with conductivity of 40 µS, pH of 4,0 and temperature of 24° (edge)–25 °C (middle of water) (R. Sawatzky, pers. comm.).

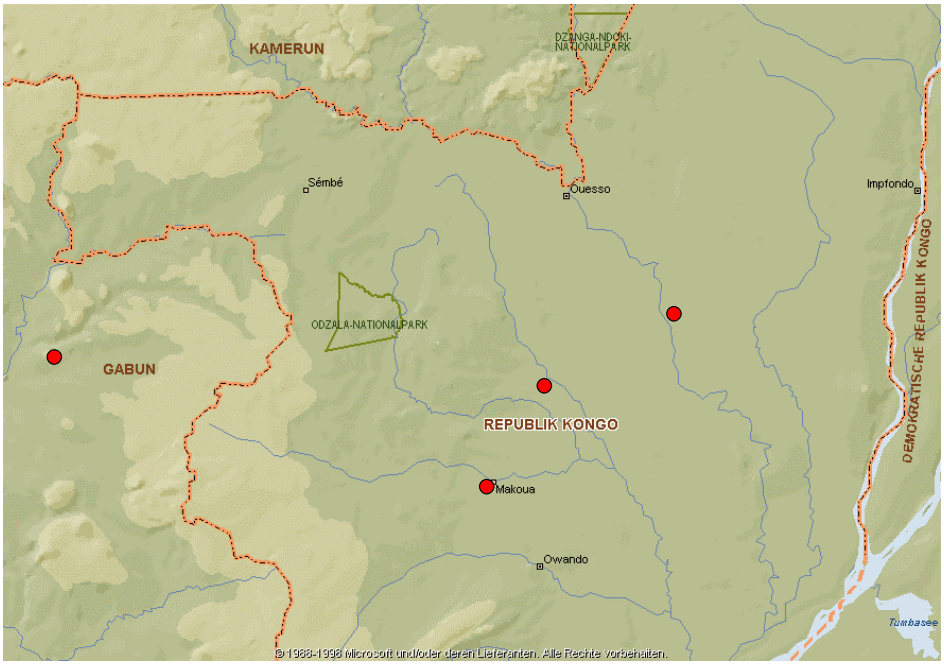

FIGURE 5. Geographical distribution of *Nanochromis sabinae*.

FIGURE 6. Type locality of *Nanochromis sabinae*, Congo, (Brazzaville): Loubi River, tributary of the Likoula River (Congo system), SW of Makou, nearby the village of Lengui; 0° 0´ S, 15° 38´ E. Photo by R. Sawatzky.

Etymology. Dedicated to my daughter Sabina Lamboj.

Comparisons. *Nanochromis sabinae* differs from *N. concortus, N. minor, N. nudiceps, N. parilus, N. splendens and N. transvestitus* in the presence of a scaled nape and cheeks and a less elevated upper lateral line, with only the last few scales contiguous with the dorsal-fin base.

It differs from *N. dimidiatus* and *N. squamiceps* in tendencies to: (a) a shorter head length (23.4–32.8 % SL vs. 27.8–35.5 % SL and 30.7–34.0 % HL), greater head depth (57.5–71.2 % HL vs. 54.2–63.6 % HL and 55.2–63.5 % HL) and a greater preorbital length (13.7–19.7 % HL vs. 12.0–16.3 % HL and 12.7–17.7 % HL), what results in a more robust and rounded forehead and snout profile; (b) a shorter caudal peduncle (11.5–16.0 % SL vs. 13.4–17.3 % SL and 12.9–17.3 % SL) and (c) a higher number of gill rakers on the first arch (11–15 vs. 10–13 and 10–14). It also differs from both species in general coloration patterns and in the few silvery scales around the genital papilla in females, vs. no silvery scales in females of *N. dimidiatus* and a broad band of silvery scales from the genital region up to mid-body in females of *N. squamiceps,* and a dark longitudinal stripe not extended into the caudal fin vs. extended into the caudal fin in both congeners. Additionally, it differs from *N. dimidiatus* in a tendency to a higher count for the total lateral line (25–31 scales vs. 23–27 scales) and in the thin white margin and red submargin on the posterior half of the upper edge of the male caudal fin, which is absent in *N. dimidiatus*.

Nanochromis sabinae presents all characteristics of Greenwood´s (1987) first group of *Nanochromis* which possibly is, following Greenwood, the less derived group. Therefore, within the genus, a closer relationship of the new species to *N. dimidiatus* and *N. squamiceps* is suggested.

An interesting fact is the distribution of the new species in the Congo system as well as in the Ogowe system (Liboumba), what could indicate some connections – at least in past decades – between the reaches of both river systems.

Comparative material

Nanochromis consortus: 2 specimens: MCZ 50552, paratypes, Democratic Republic of the Congo : Zaire River.

Nanochromis dimidiatus: 11 specimens: MNHN 92-120, holotype, Central African Republic. MNHN 92-121, paratypes, Central African Republic. MNHN 1921-440, Central African Republic: Bangui. MNHN 1921-441, Central African Republic : Bangui. MRAC 96-044-P-0113, Congo (Brazzaville): Etoumbi, au N-O vers le Gabon (après le bac).

Nanochromis minor : 1 specimen : MCZ 50342, paratype, Democratic Republic of the Congo : Zaire River.

Nanochromis nudiceps : 2 specimens: MRAC 1045, holotype, Lac Kutu. BMNH 1899.11.27.64, paralectotype, Democratic Republic of the Congo : Stanley Pool.

Nanochromis parilus : 5 specimens : MCZ 50309, paratypes, Democratic Republic of the Congo : Zaire River. MCZ 50475, paratypes, Democratic Republic of the Congo : Zaire River.

Nanochromis splendens : 10 specimens : MCZ 50311, paratypes, Democratic Republic of the Congo : Zaire River. MCZ 50553, paratypes, Democratic Republic of the Congo : Zaire River.

Nanochromis squamiceps: 13 specimens, all Democratic Republic of the Congo, Congo system: BMNH 1902.4.14.11, holotype, Lindi River. MRAC 49244-29251, Kunungu. MRAC 78-19-P-265-268, Riviere Iteli.

Nanochromis transvestitus: 5 specimens: MRAC 81-14-P-1-10, paratypes, Democratic Republic of the Congo : Lac Mai Ndombe.

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