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## Two new species of African suckermouth catfishes, genus *Chiloglanis* (Siluriformes: Mochokidae), from Kenya with remarks on other taxa from the area

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## Abstract

Recent expeditions in Kenya and examination of existing collections confirmed the presence of two undescribed Chiloglanis species and revealed previously unknown diversity within the Athi River system. The two new species are easily distinguished from described congeners in the area by external morphology, allopatric distributions, and genetic markers. Chiloglanis kerioensis sp. nov., is restricted to the Kerio River system and is the only known suckermouth catfish from the Lake Turkana basin. Chiloglanis devosi sp. nov., is known only from the type locality, the Northern Ewaso Nyiro (Ng'iro) below Chanler's Falls. In addition to these two new species, this study confirmed the presence of an undescribed Chiloglanis sp. occurring sympatrically with Chiloglanis brevibarbis in the Tsavo River. A dichotomous key for identifying all described *Chiloglanis* species found within Kenya is presented along with comments.

Key words: Chiloglanis deckenii Peters 1868, Chiloglanis somereni Whitehead 1958, Lake Victoria, East Africa

## Introduction

Species of the genus Chiloglanis Peters 1868 inhabit most tropical rivers throughout sub-Saharan Africa and the Nile River basin. With approximately 49 valid species, and more awaiting formal description, Chiloglanis is the second largest genus within the family Mochokidae. Classified in the subfamily Chiloglanidinae (Riehl & Baensch 1991; Vigliotta 2008; Friel & Vigliotta 2011), these species possess distinctive oral discs that allow them to feed and maintain their position in flowing waters.

From 2010 through 2012 populations of suckermouth catfishes and other fishes were collected across Kenya in connection with a National Science Foundation International Research Experience for Students (IRES) grant awarded to Tulane University. Three recognized species of Chiloglanis are reported from the freshwaters of Kenya (Seegers et al. 2003, Schmidt et al. 2014). Chiloglanis deckenii Peters 1868 occurs in the Pangani River basin of southern Kenya and northern Tanzania. Chiloglanis brevibarbis Boulenger 1902 occurs throughout the Tana River basin and Athi River system within central Kenya. Chiloglanis somereni Whitehead 1958 inhabits streams of the Lake Victoria basin in western Kenya. Two other species, previously discovered, have not been taxonomically described (Seegers et al. 2003; Schmidt et al. 2014). One of these species inhabits the headwaters of the Kerio River, which flows into Lake Turkana in northern Kenya; the other is found in the Northern Ewaso Nyiro (Ng'iro) below Chanler's Falls (Seegers et al. 2003; Schmidt et al. 2014). Collected specimens and existing museum collections provide comparative material for a morphological analysis of the Kenyan Chiloglanis and formal descriptions of the two previously known but undescribed species. A key for the described Kenyan Chiloglanis, including species described herein, and notes on distribution and biology of each species are also presented.

## Material and methods

*Chiloglanis* specimens were collected across Kenya during three expeditions (Fig. 1). These specimens and additional National Museum of Kenya (NMK) collections are included in this analysis. Measurements were taken to 0.1 mm with a digital caliper or with a dissection scope equipped with an ocular micrometer. Morphometric measurements of the head and body follow Friel and Vigliotta (2011).

Meristic count formulas follow Skelton and White (1980) and Friel and Vigliotta (2011); however, our terminology for premaxillary teeth differs slightly. We consider the primary premaxillary teeth to be restricted to the two ovoid tooth patches; tertiary teeth are restricted to the dorsal edge of the tooth plate; secondary premaxillary teeth are scattered across the space between the primary and tertiary premaxillary teeth. Gender of type specimens was determined by external examination of the genital papillae following described methods (Friel & Vigliotta 2011; JP Friel pers. comm.). Principal components analysis and summary statistics were completed in MYSTAT 12 (SYSTAT Software, Inc.). Institutional abbreviations follow Sabaj Perez (2010).



**FIGURE 1.** Collection localities of *Chiloglanis* specimens included in this study and type localities of new species described herein: *Chiloglanis deckenii* (triangle), *C. brevibarbis* (circle), *C. somereni* (square), *C. kerioensis* (type locality—asterisk, paratypes—cross), and *C. devosi* (type locality—star). Drainage boundaries denoted by white lines.

## **Morphological results**

The principal components analysis (PCA) of the residuals from 45 morphometric measurements regressed against standard length from 169 specimens distinguished the three previously known *Chiloglanis* species and the two new species described herein (Fig. 2). The groups revealed by the PCA correspond to those discovered in previous phylogenetic analysis (Schmidt *et al.* 2014). Principal component (PC) 1 accounts for 19.2% of overall variation. Oral disc length, prepectoral length, and dorsal spine length contributes most to the variation observed along PC1 (Tables 1–4). PC2 accounts for 15.4% of overall variation with orbit diameter, occipital shield width, adipose fin height, and length of postcleithral process contributing the most to observed variation.

While most of the species are non-overlapping there is overlap between *C. devosi* and *C. somereni*, and between *Chiloglanis* sp. aff. *deckenii* and *C. brevibarbis*. Morphological variation is observed among *C. brevibarbis* populations, but there is much overlap. *Chiloglanis* sp aff. *deckenii* specimens from the Tsavo River are morphologically similar to *C. brevibarbis*. Body measurements of these specimens' allies them with *C. brevibarbis* while the morphology of the oral disc and mouth parts are closer to *C. deckenii*. Measurements for *C. somereni*, *C. brevibarbis*, *C. deckenii*, and *Chiloglanis* sp. aff. *deckenii* are summarized in Tables 3 and 4.



**FIGURE 2.** Plot of PC1 to PC2 from principal components analysis of the residuals of 45 linear measurements regressed against standard length of 169 *Chiloglanis* specimens. Polygons outline individuals from each species or population. Two new *Chiloglanis* species are outlined in bold with holotypes (star). The undescribed taxon from the Tsavo River is outlined in hash line. Measurements contributing most to variation along PC1 and PC2 are shown.

## Chiloglanis kerioensis sp. nov.

Figs. 1, 3; Table 1

Chiloglanis spec. "Kerio"—Seegers et al. 2003: 38. Chiloglanis sp. "Kerio River"—Schmidt et al. 2014: 416, 419. **Holotype.** NMK FW/3959/1, male ALC, 40.3 mm SL; Kenya, Rift Valley Province, Barwessa River (Barwessa Village) near Lake Kamnarok, Georeferenced: 00.63505° N, 35.618126° E; L. De Vos, 4 January 1999.

**Paratypes.** NMK FW/599/1-13, 9 ALC, 32.1–37.6 mm SL; same collection data as holotype.—NMK FW/2794/1-6, 6 ALC, 27.4–38.4 mm SL; same collection data as holotype.—TU 204096, 3 ALC, 32.6–35.9 mm SL; same collection data as holotype.—NMK FW/2243/1-24, 21 ALC, 27.6–32.9 mm SL; tissue vouchers: IRES 1514—IRES 1517; Kenya, Rift Valley Province, Kerio Rift near Chebloch Gorge, off Kabernet—Tambach Rd. (C51), 00.45017° N, 35.64670° E, 2011 IRES team, 23 June 2011.—TU 204094, 3 ALC, 29.7–31.1 mm SL; same collection data as NMK FW/2243/1-24.

**Diagnosis.** *Chiloglanis kerioensis* is distinguished from *C. somereni* and *C. devosi* in having fewer mandibular teeth (eight or fewer versus eight or more) and a larger orbit (>4% SL versus <4% SL). *Chiloglanis kerioensis* is distinguished from *C. brevibarbis* by longer barbels (maxillary barbels usually >30% HL versus <30% HL, medial mandibular barbels >10% HL versus <9% HL, and lateral mandibular barbels >17% HL versus <15% HL) and in the arrangement of the mandibular teeth (exposed length of teeth not equal to row width versus exposed portion equal or greater than row width in *C. brevibarbis* populations). *Chiloglanis kerioensis* differs from *C. deckenii* in having a longer premaxillary tooth pad (>3% SL versus <3% SL) and longer lower lip (>60% HL versus <55% HL). The species is distinguished from *Chiloglanis* sp. aff *deckenii* by the following combination of characters: *C. kerioensis* has a longer postcleithral process (>9% SL versus <9% SL) and longer lateral mandibular barbels (>15% HL).

**Description.** Morphometric measurements and meristics for holotype and paratypes of *C. kerioensis* are summarized in Table 1. Dorsal, lateral, and ventral views (Fig. 3) illustrate body shape, fin shape and placement, oral disc shape and size, and barbel length.

A small, relatively deep-bodied *Chiloglanis*, maximum standard length observed 40.3 mm. Body dorsally depressed anteriorly and laterally compressed posteriorly. Predorsal angled towards snout. Pre-orbital convex. Postdorsal body angled ventrally towards caudal fin. Preanal profile horizontal; postanal sloping dorsally towards caudal fin. Skin with numerous small unculiferous (horny unicellular projections) tubercles, body uniformly covered with higher concentrations of more pronounced tubercles in the head region. Lateral line complete, arising slightly above horizontal to orbit and sloping ventrally to midlateral alongside of body. Urogenital papillae elongate in males; reduced and separated from anus by shallow invagination in females.

Head broadly depressed. Gill openings restricted, from level of pectoral fin attachment to middle of eye. Gill membranes broadly united. Occipital-nuchal shield covered and visible through skin. Eyes small, horizontal axis longest, orbit without free margin. Anterior and posterior nares positioned mid-snout length and equidistant. Nares with raised rim, posterior nares with elongated anterior and medial flaps. Mouth inferior, upper and lower lips united to form sucking disc. Oral disc moderate in size, wider than long and covered in papillae. Barbels in three pairs; maxillary barbel originating from posterolateral region of the disc, unbranched, long, reaching 45% of head length. Lateral and medial mandibular barbels moderate, lateral barbels twice the length of medial barbels, incorporated into lower lip and positioned on both sides of prominent midline cleft on the posterior margin of disc.

Primary maxillary teeth numerous (36–80), "S" shaped with exposed tips light brown in color, arranged in three rows on oval shaped tooth. Secondary premaxillary teeth fewer in number and scattered on posterior surface of premaxillae. Tertiary teeth small and needle-like, inserted near midline on dorsal edge of toothplate. Mandibular teeth arranged in one to two rows, "S" shaped, grouped near midline. The anterior row (functional row) supporting 6–8 brown tipped sharp teeth.

Dorsal fin originates in anterior third of body. Dorsal fin with small spinelet, spine and 6 rays. Dorsal spine short, anterior margins of spine marked with 2 small notches distally, posterior margins smooth. Adipose fin moderate in length, length into SL four to five times; margin convex with a small incision posteriorly. Caudal fin forked with gently pointed lobes, lower lobe slightly longer than upper lobe, count i, 7, 8, i. Anal fin extending beyond adipose fin terminus, count iii, 8. Pelvic fin origin at vertical between dorsal and adipose fin, margins convex, count i, 6. Pectoral fin with slightly curved smooth spine, moderate in length, five to six times into standard length, count i, 8–9. Post cleithral process going into standard length nine to ten times, buried under the skin. No apparent sexual dimorphism in shape or size of fins. Dimorphism of body size apparent with females being the largest specimens collected.

**Coloration.** Live coloration: Body with yellowish-brown ground color with overlying melanophores and gold iridescent flecks alongside of body. Fins yellow to orange. Typical coloration of preserved specimens is shown in

Figure 3. In dorsal view, specimens appear medium brown with three light bands. The first lies anterior to the dorsal fin; second and third bands are anterior and posterior to the adipose fin. Lighter spots visible along sides above lateral line. Head uniformly medium brown.

In lateral view, specimens have cream-buff ground color with overlying medium brown above lateral line and cream to yellow from lateral line to belly. Three light bands observed from above extend beyond midline. Light spots on sides above and below lateral line, light areas on lateral line extending dorsally. Numerous small black melanophores scattered across sides, more concentrated below lateral line.

Ventral surface yellow to cream colored. Small melanophores near origin of pelvic fins and around anal fin. Oral disc and barbels yellow to cream colored.



**FIGURE 3.** Dorsal, lateral and ventral views of *Chiloglanis kerioensis* holotype, NMK FW/3959/1, male, 40.3 mm SL; Kenya, Rift Valley Province, Barwessa River (Barwessa Village) near Lake Kamnarok Scale bar equals 1cm. Photographs by R.C. Schmidt.

**Etymology.** The specific epithet refers to the Kerio River, Lake Turkana basin, where the species is believed to be endemic.

**Distribution.** This species is known from two localities in the upper Kerio River system (the type locality on Barwessa River (asterisk, Fig. 1) and in the Kerio River at Chebloch Gorge (cross, Fig. 1)) and is likely endemic to the system. This species was abundant in the medium rapids upstream from the road crossing (Chebloch Gorge) and were aggregated near the larger boulders. It is likely that further sampling efforts within the upper Kerio River system will reveal addition populations.

| TABLE 1.     | Morphon      | netric 1 | measureme | nts ar | d m  | eristic | counts  | for  | Chile | oglanis | kerioe | ensis | (N=43;  | holotype | and  | 42  |
|--------------|--------------|----------|-----------|--------|------|---------|---------|------|-------|---------|--------|-------|---------|----------|------|-----|
| paratypes).  | Standard     | length   | expressed | in m   | n. A | ll oth  | er meas | uren | nents | express | ed in  | perce | ent SL. | Meristic | data | for |
| holotype are | e identified | d by a " | ·*".      |        |      |         |         |      |       |         |        |       |         |          |      |     |

| MORPHOMETRICS                    | Holotype | Range     | Mean±%SD          |
|----------------------------------|----------|-----------|-------------------|
| Standard length (mm)             | 40.3     | 27.4-40.3 |                   |
| Head length                      | 29.5     | 27.6-33.1 | 30.6±1.3          |
| Head depth (maximum)             | 18.4     | 13.8–19.6 | 16.3±1.5          |
| Body depth at anus               | 15.4     | 12.1–19.1 | 14.4±1.6          |
| Occipital shield width (minimum) | 3.6      | 3.6–4.7   | 4.2±1.3           |
| Prepectoral length               | 29.6     | 28.5-34.1 | 31.2±1.3          |
| Predorsal length                 | 42.0     | 40.2–44.5 | 42.0±1.1          |
| Prepelvic length                 | 56.5     | 53.3–57.3 | 55.7±1.4          |
| Preanal length                   | 70.8     | 67.2–74.9 | 71.1±1.6          |
| Eye diameter (horizontal)        | 4.3      | 3.9–5.3   | 4.5±0.3           |
| Orbital interspace               | 7.6      | 6.9-8.8   | 7.7±0.5           |
| Snout length                     | 18.9     | 15.8-20.1 | 18.4±0.9          |
| Premaxillary tooth-patch width   | 13.2     | 12.4–16.0 | 14.0±0.9          |
| Premaxillary tooth-patch length  | 3.5      | 3.0-4.3   | 3.6±0.3           |
| Mandibular tooth row width       | 2.1      | 1.3–2.7   | 2.4±0.3           |
| Anterior nares interspace        | 4.5      | 3.8–5.3   | 4.7±0.3           |
| Posterior nares interspace       | 4.4      | 3.8–5.4   | 4.7±0.4           |
| Maxillary barbel length          | 9.8      | 8.5–13.4  | 11. <b>7</b> ±1.1 |
| Medial mandibular barbel length  | 3.2      | 2.5-4.2   | 3.3±0.4           |
| Lateral mandibular barbel length | 6.0      | 4.5–7.1   | 5.9±0.5           |
| Mouth width                      | 9.1      | 8.3–10.3  | 9.2±0.5           |
| Oral disc width                  | 19.0     | 18.1–23.0 | 20.3±1.1          |
| Oral disc length                 | 18.2     | 17.4–21.4 | 19.4±1.0          |
| Upper lip length                 | 4.1      | 3.1–5.2   | 4.0±0.4           |
| Lower lip length                 | 7.6      | 6.1-8.7   | 7.7±0.6           |
| Pectoral-spine length            | 16.6     | 16.4–21.4 | 18.7±1.2          |
| Pectoral-fin length              | 22.0     | 19.3–24.7 | 21.9±1.5          |
| Width at pectoral-fin insertion  | 24.0     | 23.0-28.2 | 25.0±1.0          |
| Length of postcleithral process  | 11.9     | 9.3–13.3  | 10.9±0.9          |
| Pelvic-fin length                | 14.9     | 12.4–16.8 | 14.5±1.0          |
| Depth at dorsal-fin insertion    | 20.9     | 14.6–25.0 | 18.9±2.3          |
| Dorsal-spine length              | 12.7     | 12.2–16.1 | 14.5±1.1          |
| Dorsal-fin length (longest ray)  | 17.7     | 16.3–20.4 | 18.1±1.0          |
| Dorsal-fin base length           | 10.1     | 9.9–13.9  | 11.9±1.0          |

.....continued on the next page

| <b>TABLE 1.</b> (0 | Continued) |
|--------------------|------------|
|--------------------|------------|

| MORPHOMETRICS                                      | Holotype               | Range     | Mean±%SD |
|--|------------------------|-----------|----------|
| Dorsal fin to adipose-fin length                   | 15.7                   | 13.6–21.1 | 16.6±1.8 |
| Adipose-fin base length                            | 22.5                   | 18.0–24.4 | 21.3±1.4 |
| Adipose fin to caudal-ped length                   | 13.6                   | 10.3–14.5 | 12.3±0.9 |
| Adipose-fin height                                 | 4.3                    | 2.7–5.4   | 4.4±0.6  |
| Anal-fin length (longest ray)                      | 14.1                   | 13.4–19.6 | 15.8±1.2 |
| Anal-fin base length                               | 11.6                   | 9.8–13.6  | 12.0±1.0 |
| Lower caudal-fin lobe length                       | 28.3                   | 26.4–33.4 | 29.2±1.7 |
| Upper caudal-fin lobe length                       | 27.1                   | 23.7–32.0 | 27.2±1.7 |
| Fork Length  | 13.6                   | 12.5–16.5 | 14.4±1.0 |
| Caudal-peduncle depth (maximum)                    | 10.8                   | 9.1–12.0  | 10.7±0.7 |
| Caudal-peduncle length                             | 16.6                   | 13.6–17.4 | 15.2±0.9 |
|  |                        |           |          |
| Meristics  |                        |           |          |
| Mandibular tooth rows                              | 1,2                    |           |          |
| Mandibular tooth count (total)                     | 6–16; 8*               |           |          |
| Mandibular tooth count (functional anterior row)   | 6–8; 8*                |           |          |
| Mandibular tooth count (posterior replacement row) | 1–8;                   |           |          |
| Primary premaxillary teeth (total)                 | 36-80; 56*             |           |          |
| Pectoral-fin count                                 | I, 8*(37); I, 9(6)     |           |          |
| Pelvic-fin count                                   | i, 6*(43)              |           |          |
| Dorsal-fin count                                   | II, 6 (43)             |           |          |
| Anal-fin count                                     | iii, 7(1); iii, 8*(10) |           |          |
| Caudal-fin count                                   | i, 7, 8, i* (43)       |           |          |

## Chiloglanis devosi sp. nov.

Figs. 1, 4, 5; Table 2

*Chiloglanis* spec. "Northern Ewaso Nyiro"—Seegers *et al.* 2003: 38. *Chiloglanis* sp. "Northern Ewaso Nyiro"—Schmidt *et al.* 2014: 416, 419.

**Holotype.** NMK FW/3958/1, male ALC, 36.0 mm SL; Kenya, Eastern Province, Northern Ewaso Nyiro (Ewaso Ng'iro) below Chanler's Falls, Isiolo—Merti Road, 00.78056° N, 38.08021° E; 2012 IRES team, 12 June 2012.

**Paratypes.** NMK FW/2777/1-11, 8 ALC, 34.0–49.2 mm SL; tissue vouchers: IRES 10051—IRES 10053; same collection data as holotype.—TU 204093, 2 ALC, 35.1–52.5 mm SL; same collection data as holotype.

**Diagnosis.** *Chiloglanis devosi* is distinguished from *C. somereni* by having shorter dorsal spines (12.3–17.2% SL versus 17.9–23.0% SL) and having the anterior and posterior nares the same distance apart (versus posterior nares further apart in *C. somereni*). *Chiloglanis devosi* is easily distinguished from the other Kenyan congeners in having a wider occipital shield width (>5% SL versus <5% SL), more mandibular teeth (eight or more versus 8 or fewer), and a smaller orbit (<4% SL versus >4% SL).

**Description.** Morphometric measurements and meristics for holotype and paratypes of *C. devosi* are summarized in Table 2. Dorsal, lateral, and ventral views (Figs. 4 & 5) illustrate body shape, fin shape and placement, oral disc shape and size, and barbel length.

Moderate to small sized *Chiloglanis*, maximum standard length observed 49.2 mm. Body dorsally depressed anteriorly and laterally compressed posteriorly. Predorsal convex, post-orbital slightly so, pre-orbital sharply convex. Postdorsal body sloping ventrally towards caudal fin. Preanal profile horizontal; postanal sloping dorsally towards caudal fin. Skin with numerous small unculiferous tubercles, body uniformly covered with higher

concentrations in the head region. Lateral line complete, arising horizontal to orbit and sloping ventrally to midlateral alongside of body. Urogenital papillae elongate in males; reduced and separated from anus by shallow invagination in females.

Head depressed. Gill openings restricted, from level of pectoral fin attachment to middle of eye. Gill membranes broadly united. Occipital-nuchal shield covered and visible through skin. Eyes small, horizontal axis longest, orbit without free margin. Anterior and posterior nares positioned mid-snout length and equidistant. Nares with raised rim, posterior nares with elongated anterior flaps.

Mouth inferior, upper and lower lips united to form sucking disc. Oral disc moderate in size, slightly wider than long and covered in papillae. Barbels in three pairs; maxillary barbel originating from posterolateral region of the disc, unbranched, moderate in length, reaching 25% of head length. Lateral and medial mandibular barbels short, one-third length of maxillary barbel, and incorporated into lower lip. Mandibular barbels positioned on both sides of prominent midline cleft on the posterior margin of disc; medial mandibular barbel adjacent to cleft and lateral mandibular barbel just lateral to medial barbel.

Primary maxillary teeth numerous (51–81), "S" shaped with exposed tips brown in color, arranged in three scattered rows on kidney-shaped patched on ventral surface. Secondary premaxillary teeth fewer in number and scattered on posterior surface of premaxillae. Tertiary teeth small and needle-like, inserted near midline on dorsal edge of toothplate. Mandibular teeth arranged in one to two rows, "S" shaped and crowded at midline. The anterior row (functional row) supporting 7–12 brown tipped sharp teeth.

Dorsal fin origin in anterior third of body. Dorsal fin with small spinelet, spine and 4–6 rays. Dorsal spine long, nearly half as long as head length. Anterior margins of spine marked with three small notches distally, posterior margins smooth. Adipose fin moderate in length, length into SL four times; margin convex and slightly incised posteriorly. Caudal fin forked with rounded lobes, lower lobe slightly longer than upper lobe, count i, 7, 8, i. Anal fin sexually dimorphic; males displaying elongated rays that extend well beyond terminus of adipose fin, margin convex, count iii, 8. Pelvic fin origin at vertical between dorsal and adipose fin, margins convex, count i, 6. Pectoral fin with slightly curved smooth spine, moderate in length, count i, 8–9. Post cleithral process elongate, going into standard length ten times, buried under the skin. Body dimorphism present with females attaining larger sizes than males.



**FIGURE 4.** Lateral views of *Chiloglanis devosi* showing life coloration: (A), NMK FW/2777/1-11 male, 36.0 mm SL, (B) NMK FW/2777/1-11, female, 49.0 mm SL. Scale bar equals 1cm. Photographs by H.L. Bart Jr.



**FIGURE 5.** Dorsal, lateral and ventral views of *Chiloglanis devosi* holotype, NMK FW/3958/1, male, 36.0 mm SL; Kenya, Eastern Province, Northern Ewaso Nyiro (Ewaso Ng'iro) below Chanler's Falls, Isiolo—Merti Road, 00.78056° N, 38.08021° E. Scale bar equals 1cm. Photographs by R.C. Schmidt.

**Coloration.** Live coloration of this species shown in Figure 4. Body with pinkish brown ground color with overlying melanophores that produces the pattern observed in preserved specimens. Iridescent gold markings along sides of body, large iridescent gold area dorsal and posterior to pectoral fin origin with smaller gold markings on side of body, dorsal of lateral line. Fins yellows with brown markings. Typical coloration of preserved specimens is shown in Figure 5. In dorsal view, specimens appear medium brown with three distinct areas of light brown to cream coloration. The first lies anterior to the dorsal fin; second and third bands are anterior and posterior, respectively, to the adipose fin. Lighter spots visible along sides of dorsal fin above lateral line. Head medium brown with areas of mottled lighter brown.

In lateral view, specimens with cream-buff ground color with medium brown present along sides and above lateral line. Cream-buff ground color anterior to dorsal fin extends to lateral line, dark area anterior to adipose fin extends onto side below lateral line, and the light area posterior to adipose fin extends through caudal peduncle, giving the peduncle a depigmented appearance. Light spots on sides above and along lateral line. Numerous small black melanophores scattered across sides, more concentrated posteriorly and below lateral line.

Ventral surface cream colored. Few melanophores near origin of pelvic fins and around anal fin. Oral disc and barbels yellow to cream colored.

**Etymology.** We take pleasure in naming this species in honor of Dr. Luc DeVos, the late ichthyologist and director of the Ichthyology Section at the National Museums of Kenya. Dr. DeVos was instrumental in establishing the collection at NMK and building it into a regional and internationally invaluable collection. DeVos and others (Seegers *et al.* 2003) were also responsible for discovering and recognizing both new species described herein as distinct.

**Distribution.** This species is only known from the type locality (below Chanler's Falls on the Northern Ewaso Nyiro River (Fig. 1)). Specimens were collected around rocks and small boulders in flowing water. Additional populations on this species may occur in favorable habitats downstream from Chanler's Falls and within tributaries that join the Northern Ewaso Nyiro until the river flows into the largely endorheic Lorian Swamp (Fig. 1).

**TABLE 2.** Morphometric measurements and meristic counts for *Chiloglanis devosi* (N=11; holotype and 10 paratypes). Standard length expressed in mm. All other measurements expressed in percent SL. Meristic data for holotype are identified by a "\*".

| MORPHOMETRICS                    | Holotype | Range     | Mean±%SD |
|----------------------------------|----------|-----------|----------|
| Standard length (mm)             | 36.0     | 34.0-49.2 |          |
| Head length                      | 30.1     | 30.1–34.7 | 32.2±1.4 |
| Head depth (maximum)             | 14.5     | 14.5–17.4 | 15.5±1.0 |
| Body depth at anus               | 13.5     | 13.1–16.8 | 14.4±1.3 |
| Occipital shield width (minimum) | 5.7      | 5.5-7.1   | 5.9±0.5  |
| Prepectoral length               | 30.6     | 28.2–32.7 | 30.4±1.2 |
| Predorsal length                 | 39.0     | 36.7–42.0 | 39.8±1.6 |
| Prepelvic length                 | 55.5     | 52.1–59.4 | 56.3±1.9 |
| Preanal length                   | 70.2     | 68.1–72.0 | 69.7±1.3 |
| Eye diameter (horizontal)        | 3.3      | 3.0–3.9   | 3.5±0.3  |
| Orbital interspace               | 7.3      | 7.3-8.6   | 8.0±0.4  |
| Snout length                     | 18.1     | 17.2–19.7 | 18.8±0.7 |
| Premaxillary tooth-patch width   | 13.0     | 13.0–15.3 | 14.5±0.7 |
| Premaxillary tooth-patch length  | 3.7      | 3.3–4.3   | 3.8±0.3  |
| Mandibular tooth row width       | 2.9      | 2.4–3.9   | 3.0±0.5  |
| Anterior nares interspace        | 4.6      | 3.9–5.6   | 4.5±0.4  |
| Posterior nares interspace       | 4.4      | 3.4-4.8   | 4.2±0.4  |
| Maxillary barbel length          | 8.7      | 3.0–9.8   | 7.5±1.8  |
| Medial mandibular barbel length  | 2.4      | 1.8–3.0   | 2.2±0.4  |
| Lateral mandibular barbel length | 3.7      | 3.0-4.9   | 3.8±0.6  |
| Mouth width                      | 10.7     | 10.1–12.6 | 11.2±0.8 |
| Oral disc width                  | 20.5     | 19.7–23.7 | 21.8±1.1 |
| Oral disc length                 | 19.7     | 18.7–21.8 | 20.2±1.1 |
| Upper lip length                 | 4.4      | 3.9–5.4   | 4.5±0.4  |
| Lower lip length                 | 8.9      | 5.2-10.3  | 8.8±1.4  |
| Pectoral-spine length            | 17.7     | 15.6–21.4 | 18.8±1.8 |
| Pectoral-fin length              | 21.3     | 19.3–22.2 | 20.6±1.0 |
| Width at pectoral-fin insertion  | 23.3     | 23.0-25.3 | 23.6±0.7 |
| Length of postcleithral process  | 8.9      | 8.9–12.3  | 10.5±0.9 |
| Pelvic-fin length                | 22.0     | 11.3–22.0 | 13.6±3.0 |
| Depth at dorsal-fin insertion    | 15.5     | 15.3–18.5 | 16.6±1.0 |

.....continued on the next page

## TABLE 2. (Continued)

| MORPHOMETRICS                                      | Holotype                               | Range     | Mean±%SD |
|--|--|-----------|----------|
| Dorsal-spine length                                | 14.4                                   | 12.3–17.2 | 15.0±1.3 |
| Dorsal-fin length (longest ray)                    | 16.3                                   | 14.2–17.0 | 16.0±0.8 |
| Dorsal-fin base length                             | 12.2                                   | 10.5–12.7 | 11.7±0.6 |
| Dorsal fin to adipose-fin length                   | 14.9                                   | 11.0–17.8 | 15.2±2.3 |
| Adipose-fin base length                            | 23.3                                   | 20.6–27.1 | 24.0±2.2 |
| Adipose fin to caudal-ped length                   | 14.7                                   | 11.4–16.7 | 14.3±1.5 |
| Adipose-fin height                                 | 4.1                                    | 2.9–4.2   | 3.6±0.4  |
| Anal-fin length (longest ray)                      | 16.3                                   | 14.0–18.5 | 15.9±1.2 |
| Anal-fin base length                               | 12.6                                   | 9.5–14.1  | 11.6±1.4 |
| Lower caudal-fin lobe length                       | 26.5                                   | 25.1-27.5 | 26.2±0.8 |
| Upper caudal-fin lobe length                       | 23.7                                   | 21.3-25.9 | 23.6±1.4 |
| Fork Length  | 15.5                                   | 12.6–16.7 | 15.0±1.4 |
| Caudal-peduncle depth (maximum)                    | 10.7                                   | 10.2–11.3 | 10.8±0.4 |
| Caudal-peduncle length                             | 19.2                                   | 16.7–19.7 | 18.2±1.1 |
|  |  |           |          |
| MERISTICS  |  |           |          |
| Mandibular tooth rows                              | 2                                      |           |          |
| Mandibular tooth count (total)                     | 10–16; 11*                             |           |          |
| Mandibular tooth count (functional anterior row)   | 7–15; 9*                               |           |          |
| Mandibular tooth count (posterior replacement row) | 2–6; 2*                                |           |          |
| Primary premaxillary teeth (total)                 | 51-81; 63*                             |           |          |
| Pectoral-fin count                                 | I, 8*(10); I, 9(1)                     |           |          |
| Pelvic-fin count                                   | i, 6*(11)                              |           |          |
| Dorsal-fin count                                   | II, 4(1); II, 5(4); II, 6 <sup>3</sup> | *(6)      |          |
| Anal-fin count                                     | iii, 7(1); iii, 8*(10)                 |           |          |
| Caudal-fin count                                   | i, 7, 8, i*(11)                        |           |          |

## Key to Chiloglanis species from Kenya

| 1.     | Usually more than eight mandibular teeth in functional (anterior) row; minimum occipital shield width > 5% SL; eye small, orbit diameter < 4% SL   |
|--------|--|
| -      | Eight or fewer mandibular teeth in functional row; minimum occipital shield width $< 5\%$ SL; eye larger, orbit diameter $> 4\%$ SL  |
| 2.     | Spines long, dorsal and pectoral spine combined >40% SL; anterior nares distinctly further apart than posterior nares  |
| -      | Spines shorter, dorsal and pectoral spine combined <36% SL; anterior nares set same distance apart as posterior nares or nearly so   |
| 3.     | Mandibular teeth elongate (exposed length of teeth into row width once), two rows usually visible, strongly decurved and bunched at symphysis; premaxillary teeth pads ovoid and large with 4–5 rows of teeth (juveniles may have less than 4); oral disc usually as long as wide or nearly so; lateral barbels rarely twice as long as medial barbels |
|        | <i>Chiloglanis brevibarbis</i> (Athi and Tana R.)  |
| -      | Mandibular teeth shorter (exposed length of teeth going into row width more than once); premaxillary pads rectangular and small with less than 4 rows of premaxillary teeth; oral disc usually not as long as wide; lateral barbels usually twice as long as   |
| 4      | medial Darbels   |
| -<br>- | Premaxillary tooth patch length $<3\%$ SL (if $>3\%$ SL length of postcleithral process $<9\%$ SL)   |
| 5.     | Short snout (16.9–18.6% SL); oral disc smaller and distinctively wider (14.9–20.4% SL) than long (13.4–16.1% SL); premax-<br>illary teeth pads more rectangular with length (2.4–3.3% SL) with 3 rows of deeply embedded teeth   |
|        |  |
| -      | Moderate snout (18.0–22.0% SL); oral disc larger and slightly more wide (18.2–22.4% SL) than long (16.8–21.2% SL); pre-<br>maxillary teeth pads more ovoid with length (2.6–3.5% SL) with 3–4 rows of partially embedded teeth   |
|        |  |

## Discussion

The diminutive nature and superficially similar morphology of the suckermouth catfishes, along with the paucity of comparative material, has contributed to taxonomic confusion across this group. Though seemingly similar, here we show that it is possible to distinguish Kenyan species by comparing multiple morphological characters. In addition to the diagnostic morphological characters described herein, genetic divergence (Schmidt *et al.* 2014), and allopatric distributions support recognizing *C. kerioensis* and *C. devosi* as valid species. These findings validate previous statements that these populations required formal description (Seegers *et al.* 2003).

In addition to the two new species now formally described, this study confirmed the existence of a sympatrically occurring undescribed species within the Tsavo River (Schmidt *et al.* 2014). This taxon is morphologically intermediate of *C. deckenii* and *C. brevibarbis* (Tables 3, 4), though more similar in morphology to *C. brevibarbis* (Fig. 2). Although it is difficult to distinguish these co-occurring taxa, the morphology of the oral disc and teeth are informative in separating the two species. Additional material from the Tsavo River and other localities in the middle Athi River are needed to further quantify the characteristics of this species. The additional samples may also help us to understand how the two sympatrically occurring species are segregating ecologically. Genetically more similar to *C. deckenii* (Schmidt *et al.* 2014), the species likely gained access to the Tsavo River from the Pangani River basin through headwater capture. Genetic evidence of recent biotic dispersal of Pangani River taxa into the Athi River system was also obtained for *Garra* and *Amphilius* collected in the IRES project (unpublished data).

Through recent collection efforts we were able sample all reported species and populations of *Chiloglanis* species from Kenya and deposit much needed study material in the fish collection at NMK. Additional collections are needed in northwestern Kenyan and below Chanler's Falls to further understand the distribution of suckermouth catfishes in Kenya. In northwestern Kenya, the Lake Turkana tributaries that arise on the slope of Mt. Elgon remain poorly studied (Fig. 1). These mountain fed streams, including the Suam River and upper reaches of the Turkwell River, may provide habitat for rheophilic species like *Chiloglanis*. We would also like to collect additional populations of *C. devosi*. However, travel to the area below Chanler's Falls is logistically difficult. The new *Chiloglanis* species described herein are the first of several new taxa destined to be described as a result of our fruitful collaboration in the IRES project. Future discoveries and species descriptions should help us to establish general patterns of vicariance and area relationships across sampled regions of Kenya.

## Remarks on other Kenyan Chiloglanis

Recent collections, although certainly not exhaustive or geographically complete, enabled us to collect specimens and genetic material from all described *Chiloglanis* species that occur within Kenya. The following comments on species distributions and distinguishing characters are provided from these collections and existing museum material.

#### Chiloglanis deckenii Peters 1868

Within Kenya, *Chiloglanis deckenii* only occurs in the Pangani River basin (Fig. 1). It is likely restricted to the Pangani River basin in Tanzania but a similar species is reported to occur within the Wami and Rufiji Rivers to the south (Seegers 2008). This species was collected in large numbers in the Lumi River (Lake Jipe affluent) near rocks in fast flowing water. This species is distinguished from other Kenyan suckermouth catfishes in having long mandibular barbels and an oral disc that is distinctly wider than long (Fig 5). Morphometric measurements and meristic counts of Kenyan *C. deckenii* are found in Table 3.

|                                  | C. somereni (N | =22)            | C. deckenii ( | N=15)           | C. sp aff. deckenii 7 | Tsavo R. (N=20)       |
|----------------------------------|----------------|-----------------|---------------|-----------------|-----------------------|-----------------------|
| MORPHOMETRICS                    | Range          | Mean±%SD        | Range         | Mean±%SD        | Range                 | Mean±%SD              |
| Standard length (mm)             | 42.6–68.0      |                 | 28.0-62.2     |                 | 33.1–48.6             |                       |
| Head length                      | 27.3–31.8      | $29.5 \pm 1.3$  | 26.6-31.5     | 28.5±1.4        | 29.0–32.8             | $30.8{\pm}1.0$        |
| Head depth (maximum)             | 14.3–17.9      | $15.8 \pm 1.0$  | 16.0 - 21.1   | $18.0 \pm 1.4$  | 14.7–17.9             | $16.2 \pm 1.0$        |
| Body depth at anus               | 11.9–15.0      | $13.9 \pm 0.7$  | 15.1 - 19.8   | $16.9 \pm 1.4$  | 13.8–17.6             | $15.8 \pm 1.1$        |
| Occipital shield width (minimum) | 5.5 - 7.0      | $6.4{\pm}0.5$   | 3.9–5.4       | $4.6 \pm 0.4$   | 3.0-4.8               | $3.8 {\pm} 0.4$       |
| Prepectoral length               | 27.4–30.1      | $28.9 \pm 0.7$  | 26.0-29.1     | $27.8 \pm 0.9$  | 27.9–32.0             | $29.7 \pm 1.1$        |
| Predorsal length                 | 38.0-42.5      | $40.3 \pm 1.2$  | 36.4-40.6     | $38.5 \pm 1.2$  | 38.4-43.0             | $40.7 \pm 1.4$        |
| Prepelvic length                 | 55.0-60.2      | $57.4{\pm}1.4$  | 53.8-61.4     | 57.2±1.7        | 55.9-63.2             | 58.1±2.0              |
| Preanal length                   | 68.6-74.4      | 70.9±1.5        | 66.8–72.3     | $69.7 \pm 1.8$  | 68.9-76.3             | $7.1 \pm 1.8$         |
| Eye diameter (horizontal)        | 3.4-4.5        | $3.8 \pm 1.1$   | 3.8-5.5       | $4.2 \pm 0.5$   | 3.8 - 5.1             | $4.4 \pm 0.3$         |
| Orbital interspace               | 7.3-8.6        | $8.0{\pm}0.4$   | 6.3–7.9       | 7.0±0.5         | 5.5-7.8               | 7.0±0.6               |
| Snout length                     | 15.7 - 20.5    | $18.4{\pm}1.2$  | 16.9 - 18.6   | $17.9 \pm 0.5$  | 18.0-22.0             | $19.4{\pm}1.0$        |
| Premaxillary tooth-patch width   | 10.0 - 14.1    | $11.5 \pm 1.0$  | 10.2 - 14.0   | $12.3 \pm 1.1$  | 11.6–15.1             | $12.7 \pm 0.9$        |
| Premaxillary tooth-patch length  | 2.0 - 3.6      | $2.8 {\pm} 0.4$ | 2.1 - 2.9     | $2.5 \pm 0.3$   | 2.6-3.5               | $3.1 \pm 0.2$         |
| Mandibular tooth row width       | 1.9 - 2.6      | $2.2 \pm 0.2$   | 1.5 - 2.6     | $2.0 \pm 0.4$   | 1.6 - 2.6             | $1.9 \pm 0.3$         |
| Anterior nares interspace        | 3.6 - 5.1      | $4.4{\pm}0.4$   | 3.4-4.8       | $3.8{\pm}0.4$   | 3.8-5.4               | $4.5 \pm 0.4$         |
| Posterior nares interspace       | 3.1 - 4.3      | $3.7 \pm 0.4$   | 3.5-4.8       | $4.0 \pm 0.4$   | 3.8-5.1               | $4.4{\pm}0.3$         |
| Maxillary barbel length          | 7.5–11.9       | 9.5±1.3         | 7.8–11.5      | $9.4{\pm}0.9$   | 6.8 - 11.0            | $9.1 \pm 1.1$         |
| Medial mandibular barbel length  | 2.1 - 3.7      | $2.9 \pm 0.5$   | 2.0 - 3.3     | 2.7±0.4         | 1.5 - 3.3             | $2.7 \pm 0.5$         |
| Lateral mandibular barbel length | 3.4–5.0        | $4.1 {\pm} 0.4$ | 4.0 - 5.6     | $5.1 {\pm} 0.4$ | 3.2-5.9               | $4.4 {\pm} 0.6$       |
| Mouth width                      | 7.7 - 10.9     | $9.0{\pm}1.0$   | 7.1-8.9       | $8.0 {\pm} 0.6$ | 6.4 - 10.8            | $8.6{\pm}1.0$         |
| Oral disc width                  | 17.4–21.5      | $19.4{\pm}1.2$  | 14.9 - 20.4   | $17.6 \pm 1.3$  | 18.2–22.4             | $19.8 \pm 1.3$        |
| Oral disc length                 | 17.1 - 20.9    | $18.8 \pm 1.1$  | 13.4 - 16.1   | $14.9 \pm 0.8$  | 16.8–21.2             | $18.7 \pm 1.1$        |
| Upper lip length                 | 3.7 - 6.0      | $4.8 \pm 0.5$   | 3.0-4.0       | $3.6 {\pm} 0.3$ | 3.4-5.4               | $4.6 \pm 0.5$         |
| Lower lip length                 | 6.4–8.8        | 7.7±0.6         | 5.4-7.4       | $6.3 {\pm} 0.6$ | 6.4–7.8               | $7.1 {\pm} 0.4$       |
|                                  |                |                 |               |                 | <i>conti</i>          | nued on the next page |

TABLE 3. Morphometric measurements and meristic counts for Chiloglanis somereni, C. deckenii, and Chiloglanis sp. aff. deckenii. Standard length expressed in mm. All other measurements expressed in percent SL.

| TABLE 3. (Continued)                       |                     |                  |                   |                  |                            |                  |
|--|---------------------|------------------|-------------------|------------------|----------------------------|------------------|
| MORPHOMETRICS                              | Range               | Mean±%SD         | Range             | Mean±%SD         | Range                      | Mean±%SD         |
| Pectoral-spine length                      | 19.1 - 24.6         | $22.4{\pm}1.4$   | 12.9–23.1         | $20.2 \pm 2.6$   | 12.6–19.6                  | $17.1 \pm 1.8$   |
| Pectoral-fin length                        | 19.8 - 23.0         | $21.7 \pm 0.8$   | 16.5 - 23.7       | $21.2 \pm 2.0$   | 17.5-21.6                  | $19.3 \pm 1.3$   |
| Width at pectoral-fin insertion            | 22.3–25.3           | $23.5 \pm 0.7$   | 22.8–26.2         | $23.8 \pm 0.9$   | 22.4–26.7                  | $23.9{\pm}1.0$   |
| Length of postcleithral process            | 9.2–11.3            | $10.4{\pm}0.6$   | 8.8–11.5          | <b>9.9</b> ±0.9  | 6.8–9.6                    | $8.4{\pm}0.7$    |
| Pelvic-fin length                          | 11.5 - 14.6         | $12.9 \pm 0.8$   | 12.8 - 16.4       | $13.9{\pm}1.0$   | 11.7-15.3                  | $13.3 {\pm} 0.9$ |
| Depth at dorsal-fin insertion              | 15.8 - 19.0         | $17.5 \pm 1.0$   | 16.5 - 23.6       | $20.4 \pm 2.3$   | 16.3 - 20.9                | $18.4{\pm}1.3$   |
| Dorsal-spine length                        | 17.9 - 23.0         | $20.3 \pm 1.5$   | 13.2–22.2         | $17.9 \pm 2.7$   | 11.6–17.3                  | $13.8 {\pm} 1.5$ |
| Dorsal-fin length (longest ray)            | 17.2–22.4           | $19.4 \pm 1.3$   | 17.1–21.6         | $19.1 \pm 1.3$   | 13.2–18.6                  | $15.8 \pm 1.3$   |
| Dorsal-fin base length                     | 8.8 - 10.9          | $10.1 {\pm} 0.6$ | 9.1 - 10.3        | 9.7±0.4          | 8.0–11.2                   | 9.7±0.8          |
| Dorsal fin to adipose-fin length           | 14.7 - 24.0         | $18.5 \pm 2.1$   | 15.6 - 22.9       | $19.8 \pm 2.3$   | 17.8–25.3                  | $20.1 \pm 2.0$   |
| Adipose-fin base length                    | 18.9 - 27.6         | $22.4{\pm}1.9$   | 14.6 - 23.0       | $20.2 \pm 2.1$   | 16.2–22.8                  | $20.2 \pm 1.9$   |
| Adipose fin to caudal-ped length           | 10.7 - 14.3         | $12.2 \pm 1.0$   | 12.1 - 16.0       | $14.1 \pm 1.3$   | 10.4 - 15.4                | $11.9 \pm 1.4$   |
| Adipose-fin height                         | 3.1 - 4.4           | $3.6 {\pm} 0.3$  | 3.9–5.6           | $4.6{\pm}0.5$    | 3.2-5.6                    | $4.4{\pm}0.6$    |
| Anal-fin length (longest ray)              | 12.6–21.3           | $16.4{\pm}3.0$   | 11.8 - 19.0       | $15.3 \pm 2.1$   | 12.0 - 20.1                | $14.8 \pm 2.3$   |
| Anal-fin base length                       | 9.2–12.4            | $10.9 \pm 1.0$   | 9.1–13.5          | $11.0 \pm 1.1$   | 8.8–13.4                   | $11.3 \pm 1.0$   |
| Lower caudal-fin lobe length               | 23.1–27.5           | $25.2 \pm 1.3$   | 23.2 - 34.0       | <b>26.7±2.7</b>  | 24.4–34.4                  | 28.5±2.3         |
| Upper caudal-fin lobe length               | 21.8 - 26.1         | $23.8 \pm 1.2$   | 22.0–29.4         | $25.3 \pm 1.9$   | 22.6–30.6                  | $25.8 \pm 1.9$   |
| Fork Length                                | 13.4–15.9           | $14.7 {\pm} 0.7$ | 9.3–16.7          | $12.6 \pm 2.4$   | 10.4 - 16.2                | $13.9 \pm 1.5$   |
| Caudal-peduncle depth (maximum)            | 9.8 - 11.6          | $10.7 {\pm} 0.5$ | 10.8 - 13.2       | $12.0 \pm 0.7$   | 10.2 - 13.2                | $11.7{\pm}0.8$   |
| Caudal-peduncle length                     | 16.5–19.1           | $18.0 \pm 0.9$   | 16.6–21.2         | $19.1 \pm 1.3$   | 15.6–18.8                  | $16.6 \pm 1.2$   |
| MERESTICS                                  |                     |                  |                   |                  |                            |                  |
| Mandibular tooth rows                      | 1,2                 |                  | 1,2               |                  | 1,2                        |                  |
| Mandibular tooth count (total)             | 12–26               |                  | 6-16              |                  | 6–16                       |                  |
| Mandibular tooth ct. (functional ant. row) | 10 - 14             |                  | 1-8               |                  | 68                         |                  |
| Mandibular tooth ct.(post.replacement row) | 0 - 12              |                  | 08                |                  | 0-8                        |                  |
| Primary premaxillary teeth (total)         | 34–58               |                  | 30–68             |                  | 44–77                      |                  |
| Pectoral-fin count                         | I, 8(22)            |                  | I, 7(3); I, 8(1   | 1); I, 9 (1)     | I, 7(1); I, 8(19)          |                  |
| Pelvic-fin count                           | i, 6 (22)           |                  | i, 6 (15)         |                  | i, 6 (20)                  |                  |
| Dorsal-fin count                           | II, 5(2); II, 6(20  |                  | II, 4(1); II, 5(  | [14]             | II, 5(19); II, 6(1)        |                  |
| Anal-fin count                             | iii, 7(13); iii, 8( | (6               | iii, 7(2); iii, 8 | ((11); iii, 9(2) | iii, 6(1); iii, 7(7); iii, | 8(12)            |
| Caudal-fin count                           | i, 7, 8, i (22)     |                  | i, 7, 8, i (15)   |                  | i, 7, 8, i (20)            |                  |



**FIGURE 6.** Lateral and ventral views of *Chiloglanis deckenii* (A), TU 203003, Kenya, Coast Province, Lumi River at Taveta Township: and *Chiloglanis brevibarbis* (B), NMK FW/2732/1-5, Kenya, Eastern Province, Ragati River at Kwamora area off Sagana-Karatina Road. Scale bar equals 1 cm. Photographs by R.C. Schmidt.

## Chiloglanis brevibarbis Boulenger 1902

Described from the Tana River basin, *Chiloglanis brevibarbis* occurs throughout the Athi and Tana River basins in Central Kenya (Fig. 1). This species in found in a variety of habitat types, although it is usually associated with or near flowing water. Most commonly utilized habitats are rocks and small boulders in flowing water, this species is also found near woody debris or exposed roots along the river bank. In the Athi River at Kibwesi, 141 specimens were collected in emergent stands of vegetation in the middle of the sandy channel.

*Chiloglanis brevibarbis* is the only species of *Chiloglanis* throughout its range except in the Tsavo River and potentially in other streams of the middle Athi. In the Tsavo River this species is sympatric with an undescribed *Chiloglanis sp.* that is sister to *C. deckenii* from the Pangani River. *Chiloglanis brevibarbis* is distinguished from other Kenyan species in having fewer mandibular teeth, exposed length of mandibular teeth greater than row width, and in possessing 4–5 rows of well-developed premaxillary teeth in large ovoid tooth pads (Fig. 6). Morphological variation is observed between Athi and Tana River populations (Fig. 2, also noted in Whitehead 1958) though biotic dispersal events in the upper reaches of the drainages have likely contributed to admixture between the populations resulting in incomplete lineage sorting (Schmidt *et al.* 2014). Little is known of ecology and life history of this species. Morphometric measurements and meristic counts of *C. brevibarbis* populations are found in Table 4.



FIGURE 7. Lateral and ventral views of *Chiloglanis somereni*, TU 203006, Kenya, Nyanza Province, Riana River, Konyango area at bridge along Homa Bay-Rongo Road. Scale bar equals 1 cm. Photographs by R.C. Schmidt.

## Chiloglanis somereni Whitehead 1958

*Chiloglanis somereni*, described from the Nyanza Province, occurs in Kenyan rivers and streams that flow into Lake Victoria (Fig. 1). The species is also found within the Lake Victoria affluents in Tanzania, the Malagarasi River, and may also occur within western Lake Victoria affluents (Seegers 2008). This species was collected in large numbers in the Riani River (affluent to the Kuja River) in the swift flowing water over rocks and small boulders.

|                                  | C. brevibarbis <sup>-</sup> | Tana R. (N=20)   | C. brevibarbis A | thi R. (N=15)   | C. brevibarbis T | savo R. (N=22)     |
|----------------------------------|-----------------------------|------------------|------------------|-----------------|------------------|--------------------|
| MORPHOMETRICS                    | Range                       | Mean±%SD         | Range            | Mean±%SD        | Range            | Mean±%SD           |
| Standard length (mm)             | 35.1-61.8                   |                  | 31.9-49.0        |                 | 34.1-57.3        |                    |
| Head length                      | 29.7-34.3                   | $32.0 \pm 1.4$   | 26.6-33.4        | $30.1{\pm}1.8$  | 27.5-33.2        | $31.1 \pm 1.5$     |
| Head depth (maximum)             | 14.2-18.7                   | $16.1 \pm 1.3$   | 12.3-17.4        | $14.6 \pm 1.4$  | 14.8-18.6        | $16.0 \pm 0.9$     |
| Body depth at anus               | 12.6-15.6                   | $14.1 {\pm} 0.8$ | 9.5-14.1         | $12.4{\pm}1.2$  | 14.2-18.4        | $15.5 \pm 0.9$     |
| Occipital shield width (minimum) | 3.2-4.4                     | $3.9 \pm 0.3$    | 3.3-4.1          | $3.8 {\pm} 0.2$ | 3.3-4.2          | $3.8{\pm}0.3$      |
| Prepectoral length               | 28.4-35.4                   | $31.4{\pm}1.4$   | 28.0-32.1        | $30.4{\pm}1.1$  | 28.1-31.6        | $30.1{\pm}1.1$     |
| Predorsal length                 | 40.0-43.4                   | $41.7 \pm 1.0$   | 37.5-42.0        | $39.8{\pm}1.3$  | 40.0-43.3        | $31.3{\pm}1.0$     |
| Prepelvic length                 | 56.8-62.1                   | 59.7±1.4         | 56.4-61.8        | 58.3±1.5        | 55.3-62.3        | 58.2±1.8           |
| Preanal length                   | 67.0-74.6                   | 71.2-2.0         | 69.8-75.9        | $72.0 \pm 1.9$  | 69.0-75.0        | $71.9 \pm 1.7$     |
| Eye diameter (horizontal)        | 3.9-5.2                     | $4.6 \pm 0.3$    | 4.2-5.3          | 4.7±0.3         | 4.0-5.1          | $4.5 \pm 0.3$      |
| Orbital interspace               | 6.3-7.9                     | 7.3±0.5          | 6.3-7.5          | 6.8-0.3         | 5.6-7.8          | 7.0±0.6            |
| Snout length                     | 19.0-23.4                   | $20.7 \pm 1.2$   | 17.3-21.5        | $19.1 \pm 1.1$  | 18.3-21.5        | $19.9 {\pm} 0.8$   |
| Premaxillary tooth-patch width   | 11.3-16.0                   | $13.1 \pm 1.4$   | 10.1-13.2        | $11.8 \pm 0.8$  | 10.6-16.7        | $12.4{\pm}1.2$     |
| Premaxillary tooth-patch length  | 2.4-3.3                     | $3.0 \pm 0.2$    | 2.6-3.4          | $2.9 \pm 0.3$   | 2.9-4.0          | $3.2 \pm 0.3$      |
| Mandibular tooth row width       | 1.5-2.9                     | $2.0 \pm 0.4$    | 1.6-2.4          | $2.0 \pm 0.3$   | 1.4-2.4          | $1.9 \pm 0.3$      |
| Anterior nares interspace        | 3.9-5.1                     | $4.5 \pm 0.4$    | 3.5-4.9          | $4.3 \pm 0.4$   | 3.8-5.8          | $4.6 \pm 0.4$      |
| Posterior nares interspace       | 3.9-5.3                     | $4.4{\pm}0.4$    | 3.5-5.0          | $4.3 \pm 0.4$   | 3.9-5.1          | $4.6 \pm 0.3$      |
| Maxillary barbel length          | 6.3-7.9                     | $7.0 \pm 0.4$    | 7.5-10.3         | $8.6 {\pm} 0.8$ | 7.1-9.9          | 8.3±0.7            |
| Medial mandibular barbel length  | 0.7-3.0                     | $2.1 {\pm} 0.5$  | 2.0-3.1          | $2.5 \pm 0.3$   | 1.8-3.3          | <b>2.4</b> ±0.4    |
| Lateral mandibular barbel length | 1.6-4.0                     | $3.4{\pm}0.6$    | 3.3-4.4          | $3.8 {\pm} 0.4$ | 3.3-5.0          | $4.0{\pm}0.4$      |
| Mouth width                      | 8.0-10.3                    | $9.1 {\pm} 0.5$  | 7.3-8.9          | $8.2 {\pm} 0.4$ | 7.0-10.1         | 8.3±0.7            |
| Oral disc width                  | 17.6-21.9                   | $19.6 \pm 1.2$   | 16.2-19.7        | $17.5 \pm 1.0$  | 17.7-22.4        | $19.5 \pm 1.2$     |
| Oral disc length                 | 16.5-21.2                   | $18.7 \pm 1.2$   | 15.8-18.9        | $17.4 \pm 0.9$  | 17.3-21.8        | $19.2 \pm 1.2$     |
| Upper lip length                 | 3.8-5.4                     | $4.4{\pm}0.4$    | 3.5-5.0          | $4.1 {\pm} 0.5$ | 4.0-5.8          | 4.7±0.5            |
| Lower lip length                 | 6.3-8.2                     | 7.3±0.5          | 5.6-7.1          | $6.5 {\pm} 0.5$ | 6.3-8.0          | 7.2±0.4            |
|                                  |                             |                  |                  |                 | continue         | d on the next page |

TABLE 4. Morphometric measurements and meristic counts for Chiloglanis brevibarbis. Standard length expressed in mm. All other measurements expressed in percent SL.

| <b>TABLE 4.</b> (continued)                      |                     |                  |                       |                |                      |                |
|--|---------------------|------------------|-----------------------|----------------|----------------------|----------------|
| MORPHOMETRICS                                    | Range               | Mean±%SD         | Range                 | Mean±%SD       | Range                | Mean±%SD       |
| Pectoral-spine length                            | 18.6-24.6           | $21.3 \pm 1.6$   | 17.0-21.9             | $19.5 \pm 1.3$ | 13.9-20.7            | $17.5 \pm 1.7$ |
| Pectoral-fin length                              | 20.1-24.2           | $22.5 \pm 1.2$   | 18.7-22.8             | $20.6 \pm 1.4$ | 17.9-23.1            | $19.4{\pm}1.2$ |
| Width at pectoral-fin insertion                  | 23.9-26.9           | $25.4 \pm 0.9$   | 21.5-25.6             | $23.8 \pm 1.1$ | 22.2-26.1            | $24.0 \pm 1.1$ |
| Length of postcleithral process                  | 8.3-10.6            | <b>9.4</b> ±0.7  | 7.0-9.5               | $8.4{\pm}0.7$  | 7.6-12.4             | $9.0{\pm}1.0$  |
| Pelvic-fin length                                | 11.9-14.9           | $13.0 \pm 0.8$   | 11.1-13.9             | $12.3 \pm 0.8$ | 11.2-15.1            | $12.9 \pm 0.9$ |
| Depth at dorsal-fin insertion                    | 14.9-20.1           | $17.4 \pm 1.6$   | 12.6-18.6             | $15.3 \pm 1.6$ | 15.5-22.1            | $18.2 \pm 1.7$ |
| Dorsal-spine length                              | 13.7-21.3           | $16.5 \pm 2.0$   | 12.2-16.7             | $14.7 \pm 1.1$ | 11.4-20.2            | $14.4{\pm}2.0$ |
| Dorsal-fin length (longest ray)                  | 15.3-20.4           | $17.3 \pm 1.4$   | 15.2-18.6             | $16.8 \pm 0.9$ | 13.9-19.5            | $16.3 \pm 1.5$ |
| Dorsal-fin base length                           | 8.4-12.0            | $9.9{\pm}1.0$    | 7.2-11.9              | $9.6{\pm}1.0$  | 8.4-11.1             | 9.5±0.7        |
| Dorsal fin to adipose-fin length                 | 17.9-25.4           | $21.5 \pm 2.0$   | 16.9-23.8             | $20.9 \pm 2.2$ | 15.5-26.0            | $20.9 \pm 2.6$ |
| Adipose-fin base length                          | 13.7-18.5           | $16.3 \pm 1.4$   | 15.0-23.0             | $18.3 \pm 2.0$ | 15.9-22.5            | $19.9 \pm 1.9$ |
| Adipose fin to caudal-ped length                 | 9.9-14.1            | $11.7 \pm 1.2$   | 10.1-13.6             | $12.2 \pm 1.0$ | 9.6-14.2             | $11.5 \pm 1.0$ |
| Adipose-fin height                               | 2.8-4.2             | $3.6 \pm 0.4$    | 3.7-4.9               | $4.3 \pm 0.4$  | 3.6-5.1              | $4.3 \pm 0.4$  |
| Anal-fin length (longest ray)                    | 11.8-17.4           | $14.9 \pm 1.7$   | 11.7-17.9             | $13.8 \pm 1.7$ | 12.5-17.3            | $14.6 \pm 1.3$ |
| Anal-fin base length                             | 7.5-12.6            | $11.0 \pm 1.3$   | 9.4-12.8              | $11.0{\pm}1.0$ | 9.7-13.2             | $11.7{\pm}1.0$ |
| Lower caudal-fin lobe length                     | 26.8-33.7           | $30.1{\pm}1.8$   | 27.2-33.1             | $30.4{\pm}1.8$ | 27.2-32.1            | $29.2 \pm 1.5$ |
| Upper caudal-fin lobe length                     | 25.8-31.3           | $28.1 \pm 1.6$   | 24.3-29.8             | $27.9{\pm}1.7$ | 23.8-30.6            | $26.7 \pm 1.6$ |
| Fork Length                                      | 11.8-15.3           | $13.6 \pm 1.0$   | 12.5-16.7             | $14.4{\pm}1.1$ | 12.4-17.0            | $14.5 \pm 1.2$ |
| Caudal-peduncle depth (maximum)                  | 8.9-11.7            | $10.1 {\pm} 0.7$ | 10.1-11.8             | $11.0 \pm 0.6$ | 10.2-12.6            | $11.5 \pm 0.6$ |
| Caudal-peduncle length                           | 13.6-18.5           | $15.4 \pm 1.3$   | 14.1-18.1             | $15.9 \pm 0.3$ | 14.8 - 18.4          | $16.0{\pm}1.0$ |
| Meristics  |                     |                  |                       |                |                      |                |
| Mandibular tooth rows                            | 1,2                 |                  | 1,2                   |                | 1,2                  |                |
| Mandibular tooth count (total)                   | 6-15                |                  | 6-16                  |                | 7-18                 |                |
| Mandibular tooth count (functional anterior row) | 5-8                 |                  | 6-8                   |                | 6-9                  |                |
| Mandibular tooth count (post. replacement row)   | 6-0                 |                  | 0-8                   |                | 6-0                  |                |
| Primary premaxillary teeth (total)               | 51-75               |                  | 55-90                 |                | 44-112               |                |
| Pectoral-fin count                               | I, 7(2); I, 8(17)   | I, 9(1)          | I, 7(2); I, 8(13)     |                | I, 7(2); I, 8(20)    |                |
| Pelvic-fin count                                 | i,6 (20)            |                  | i, 6 (15)             |                | i, 6 (22)            |                |
| Dorsal-fin count                                 | П, 5(19); П, 6(1    | (                | II, 4(2); II, 5(13)   |                | II, 5 (22)           |                |
| Anal-fin count                                   | iii, 7(12); iii, 8( | 9); iii, 9(1)    | iii, 7(10); iii, 8(5) |                | iii, 7(4); iii, 8(12 | ); iii, 9(5)   |
| Caudal-fin count                                 | i, 7, 8, i (20)     |                  | i, 7, 8, i (15)       |                | i, 7, 8, i (22)      |                |

*Chiloglanis somereni* is allopatrically distributed and readily distinguished from other Kenyan suckermouth catfishes. It is a sexually dimorphic species, with males displaying elongated rays in the anal fin (Fig. 7). This species has more mandibular teeth (10–12 in functional row) than all other Kenyan species except *C. devosi* and has longer pectoral and dorsal spines than *C. devosi*. It is one of the larger suckermouth catfishes found in Kenya with a maximum reported size of 68 mm SL. Whitehead (1958) provided a few comments on reproductive biology, but little else is known of the ecology and life history of *C. somereni*. Morphometric measurements and meristic counts of Kenyan *C. somereni* are found in Table 3.

## Additional material examined

Chiloglanis brevibarbis: TU 203004, 20 ALC, 31.8-49.0 mm SL; Kenya, Eastern Province, Athi River at Kibwezi—Kitui Road bridge, 02.20419° S, 38.05883° E; 2012 IRES team, 20 June 2012.—CUMV 98651, 10 ALC, 34.2-45.3 mm SL; collection data same as TU 203004. NMK FW/2732/1-5, 5 ALC, 50.3-61.8 mm SL; Kenya, Eastern Province, Ragati River at Kwamora area off Sagana-Karatina Road, 00.58778° S, 37.19130° E; 2012 IRES team, 15 June 2012.—TU 202993, 22 ALC, 35.1–45.9 mm SL; Kenya, Eastern Province, Murera River outside Meru National Park, 00.27413° N, 38.12201° E; 2012 IRES team, 13 June 2012.-TU 203005, 9 ALC, 33.1-47.8 mm SL; Kenya, Coast Province, Tsavo River at Mombasa Road Bridge, 02.99466° S, 38.46074° E; 2012 IRES team, 20 June 2012.—NMK FW/2756/1-20, 11 ALC, 33.2-57.3 mm SL; tissue voucher: IRES 10184; collection data same as TU 203005.-NMK FW/559/1, 1 ALC, 40.9 mm SL; Kenya, Coast Province, Tsavo River at Ziwani gate.-BMNH 1902.5.26.19, photograph of ALC holotype, Kenya, Mathioya River.-Chiloglanis deckenii: TU 203003, 20 ALC, 28.0-62.2 mm SL; Kenya, Coast Province, Lumi River at Taveta Township, 03.38950° S, 37.70597° E; 2012 IRES team, 19 June 2012.— ZMB 16387, photographs of 16 ALC syntypes, Tanzania, Africa orientalis.--Chiloglanis somereni: TU 203006, 20 ALC, 42.6-68.0 mm SL; Kenya, Nyanza Province, Riana River, Konyango area at bridge along Homa Bay-Rongo Road 00.70492° S, 34.84426° E; 2011 IRES team, 30 June 2011.-CUMV 98650, 5 ALC, 42.8-60.8 mm SL; collection data same as TU 203006.-NMK FW/527/1-7, 7 ALC, 44.7-52.0 mm SL; Kenya, Nyanza Province, Runyerere River (affluent to Yala River).-BMNH 1958.7.18.1, photograph of ALC holotype, Kenya, Nyanza Province, Waroya River.-Chiloglanis sp. aff. deckenii: NMK FW/558/1, 1 ALC, 44.0 mm SL; Kenya, Coast Province, Tsavo River at Ziwani gate.—TU 204097, 11 ALC, 35.9–46.2 mm SL; Kenya, Coast Province, Tsavo River at Mombasa Road Bridge, 02.99466° S, 38.46074° E; 2012 IRES team, 20 June 2012.—NMK FW/3960/1-9, 9 ALC, 33.1-47.8 mm SL; collection data same as TU Cat 203005.

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