

Phylogenetic diagnosis of the African cyprinid genus *Clypeobarbus* (Ostariophysi: Cyprinidae), with the rehabilitation of *Clypeobarbus bomokandi*

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Abstract The subgenus *Clypeobarbus* Fowler 1936 is elevated to generic rank and distinguished from African “*Barbus*” by the derived presence of a midlateral row of greatly enlarged, shield-like scales edged with dark pigment and deepest and widest below the dorsal fin, a dark pigment streak situated posterodorsal to the cleithrum, and the presence of a large occipital fontanel, border laterally by the frontals and parietals and posteriorly by the supra-occipital bone of the neurocranial vault. Seven species are placed within *Clypeobarbus*, *C. pleuropholis* (Boulenger 1899), *C. congicus* (Boulenger 1899), *C. pseudognathodon* (Boulenger 1915), *C. bomokandi* (Myers 1924), *C. hypsolepis* (Daget 1959), *C. schoutedeni* (Poll and Lambert 1961), and *C. bellcrossi* (Jubb 1965), and a redescription is provided for *C. bomokandi*, which is rehabilitated as a valid species.

Keywords Taxonomy · Cypriniformes · Cyprinidae · *Clypeobarbus* · Congo River basin

Introduction

As noted by Berrebi et al. (1996: 7), with the restriction of *Barbus* sensu stricto to include only some 20 species from Europe, Southwest Asia, and Northeast Africa, the

remaining 300 or more African *Barbus* are perhaps best referred to as “*Barbus*,” at least “... until a taxonomic analysis elucidates their systematic position.” Resolution of “*Barbus*” phylogenetics in Africa remains a notoriously problematical task, but progress towards that goal can perhaps best be achieved by the recognition and diagnosis of monophyletic subgroupings within the poorly defined assemblage of African “*Barbus*.” One such grouping, *Clypeobarbus*, was proposed by Fowler (1936) as a subgenus of African “*Barbus*.” Fowler provided a single character for the subgenus, a row of enlarged, shield-like, midlateral scales, but did not provide a list of included species other than the type, “*Barbus*” *kemoensis* Fowler 1936. Nearly thirty years later, Poll and Lambert (1961) provided further characterization of the subgenus as possessing a row of enlarged, shield-like midlateral scales, a flexible last unbranched dorsal-fin ray lacking posterior serration, and a dorsal-fin origin situated posterior to the pelvic-fin insertion. They additionally provided a list of included species; “*Barbus*” *pleuropholis* Boulenger 1899, “*Barbus*” *pseudognathodon* Boulenger 1915, “*Barbus*” *gribinguiensis* Pellegrin 1919, “*Barbus*” *hypsolepis* Daget 1959, and “*Barbus*” *schoutedeni* Poll and Lambert 1961, while placing three species (“*Barbus*” *uellensis* Boulenger 1919, “*Barbus*” *bomokandi* Myers 1924, and “*Barbus*” *kemoensis*) in synonymy of “*B.*” *pleuropholis*. The subgeneric name *Clypeobarbus* has been rarely mentioned by subsequent authors, although Jubb (1965) suggested that “*Barbus*” *bellcrossi* Jubb 1965, a species from the Upper Zambezi, was similar in appearance to species of *Clypeobarbus*, as did Skelton (1993). Our examination of putative members of *Clypeobarbus* provides additional characters, other than those listed by Fowler (1936) and Poll and Lambert (1961) that confirm this grouping is diagnosably distinct from other species of African “*Barbus*.”

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Nichols and Griscom (1917) described “*Barbus*” *rubripinnis* from a single specimen collected at Poko, a locality on the Bomokandi River, a large right bank tributary of the Uele River in the Democratic Republic of Congo. This specimen, collected during the American Museum Congo Expedition (1909–1915), was noteworthy in possessing a single pair of barbels, rather than the usual two pairs, a distinct lachrymal stripe passing from snout to eye, and a row of greatly enlarged midlateral scales. Soon after its description, Myers (1924) noted that the name “*Barbus*” *rubripinnis* Nichols and Griscom 1917 was preoccupied by “*Barbus*” *rubripinnis* Valenciennes in Cuvier and Valenciennes 1842 [a synonym of *Puntius sarana* (Hamilton 1822)] and proposed “*Barbus*” *bomokandi* as a replacement name. Following the work of Poll and Lambert (1961), “*B.*” *bomokandi* has been considered a synonym of “*B.*” *pleuropholis* by all subsequent workers.

During recent investigations of the fishes of the Lower and Middle Congo River ecoregions, numerous specimens of a small “*Barbus*” species fitting the description of “*B.*” *bomokandi* have been collected from the vicinity of Odzala in the Lekoli River, a tributary of the Mambili River in the Republic of Congo. Comparison between these specimens and the type of “*B.*” *bomokandi* indicates that they are conspecific. Furthermore, comparison of these and specimens of “*B.*” *pleuropholis* indicates that “*B.*” *bomokandi* is diagnosably distinct and should be considered valid. Herein, we elevate the subgenus *Clypeobarbus* to generic rank and provide a character-based generic diagnosis and a re-description of *C. bomokandi*, which is rehabilitated as a valid species.

Materials and methods

Standard counts and measurements follow Lévêque et al. (1987). In order to accurately count vertebrae and fin rays, and to visualize other skeletal features, all specimens were radiographed, and some were cleared and double stained following a modified protocol based on Taylor and van Dyke (1985). Vertebral counts include the four Weberian centra and the compound terminal centrum (sensu Fink and Fink 1981). All measurements and counts were made under a stereomicroscope (S8AP0; Leica Microsystems GmbH, Wetzlar) using digital calipers. Congolese place names follow contemporary usage, and equivalent colonial-era place names previously utilized in the literature are given within brackets following their initial appearance in the body of the text.

For some of the taxa discussed herein, we have relied on photographs of type specimens and morphometric and meristic data from original and subsequent literature. The following *Clypeobarbus* materials have been included in

this study [values after catalog number indicate number of specimens examined and do not necessarily correspond to the total number of specimens in the lot; C&S indicates cleared-and-stained preparation; ex., total number of examples examined; ph., photograph; SL, standard length; HL, head length; institutional abbreviations follow Leviton et al. (1985)].

Clypeobarbus bomokandi. AMNH 6328, holotype, 42.8 mm SL, Democratic Republic of Congo, Poko, Bomokandi River; AMNH 240157, 24 ex., 26.1–44.7 mm SL, 3 C&S, Republic of Congo, Cuvette Ouest, Odzala National Park, Small branch of Lekoli River about 300 m long before it re-enters the main channel; AMNH 240158, 9 ex., 24.1–41.9 mm SL, same data as AMNH 240157.

Clypeobarbus congicus. BMNH 1899.11.27.6–7, syntypes, 2 ex., ph., 43.4 and 45.6 mm SL, Democratic Republic of Congo, Matadi; AMNH 237115, 10 ex, 27.1–41.3 mm SL, Democratic Republic of Congo, Nziya, downstream of Inga below Bundi stream at Congo river confluence; AMNH 237119, 4 ex., 21.0–32.0 mm SL, 2 C&S, Congo River at Lufu River confluence, across from Matadi.

Clypeobarbus hypsolepis. AMNH 226484, 7 ex., 15.5–25.6 mm SL, Benin: lagoon on Niger River floodplain at border between Benin and Niger.

Clypeobarbus pleuropholis. BMNH 1899.11.27.8, syntype, ph., 24.2 mm SL, Democratic Republic of Congo, Mbandaka [Coquilhatville], Congo River; MRAC 1829–30, syntypes of “*Barbus*” *uellensis*, 1 ex., ph., 45.4 mm SL, Democratic Republic of Congo, Uelé River; AMNH 5840, 11 ex., 21.0–35.0 mm SL, Democratic Republic of Congo, Orientale Province, Kisangani [Stanleyville], junction of Lualaba River with Congo River, Upper Congo River Drainage; ANSP 65561, holotype of “*Barbus*” *kemoensis*, ph., 54.0 mm SL, Central African Republic [French Equatorial Africa], Fort Sibut, Ubangi-Shari; ANSP 65562, paratypes of “*Barbus*” *kemoensis*, 1 ex., ph., 43.0 mm SL, same data as holotype; AMNH 6075, 2 ex., 21.0–36.0 mm SL, Democratic Republic of Congo, Orientale Province, Niapu, small brook, affluent tributary to Bima River, Uele River; AMNH 6215, 2 ex., 36.0–38.0 mm SL, Democratic Republic of Congo, Orientale Province, Yakuluku Post, Yakuluku River, Uele River; AMNH 19693, 3 ex., 29.5–32.2 mm SL, Central African Republic, Zemio, Bomu River; AMNH 227457, 2 ex., 38.0–39.0 mm SL, Central African Republic, Massapoula Creek, near mouth in to Sangha, Sangha-Congo River Drainage; AMNH 230581, 287 ex., 18.5–56.5 mm SL, Central African Republic, Control zone of Sangba, Kpata River, Tributary to Boun-gou River, Oubangui River Drainage; AMNH 237083, 2 ex., 47.0–48.8 mm SL, Republic of Congo, main channel of Congo River, Foota; AMNH 237086, 54 ex., 17.5–50.0, 8 C&S, Republic of Congo, main channel of Congo River,

Les Rapides, near Djoue River confluence; AMNH 237098, 1 ex., 30.4 mm SL, Democratic Republic of Congo, Bandundu, Bokoni Village, Kasai River Estuary across from village; AMNH 238327, 1 ex., 29.3 mm SL, Democratic Republic of Congo, Small channel adjacent to main channel rapid, below Inga intake canal; AMNH 240159, 15 ex., 21.0–31.5 mm SL, Republic of Congo, Baluku, small stream at confluence of main channel of Congo River, above Malebo Pool.

Clypeobarbus pseudognathodon. MRAC 10410–10495, 1 ex., ph., 30.7 mm SL, Democratic Republic of Congo, River Lobozi, Lake Mweru, South Katanga.

Clypeobarbus schoutedeni. MRAC 138836, holotype, ph., 26.0 mm SL, Democratic Republic of Congo, Gangala na Bodio, Dungu River, northeast basin of Congo.

Results

Clypeobarbus Fowler 1936

Type species. “*Barbus*” *kemoensis* Fowler 1936, a junior synonym of *C. pleuropholis* (Boulenger 1899).

Diagnosis. A genus of small-bodied barbin distinguished from other small African “*Barbus*” by the shared derived presence of a midlateral row of greatly enlarged, shield-like scales edged with dark pigment and deepest and widest below dorsal fin (Fig. 1a, b); a dark pigment streak situated posterodorsal to the cleithrum (Fig. 1a, b) (absent in *C. schoutedeni*); and the presence of a large occipital fontanel, border laterally by the frontals and parietals and posteriorly by the supraoccipital bone of the neurocranial vault (Fig. 1c).

In addition the following features, although not unique to *Clypeobarbus*, serve to further characterize the genus: 20–27 lateral line scales; 2.5–3.5/1/1.5–2.5 body scale rows; 8–12 circumpeduncular scale rows; 7–9 predorsal scale rows; 32 total vertebrae, consisting of 16–17 + 15–

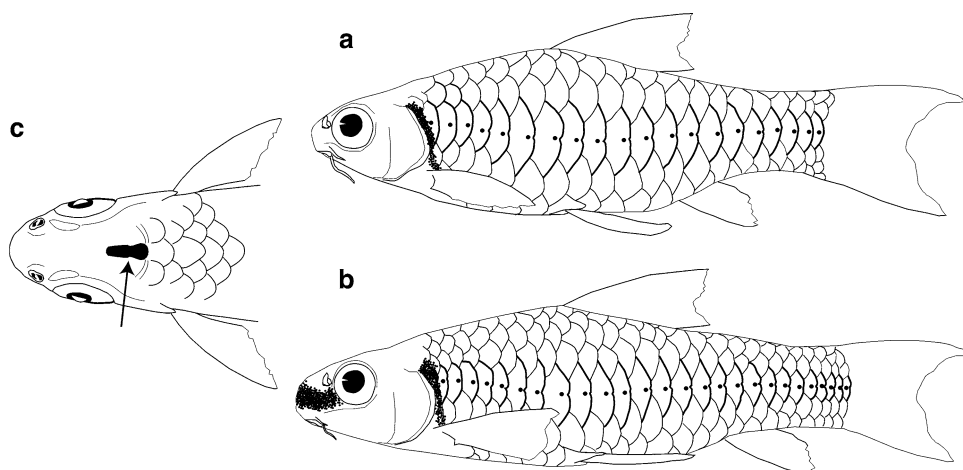
16 vertebral centra; iv,8 dorsal-fin rays; last unbranched dorsal-fin ray flexible, with a smooth posterior edge; iii,5 anal-fin rays; 8–9 pelvic-fin rays; 15–17 pectoral fin-rays.

Remarks. Fowler (1936) listed “*Barbus*” *kemoensis* as the type species of the subgenus *Clypeobarbus*. Following Poll and Lambert (1961) and from our own examination of the holotype, we concur that *C. kemoensis* should be treated as a synonym of *C. pleuropholis*. Article 67.1.2 of the International Code of Zoological Nomenclature (ICZN) specifies that the name of a type species remains unchanged even if it is a junior synonym; “*B.*” *kemoensis* is retained here as the type species of the genus *Clypeobarbus*.

Nichols and Griscom (1917) suggested that *C. pleuropholis* might simply be young specimens of *B. congicus* Boulenger 1899, a taxon excluded from discussion by Poll and Lambert (1961). Nichols and Griscom (1917: 699) stated that examination of ten (*C. pleuropholis*) from Stanleyville [Kisangani] “...shows a scale variation of 21–24 (lateral line scales) and an increase of depth with age. From this it seems probable that *pleuropholis* is the young of *congicus*.” Our observations of a large number of *C. pleuropholis* ranging in size from 18.2 to 56.5 mm SL indicate that while body depth does increase with size, scale counts remain invariant. *Clypeobarbus pleuropholis*, at all sizes, is readily distinguished from *C. congicus* in consistently possessing fewer body scale rows (2.5/1/1.5 vs. 3.5/1/2.5). It is clear that *C. pleuropholis* is not the juvenile form of *C. congicus* and is correctly considered a separate species.

Included species. *Clypeobarbus pleuropholis* (Boulenger 1899) [type locality: Mbandaka (Coquilhatville) Congo R., Democratic Republic of Congo, 0°4′N, 18°16′E]; *C. congicus* (Boulenger 1899) (type localities: Boma, Congo R., Democratic Republic of Congo, Congo R., Democratic Republic of Congo, 5°50′S, 13°03′0″E, and Matadi, Congo R., Democratic Republic of Congo, 5°50′S, 13°32′E); *C. pseudognathodon* (Boulenger 1915) [type

Fig. 1 Schematic representation of **a** *Clypeobarbus pleuropholis*, **b** *Clypeobarbus bomokandi*, and, **c** dorsal view of head of *Clypeobarbus pleuropholis*. Arrow indicates cranial fontanel



locality: Lake Mweru (Lake Moero), Democratic Republic of Congo, 8°28'S, 28°53'60"E]; *C. bomokandi* (Myers 1924) (type locality: Poko, Bomokandi River, Democratic Republic of Congo, 03°08'60"N 26°52'60"E); *C. hypsolepis* (Daget 1959) (type locality: Diafarabé and Lake Débo, Upper Niger, Mali, 14°9'N, 5°1'W)]; *C. schoutedeni* (Poll and Lambert 1961) (type locality: Gangala na Bodio, Dunga R., northeast basin of Congo, Democratic Republic of Congo, 3°40'60"N, 29°7'60"E); *C. bellcrossi* (Jubb 1965) (type locality: Nyakaseya, Upper Zambezi R., Zambia, 11°08'S, 24°08'E).

With two exceptions *Clypeobarbus* are essentially Congo River basin species (Fig. 2). *Clypeobarbus bellcrossi* is known only from the headwaters of the Upper Zambezi (Jubb 1965; Skelton 1993), while *C. hypsolepis* is widespread in the Niger Delta, Upper Niger, Volta, Bandama and Agnébi River basins (Froese and Pauly 2007; Moritz et al. 2006).

Etymology. From the Latin *Clipeus* meaning round shield in reference to the characteristically enlarged shield-like scales of the midlateral series.

***Clypeobarbus bomokandi* (Myers 1924)** (Figs. 1a, 3a, b)

Barbus rubripinnis Nichols and Griscom 1917: 699 (type locality Poko, Bomokandi River, Democratic Republic of Congo)

Barbus bomokandi Myers 1924: 397 (replacement name for *B. rubripinnis*)

Material examined. 34 specimens, including holotype (see list of materials examined).

Diagnosis. A species of *Clypeobarbus* distinguished from all congeners by the presence of a well-defined lachrymal stripe running from the tip of the snout to the eye (vs. absence or a more diffuse marking) and an elevated number of circumpeduncular scales (12 vs. 8). It further differs from all except *C. pseudognathodon* in the presence of small, feeble anterior barbel, not reaching base of posterior barbel (vs. anterior barbel robust, reaching base of posterior barbel). Additionally, *C. bomokandi* is distinguished from *C. pleuropholis*, *C. congicus*, and *C. hypsolepis* by an elevated number of lateral line scales (26–27 vs. 20–22 in *C. pleuropholis* and *C. congicus*, and 22–24 in *C. hypsolepis*), from *C. pleuropholis* by an elevated number of scale rows between the lateral line and dorsal-fin origin (3.5 vs. 2.5), and from *C. congicus* by the lower number of scale rows below the lateral line and the ventral body surface (1.5 vs. 2.5).

Description. A species of *Clypeobarbus* attaining a maximum recorded size of 42.8 mm SL. General body shape and appearance as in Fig. 3. Morphometric features are listed in Table 1, and meristic counts are given in Table 2. Head and eye large, mouth inferior. Small conical tubercles over upper and lower lip and posterior edge of rostral cap. Two pairs of barbels; anterior (rostral) barbel small and feeble, not reaching base of posterior barbel, posterior barbel longer and more robust than anterior barbel, not reaching center of pupil. Large occipital fontanel

Fig. 2 Map of central Africa, with type localities of all *Clypeobarbus* species indicated

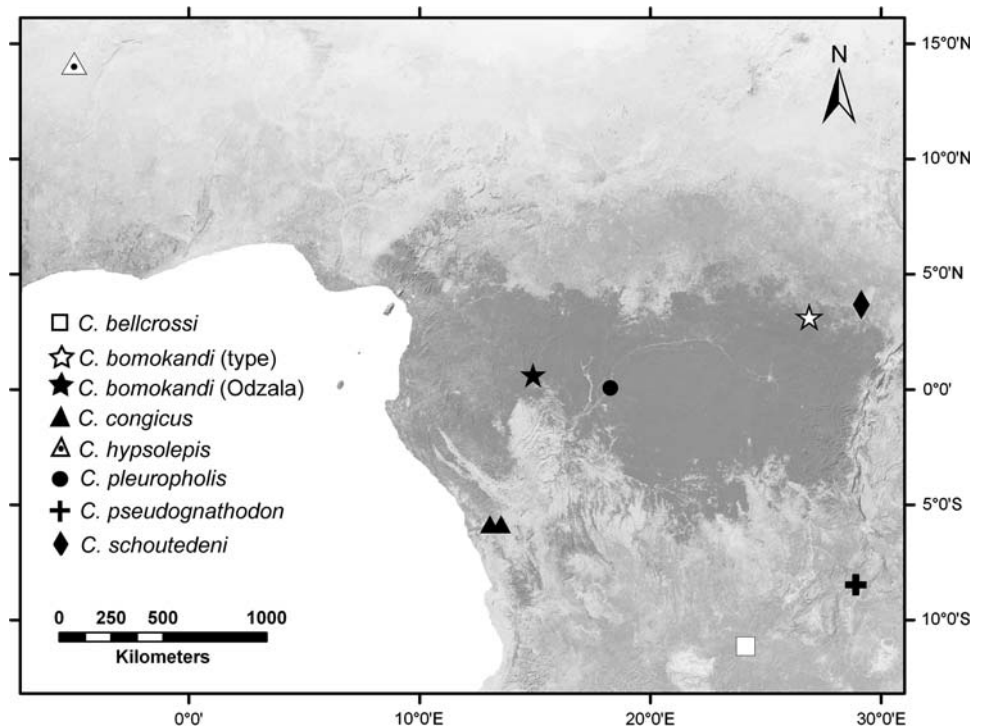


Fig. 3 **a** Holotype of *Clypeobarbus bomokandi*, AMNH 6328, 42.8 mm SL, Poko, Democratic Republic of Congo. **b** *Clypeobarbus bomokandi*, AMNH 240157, 41.0 mm SL, Republic of Congo, Cuvette Ouest, Odzala National Park, Small branch of Lekoli River about 300 m long before it re-enters the main channel



Table 1 Morphometrics for *Clypeobarbus bomokandi* and *C. pleuropholis*

	Holotype	<i>C. bomokandi</i> (n = 15) ^a		<i>C. pleuropholis</i> (n = 15) ^b	
		Mean	Range	Mean	Range
Standard length (SL, mm)	42.8		24.1–44.7		18.5–56.5
In % SL					
Head length (HL, mm)	26.4	25.9	25.1–26.7	27.0	25.4–28.4
Predorsal length	47.9	47.4	45.1–48.9	50.6	49.7–51.7
Preanal length	68.7	71.7	68.7–74.2	73.4	70.4–74.8
Prepelvic length	49.5	50.2	48.6–52.7	51.3	49.2–52.1
Body depth in front of dorsal fin	25.9	25.8	24.8–27.4	33.6	30.2–35.5
Caudal peduncle length	21.0	21.3	19.4–23.1	20.4	19.9–20.8
Caudal peduncle depth	12.6	13.2	11.9–14.2	15.1	13.9–15.9
Anal-fin base length	8.6	8.3	7.1–10.3	9.5	8.4–10.2
Dorsal-fin base length	15.0	15.3	14.0–16.8	19.4	17.8–20.5
In % HL					
Eye diameter	32.7	34.1	32.3–35.9	34.3	31.9–36.8
Snout length	25.7	27.3	32.3–35.9	25.4	23.2–27.3
Head depth through pupil	50.4	52.5	49.1–54.2	59.2	57.8–63.3

^a AMNH 6328 (holotype) and AMNH 240157 (14 specimens)

^b AMNH 237086

bordered laterally by frontal and parietal, and posteriorly by supraoccipital. Five infraorbital bones (IO) present: IO1 largest of the series; IO2–3 half height of IO1; IO4–5 reduced to infraorbital canal portion of bone only.

Scales radially striated, 26–27 in lateral line (+1–2 on caudal fin base); 3.5/1/1.5 body rows; 12 circumpeduncular rows; 8–9 predorsal rows. Lateral line complete. Size and shape of lateral line scales variable; first lateral line scale small and regular in shape; scales 2–6/7 becoming increasingly narrow and tall; scales 7/8–12/13 tall, twice as thick as preceding scales; scales 12/13–26/27 shorter and

narrower than preceding scales, decreasing in height and width posteriorly. A few small scales also present on base of caudal-fin lobes.

Dorsal fin with iv,8 rays (last branched + ½ branched ray articulating with same pterygiophore and counted as one element); positioned midway between snout and caudal-fin base; origin anterior to pelvic-fin insertion; last unbranched ray simple and smooth. Anal fin with iii, 5 rays (last branched + ½ branched ray articulating with same pterygiophore and counted as one element). Principal caudal-fin rays 10 + 9. Dorsal procurent rays 8; ventral

Table 2 Selected meristics for *Clypeobarbus bomokandi*, *C. pleuropholis*, and *C. congicus*

	<i>C. bomokandi</i> <i>n</i> = 10 ^a	<i>C. pleuropholis</i> <i>n</i> = 10 ^b	<i>C. congicus</i> <i>n</i> = 2 ^c
Lateral line scales	26–27	20–22	22
Body scale rows	3.5/1/1.5	2.5/1/1.5	3.5/1/2.5
Predorsal scale rows	9	6–8	8
Circumpeduncular scale rows	12	8	8
Dorsal-fin rays	iv, 8	iv, 8	iv, 8
Anal-fin rays	iii, 5	iii, 5	iii, 5
Principal caudal-fin rays	10 + 9	10 + 9	10 + 9
Pectoral-fin rays	15–17	14–16	15–16
Pelvic-fin rays	8	8–9	8
Abdominal vertebra	16–17	15–16	15–17
Caudal vertebra	15–16	15	15–17

^a AMNH 6328 (holotype) and AMNH 240157 (9 specimens)

^b AMNH 237086

^c BMNH 1899.11.27

procurent rays 7. Pelvic-fin rays 8 (i,7); pectoral-fin rays 15–16 (i,14–15).

Total vertebrae 32, consisting of 16 or 17 abdominal plus 16 or 15 caudal vertebrae (holotype: 17 + 15). Twelve pairs of pleural rib, situated on vertebral centra 5–16. Four free supraneurals, situated between neural spines of vertebral centra 4–8. First dorsal pterygiophore inserted between neural spines of vertebral centra 8–9. First anal pterygiophore situated between hemal spines of vertebral centra 18–19. Caudal fin rays supported by neural and hemal spines of PU2–3, pleurostyle, epural, parhypural + 6 hypural elements and two small elongate caudal radial cartilages; free uroneural absent.

Coloration. In alcohol, body pale creamy white. All scales bordered with black melanophores; pigmentation most intense around lateral line scales. Strongly marked black lachrymal stripe from anterior margin of eye to tip of snout, connected with contralateral stripe along midline. Prominent dark oblique bar situated posterodorsal to cleithrum. Tip of dorsal fin and first pectoral fin-ray with faint scattering of melanophores. Anal, caudal, and pelvic fins colorless.

Distribution. Currently known from two disjunct localities in the Congo River basin; the type locality, at Poko (Democratic Republic of Congo), and the Lekoli River, in the vicinity of Odzala (Republic of Congo). To date no specimens have been reported from the basin spanning these two regions (Fig. 2).

Remarks. In the original description of *C. bomokandi* (then referred to as *B. rubripinnis*), Nichols and Griscom

(1917) mistakenly described this species as possessing a single pair of (posterior) barbels. Reexamination of the type specimen reveals that an anterior pair of barbels is present, though extremely reduced in size and easily overlooked. Nichols and Griscom also report a dorsal-fin ray count of iii,8, differing from the dorsal fin-ray count provided herein (iv,8). It appears that Nichols and Griscom overlooked the first unbranched ray, which is diminutive and apparent only in cleared and stained specimens. The only other discrepancy between the original description and the fresh material relates to live coloration. Nichols and Griscom (1917: 700) state that the dorsal fin is “bright red, tipped with white,” hence the original specific name of *rubripinnis* for this species. We are unable to confirm live coloration for the material that we have examined. We note, however, that the presence of a red dorsal fin is mentioned in most original descriptions of species considered here to be *Clypeobarbus*, and as such the presence of red coloration on the dorsal fin may prove to be an additional synapomorphy of this clade.

The wide geographic separation between the locality of the fresh material of *C. bomokandi*, upon which this redescription is based, and the type locality (Fig. 2) may lead some to question our inclusion of both samples under the same specific name. However, detailed comparison of the newly collected Odzala material with the holotype of *C. bomokandi* indicates that in all aspects these specimens are identical. The most obvious similarity between the type specimen of *C. bomokandi* and the Odzala material is the presence of the dark lachrymal stripe between the snout and the eye, and the presence of a small and feeble anterior barbel. No other species of *Clypeobarbus* or “*Barbus*” with similar meristic counts is known to exhibit a well-defined lachrymal stripe in combination with a small anterior barbel that does not reach to the base of the posterior barbel. As the Odzala material fits the original description of *C. bomokandi* and cannot be distinguished from the type specimen on the basis of osteological, meristic, or morphometric comparison, we see no reason not to consider it conspecific with the type specimen.

Clypeobarbus bomokandi was placed in the synonymy of *C. pleuropholis*, but without any justification by Poll and Lambert (1961). This action was followed by subsequent authors. Yet the former is easily distinguished from the latter, not only in meristic counts (26–27 lateral line scales vs. 20–22; 3.5 scale rows between the lateral line and dorsal origin vs. 2.5; 12 circumpeduncular scale rows vs. 8) and morphometric features [shallower body (body depth 24.8–27.4% SL vs. 30.2–35.5% SL), and head (head depth 49.1–54.2% HL vs. 57.8–63.3% HL), and a shorter predorsal length (45.1–48.9% SL vs. 49.7–51.7% SL)], but also in general anatomical features [anterior barbel short and feeble, not reaching base of posterior barbel (vs.

anterior barbel robust, reaching base of posterior barbel), dorsal-fin origin anterior to pelvic origin (vs. dorsal-fin origin opposite pelvic origin)] and as such should be treated as a separate and valid species.

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