

Paragobiocichla, a new genus name for *Gobiocromis irvinei* Trewavas, 1943

(Teleostei, Cichlidae)

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Paragobiocichla, new genus, is established for *Gobiocromis irvinei* Trewavas, 1943, a rheophilic cichlid fish from the Volta River drainage in Ghana and Burkina Faso. It had previously been placed in the genus *Steatocranus* Boulenger, 1899 (synonyma *Leptotilapia* Pellegrin, 1928 and *Gobiocromis* Poll, 1939), which otherwise contains only members endemic to the Congo River basin. However, it is distinguished from *Steatocranus* by having cycloid scales on the opercle (vs. none in *Steatocranus*) and by 11–13 gill rakers on the first arch (vs. 4–10 in *Steatocranus*).

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Introduction

Haplotilapiine African rheophilic cichlid species of the genera *Gobiocichla* Kanazawa, 1951, *Orthochromis* Greenwood, 1954, *Schwetzoichromis* Poll, 1948 and *Steatocranus* Boulenger, 1899, and partially of the catch-all genus *Haplochromis* share a number of ecophenotypic similarities, which are at least partially considered as convergent adaptations to benthic life in the strong current of rapids: a reduced squamation on head, nape, and chest, rounded pelvic fins in both sexes with a thickened first spine and a comparatively slender body (Roberts & Stewart 1976, Schedel et al. 2014, 2018). Given the well-

known evolutionary plasticity of cichlids, it was not surprising that molecular and morphological phylogenetic studies revealed multiple origins of the rheophilic ecomorphology in African cichlids, because the aforementioned genera are not closely related (Schliewen & Stiassny 2003). More surprisingly though, these studies further revealed that some of those cichlid genera are polyphyletic, one of which is *Steatocranus*. As currently understood, *Steatocranus* is a haplotilapiine genus, with eight valid species from the Congo Basin and one from the West African Volta basin (Schliewen 2006, 2008, Schwarzer et al. 2011, 2012). The current species composition of the genus is a result of the revision of the genus by Roberts &

Stewart (1976), who synonymized both *Leptotilapia* Pellegrin, 1928 (type species *Leptotilapia rouxi* Pellegrin, 1928), and *Gobiochromis* Poll, 1939 (type species *Gobiochromis tinanti* Poll, 1939) with *Steatocranus* (type species *Steatocranus gibbiceps* Boulenger, 1899). The disjunctly distributed *Steatocranus irvinei* (Trewavas, 1943) had originally been described as a member of *Gobiochromis* (Trewavas 1943), but was later transferred to *Leptotilapia* (Trewavas & Irvine 1947). Molecular phylogenetic studies based on an almost complete taxon sampling of haplotilapiine cichlid genera including most *Steatocranus* species supported the monophyly of all Congolese *Steatocranus* species, including all species previously assigned to *Leptotilapia* and *Gobiochromis*. In contrast, these studies strongly rejected the inclusion of *S. irvinei* into that group (Schliewen & Stiassny 2003, Schwarzer et al. 2009, Dunz & Schliewen 2013, Irisarri et al. 2018).

Already Roberts & Stewart (1976) had highlighted in their species account on *S. irvinei* a combination of externally visible morphological characters, that would unambiguously separate this species from all seven known species of Congolese *Steatocranus* known at their time, i. e. by having (i) scales on the opercle (vs. scaleless opercle), (ii) relatively small, high-set eyes, with a wide preorbital bone, (iii) 11–12 gill rakers on the first gill arch, including two or three on its upper limb (vs. 6–8), (iv) jaw teeth being smaller (vs. large) and more numerous (48–56 outer teeth in upper jaw vs. 26–54), and arranged in four rows in both jaws (vs. two or three rows), (v) teeth in internal rows of lower jaw predominantly conical (vs. predominantly tricuspid), and (vi) adults commonly reaching 150 mm (vs. about 90 mm) SL. Since then, one further species has been described (Meyer 1993), and several undescribed *Steatocranus* species have been reported in the scientific and hobbyist literature, hereby suggesting that a revision of the genus is necessary (Schliewen 2006, 2008, Ibala Zamba 2010, Schwarzer et al. 2011, 2012). As a first step for the revision of *Steatocranus*, we investigated whether variation of unambiguously scorable meristic characters of all described and yet undescribed Congolese *Steatocranus* taxa would enable their diagnostic separation from the phylogenetically unrelated species endemic to the Volta River, i. e. from *S. irvinei*. The results of this attempt are presented here.

Investigated specimens and methods

In total, 380 specimens representing all nine described as well as eleven yet undescribed species of the Congo and Volta basins have been evaluated with regard to the two characters that alone would, according to Roberts

& Stewart (1976), allow for separation of *S. irvinei* from all other *Steatocranus* known at that time, i. e. (i) presence or absence of scales on the opercle and (ii) total gill-raker number on the first gill arch. In addition, all those externally visible meristic characters were scored, whose variation in combination with the other two characters would likely yield additional diagnostic information, i. e. dorsal fin ray counts, lateral line scale and circumpeduncular scale counts. Definitions of counted and measured characters follow Schedel et al. (2014). A focus was put on externally visible meristic characters, because their values are independent of size and ontogenetic stage, because scoring is unambiguous even under field conditions, and because all these characters could be scored for all specimens, even distorted ones. Albeit mentioned by Roberts & Stewart (1976) as diagnostic for *S. irvinei* we refrained from counting tooth rows and numbers. In *Steatocranus* these counts often only represent minimum numbers because of the strongly developed lip and jaw tissue preventing unambiguous detection of small teeth, at least in unstained individuals. In total, the following seven characters were recorded under the stereomicroscope: Dorsal fin spine and ray count, total gill rakers, upper and lower pored lateral lines scales, E1-scales and scales around the caudal peduncle. A PCA using a correlation matrix was performed with these seven meristic characters using the software PAST 3.07 (Hammer et al. 2001). Scores of the two diagnostically most informative principal components (PC I and PC II) were visualized using a bivariate plot, and variables contributing most to PC variation were identified using their loadings. The diagnosis of the new genus is based on all these specimens as well as on comparative literature data of diagnostic characters of all African ecomorphologically similar rheophilic cichlid species, i. e. members of the genera *Orthochromis*, *Lamprologus*, *Gobiocichla*, *Schweitzochromis*, *Teleogramma*, and ecomorphologically similar species of the catch-all genus *Haplochromis*.

Investigated specimens are deposited in: AMNH, American Museum of Natural History, New York; CUMV, Cornell University Museum of Vertebrates, Ithaca; NHM, Natural History Museum London; MRAC, Royal Museum for Central Africa, Tervuren; USNM, United States National Museum; ZSM, Bavarian State Collection of Zoology, Munich.

Results

Ranges of selected meristic values of all *Steatocranus* specimens from the Congo basin combined were wider than values presented in Roberts & Stewart (1976) and Meyer (1993), most likely due to the increased number of specimens and new species. In the PCA, PC I explained 35.60 % and PC II 26.41 % of the total variance. In combination PC I and PC II separate *S. irvinei* from all other *Steatocranus*; however, on PC I and PC II a slight overlap with individuals of *S. sp.*

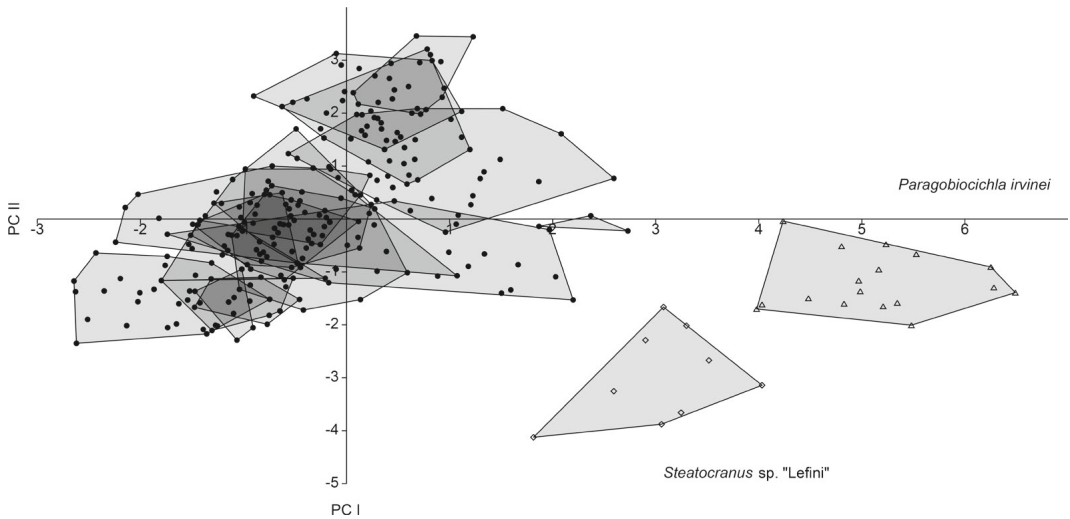


Fig. 1. PCA scatter plot of PC I vs. PC II based on 7 meristics of *Steatocranus* (dot symbols, except for *S.* sp. 'Lefini' with diamond symbols; intermediate cluster of PC I) and *Paragobiocichla* specimens (triangle symbols, high PC I values on the right); $N=380$. Species score limits visualized as grey filled convex hulls. PC I explains 35.60 % of the variance and PC II 26.41 %.

'Lefini', an undescribed species of the Lefini River (Congo drainage), is present (Fig. 1). On PC I the dorsal ray, upper lateral line scales, scales around the caudal peduncle and total gill raker counts load highest, the most important loadings on the PC II are contributed by lower lateral line and E1-scale counts. Total gill raker counts of *S. irvinei* are non-overlapping with any Congo basin *Steatocranus*: 11–13 vs. 4–10. Investigated *S. irvinei* individuals had at least a few scales on the opercle, whereas none of the Congolese *Steatocranus* had any on the opercle, not even deeply embedded ones. In summary, results presented herein support full meristic separation of *S. irvinei* from all Congolese *Steatocranus* on the basis of characters already stated as diagnostic for *S. irvinei* by Roberts & Stewart (1976), but here confirmed with the inclusion of all recently discovered *Steatocranus*. As no genus name is available to host the species taxon *Gobiochromis irvinei* Trewavas, 1943 in a separate genus, a new genus name and diagnosis is introduced here for that species, which is based on data presented in Trewavas (1943), Roberts & Stewart (1976) and Meyer (1993). With regard to the latter citation, we refrain from integrating Meyer's (1993: 114) revised diagnosis for *Steatocranus*, because he only used two characters of little use for comparison of specimens of both sexes and of juvenile and adults, i. e. his derived characters S1 and S2: "(S1) two small horizontal dark bands along middle and upper body side, confluent in the middle region of caudal peduncle, bands crossed with usually 4 to 7 dark,

broad irregular vertical stripes and (S2) head over-extended and massy, males usually with a frontal gibbosity of variable development". Both characters are visible only in certain motivational states (S1) or they are not expressed in all ontogenetic stages of both sexes (S2). Despite the claim in Meyer (1993), the first character state is not expressed in *Paragobiocichla irvinei* comb. nov., since only *Steatocranus* of the Congo basin sometimes show two longitudinal lines confluent on the caudal peduncle (see, e. g., photographs in Schlieven 2006), whereas the upper longitudinal line does not converge with the lower one in *P. irvinei* (see, e. g., photographs in Stawikowski (1987) or Werner (2008)). Therefore, this character state could possibly serve as a diagnostic character for the Congolese *Steatocranus* only, but this would need further examinations in all *Steatocranus* species and should be dealt with in a revision of *Steatocranus*.

Taxonomy

Paragobiocichla Schlieven & Weiss, gen. nov.

Type species. *Gobiochromis irvinei*, Trewavas, 1943 based on four syntypes (BMNH 1943.7.24.1–4), 101 to 107 mm SL, collected by F. R. Irvine from the Volta River rapids at Senchi [coordinates of the town of Senchi: 6.20/0.08].

Included species. Only the type species, which is endemic to the Volta basin in Ghana and Burkina Faso

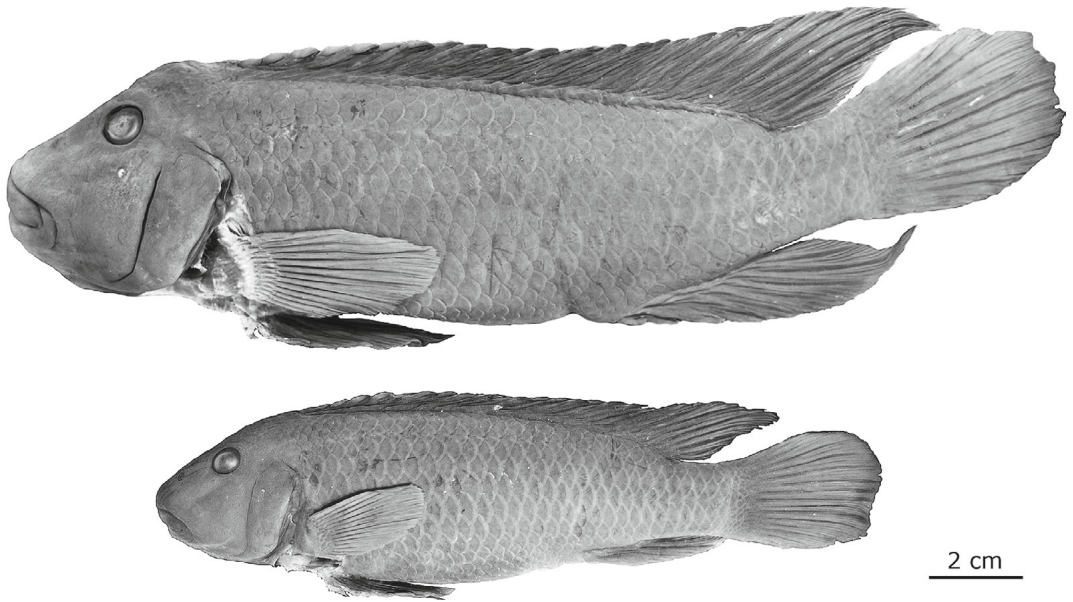


Fig. 2. *Paragobiocichla irvinei* (Trewavas, 1943). Topotypical specimens from Senchi rapids of Volta River (MRAC 154535–567). Male above (183 mm SL – largest known male specimen of *P. irvinei*), female below (123 mm SL – largest known female specimen). Photo: F. Schedel (SNSB-ZSM).

(for a distribution map see Teugels & Thys van den Audenaerde 2003: 528).

Etymology. Para from Greek παρά (pará), meaning, among other meanings, “side by side”, and gobiocichla, an allusion to the genus *Gobiocichla* Kanazawa, 1951. This rheophilic cichlid genus is endemic to the Niger and Cross River drainages, and according to molecular phylogenetic analyses phylogenetically close to *Paragobiocichla irvinei* (Schliewen & Stiassny 2003, Schwarzer et al. 2009, Dunz & Schliewen 2013). Nevertheless, *Gobiocichla* is readily distinguished from *Paragobiocichla* by having only one continuous lateral line, a rare character in African cichlids.

Diagnosis. *Paragobiocichla* is distinguishable from all other African cichlid genera except *Steatocranus* by the combination of following characters: (1) one supraneural bone; (2) two rows of scales bearing lateral line pores; (3) tricuspid inner jaw dentition; (4) exclusively cycloid scales, on flanks with a soft posterior margin; (5) head and nape scaleless; (6) rounded pelvic fins with the first spine thickly covered with skin in both sexes, and (7) a slender body (body depth 24–28 % SL). It is distinguished from *Steatocranus* by (8) having cycloid scales on the opercle (vs. none in *Steatocranus*), and by (9) 11–13 gill rakers on the first arch (vs. 4–10 in *Steatocranus*). Additional meristic ranges of *Paragobiocichla* are: dorsal fin: XX–XXI,11–12 (vs. XVIII–XXII,5–9 in

Steatocranus); anal fin: III,6–7 (vs. III–IV,5–7 in *Steatocranus*), pectoral fin: 13–14 (vs. 11–17 in *Steatocranus*), pelvic fin: I,V (as in *Steatocranus*); upper lateral line scales: 24–26 (vs. 18–27 in *Steatocranus*), lower lateral line scales: 10–11 (vs. 6–13 in *Steatocranus*), E1-scales: 30–31 (26–36 in *Steatocranus*), scale rows between dorsal fin and lateral line: 2 (vs. 1–2 in *Steatocranus*), circumpeduncular scales: 16 (vs. 11–16 in *Steatocranus*). Total vertebrae excluding the urostyle: 30–32, abdominal vertebrae: 17–18, caudal vertebrae 13–15. With a maximum TL of 226 mm (183 mm SL; largest specimen in lot MRAC154535–567, a male), *Paragobiocichla irvinei* attains a substantially larger size than any *Steatocranus*: the largest *Steatocranus* is a male *S. cf. mpozoensis* specimen from Boma (ZSM 34924) with 110 mm TL (89 mm SL).

Specimens examined

Paragobiocichla irvinei (Trewavas, 1943): MRAC 154535–567, 6 (specimens #1, 4, 5, 9, 10, 15), 94.0–183.4 mm SL; Senchi rapids at Volta River (type locality of *P. irvinei*; coordinates of the town of Senchi: 6.20/0.08). – MRAC 154680–692 (partim), 6 specimens (#1, 2, 3, 6, 7, 11), 60.3–68.6 mm SL; Ghana, Volta River basin, Black Volta River at Bator cataracts (approx. 8.67/–2.45 according to MRAC database). – ZSM 27497, 6, 52.0–78.4 mm SL, Ghana, descendants of a commercial ornamental fish import of unknown origin.

Comparative material examined

Steatocranus bleheri Meyer, 1993: Democratic Republic of Congo?: MTD F 11386-87, 2 (paratypes, the type locality of *S. bleheri* "Lubumbashi, Kafubu River basin, Luapula River system" is most likely erroneous: see Schliewen (2006: 22)), 60.3-68.6 mm SL. Republic of Congo (Congo River below Brazzaville): ZSM32398, 1, 57.6 mm SL. - ZSM37513, 4, 31.1-62.7 mm SL. - AMNH 238626, 2, 24.5-31.8 mm SL.

Steatocranus casuarius Poll, 1939: Democratic Republic of Congo (Congo River rapids from Kinshasa to Kinsuka): MRAC 39449-39450, 2 (syntypes), 69.0-77.7 mm SL. - MRAC 44008-44010, 3, 50.2-72.5 mm SL. - ZSM 37392, 3, 46.0-85.9 mm SL. - ZSM 36611, 2, 61.3-68.4 mm SL. - ZSM 37386, 2, 46.4-58.6 mm SL. - ZSM 37389, 1, 40.2 mm SL. - ZSM 37505, 1, 39.8 mm SL. - ZSM 37507, 2, 39.7-47.3 mm SL. - ZSM 37503, 1, 45.2 mm SL. Republic of Congo (Congo River below Kinshasa to border with Democratic Republic of Congo): AMNH 238610, 1, 43.2 mm SL. - AMNH 238620, 2, 46.6-50.4 mm SL. - ZSM 34926, 2, 54.0-54.8 mm SL. - ZSM 34925, 1, 46.1 mm SL. - ZSM 32413, 2, 45.4-50.8 mm SL. - ZSM 32375, 1, 43.1 mm SL. - ZSM 32397, 3, 50.4-57.7 mm SL. - ZSM 32399, 1, 41.1 mm SL.

Steatocranus sp. aff. *casuarius* "brown pearl": Democratic Republic of Congo (Congo River between upstream of Luozi to above Inga): AMNH 237739, 2, 53.7-67.8 mm SL. - AMNH 237736, 2, 58.4-85.6 mm SL. - AMNH 237732, 1, 57.5 mm SL. - AMNH 237734, 2, 57.7-74.5 mm SL. - ZSM 34916, 1, 35.2 mm SL. - ZSM 34918, 4, 52.8-76.9 mm SL. - ZSM 34920, 2, 41.4-72.5 mm SL. - ZSM 34933, 2, 42.9-41.1 mm SL. - ZSM 36610, 2, 53.2-46.5 mm SL. - ZSM 36612, 1, 42.2 mm SL. - ZSM 36613, 1, 35.7 mm SL. - ZSM 36615, 1, 37.1 mm SL. - ZSM 36616, 2, 33.4-35.8 mm SL. - ZSM 37512, 1, 54.3 mm SL. - ZSM 37405, 1, 41.9 mm SL. - ZSM 37407, 1, 29.7 mm SL. - ZSM 37492, 1, 51.6 mm SL. - ZSM 37494, 1, 38.8 mm SL. - ZSM 37502, 1, 39.90 mm SL.

Steatocranus gibbiceps Boulenger, 1899: Democratic Republic of Congo (Congo River between first rapids below Kinshasa to Inga): MRAC 62 (1, syntype; type locality "Matadi" of *S. gibbiceps* most likely erroneous: see Schliewen (2006: 23)). - AMNH 237733, 1, 28.1 mm SL. - AMNH 237735, 1, 41.0 mm SL. - AMNH 237737, 1, 36.7 mm SL. - AMNH 237740, 2, 48.0-64.8 mm SL. - AMNH 237749, 1, 44.8 mm SL. - ZSM 23163, 2, 44.747.7 mm SL. - ZSM 37498, 10, 38.0-52.4 mm SL. - ZSM 34919, 1, 48.1 mm SL. - ZSM 34938, 1, 42.3 mm SL. - ZSM 34942, 2, 51.2-63.2 mm SL. - ZSM 34943, 1, 51.9 mm SL. - ZSM 36599, 1, 36.9 mm SL. - ZSM 36600, 1, 47.1 mm SL. - ZSM 36601, 1, 45.7 mm SL. - ZSM 36602, 2, 44.9-58.4 mm SL. - ZSM 36603, 3, 39.1-66.6 mm SL. - ZSM 36604, 1, 52.3 mm SL. - ZSM 36605, 1, 41.5 mm SL. - ZSM 36606, 1, 33.5 mm SL. - ZSM 36607, 1, 45.1 mm SL. - ZSM 36609, 2, 47.9-49.4 mm SL. - ZSM 37385, 1, 46.6 mm SL. - ZSM 37398, 1, 41.0 mm SL. - ZSM 37406, 1, 48.9 mm SL. - ZSM 37409, 1, 43.4 mm SL. - ZSM 37497, 1, 27.7 mm SL. - ZSM 37500, 1, 32.9 mm SL. -

ZSM 37504, 1, 34.3 mm SL. - ZSM 37511, 1, 39.8 mm SL. Republic of Congo (Congo River below Brazzaville to border with Democratic Republic of Congo): - ZSM 37509, 1, 29.0 mm SL. - ZSM 26757, 2, 50.6-65.8 mm SL. - ZSM 32396, 5, 53.0-73.0 mm SL. - ZSM 32412, 5, 32.1-44.0 mm SL. - ZSM 34927, 1, 46.5 mm SL. - ZSM 34939, 1, 60.8 mm SL. - ZSM 34917, 1, 33.6 mm SL. - ZSM 32373, 2, 37.8-68.1 mm SL. - ZSM 32374, 1, 64.7 mm SL. - ZSM 23920, 1, 53.2 mm SL.

Steatocranus glaber Roberts & Stewart, 1976: Democratic Republic of Congo (Congo River below Inga and at Yalala): AMNH 237730, 4, 30.3-54.4 mm SL. - AMNH 237743, 3, 44.9-57.6 mm SL. - AMNH 237728, 2, 34.4-34.5 mm SL. - ZSM 34946, 5, 26.5-43.9 mm SL. - ZSM 34929, 2, 34.5-50.6 mm SL. - ZSM 37493, 2, 41.1-44.7 mm SL. - ZSM 34931, 2, 46.9-57.8 mm SL. - ZSM 37390, 2, 57.0-75.2 mm SL. - ZSM 37389, 2, 46.2-48.5 mm SL. - ZSM 37403, 2, 45.6-42.6 mm SL. - ZSM 34930, 2, 32.8-46.0 mm SL. - ZSM 37394, 2, 36.8-41.1 mm SL.

Steatocranus mpozoensis Roberts & Stewart, 1976: Democratic Republic of Congo (Congo and Mpozo Rivers in the Matadi and Boma regions): MRAC 72649-651, 2, 49.5-53.5 mm SL. - AMNH 237744, 2, 50.0-75.4 mm SL. - AMNH 237745, 5, 43.4-57.1 mm SL. - AMNH 242279, 2, 48.1-52.5 mm SL. - AMNH 237727, 2, 46.2-50.1 mm SL. - ZSM 37487, 6, 49.8-81.3 mm SL. - ZSM 37396, 3, 37.3-87.6 mm SL. - ZSM 34944, 4, 45.8-56.3 mm SL. - ZSM 34924, 5, 39.0-89.0 mm SL. - ZSM 36617, 2, 48.6-50.8 mm SL. - ZSM 34928, 2, 42.3-49.1 mm SL.

Steatocranus tinanti (Poll, 1939): Democratic Republic of Congo (Congo River rapids at Kinshasa and Kinsuka below Kinshasa): MRAC 55498, 1 (syntype), 51.3 mm SL. - MRAC 55187-55190, 4 (syntypes), 50.0-55.5 mm SL. - ZSM 37501, 4, 39.1-60.7 mm SL. - ZSM 37499, 1, 62.9 mm SL. - ZSM 37510, 1, 60.0 mm SL. - ZSM 37387, 2, 62.1-84.5 mm SL. Republic of Congo (Congo River rapids at Brazzaville and below): AMNH 238618, 1, 60.9 mm SL. - ZSM 32378, 2, 65.0-65.5 mm SL. - ZSM 32401, 2, 46.7-56.1 mm SL. - ZSM 32395, 8, 46.2-67.4 mm SL. - ZSM 32376, 5, 43.2-65.5 mm SL. - ZSM 34941, 1, 83.9 mm SL.

Steatocranus sp. aff. *tinanti* "ultraslender": Democratic Republic of Congo (Congo River from above Luozi to above Inga): AMNH 237738, 1, 54.6 mm. - AMNH 237750, 1, 43.2 mm SL. - ZSM 34934, 1, 42.1 mm SL. - ZSM 34935, 2, 38.1-41.5 mm SL. - ZSM 36608, 4, 35.7-38.3 mm SL. - ZSM 37388, 1, 57.0 mm SL. - ZSM 37496, 1, 39.5 mm SL. - ZSM 34935, 4, 38.3-41.8 mm SL. - ZSM 38672, 2, 33.1-43.3 mm SL. - ZSM 37401, 1, 43.5 mm SL. - ZSM 36614, 3, 33.9-42.5 mm SL. - ZSM 38869, 2, 38.0-40.6 mm SL. - ZSM 38671, 1, 35.5 mm SL. - ZSM 37402, 1, 31.8 mm SL. - ZSM 38670, 1, 35.1 mm SL.

Steatocranus sp. "intermediate": Democratic Republic of Congo (Congo River at Yalala rapids): AMNH 237729, 1, 39.70 mm SL. - AMNH 227731, 1, 38.80 mm SL. - ZSM 34942, 1, 35.9 mm SL. - ZSM 37391, 7, 41.4-72.7 mm SL.

Steatocranus rouxi (Pellegrin, 1928): Democratic Republic of Congo (Lulua River, Kasai drainage): AMNH 243542, 1, 40.6 mm SL. – AMNH 243543, 3, 49.9–53.2 mm SL.

Steatocranus ubanguiensis Roberts & Stewart, 1976: Central African Republic (Ubanghi River): ZSM 26380, 3, 36.1–49.9 mm SL. – CU 91448, 1, 44.8 mm SL. – CU 91449, 5, 35.8–40.4 mm SL.

Steatocranus sp. 'Nki': Republic of Cameroon (Congo River drainage, Sangha system Ngoko River below Nki Falls): ZSM 32366, 3, 34.3–36.5 mm SL. – ZSM 37357, 1, 43.8 mm SL. – ZSM 37356, 1, 39.9 mm SL. – ZSM 37358, 2, 30.6–31.3 mm SL.

Steatocranus sp. 'Maluku': Democratic Republic of Congo (Congo River upstream of Malebo Pool): MRAC 100900, 1, 62.7 mm SL. – ZSM 37488, 8, 30.0–61.8 mm SL. – ZSM 37490, 11, 31.3–43.3 mm SL. – ZSM 37491, 1, 62.8 mm SL. Republic of Congo (Congo River upstream of Malebo Pool): – AMNH 238703, 7, 32.9–48.4 mm SL. – AMNH 238704, 5, 29.2–54.0 mm SL.

Steatocranus sp. 'squarehead': Republic of Congo (Congo River rapids at Brazzaville): ZSM 34502, 2, 58.1–75.0 mm SL.

Steatocranus sp. 'bulky head': Democratic Republic of Congo (Congo River rapids at Kinsuka): ZSM 37506, 1, 84.0 mm SL. Republic of Congo (Congo River rapids at Brazzaville): ZSM 37508, 1, 52.6 mm SL. – ZSM 32423, 1, 48.3 mm SL.

Steatocranus sp. 'red eye': Democratic Republic of Congo (Kwango River basin): MRAC 99-078-P-0022, 1, 38.2 mm SL. – ZSM 32419, 10, 38.3–45.0 mm SL. – ZSM 34470, 1, 38.5 mm SL. – ZSM 34471, 1, 37.9 mm SL.

Steatocranus sp. 'Kisangani': Democratic Republic of Congo (Congo River and affluents in the greater Kisangani area): MRAC 15647–15648, 2, 44.9–55.8 mm SL. – USNM 094248, 1, 43.4 mm SL. – ZSM 37393, 1, 40.8 mm SL. – ZSM 37400, 2, 36.5–46.4 mm SL. – ZSM 37397, 1, 36.0 mm SL. – ZSM 37514, 1, 33.0 mm SL. – ZSM 37399, 1, 44.2 mm SL.

Steatocranus sp. 'Lefini': Republic of Congo (Lefini River Basin): MRAC A8-020-P-0036-0045, 10, 33.6–41.7 mm SL.

Steatocranus sp. 'dwarf': Aquarium specimens imported via Kinshasa, Democratic Republic of Congo: ZSM 27498, 3, 39.0–53.1 mm SL. – ZSM 32390, 1, 46.9 mm SL. – ZSM 26761, 1, 36.0 mm SL.

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References

- Boulenger, G. A. 1899. Matériaux pour la faune du Congo. Poissons nouveaux du Congo. Troisième Partie. Silures, Acanthoptérygiens, Mastacembles, Plectognathes. Annales du Musée Royal du Congo Belge Sciences Zoologiques 1(3): 39–58.
- Dunz, A. R. & Schliewen, U. K. 2013. Molecular phylogeny and revised classification of the haplofilapiine cichlid fishes formerly referred to as "Tilapia". Molecular Phylogenetics and Evolution 68: 64–80.
- Greenwood, P. H. 1954. On two species of cichlid fishes from the Malagarazi River (Tanganyika), with notes on the pharyngeal apophysis in species of the *Haplochromis* group. Annals and Magazine of Natural History (Series 12) 7: 401–414.
- Ibala Zamba, A. 2010. Faune des poissons des rivières Luki et Lefini (Bassin du Congo): diversité et écologie. PhD thesis, 430 pp., Catholic University of Leuven.
- Irisarri, I., Singh, P., Koblmüller, S., Torres-Dowdall, J., Henning, F., Franchini, P., Fischer, C., Lemmon, A., Moriarty Lemmon, E., Thallinger, G. H., Sturmhuber, C. & Meyer, A. 2018. Phylogenomics uncovers early hybridization and adaptive loci shaping the radiation of Lake Tanganyika cichlid fishes. Nature Communications 9(3159): 1–12.
- Hammer, Ø., Harper, D. A. T. & Ryan, P. D. 2001. PAST: paleontological statistics software package for education and data analysis. Palaeontologia Electronica 4(1): 9.
- Kanazawa, R. H. 1951. Description of a new genus of cichlid fish, *Gobiocichla*, from the French Sudan. Annals and Magazine of Natural History 12(4): 378–381.
- Meyer, M. K. 1993. Description of a new *Steatocranus* species from Luapula River system, Zaire. Zoologische Abhandlungen Staatliches Museum für Tierkunde Dresden 47(9): 113–120.
- Pellegrin, J. 1928. Poisson du Kasai (Congo Belge). Description d'un genre nouveau et de quatre espèces nouvelles. Bulletin de la Société Zoologique de France 53(1): 103–113.
- Poll, M. 1939. Les poissons du Stanley-Pool. Annales du Musée du Congo Belge, Sér. C (Zoologie: Poissons, reptiles, amphibiens) (Sér. 1) 4(1): 1–60.
- 1948. Descriptions de Cichlidae nouveaux recueillis par le Dr. J. Schwetz dans la rivière Fwa (Congo belge). Revue de Zoologie et de Botanique Africaines 41(1): 91–104.
- Roberts, T. R. & Stewart, D. J. 1976. An ecological and systematic survey of fishes in the rapids of the lower Zaire or Congo River. Bulletin of the Museum of Comparative Zoology 147(6): 239–317.

- Schedel, F. D. B., Friel, J. P. & Schliewen, U. K. 2014. *Haplochromis vanheusdeni*, a new haplochromine cichlid species from the Great Ruaha River drainage, Rufiji basin, Tanzania (Teleostei, Perciformes, Cichlidae). *Spixiana* 37(1): 135-149.
- , Vreven, E. J. W. M. N., Katemo Manda, B., Abwe, E., Chocha Manda, A. & Schliewen, U. K. 2018. Description of five new rheophilic *Orthochromis* species (Teleostei: Cichlidae) from the Upper Congo drainage in Zambia and the Democratic Republic of the Congo. *Zootaxa* 4461(3): 301-349.
- Schliewen, U. K. 2006. *Steatocranus*. Buckelkopfcichliden aus dem Kongo (Teil 1/2). Die Aquarien- und Terrarien-Zeitschrift (DATZ) 59(6): 20-23 and (7): 20-25.
- 2008. Aquaristisch neue Buckelköpfe aus dem Kongobecken. Die Aquarien- und Terrarien-Zeitschrift (DATZ) 61(12): 38-41.
- & Stiassny, M. L. J. 2003. *Etia nguti*, a new genus and species of cichlid fish from the River Mamfue, Upper Cross River basin in Cameroon, West-Central Africa. *Ichthyological Exploration of Freshwaters* 14(1): 61-71.
- Schwarzer, J., Misof, B. & Schliewen, U. K. 2009. The root of the East African cichlid radiations. *BMC Evolutionary Biology* 9(186): 1-11.
- , Misof, B. & Schliewen, U. K. 2011. Time and origin of cichlid colonization of the lower Congo rapids. *PLoS ONE* 6(7): e22380.
- , Misof, B. & Schliewen, U. K. 2012. Speciation within genomic networks: a case study based on *Steatocranus* cichlids of the lower Congo rapids. *Journal of Evolutionary Biology* 25(1): 138-148.
- Stawikowski, R. 1987. Buckelköpfe. Neues aus der Gattung *Steatocranus* (Part II). Die Aquarien- und Terrarien-Zeitschrift (DATZ) 40(2): 67-70.
- Teugels, G. G. & Thys van den Audenaerde, D. F. E. 2003. Cichlidae. Pp. 521-600 in: Paugy, D., Lévêque, C. & Teugels, G. G. (eds) *The fresh and brackish water fishes of West Africa, Volume II*.
- Trewavas, E. 1943. A new cichlid fish from the Gold Coast. *Annals and Magazine of Natural History* 10(63): 186-191.
- & Irvine, F. 1947. Fresh-water fishes. Pp. 221-282 in: Irvine, F. (ed.) *Fishes and fisheries of the Gold Coast*. xvi+352 pp., Cambridge (Univ. Press).
- Werner, U. 2008. From Ghana: the Volta Fast Water Cichlid – *Steatocranus irvinei* (Trewavas, 1943). *Cichlid News Magazine* 17(3): 17-21.

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