A new species of *Petrochromis* (Perciformes: Cichlidae) from Lake Tanganyika

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Based on morphological and molecular analyses of a *Petrochromis* fish (Cichlidae) from the southern end of Lake Tanganyika, this fish is considered a taxonomic species distinct from the six known congeners. A new scientific name is proposed for this fish. A key to the seven *Petrochromis* species is included.

Key words Taxonomy · Morphology · mtDNA phylogeny · Description of a new species · Key to species

Introduction

Lake Tanganyika in the East African Rift Valley (Fig. 1) harbours morphologically, ecologically, and genetically exceptionally diverse cichlid species assemblage. About 200 cichlid species have been described so far for Lake Tanganyika (Koblmüller et al. 2008a), and new species are still being discovered (e.g., Takahashi and Hori 2006; Schelly et al. 2007; Verburg and Bills 2007; Takahashi 2008; Burgess 2012; Kullander et al. 2012), such that the total number of species may reach 250 (Snoeks 2000). Most of these species are endemic to the lake and this cichlid radiation most likely originated via intra-lacustrine speciation after the lake was established 9–12 million years ago (Cohen et al. 1993; Koblmüller et al. 2008a). Due to this high diversity and rapid cladogenesis, these fish are important model systems for studying the factors and processes underlying adaptive radiation (e.g., Fryer and Iles 1972; Kornfield and Smith 2000; Turner et al. 2001; Kocher 2004; Seehausen 2006; Turner 2007; Koblmüller et al. 2008a; Salzburger 2009; Sturmbauer et al. 2011; Takahashi and Koblmüller 2011; Gante and Salzburger 2012).

Tropheini Poll 1986 is one of the most species-rich cichlid tribes endemic to the lake. In this tribe, 23 mouth-brooding species are currently considered valid and belong to seven genera (genus allocation for two species is not resolved, Takahashi 2003). Molecular phylogenetic studies indicate that this tribe forms a monophyletic group within the so-called "modern haplochromines", sister to the extremely species-rich lineage that includes the species flocks of Lake Malawi and the Lake Victoria region as well as numerous riverine taxa (Salzburger et al. 2005; Koblmüller et al. 2008b). *Petrochromis* Boulenger 1898 is a genus belonging to this tribe (Poll 1986; Takahashi 2003). This genus is morphologically defined by having a brush-like tooth plate on each jaw (Poll 1986), which allows the fish to comb unicellular algae from filamentous algae on rocks (Yamaoka 1983a). These tooth plates are composed of tricuspid teeth arranged in irregular rows, and the shape of the outer teeth does not differ from the inner teeth (e.g., Poll 1956: figs. 18, 20), whereas in the other species of the tribe Tropheini, the outer teeth are clearly different from the inner teeth. They are bicuspid in many species, are larger than the inner teeth, and are arranged in a single regular row (e.g., Poll 1956: figs. 10, 17). The fishes of the genus *Petrochromis* inhabit the rocky littoral zone where they represent one of the dominant cichlid genera (Sturmbauer et al. 2008; Takeuchi et al. 2010; van Steenberge et al. 2011); sandy bottom between rocky habitats restricts migration and gene flow in these fishes (Wagner and McCune 2009; Wagner et al. 2012). Thus, their habitat fragmentation and allopatric diversification resulted in numerous local colour variants (e.g., Kohda et al. 1996; Konings 1998). Six taxonomic species are currently considered valid in this genus (Yamaoka 1983b; Poll 1986; Maréchal and Poll 1991): *P. famula* Matthes and Trewavas 1960, *P. fasciolatus* Boulenger 1914, *P. macrognathus* Yamaoka 1983b, *P. orthognathus* Matthes 1959, *P. polyodon* Boulenger 1898, and *P. trewavasae* Poll 1948. Although molecular phylogenies based on mitochondrial DNA (mtDNA) sequences and amplified fragment length polymorphism (AFLP) of nuclear DNA question the monophyly of this genus (Sturmbauer et al. 2003; Koblmüller et al. 2010), this study uses this conventional taxonomic classification.

During his survey at the southern end of Lake Tanganyika, M. Hori of Kyoto University found an undescribed *Petrochromis* fish that was similar to *P. fasciolatus* in body coloration and stripe pattern (Fig. 2) but did not have a protruding lower jaw that characterises *P. fasciolatus* (Yamaoka 1983b). This fish was first recorded in 1996 and has been called *Petrochromis* sp. ("rotundus") (Takeuchi et al. 2010). The present study conducted morphological and molecular analyses and compared the undescribed fish with the six known *Petrochromis* species to infer whether this fish is indeed a distinct taxonomic species.

Materials and methods

Specimens of the undescribed fish. M. Hori collected twelve individuals of the undescribed fish at Kasenga, Zambia (Fig. 1) by chasing the fish into a screen net while SCUBA diving. For molecular analyses, the right pectoral fin was fixed in 100% ethyl alcohol in nine of the twelve individuals. The bodies of all the individuals were fixed in 10% formalin and thereafter preserved in 70–75% ethyl alcohol for morphological analyses.

Comparative materials for morphological analyses. For comparison, 130 specimens including name-bearing types (i.e., holotypes and syntypes) of the six described *Petrochromis* species were examined (Tables 1, S1).

Brichard (1989) divided *P. trewavasae* into two subspecies based on differences in body colouration and caudal-fin shape and described one of the subspecies as *Petrochromis trewavasae ephippium* Brichard 1989. No type specimens have been designated for *P. t. ephippium*. Konings (1998) reported another *P. trewavasae*-like fish, *Petrochromis* sp. "Moshi Yellow". These three fishes show different geographical distributions with overlaps at a few localities; *Petrochromis trewavasae trewavasae* is restricted to the southern region of the west coast of the lake, *Petrochromis* sp. "Moshi Yellow" is found at several localities on the east coast, and *P. t. ephippium* is distributed over the other coastal regions (Konings 1998). As the taxonomic status of these fish is still unclear, the present study treats these fish as a single operational taxonomic unit, *P. trewavasae*, though these fish probably includes some distinct species [Koblmüller et al. 2010; J. Snoeks of MRAC (Royal Museum for Central Africa, Tervuren, Belgium) personal communication; SK personal observation]. The present sample for morphological analyses includes three individuals that are considered (as judged from their sampling locations) *P. t. trewavasae*, 17 individuals that are considered *P. t. ephippium*, and two individuals that are considered *Petrochromis* sp. "Moshi Yellow".

Some phenotypic variants are known in the *P. polyodon* species-complex (e.g., Koblmüller et al. 2010; Wagner et al. 2012). Although paraphyletic in a mtDNA-phylogeny, this species-complex forms a well-supported monophyletic group based on nuclear multi-locus (AFLP) data (Koblmüller et al. 2010). As the taxonomic status of these fishes is still unresolved, the present study treats this species-complex as a single operational taxonomic unit, *P. polyodon*, though it clearly represents a complex of several distinct, partially sympatric species (Koblmüller et al. 2010; Wagner et al. 2012).

Konings (1998) reported a local variant of *P. orthognathus* from the east coast between Luagala Point and Cape Mpimbwe and called it *Petrochromis* sp. "orthognathus ikola". Molecular phylogenies based on AFLP and mtDNA strongly support the monophyly of a clade containing *P. orthognathus* and *Petrochromis* sp. "orthognathus ikola" (Koblmüller et al. 2010). As the taxonomic status of *Petrochromis* sp. "orthognathus ikola" is still unresolved, the present study treats these individuals as a single operational taxonomic unit, *P. orthognathus*. The present morphological analysis includes 20 individuals that are considered (as judged from their sampling locations) *P. orthognathus* and six individuals that are considered *Petrochromis* sp. "orthognathus ikola".

Interochromis loocki (Poll 1949) is known among aquarists as *Petrochromis* sp. "orthognathus tricolor", reflecting its similarities in general appearance to *P. orthognathus* (Konings 1998). However, this species does not meet the morphological definition of *Petrochromis*; for example, the outer teeth on jaws are bicuspid in *I. loocki*, whereas tricuspid in *Petrochromis*. Therefore, this species is not a member of the morphologically defined genus *Petrochromis*, and the present study did not include this species in morphological analyses.

Morphological data. Sixteen morphometric characters [standard length (SL), body depth, head length, length and depth of caudal peduncle, lengths of dorsal-fin and anal-fin bases, lengths of pectoral, pelvic, and caudal fins, head width, snout length, eye length, interorbital width, lower-jaw length, and upper-jaw protrusion] and 10 meristic characters (spines and soft rays in dorsal fin, spines and soft rays in anal fin, soft rays in pectoral fin, scales in longitudinal line, scales on upper and lower lateral lines, scale rows between lateral lines, and gill rakers on the first ceratobranchial) were examined in all individuals, and four morphometric characters on the lower pharyngeal jaw (length and width of lower pharyngeal jaw, and length and width of dentigerous area on the lower pharyngeal jaw) were measured in one individual of the undescribed fish (MRAC B3-03-P-05). The methods used to measure and count these characters correspond with those of Snoeks (2004) with the following exceptions. Lengths of the pectoral and pelvic fins were measured from the base to the tip of the longest ray in each fin. Length of the caudal fin was measured from the base to the tip of the longest soft ray in the upper lobe, which was the second, third or fourth branched soft ray from the upper. The base of the soft ray is on a skinfold resulting from lateral bending of the caudal fin. Protrusion of the upper jaw is the horizontal distance between the anterior tips of the upper and lower jaws when the mouth was closed completely, or closed to the hypothetical normal position in species that cannot close the mouth completely. The anterior tips of jaws are on the lip-tissues. When the lip-tissues have been fixed in unnatural shape, the upper-jaw protrusion was measured between hypothetical points if the lip-tissues would have been in natural shape. A positive value indicates that the upper jaw protrudes anterior to the lower jaw and a negative value indicates that the lower jaw protrudes anterior to the upper jaw. Scale rows between lateral lines were counted at the anterior end of the lower lateral line. Paired characters except for gill rakers were measured or counted on the left side of the body unless these were broken. Gill rakers were counted on the right side. Although counted in many taxonomic studies of cichlid fish, the outer teeth on the upper jaw were not counted in the present study, as they are difficult to count correctly; these teeth were irregularly arranged and not distinguishable from the inner teeth in *Petrochromis*. The last two soft rays of the dorsal and anal fins were counted as two soft rays, although these are sometimes counted as one soft ray in non-cichlid fishes (e.g., Hubbs and Lagler 2004). The numbers of spines and soft rays in a fin were indicated by Roman and Arabic numerals, respectively.

Measurements were taken to the nearest 0.1 mm using dividers or digital callipers except for the lower pharyngeal jaw, of which measurements were taken to the nearest 0.01 mm using a digital microscope (KEYENCE VHX-100).

Statistical analyses of morphological data. Fifteen morphometric characters and eight meristic characters were used for statistical analyses. The SL was used as covariate. The four morphometric characters on the lower pharyngeal jaw, the number of spines on anal fin, and the number of scale rows between lateral lines were not used for statistic analyses, as these were measured only in one individual or were invariable.

Three analyses were conducted to test differences between the undescribed fish and each of the six known *Petrochromis* species and between sexes; those were a multivariate analysis of covariance (MANCOVA) with $\log_{10}$-transformed SL as a covariate on 14 $\log_{10}$-transformed morphometric characters except for upper jaw protrusion, an analysis of covariance (ANCOVA) with SL as a covariate on the upper jaw protrusion, of which the raw data were analysed, as it can be zero or negative, and a multivariate analysis of variance (MANOVA) for the eight meristic characters. Critical significance levels were corrected following the Bonferroni procedure.

Phylogeny of mtDNA sequences. Koblmüller et al. (2010) inferred the phylogeny of the Tropheini based on mtDNA sequence data, including the NADH dehydrogenase subunit 2 gene (ND2, 1047 bp) and control region (CR, 962 bp; excluding the poly-T region). To infer the phylogenetic position of the undescribed *Petrochromis* fish, we added mtDNA sequence data of this fish to the data matrix of Koblmüller et al. (2010) [*N* = 9, MRAC B3-03-P-04 to B3-03-P-07 and BMNH (The Natural History Museum, London, UK) 2013.2.13.1 to 2013.2.13.5]. We also included mtDNA sequence data of *P. macrognathus*, which has not been included in the phylogenetic analysis of Koblmüller et al. (2010) [*N* = 6, Zm (private collection of M. Hori) 02170, 02573, 02574, 02578, 02579, 03532, collected at Kasenga, Zambia]. *Petrochromis polyodon*, *P. cf. polyodon*, *P.* sp. "macrognathus rainbow", and *P.* sp. "Texas Longola" of Koblmüller et al. (2010) were treated as *P. polyodon*, and *P. trewavasae*, *P. t. ephippium*, and *Petrochromis* sp. "Moshi yellow" were treated as *P. trewavasae* (see above). This phylogenetic analysis includes the undescribed fish of *Petrochromis*, all the six described congeners, and two unidentified fishes; namely, *Petrochromis* sp. "Katete" and *P. cf. macrognathus* (*sensu* Koblmüller et al. 2010). Details for the samples used in the phylogenetic analysis are in Table S2.

Total DNA was extracted from right pectoral fin using AquaPure Genomic DNA Kit

(Bio-Rad). Polymerase chain reaction was conducted using a GeneAmp PCR System 9700 (Applied Biosystems) with the following programme: one cycle of 94 ºC for 2 min., and 32 cycles of 94 ºC for 15 s, 55ºC for 30 s, 72 ºC for 2 min. The ND2 region was amplified with the primers MET (Duftner et al. 2005) and TRP (Kocher et al. 1995), and sequenced using these primers and the internal primers ND2.T-R and ND2.2A (Duftner et al. 2005). The CR was amplified with the primers L-Pro-F_Tropheus (Koblmüller et al. 2011) and TDK-DHG (primer G in Lee et al. 1995), and sequenced using these primers and the internal primers TDK-D (primer E in Lee et al. 1995) and SC-DL (Salzburger et al. 2002). The PCR fragments were purified using PEG and directly sequenced with the BigDye sequencing chemistry (Applied Biosystems) using an ABI 3130xl sequencer (Applied Biosystems). DNA sequences were aligned by eye using MEGA4 software (Tamura et al. 2007). Sequences are available in the DNA Data Bank of Japan (DDBJ Accession no. AB850665–AB850679 for ND2, AB850680–AB850694 for CR).

Phylogenetic tree construction. Phylogenetic inference based on maximum-likelihood (ML) was done in Treefinder version October 2008 (Jobb et al. 2004). Shotgun search was repeated until the likelihood value was not improved. Statistical support was assessed by bootstrapping (100 pseudo-replicates). The best-fit model of molecular evolution for each region was selected under the Akaike Information Criterion (AIC) by Kakusan4 (Tanabe 2011). The transition model (TIM) with gamma distribution (+ G) was selected for the first and second codon positions of the ND2 region, and the J2 model + G for the third position. The general time reversible model (GTR) + G was selected for the CR. Bayesian phylogenetic analysis was conducted using MrBayes version 3.2 (Ronquist and Huelsenbeck 2003). Data were partitioned by gene, and additionally by codon position within ND2. Rate heterogeneity was set according to a gamma distribution with six rate categories (GTR model) for each data partition, which was selected under the AIC by Kakusan4. Posterior probabilities were obtained from MCMC simulations (5 million generations; trees sampled every 100 generations). The first 2000 trees were discarded as burn-in to obtain 50% majority consensus topology. Chain stationarity was checked using Tracer version 1.5 (Rambaut and Drummond 2009).

Results

Morphological analyses. Raw morphometric and meristic data for the undescribed fish and the six known *Petrochromis* species are available in Table S1. The ranges of some characters did not or little overlap between the undescribed fish and the known species (Table 2).

The MANCOVAs on 14 $\log_{10}$-transformed morphometric characters showed significant differences between the undescribed fish and five known *Petrochromis* species except for *P. polyodon* (Table 3). *Petrochromis polyodon* was not significantly different from the undescribed fish in these characters after a Bonferroni correction, but the *P*-value was rather small (0.0096). The range of upper-jaw protrusion of the undescribed fish did not overlap with those of *P. fasciolatus*, *P. macrognathus*, *P. polyodon*, and *P. trewavasae* (Table 2), and these differences were statistically significant (Table 3). The MANOVAs on eight meristic characters showed significant differences between the undescribed fish and five known species except for *P. fasciolatus* (Table 3). Sexual differences were not significant in these analyses.

Phylogenetic analysis of mtDNA sequences. Except for some nodes with bootstrap support (BS) lower than 70 of the ML tree, the ML and Bayesian tree topologies were identical (Fig. 3). Both analyses resolved the undescribed fish as a monophyletic group (BS of 100), sister to *Petrochromis* sp. "Katete" (BS of 100), which together represent a rather distinct clade of the genus *Petrochromis*. *Petrochromis macrognathus* resulted as monophyletic and was placed in a lineage containing the polyphyletic species *P. polyodon* and *P. trewavasae*. The other parts of the trees were identical with the mtDNA tree of Koblmüller et al. (2010) except for nodes with low bootstrap support; i.e. the monophyly of each species and *Tropheus* species complex was recovered with high bootstrap support with exception of *P. polyodon* and *P. trewavasae*. All polytypic genera (*Petrochromis*, *Simochromis* Boulenger 1898, and *Tropheus* Boulenger 1898) resulted as polyphyletic.

Discussion

Taxonomy. The undescribed fish was clearly distinct from the six described species of the genus *Petrochromis* in several morphological characters with no or less overlaps (Table 2).

These morphological differences were statistically significant (Table 3). The ML and Bayesian trees based on mtDNA sequences showed a clear separation of the undescribed fish from the six congeners (Fig. 3). Thus, both morphological and molecular data support the hypothesis that the undescribed fish represents a distinct taxonomic species rather than a variant of a described species of *Petrochromis*.

Habitat use. The undescribed fish occurs sympatrically with five known species of *Petrochromis* except for *P. orthognathus* at Kasenga (i.e., *P. famula*, *P. fasciolatus*, *P. macrognathus*, *P. polyodon*, and *P. trewavasae*). The undescribed fish is usually found on rocks at 13–15 m depth (main habitat of this fish may be deeper than this area). The five sympatric congeners mainly dwell in shallower areas, and their densities are much lower in the deep-water areas where the undescribed fish occurs [present study; appendix S2 of Takeuchi et al. (2010), which called the undescribed fish *Petrochromis* sp. ("rotundus")]. The undescribed fish may reduce congeneric competition for resources such as food by exploiting this deep habitat.

Phylogenetic considerations. Although phylogenetic inference of Lake Tanganyika's cichlids, including the Tropheini, based on mtDNA data has been repeatedly shown to be heavily impacted by (ancient) incomplete lineage sorting and (ancient) hybridisation/introgression (e.g., Rüber et al. 2001; Koblmüller et al. 2007ab, 2010; Sturmbauer et al. 2010), mtDNA data do provide important information on phylogenetic relationships between species. The close phylogenetic relationship of the undescribed

Petrochromis species with *P.* sp. "Katete" might indicate that these two taxa are conspecific. Unfortunately, no voucher specimen is available for *P*. sp. "Katete", but it resembles the undescribed fish in its overall appearance (SK personal observation). Similarly, *Petrochromis* sp. "flame tail", another deep-water *Petrochromis* that recently entered the aquarium trade resembles the undescribed fish. More samples and analyses are needed to clarify whether these fish belong to the same taxonomic species as the undescribed fish and what's the geographic distribution of this species.

The new mtDNA data, in particular those of *P. macrognathus*, indicate that the large-bodied *P. polyodon*-, *P. macrognathus*- and *P. trewavasae*-like fishes are very closely related. Paraphyly or polyphyly of nominal taxa may indicate that incomplete lineage sorting and/or hybridization complicate phylogenetic inference and taxonomic assignment based on single molecular markers in this cichlid lineage (also see Sturmbauer et al. 2003; Koblmüller et al. 2010). Nevertheless, the mtDNA data point to the urgent need for an extensive taxonomic revision of the entire genus as morphologically and genetically distinct, yet taxonomically undescribed, taxa of the *P. polyodon*-species complex appear to occur sympatrically at various locations (Konings 1998; Koblmüller et al. 2010; Wagner et al. 2012). Thus, at present the true species number and consequently diversification rate appears to be dramatically underestimated in this clade, similar to the situation in the closely related genus *Tropheus* (Konings 1998; Schupke 2003; Egger et al. 2007).

***Petrochromis horii* n. sp.**

Here the undescribed fish is named *Petrochromis horii* n. sp.

Holotype. MRAC B3-03-P-01 (female, 137.6 mm SL), Kasenga, Zambia, rocky bottom at 13 m depth, screen net, M. Hori and T. Takahashi, 21 Nov. 2009.

Paratypes. *N* = 11. A fin-clip was taken from nine specimens for DNA analysis (indicated by *). MRAC B3-03-P-02 (female, 85.0 mm SL), B3-03-P-03 (female, 105.7 mm SL), B3-03-P-04* (male, 100.7 mm SL), collected with the holotype; MRAC B3-03-P-05* (female, 128.3 mm SL), Kasenga, Zambia, rocky bottom at 15 m depth, screen net, M. Hori, 28 Nov. 2007; MRAC B3-03-P-06* (female, 116.6 mm SL), B3-03-P-07* (female, 100.4 mm SL), Kasenga, Zambia, rocky bottom at 14 m depth, screen net, M. Hori, 5 Nov. 2008; BMNH 2013.2.13.1* (male, 104.4 mm SL), 2013.2.13.2* (male, 100.1 mm SL), 2013.2.13.3* (female, 130.3 mm SL), 2013.2.13.4* (male, 89.1 mm SL), 2013.2.13.5* (female, 105.7 mm SL), Kasenga, Zambia, rocky bottom at 14 m depth, screen net, M. Hori, 9 Nov. 2008.

Diagnosis. This new taxonomic species differs from its congeners with no overlaps in several morphological characters (Table 2). Its body is deeper than that of *P. macrognathus*, the caudal peduncle is deeper than that of *P. orthognathus*, the pectoral fin is longer than that of *P. macrognathus*, the pelvic fin is longer than that of *P. fasciolatus*, the caudal fin is longer than that of *P. famula*, *P. fasciolatus*, and *P. orthognathus*, the interorbital region is wider than that of *P. macrognathus* and *P. orthognathus*, the upper jaw protrudes more than that of *P. fasciolatus* and less than that of *P. macrognathus*, *P. polyodon*, and *P. trewavasae*, the soft rays in the dorsal fin are fewer than in *P. macrognathus*, and the number of scales in longitudinal line is larger than in *P. famula* and *P. orthognathus*.

Morphological description. The morphological description, except for the lower pharyngeal jaw, is based on the holotype (Fig. 4a, b), and the ranges for paratypes are given in parentheses; the morphometric and meristic data are summarized in Table 4. The description of the lower pharyngeal jaw is based on a paratype (MRAC B3-03-P-05, Fig. 4c).

Body short, deepest at dorsal-fin origin, gradually becoming shallow to caudal peduncle; caudal peduncle short, depth of caudal peduncle 89.2% (82.2–101.6%) of its length. Dorsal profile of head sloping steeply; ventral profile slightly rounded. Eye small, rounded [percentage of eye length against head length decreased with increasing SL, non-parametric Spearman test: $N = 12$ (holotype and 11 paratypes), $\rho = -0.73$, $P = 0.007$]; eye length 62.4% (62.2–72.8%) of snout length. Interorbital region convex. Mouth lower than body axis; jaws almost equal anteriorly [percentage of upper jaw protrusion against head length decreased with increasing SL, non-parametric Spearman test: $N = 12$ (holotype and 11 paratypes), $\rho = -0.84$, $P < 0.001$]; posterior edge of mouth not reaching vertical line through anterior margin of eye.

Dorsal fin originating slightly anterior to vertical line through posterior margin of operculum; each spine with a lappet near tip; all soft rays branched; posterior tip of the fin elongate, extending beyond caudal-fin base when depressed. Anal fin originating slightly anterior to vertical line through base of last dorsal-fin spine; three spines increasing in length posteriorly; first and second spines with a lappet near tip; all soft rays branched; posterior tip elongate, extending beyond caudal-fin base when depressed. Upper end of pectoral-fin base slightly posterior to vertical line through posterior margin of operculum; distal tip acutely pointed; fifth soft ray from upper longest, reaching vertical line through anus; soft rays branched, except uppermost two and lowermost two (except uppermost two and lowermost one or two). Pelvic fin originating posterior to vertical line through posterior margin of operculum; all soft rays branched; outer soft rays longer than inner ones; outermost soft ray filamentous, reaching anal-fin origin. Caudal fin lunate; distal tips of upper and lower lobes acutely pointed.

Scales on flank cycloid or ctenoid with radially directed short ctenii; granulation extending over almost entire exposed part of scale. Posterior half of cheek scaled; caudal fin with scales on fin membrane between rays; other fins lack scales. Upper lateral line originating from sensory canal of supracleithrum, running below dorsal margin of body, posteriorly not reaching posterior end of dorsal-fin base. Lower lateral line running on body axis, anteriorly not reaching vertical line through anal-fin origin, posteriorly extending beyond caudal-fin base.

Oral teeth tricuspid, arranged in 9 to 11 irregular rows at anterior parts of upper and lower jaws, making brush-like, broad tooth plate on each jaw; outer and inner teeth indistinguishable in size, shape, or arrangement pattern. Gill rakers short.

Lower pharyngeal jaw of a paratype (MRAC B3-03-P-05, Fig. 4c) sub-triangular with concave lateral margins and roundly convex caudal margins on both sides, length 14.83 mm, width 12.63 mm; dentigerous area sub-triangular, length 6.80 mm, width 10.13 mm; teeth villiform.

Body colour pattern. The colour of live fish is described based on two photographs; one is of the holotype that was taken under water when it was caught (Fig. 4b, female), and the other is of individuals that were not collected (Fig. 2b, sex unknown). A part of head anterior to the posterior margin of eye moss green; pale ventrally. Body with eleven moss green vertical bands from nape to caudal-fin base (the most anterior one combines with the moss-green blot on the head in Fig. 4b), and a moss green or dark green horizontal broad band on body axis (pale above anus, breaking the band into two parts in Fig. 2b); spaces between the bands and ventral part of body pale green. Fins moss green; anterior margin of pelvic fin pale green.

The vertical and horizontal bands are unclear in fixed specimens (Fig. 4a).

Sexual dimorphism. Apparent differences between sexes were not found in morphometric and meristic characters. The largest female was 1.3 times larger than the largest male in SL, but small sample size precludes a definite conclusion (note: males grow larger than females in all other species of *Petrochromis*). Given the relatively small size of the males examined, no sexual dimorphism of body shape and coloration was observed. Whether *P. horii* n. sp. indeed exhibits no (or even reversed) sexual dimorphism in body shape, coloration, or body size clearly requires the examination of a larger sample size of adult specimens.

Distribution. At present, this new species is only known from Kasenga.

Etymology. Named in honour of M. Hori of Kyoto University, Japan; he suggested that this fish might represent an undescribed species.

Key to the seven *Petrochromis* species.

This key was constructed based on specimens larger than ~80 mm SL (Table 2). Therefore, the key morphometric characters are not applicable to smaller individuals. Known maximum SL of each species was drawn from Poll (1956), Yamaoka (1983b), and the present study.

1a. Lower jaw protruding anterior to upper jaw (protrusion of upper jaw -1.0 to -6.6% of head length, Fig. 5a) ---------- *P. fasciolatus* (maximum SL, 131.0 mm)

1b. Upper jaw a little protruding anterior to lower jaw (protrusion of upper jaw 0.6–4.6% of head length, Fig. 5b) ---------- 2

1c. Upper jaw greatly protruding anterior to lower jaw (protrusion of upper jaw 4.8–15.4% of head length, Fig. 5c) ----------4

2a. 34 or 35 scales in longitudinal line; caudal fin long (length 27.2–32.3% of SL) ---------- *P. horii* n. sp. (maximum SL, 137.6 mm)

2b. 31–33 scales in longitudinal line; caudal fin short (length 22.2–26.3% of SL) ---------- 3

3a. Body shallow (depth 36.5–41.5% of SL); head small (length 30.5–33.7% of SL); caudal peduncle narrow (depth 71.4–88.9% of the length); 7 soft rays in anal fin ---------- *P. orthognathus* (maximum SL, 150.5 mm)

3b. Body deep (depth 40.5–45.0% of SL); head large (length 31.9–36.3% of SL); caudal peduncle deep (depth 79.4–108.2% of the length); usually 8 soft rays in anal fin ---------- *P. famula* (maximum SL, 133.0 mm)

4a. 11 or 12 soft rays in dorsal fin; interorbital region narrow (width 28.8–33.9% of head length); upper jaw protrusion 6.4–15.4% of head length; pectoral fin short (length 24.1–30.1% of SL) ---------- *P. macrognathus* (maximum SL, 178.7 mm)

4b. Usually 10 or less soft rays in dorsal fin; interorbital region wide (width 31.2–40.9% of head length); upper jaw protrusion 4.8–11.9% of head length; pectoral fin long (length 29.9–37.1% of SL) ---------- 5

5a. Usually 17 or 18 spines in dorsal fin; usually 8 soft rays in anal fin; caudal fin short (length 24.8–30.6% of SL); dorsal profile of head gently rounded ---------- *P. polyodon* (maximum SL, 179.8 mm)

5b. Usually 19 spines in dorsal fin; usually 7 soft rays in anal fin; caudal fin long (length 28.3–35.8% of SL); dorsal profile of head nearly straight ---------- *P. trewavasae*

(maximum SL, 153.3 mm)

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Figure legends

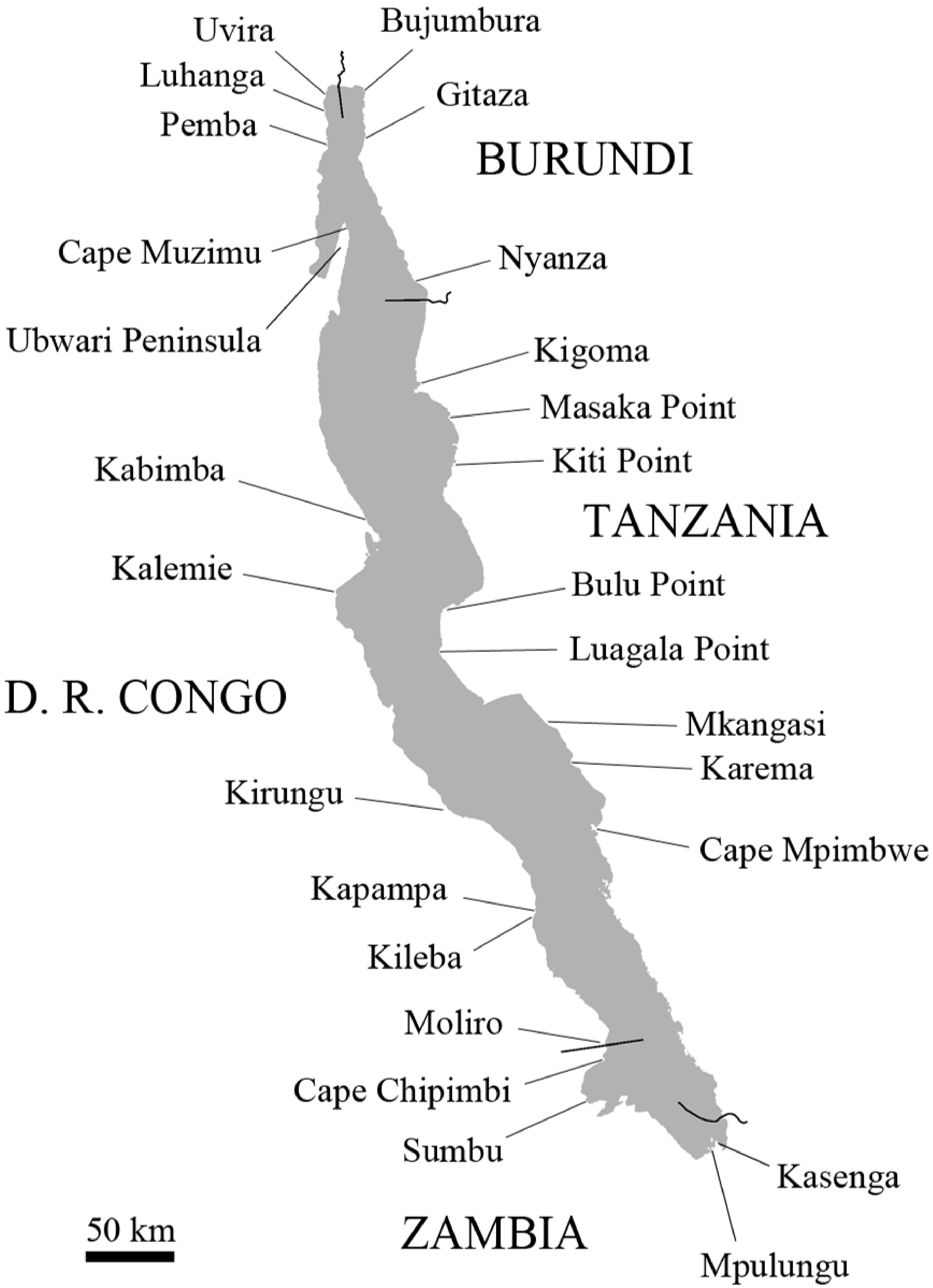
Fig. 1 Map of Lake Tanganyika (29º05'–31º15'E, 3º30'–8º50'S, 650 km in length, Coulter 1994), showing the sampling localities of the specimens examined in morphological analyses.

Fig. 2 Underwater photographs taken at Kasenga (14–16 m depth) in November 2010 by M. Hori. Colour was corrected using Adobe Photoshop CS3 (Adobe Systems, Inc.). **a** The head of the group is *Petrochromis fasciolatus*, followed by two individuals of the undescribed fish (sex is unknown). The smallest individual could not be identified to species level. **b** An expanded image showing the two individuals of the undescribed fish. **c** Another photograph of *P. fasciolatus*; this individual appears to be a mouth-brooding female.

Fig. 3 The best ML tree of the Tropheini based on the complete ND2 gene and the mitochondrial control region (excluding the poly-T region). Only ML-bootstrap percentages >50 and posterior probabilities >0.50 resulting from Bayesian inference are shown at the nodes. *Astatotilapia burtoni* (Günther 1893), *Aulonocara* sp. and *Copadichromis borleyi* (Iles 1960) were used as outgroup taxa. The coloured bars depict the assignment to different genera of Tropheini. The catalogue numbers of specimens correspond to those in Table S1 and those of Koblmüller et al. (2010). Generic allocation has not been resolved for *Chromis horei* and *Paratilapia pfefferi*, so the genus in original description is tentatively used.

Fig. 4 *Petrochromis horii* n. sp. **a** Holotype (MRAC B3-03-P-01, female, 137.6 mm SL) after fixation. **b** Holotype when caught; colour was corrected using Photoshop; white mesh on the fish is a screen net. **c** Lower pharyngeal jaw (14.83 mm in length) of a paratype (MRAC B3-03-P-05, female, 128.3 mm SL) in dorsal view; the background was trimmed using Photoshop.

Fig. 5 Different mouth shapes of *Petrochromis*. **a** Lower jaw protruding (*P. fasciolatus*, Zm 401-b, female, 113.1 mm SL). **b** Upper jaw a little protruding (*P. famula*, Zm 869-b, female 108.2 mm SL). **c** Upper jaw greatly protruding (*P. trewavasae*, TT 1215, male, 113.0 mm SL).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Bujumbura
Luhanga
Gitaza
Pemba
BURUNDI
Cape Muzimu
Nyanza
Ubwari Peninsula
Kigoma
Masaka Point
Kiti Point
Kabimba
TANZANIA
Kalemie
Bulu Point
Luagala Point
D. R. CONGO
Mkangasi
Karema
Kirungu
Cape Mpimbwe
Kapampa
Kileba
Moliro
Cape Chipimbi
Sumbu
Kasenga
50 km
ZAMBIA
Mpulungu

Fig. 1

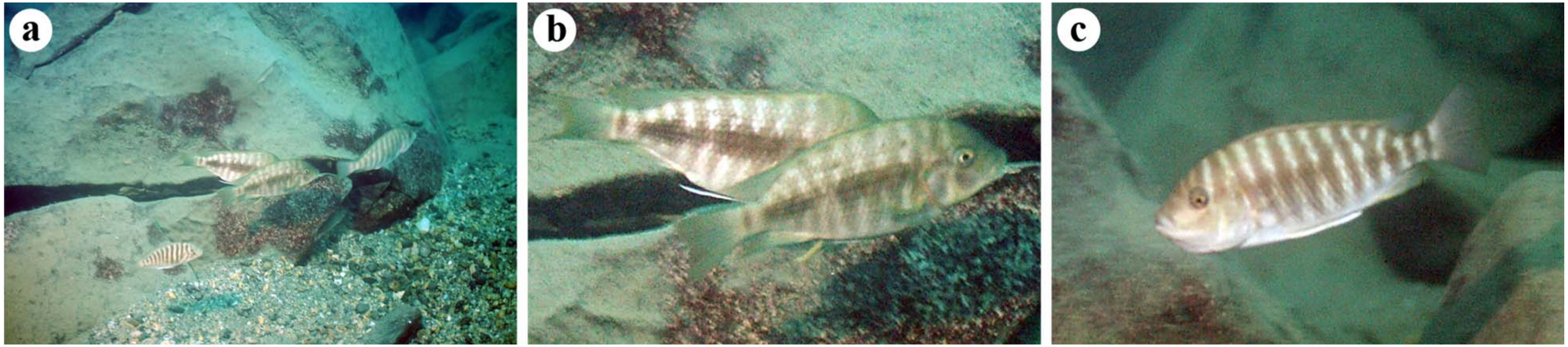

Fig. 2

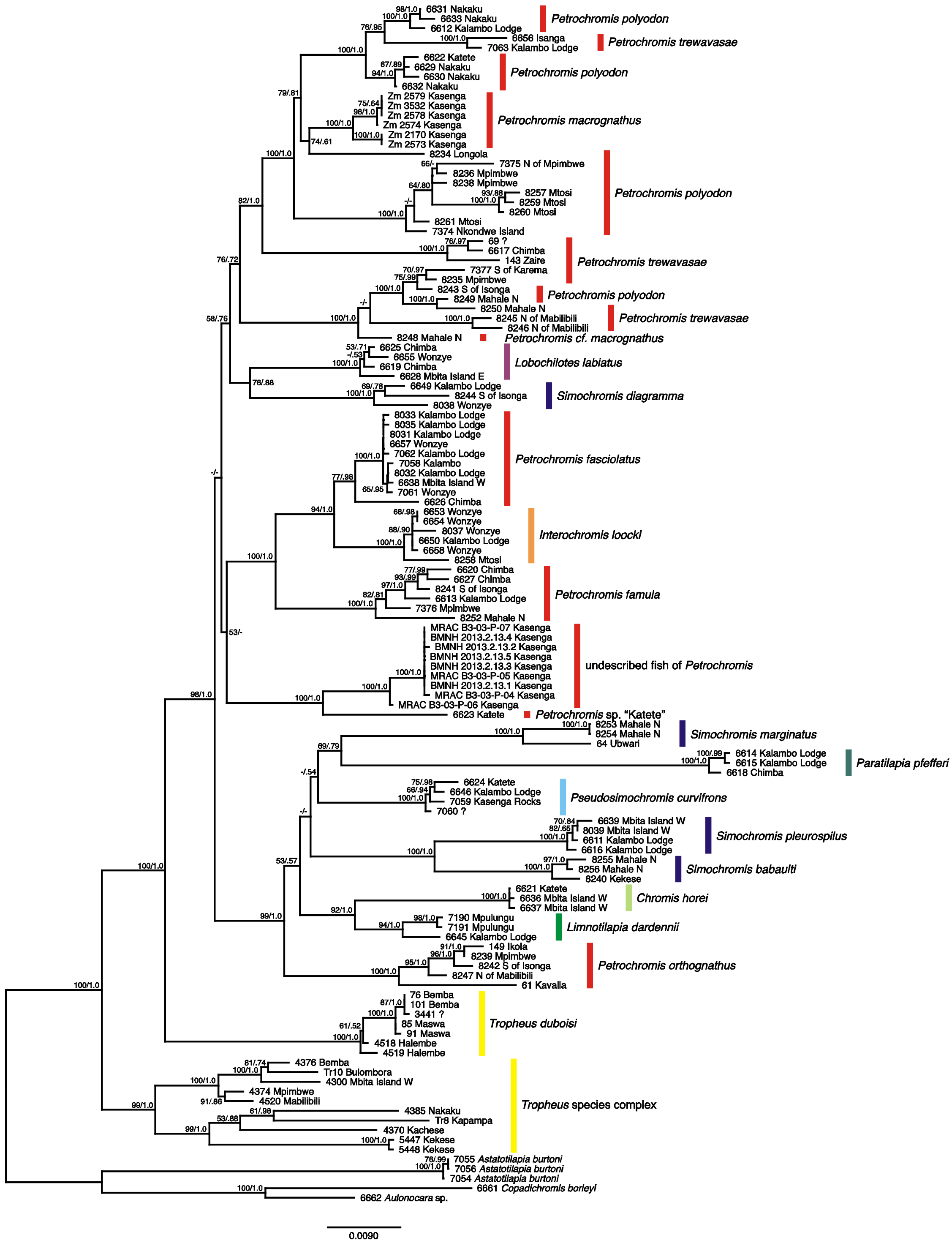
Petrochromis polyodon
Petrochromis trewavasae
Petrochromis polyodon
Petrochromis macrognathus
Petrochromis polyodon
Petrochromis trewavasae
Petrochromis polyodon
Petrochromis trewavasae
Petrochromis cf. macrognathus
Lobochilotes labiatus
Simochromis diagramma
Petrochromis fasciolatus
Interochromis loocki
Petrochromis famula
undescribed fish of Petrochromis
Petrochromis sp. "Katete"
Simochromis marginatus
Paratilapia pfefferi
Pseudosimochromis curvifrons
Simochromis pleurospilus
Simochromis babaulti
Chromis horei
Limnotilapia dardennii
Petrochromis orthognathus
Tropheus duboisi
Tropheus species complex
0.0090

Fig. 3

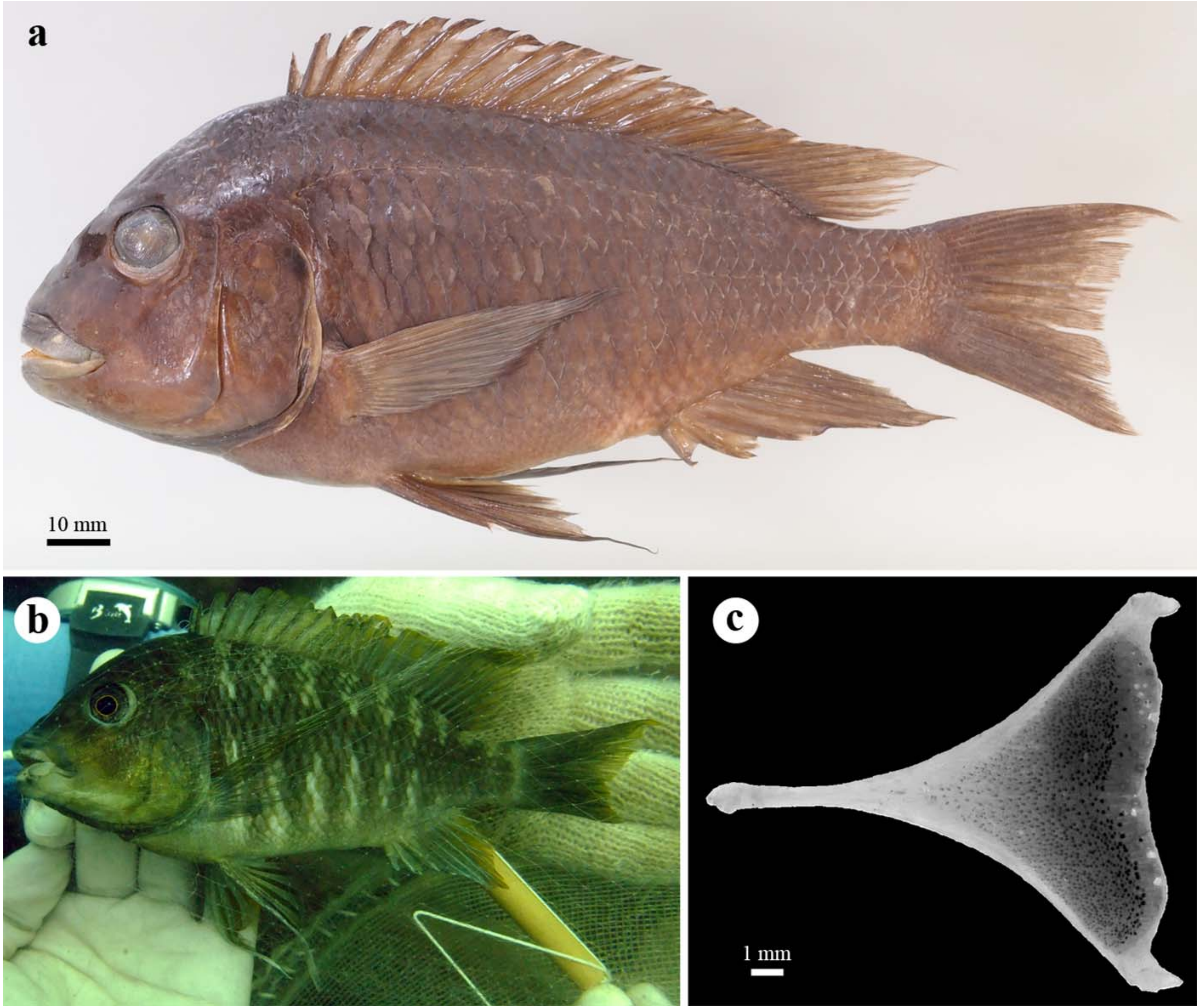

Fig. 4

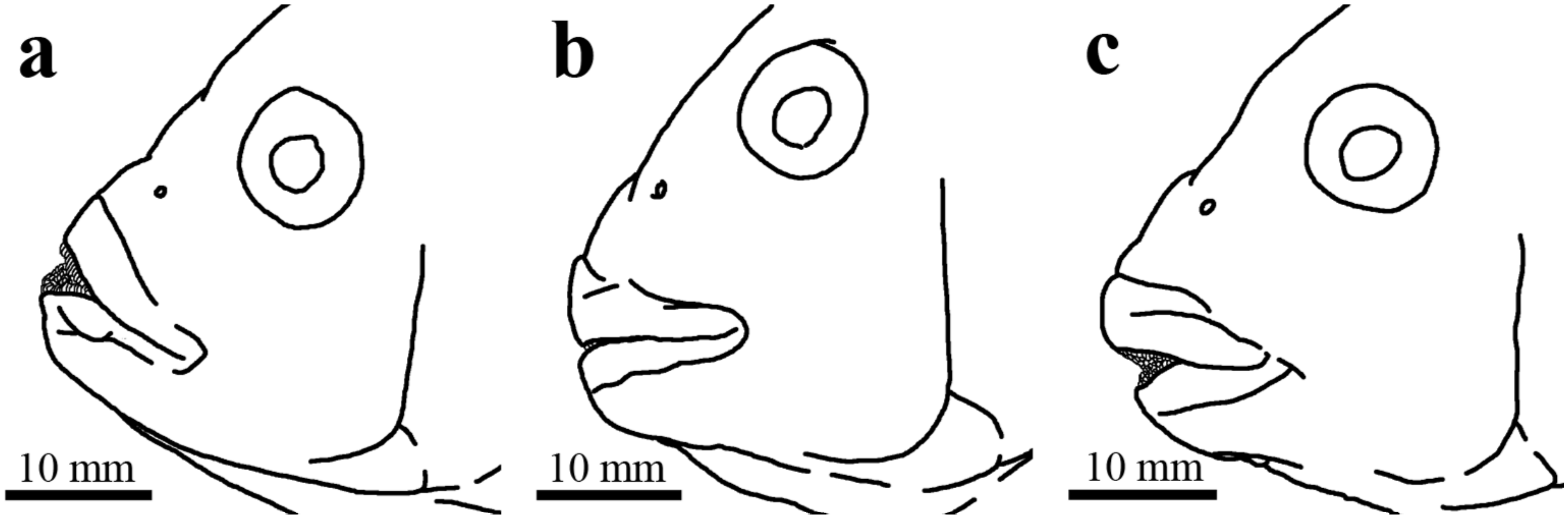

Fig. 5

Table 1. Summary of specimens used for morphological analyses. See Table S1 for details of the sampling.

	No. and SL (mm) of females	No. and SL (mm) of males	Sampling localities
Undescribed fish	*N* = 8 85.0–137.6	*N* = 4 89.1–104.4	Kasenga
P. famula	*N* = 8 84.7–108.2	*N* = 12 97.6–133.0	Pemba, Cape Muzimu, Kabimba, Kasenga
P. fasciolatus	*N* = 11 77.6–113.1	*N* = 10 82.2–128.6	Pemba, Cape Muzimu, Kalemie, Kapamba (= Kapampa?), baie de Kilewa (= Kileba?), Kasenga
P. macrognathus	*N* = 10 87.1–132.2	*N* = 11 93.2–178.7	Luhanga, Pemba, Sumbu, Kasenga
P. orthognathus	*N* = 11 88.4–129.9	*N* = 15 84.2–150.5	Pemba, Cape Muzimu, near Kalemie, Cape Mpibmwe, Karema, Mkangasi, near Bulu Point, Kiti Point, Kigoma, near Nyanza, Gitaza
P. polyodon	*N* = 8 101.6–149.6	*N* = 12 77.3–179.8	Pemba, Cape Muzimu, Kalemie, Mpulungu, Kasenga, Masaka Point, Kigoma, near Nyanza

P. trewavasae	*N* = 10 77.3–145.3	*N* = 12 77.1–153.3	Pemba, Ubwari Peninsula, Cape Muzimu, Moliro, Chipimbi, Kasenga, Kigoma

Table 2 Summary of characters that differ between the undescribed fish and the six known *Petrochromis* species with no or little overlaps

	N	SL (mm) of specimens examined	Body depth % of SL	Caudal-peduncle depth % of SL	Dorsal-fin base length % of SL	Pectoral-fin length % of SL	Pelvic-fin length % of SL	Caudal-fin length % of SL	Snout length % of head length	Eye length % of head length
Undescribed fish	12	85.0–137.6	41.0–45.5	12.7–14.9	60.5–64.8	30.7–37.1	33.9–42.3	27.2–32.3	40.3–44.3	26.9–30.1
P. famula	20	84.7–133.0	40.5–45.0	11.5–13.7	60.4–64.8	30.1–39.3	28.9–41.8	22.7–26.3[a]	40.3–46.3	22.2–28.1
P. fasciolatus	21	77.6–128.6	33.6–41.9	10.4–13.0	57.2–63.4	27.9–34.0	25.5–31.5[b]	21.2–26.3[b]	35.1–41.9	24.8–31.8
P. macrognathus	21	87.1–178.7	35.6–40.2	12.2–14.3	56.5–61.6	24.1–30.1	24.7–42.9	25.5–30.7	42.1–49.5	21.3–27.5
P. orthognathus	26	84.2–150.5	36.5–41.5	10.8–12.4	58.4–65.5	30.3–38.5	28.2–42.9	22.2–25.9[c]	36.4–45.2	25.4–32.5
P. polyodon	20	77.3–179.8	36.5–43.1	11.8–14.2	56.3–62.9	29.9–37.1	27.9–48.8	24.8–30.6[e]	36.4–48.9	22.2–28.6
P. trewavasae	22	77.1–153.3	38.4–43.9	11.8–13.3	59.5–66.6	30.1–36.6	32.3–51.4[b]	28.3–35.8[b]	40.2–48.9	22.9–30.0

Shading indicates characters in which the values of all individuals (heavy shading) or >90% individuals (light shading) are excluded from the ranges of the undescribed fish. [a] *N* = 19; [b] *N* = 20; [c] *N* = 24; [d] *N* = 25; [e] *N* = 18.

Table 2 Continued (this is the right part of Table 2)

Interorbital width % of head length	Upper-jaw protrusion % of head length	Soft rays in dorsal fin	Scales in longitudinal line
37.0–40.4	0.6–4.6	9–10	34–35
33.3–38.2	0.9–3.3	8–10	31–33
32.3–40.1	-6.6 to -1.0	8–11	33–34
28.8–33.9	6.4–15.4	11–12	35–37
29.9–36.7	0.6–4.0[d]	8–10	31–33
31.2–40.5	4.8–11.9	9–11	34–36
33.7–40.9	5.2–9.3	8–10	34–35

Table 3 Results of 1) MANCOVA on 14 log_{10}-transformed morphometric characters, 2) ANCOVA on the upper jaw protrusion, and 3) MANOVA on eight meristic characters to test morphological differences between the undescribed fish and each of the six known *Petrochromis* species

	Fish	Sex	*y*	Fish × sex	Fish × *y*	Sex × *y*
vs. *P. famula*						
1) 14 morphometrics, *y*: log_{10}(SL)	$F_{(14, 11)} = 11.6^{**}$	$F_{(14, 11)} = 1.80^{NS}$	$F_{(14, 11)} = 95.8^{**}$	$F_{(14, 11)} = 0.70^{NS}$	$F_{(14, 11)} = 1.76^{NS}$	$F_{(14, 11)} = 2.70^{NS}$
2) Upper-jaw protrusion, *y*: SL	$F_{(1, 25)} = 2.26^{NS}$	$F_{(1, 25)} = 0.47^{NS}$	$F_{(1, 25)} = 0.14^{NS}$	$F_{(1, 25)} = 0.94^{NS}$	$F_{(1, 25)} = 2.03^{NS}$	$F_{(1, 25)} = 0.15^{NS}$
3) 8 meristics	$F_{(8, 21)} = 14.6^{**}$	$F_{(8, 21)} = 1.51^{NS}$	—	$F_{(8, 21)} = 0.67^{NS}$	—	—
vs. *P. fasciolatus*						
1) 14 morphometrics, *y*: log_{10}(SL)	$F_{(14, 11)} = 52.1^{**}$	$F_{(14, 11)} = 0.86^{NS}$	$F_{(14, 11)} = 259^{**}$	$F_{(14, 11)} = 1.51^{NS}$	$F_{(14, 11)} = 1.39^{NS}$	$F_{(14, 11)} = 2.30^{NS}$
2) Upper-jaw protrusion, *y*: SL	$F_{(1, 26)} = 148^{**}$	$F_{(1, 26)} = 0.33^{NS}$	$F_{(1, 26)} = 7.18^{NS}$	$F_{(1, 26)} = 0.27^{NS}$	$F_{(1, 26)} = 0.10^{NS}$	$F_{(1, 26)} = 0.22^{NS}$
3) 8 meristics	$F_{(8, 21)} = 3.45^{NS}$	$F_{(8, 21)} = 0.37^{NS}$	—	$F_{(8, 21)} = 1.05^{NS}$	—	—
vs. *P. macrognathus*						
1) 14 morphometrics, *y*:	$F_{(14, 12)} = 26.0^{**}$	$F_{(14, 12)} = 1.69^{NS}$	$F_{(14, 12)} = 173^{**}$	$F_{(14, 12)} = 0.40^{NS}$	$F_{(14, 12)} = 0.88^{NS}$	$F_{(14, 12)} = 1.20^{NS}$

$\log_{10}$(SL)						
2) Upper-jaw protrusion, *y*: SL	$F_{(1, 26)} = 58.0^{**}$	$F_{(1, 26)} = 3.97^{NS}$	$F_{(1, 26)} = 2.49^{NS}$	$F_{(1, 26)} < 0.01^{NS}$	$F_{(1, 26)} = 1.24^{NS}$	$F_{(1, 26)} = 1.89^{NS}$
3) 8 meristics	$F_{(8, 22)} = 14.7^{**}$	$F_{(8, 22)} = 0.56^{NS}$	——	$F_{(8, 22)} = 0.31^{NS}$	——	——
vs. *P. orthognathus*						
1) 14 morphometrics, *y*: $\log_{10}$(SL)	$F_{(14, 16)} = 19.9^{**}$	$F_{(14, 16)} = 2.92^{NS}$	$F_{(14, 16)} = 355^{**}$	$F_{(14, 16)} = 1.11^{NS}$	$F_{(14, 16)} = 1.10^{NS}$	$F_{(14, 16)} = 1.53^{NS}$
2) Upper-jaw protrusion, *y*: SL	$F_{(1, 30)} = 3.03^{NS}$	$F_{(1, 30)} = 2.12^{NS}$	$F_{(1, 30)} = 3.53^{NS}$	$F_{(1, 30)} = 0.07^{NS}$	$F_{(1, 30)} = 0.41^{NS}$	$F_{(1, 30)} = 0.06^{NS}$
3) 8 meristics	$F_{(8, 27)} = 37.1^{**}$	$F_{(8, 27)} = 0.92^{NS}$	——	$F_{(8, 27)} = 0.88^{NS}$	——	——
vs. *P. polyodon*						
1) 14 morphometrics, *y*: $\log_{10}$(SL)	$F_{(14, 10)} = 4.65^{NS}$	$F_{(14, 10)} = 1.30^{NS}$	$F_{(14, 10)} = 164^{**}$	$F_{(14, 10)} = 0.83^{NS}$	$F_{(14, 10)} = 0.71^{NS}$	$F_{(14, 10)} = 1.12^{NS}$
2) Upper-jaw protrusion, *y*: SL	$F_{(1, 25)} = 34.0^{**}$	$F_{(1, 25)} = 2.54^{NS}$	$F_{(1, 25)} = 0.01^{NS}$	$F_{(1, 25)} = 0.02^{NS}$	$F_{(1, 25)} = 0.47^{NS}$	$F_{(1, 25)} = 1.00^{NS}$
3) 8 meristics	$F_{(8, 21)} = 7.14^{**}$	$F_{(8, 21)} = 0.31^{NS}$	——	$F_{(8, 21)} = 0.81^{NS}$	——	——
vs. *P. trewavasae*						
1) 14 morphometrics, *y*: $\log_{10}$(SL)	$F_{(14, 12)} = 12.2^{**}$	$F_{(14, 12)} = 1.\ 08^{NS}$	$F_{(14, 12)} = 127^{**}$	$F_{(14, 12)} = 1.01^{NS}$	$F_{(14, 12)} = 2.26^{NS}$	$F_{(14, 12)} = 1.07^{NS}$

2) Upper-jaw protrusion, *y*: SL	$F_{(1, 27)} = 82.8^{**}$	$F_{(1, 27)} = 0.74^{NS}$	$F_{(1, 27)} = 0.84^{NS}$	$F_{(1, 27)} = 0.10^{NS}$	$F_{(1, 27)} = 8.77^{NS}$	$F_{(1, 27)} < 0.01^{NS}$
3) 8 meristics	$F_{(8, 23)} = 7.40^{**}$	$F_{(8, 23)} = 1.53^{NS}$	—	$F_{(8, 23)} = 0.86^{NS}$	—	—

** $\alpha < 0.01$ ($P < 0.000556$), * $\alpha < 0.05$ ($P < 0.00267$), ^{NS} $\alpha \geq 0.05$ ($P \geq 0.00267$) after a Bonferroni correction.

Table 4 Morphometric and meristic characters of *Petrochromis horii* n. sp.

	Holotype Female	Paratypes Seven females and four males
SL (mm, female)	137.6	85.0–130.3
SL (mm, male)	——	89.1–104.4
Percentage of SL		
Body depth	43.2	41.0–45.5 (43.4 ± 1.4)
Head length	34.4	31.6–33.7 (32.5 ± 0.8)
Caudal-peduncle length	14.8	14.4–15.7 (15.1 ± 0.5)
Caudal-peduncle depth	13.2	12.7–14.9 (13.5 ± 0.6)
Dorsal-fin base length	60.5	61.7–64.8 (63.1 ± 0.9)
Anal-fin base length	16.6	17.5–19.9 (18.5 ± 0.7)
Pectoral-fin length	33.6	30.7–37.1 (34.2 ± 1.9)
Pelvic-fin length	33.9	34.5–42.3 (38.9 ± 2.4)
Caudal-fin length	29.7	27.2–32.3 (29.8 ± 1.4)
Percentage of head length		
Head width	52.5	54.4–60.9 (57.5 ± 2.1)
Snout length	44.3	40.3–43.3 (41.5 ± 0.9)
Eye length	27.6	26.9–30.1 (28.6 ± 1.0)
Interorbital width	38.2	37.0–40.4 (38.5 ± 1.0)
Lower-jaw length	31.0	25.9–33.2 (28.6 ± 2.1)

Upper-jaw protrusion	0.6	1.0–4.6 (3.2 ± 1.1)
Meristic characters		
Dorsal fin	XIX,9	XVIII,10 (5), XIX,9 (4), XIX,10 (2)
Anal fin	III,7	III,7 (2), III,8 (9)
Pectoral fin	16	15 (2), 16 (9)
Scales in longitudinal line	34	34 (8), 35 (3)
Scales on upper lateral line	24	23 (2), 24 (6), 25 (2), 26 (1)
Scales on lower lateral line	14	10 (1), 13 (2), 14 (6), 15 (1), 16 (1)
Scale rows between lateral lines	2	2 (11)
Gill rakers	11	11 (4), 12 (6), 13 (1)

Morphometric characters of paratypes are indicated as follows: minimum value–maximum value (mean ± standard deviation). Meristic characters of paratypes are indicated as follows: observed value (number of paratypes).

Table S1 Samples used for the morphological analysis

Species	Catalogue no.	Locality	Depth (m)	Type	Sex	Standard length (mm)	Body depth (mm)	Head length (mm)	Caudal-peduncle length (mm)	Caudal-peduncle depth (mm)	Dorsal-fin-base length (mm)	Anal-fin-base length (mm)	Pectoral-fin length (mm)	Pelvic-fin length (mm)	Shortest caudal-fin-ray length (mm)	Longest caudal-fin-ray length (mm)	Head width (mm)	Snout length (mm)	Eye length (mm)	Interorbital width (mm)	Lower-jaw length (mm)	Upper-jaw protrusion (mm)	Length of LPJ (mm)	Width of LPJ (mm)	Length of dentigerous area on LPJ (mm)	Width of dentigerous area on LPJ (mm)	Dorsal-fin spines	Dorsal-fin soft rays	Anal-fin spines	Anal-fin soft rays	Pectoral-fin soft rays	Scales in longitudinal line	Scales on upper lateral line	Scales on lower lateral line	Scale rows between lateral lines	Gill rakers on first ceratobranchial
Petrochromis horii n. sp.	MRAC B3-03-P-01	Kasenga, Zambia	13	Holotype	Female	137.6	59.5	47.4	20.3	18.1	83.2	22.8	46.2	46.7	29.8	40.9	24.9	21.0	13.1	18.1	14.7	0.3	—	—	—	—	19	9	3	7	16	34	24	14	2	11
Petrochromis horii n. sp.	MRAC B3-03-P-02	Kasenga, Zambia	13	Paratype	Female	85.0	37.1	28.3	12.5	12.7	53.3	16.2	30.2	31.3	19.9	24.4	15.4	11.4	8.3	10.7	8.0	1.1	—	—	—	—	18	10	3	8	16	34	25	14	2	12
Petrochromis horii n. sp.	MRAC B3-03-P-03	Kasenga, Zambia	13	Paratype	Female	105.7	47.7	35.6	16.0	14.8	67.1	19.3	39.2	43.8	26.1	34.1	20.4	15.0	10.2	13.9	10.5	0.7	—	—	—	—	18	10	3	8	16	34	23	10	2	12
Petrochromis horii n. sp.	MRAC B3-03-P-04	Kasenga, Zambia	13	Paratype	Male	100.7	44.7	33.8	14.7	14.0	62.6	17.8	36.3	42.6	24.0	29.8	18.6	13.8	9.9	13.6	8.8	1.4	—	—	—	—	18	10	3	8	16	34	23	14	2	12
Petrochromis horii n. sp.	MRAC B3-03-P-05	Kasenga, Zambia	15	Paratype	Female	128.3	53.5	42.2	19.9	16.6	80.3	23.4	45.0	51.5	29.6	40.6	23.0	17.2	11.7	15.6	14.0	1.1	14.83	12.63	6.80	10.13	18	10	3	7	15	35	25	15	2	11
Petrochromis horii n. sp.	MRAC B3-03-P-06	Kasenga, Zambia	14	Paratype	Female	116.6	51.7	39.0	17.2	16.0	75.5	22.2	38.9	42.7	26.0	34.4	22.2	16.2	10.5	15.0	12.0	1.2	—	—	—	—	19	9	3	8	16	34	24	16	2	13
Petrochromis horii n. sp.	MRAC B3-03-P-07	Kasenga, Zambia	14	Paratype	Female	100.4	45.7	31.7	15.5	13.5	64.1	20.0	33.9	39.5	23.6	30.7	19.3	12.8	9.1	12.2	9.1	1.3	—	—	—	—	19	9	3	8	15	34	24	14	2	12
Petrochromis horii n. sp.	BMNH 2013.2.13.1	Kasenga, Zambia	14	Paratype	Male	104.4	44.5	33.6	15.0	14.1	66.5	19.4	35.5	43.0	24.6	32.1	20.1	13.8	9.6	12.7	9.4	1.3	—	—	—	—	19	9	3	8	16	34	24	13	2	12
Petrochromis horii n. sp.	BMNH 2013.2.13.2	Kasenga, Zambia	14	Paratype	Male	100.1	42.3	31.6	14.6	13.0	62.4	18.7	34.6	39.7	24.4	30.2	18.5	13.3	9.0	12.2	8.2	1.1	—	—	—	—	19	10	3	8	16	34	24	14	2	11
Petrochromis horii n. sp.	BMNH 2013.2.13.3	Kasenga, Zambia	14	Paratype	Female	130.3	53.4	41.6	20.2	16.6	81.6	24.4	40.0	47.8	27.4	35.5	24.0	18.0	11.2	16.8	12.0	0.4	—	—	—	—	18	10	3	8	16	34	24	14	2	11
Petrochromis horii n. sp.	BMNH 2013.2.13.4	Kasenga, Zambia	14	Paratype	Male	89.1	38.1	28.2	14.0	12.1	56.8	16.1	31.2	30.7	21.5	26.0	16.6	11.7	8.5	10.7	8.1	1.3	—	—	—	—	19	9	3	8	16	35	26	14	2	11
Petrochromis horii n. sp.	BMNH 2013.2.13.5	Kasenga, Zambia	14	Paratype	Female	105.7	46.0	34.0	16.6	14.0	65.2	18.5	33.2	41.2	24.6	30.2	19.8	14.4	10.0	12.9	9.0	0.8	—	—	—	—	19	10	3	7	16	35	24	13	2	12
Petrochromis famula	BMNH 1950.4.1:7636	Lake Tanganyika	—	Holotype	Male	122.2	50.8	40.6	16.3	14.3	78.4	23.5	42.8	42.2	25.7	27.7	21.7	17.5	10.5	15.3	12.5	0.5	—	—	—	—	18	10	3	8	14	32	22	10	2	12
Petrochromis famula	BMNH 1950.4.1:7640	Lake Tanganyika	—	Paratype	Male	115.7	47.8	39.6	15.3	14.9	74.0	22.5	44.3	39.3	25.0	27.2	19.3	17.8	9.9	14.3	11.6	1.0	—	—	—	—	18	9	3	8	16	33	22	13	2	12
Petrochromis famula	BMNH 1950.4.1:7641	Lake Tanganyika	—	Paratype	Male	121.1	49.2	42.3	16.3	15.1	76.2	24.5	42.8	35.0	26.7	29.0	20.7	18.4	9.4	14.1	13.3	1.3	—	—	—	—	18	10	3	9	15	33	23	12	2	11
Petrochromis famula	MRAC 131113	Kabimba, D. R. Congo	—	Non-type	Male	115.7	50.1	38.9	17.7	14.7	70.2	20.1	41.6	48.4	25.8	27.5	22.1	18.0	9.5	14.2	12.1	0.6	—	—	—	—	18	9	3	8	16	32	22	11	2	11
Petrochromis famula	MRAC 131114	Kabimba, D. R. Congo	—	Non-type	Male	111.6	48.2	38.2	16.5	13.1	69.5	22.1	41.3	38.0	25.0	26.3	21.4	16.9	9.8	13.6	11.3	1.1	—	—	—	—	18	9	3	8	15	31	22	9	2	12
Petrochromis famula	MRAC 131115	Kabimba, D. R. Congo	—	Non-type	Male	102.0	41.9	32.5	14.1	12.1	62.9	18.8	35.5	35.6	22.0	23.5	18.8	13.7	8.0	11.7	9.5	0.3	—	—	—	—	18	10	3	8	15	32	23	12	2	11
Petrochromis famula	HUMZ 116502	Pemba, D. R. Congo	—	Non-type	Female	90.8	40.9	33.0	11.0	11.5	55.2	16.9	33.5	30.3	21.4	22.6	17.4	14.1	8.9	11.6	9.7	0.8	—	—	—	—	18	9	3	8	15	31	22	9	2	12
Petrochromis famula	HUMZ 118085	Pemba, D. R. Congo	—	Non-type	Female	95.7	39.5	33.0	11.0	11.0	57.8	16.6	32.9	29.5	21.5	22.7	17.5	13.3	8.8	11.9	10.3	0.3	—	—	—	—	18	9	3	8	15	32	23	10	2	12
Petrochromis famula	HUMZ 127712	Muzimu, D. R. Congo	5	Non-type	Male	97.6	39.5	32.3	12.5	11.5	59.7	18.3	33.7	38.5	22.8	24.5	17.4	14.1	8.4	11.3	8.3	0.8	—	—	—	—	19	9	3	8	16	32	23	11	2	12
Petrochromis famula	HUMZ 127713	Muzimu, D. R. Congo	5	Non-type	Female	84.7	37.7	30.2	9.7	10.5	52.1	14.8	33.3	26.6	20.8	21.5	16.2	13.3	8.5	10.3	8.1	1.0	—	—	—	—	18	9	3	8	15	32	23	10	2	12
Petrochromis famula	Zm 465-a	Kasenga, Zambia	1.5-2	Non-type	Female	94.6	41.3	32.9	13.3	12.3	59.7	16.7	32.5	31.4	21.5	22.6	16.9	14.0	8.2	11.1	9.3	0.6	—	—	—	—	19	8	3	7	15	33	24	12	2	14
Petrochromis famula	Zm 465-b	Kasenga, Zambia	1.5-2	Non-type	Female	90.1	40.0	31.5	12.2	12.2	55.1	15.9	31.7	28.1	20.5	22.0	16.7	13.0	8.5	10.6	9.6	0.3	—	—	—	—	18	8	3	7	15	32	24	11	2	12
Petrochromis famula	Zm 483-a	Kasenga, Zambia	1.5	Non-type	Male	101.1	45.2	34.6	13.7	13.5	65.1	19.8	34.4	37.5	23.8	26.3	18.0	15.6	8.2	12.1	9.5	1.0	—	—	—	—	18	9	3	8	15	32	22	12	2	11
Petrochromis famula	Zm 483-b	Kasenga, Zambia	1.5	Non-type	Male	99.0	41.8	33.7	14.8	13.3	61.6	18.2	29.8	29.3	21.5	23.4	17.4	14.5	8.1	11.5	9.6	0.5	—	—	—	—	18	9	3	8	15	32	23	12	2	12
Petrochromis famula	Zm 483-c	Kasenga, Zambia	1.5	Non-type	Female	95.1	40.6	33.3	12.7	12.2	58.1	16.9	32.3	31.1	21.9	25.0	17.3	14.3	8.5	11.6	9.4	0.8	—	—	—	—	18	9	3	8	15	32	22	12	2	12
Petrochromis famula	Zm 483-d	Kasenga, Zambia	1.5	Non-type	Female	92.9	41.1	32.6	13.0	12.2	57.8	16.8	33.1	29.3	19.9	21.8	17.3	14.5	8.2	11.3	9.2	0.4	—	—	—	—	18	9	3	8	15	32	22	12	2	13
Petrochromis famula	Zm 869-a	Kasenga, Zambia	3-4	Non-type	Male	121.1	53.7	41.5	17.1	16.6	78.5	23.0	44.6	46.6	27.2	30.8	21.6	18.7	9.5	15.6	12.5	1.1	—	—	—	—	18	10	3	8	15	33	22	12	2	12
Petrochromis famula	Zm 869-b	Kasenga, Zambia	3-4	Non-type	Female	108.2	48.1	37.7	16.5	14.1	68.3	20.5	36.3	32.7	—	—	19.7	16.7	10.0	13.2	11.8	1.1	—	—	—	—	18	9	3	8	15	32	22	10	2	11
Petrochromis famula	Zm 93792-d	Kasenga, Zambia	1-3	Non-type	Male	126.3	53.7	45.8	17.1	16.1	79.0	22.4	44.8	47.6	30.0	32.0	23.6	21.1	10.5	16.0	14.0	1.5	—	—	—	—	18	9	3	8	15	32	22	13	2	12
Petrochromis famula	Zm 93792-e	Kasenga, Zambia	1-3	Non-type	Male	133.0	55.6	43.2	16.3	16.1	84.6	24.8	46.6	47.0	28.6	32.7	24.0	19.2	10.0	16.5	13.1	1.0	—	—	—	—	18	10	3	8	15	33	24	10	2	12
Petrochromis fasciolatus	MRAC 10.749	devant Kapamba, D. R. Congo	—	Syntype	Female	85.3	30.3	26.7	14.2	9.6	51.4	14.6	27.7	24.0	18.3	—	14.9	9.7	8.5	9.6	10.0	-0.8	—	—	—	—	19	8	3	7	16	33	23	10	2	13
Petrochromis fasciolatus	MRAC 10.750	devant Kapamba, D. R. Congo	—	Syntype	Female	77.6	29.6	25.3	12.0	9.2	46.1	14.2	25.8	22.5	16.8	19.0	13.7	8.9	8.0	8.7	8.7	-0.8	—	—	—	—	19	9	3	8	15	33	24	13	2	—
Petrochromis fasciolatus	MRAC 11.695	baie de Kilewa, devant la Sambala, D. R. Congo	—	Syntype	Female	92.0	31.8	29.4	14.5	10.4	52.6	16.7	28.8	23.5	18.5	20.7	15.6	10.7	8.6	9.5	9.6	-0.9	—	—	—	—	19	9	3	8	16	34	24	14	2	13
Petrochromis fasciolatus	MRAC 11.696	baie de Kilewa, devant la Sambala, D. R. Congo	—	Syntype	Female	95.2	34.1	30.2	14.9	11.1	55.1	16.9	29.5	25.5	18.5	21.0	16.1	11.5	9.2	10.4	10.0	-1.7	—	—	—	—	18	10	3	8	16	34	23	12	2	11
Petrochromis fasciolatus	MRAC 106550	Albertville, D. R. Congo	—	Non-type	Female	99.1	38.5	32.1	15.8	11.5	59.8	17.5	32.4	27.4	20.3	23.2	18.2	12.1	9.3	11.2	11.6	-0.6	—	—	—	—	18	10	3	8	16	34	24	13	2	13
Petrochromis fasciolatus	MRAC 106551	Albertville, D. R. Congo	—	Non-type	Female	85.5	33.1	28.1	12.8	9.8	51.8	15.3	28.7	24.9	19.3	22.5	15.6	10.5	8.5	9.1	9.2	-0.6	—	—	—	—	18	10	3	8	16	34	25	15	2	11
Petrochromis fasciolatus	MRAC 106552	Albertville, D. R. Congo	—	Non-type	Male	101.3	39.3	32.2	15.9	11.2	60.2	16.3	32.8	—	20.9	24.1	18.3	12.6	9.7	11.6	11.0	-0.5	—	—	—	—	18	10	3	8	16	34	25	14	2	12
Petrochromis fasciolatus	MRAC 106553	Albertville, D. R. Congo	—	Non-type	Female	111.2	42.8	35.4	17.6	12.5	67.4	19.5	36.8	29.1	22.6	26.1	19.7	14.1	10.0	12.6	12.5	-1.1	—	—	—	—	18	10	3	8	16	34	26	14	2	14
Petrochromis fasciolatus	MRAC 106554	Albertville, D. R. Congo	—	Non-type	Male	102.9	40.9	31.0	15.6	10.7	62.5	18.8	31.5	30.7	21.7	25.4	18.1	13.0	9.7	11.1	10.6	-0.9	—	—	—	—	18	10	3	8	16	34	25	12	2	13
Petrochromis fasciolatus	MRAC 106555	Albertville, D. R. Congo	—	Non-type	Female	109.0	40.6	34.9	17.1	12.5	65.5	19.2	34.5	29.7	22.7	26.7	20.2	13.0	10.0	12.4	11.7	-0.5	—	—	—	—	18	10	3	8	16	34	25	15	2	13
Petrochromis fasciolatus	MRAC 106556	Albertville, D. R. Congo	—	Non-type	Male	105.6	41.2	34.1	15.4	12.1	63.5	18.4	35.9	33.3	23.9	27.6	20.0	13.2	10.1	12.2	12.0	-1.2	—	—	—	—	17	11	3	8	16	33	24	13	2	13
Petrochromis fasciolatus	MRAC 106557	Albertville, D. R. Congo	—	Non-type	Female	107.0	42.7	35.0	17.4	12.3	63.5	18.5	35.8	30.1	22.8	26.3	20.0	12.7	10.1	11.6	13.1	-0.9	—	—	—	—	18	10	3	7	17	34	22	13	2	13
Petrochromis fasciolatus	Zm 324	Kasenga, Zambia	2-4	Non-type	Male	124.4	50.8	39.4	18.2	14.9	78.6	22.5	35.2	38.3	25.1	27.5	22.1	15.3	10.3	15.3	14.4	-2.6	—	—	—	—	19	10	3	8	15	34	24	9	2	12
Petrochromis fasciolatus	Zm 401-a	Kasenga, Zambia	1	Non-type	Male	117.7	49.3	35.0	20.0	15.3	73.4	19.4	33.9	33.6	24.5	27.9	22.0	12.3	9.7	14.0	12.9	-1.4	—	—	—	—	19	9	3	7	15	33	24	13	2	13
Petrochromis fasciolatus	Zm 401-b	Kasenga, Zambia	1	Non-type	Female	113.1	46.2	33.3	18.5	13.8	70.3	18.0	32.1	31.6	23.5	25.1	19.4	12.5	9.3	12.8	12.0	-1.7	—	—	—	—	19	9	3	7	16	34	27	13	2	13
Petrochromis fasciolatus	Zm 449	Kasenga, Zambia	1.5	Non-type	Male	128.6	51.1	38.7	20.1	15.5	78.8	25.0	35.9	35.3	24.9	27.2	23.4	15.0	9.6	15.5	12.1	-1.1	—	—	—	—	18	10	3	8	16	34	25	13	2	12
Petrochromis fasciolatus	Zm 473-a	Kasenga, Zambia	1.5	Non-type	Male	82.2	32.4	24.3	13.8	10.3	50.4	13.9	24.0	24.0	17.5	19.9	14.3	9.0	7.5	9.0	8.2	-1.3	—	—	—	—	19	9	3	7	16	34	23	12	2	14
Petrochromis fasciolatus	HUMZ 127933	Cape Muzimu, D. R. Congo	5	Non-type	Female	108.3	36.4	33.8	16.5	12.1	65.0	19.7	35.8	32.2	22.5	25.9	19.2	12.7	9.4	12.2	11.5	-1.6	—	—	—	—	18	10	3	8	15	33	23	13	2	14
Petrochromis fasciolatus	HUMZ 137288	Pemba, D. R. Congo	0.5	Non-type	Male	87.0	34.4	26.6	14.1	10.2	53.2	14.9	29.1	24.9	20.0	22.1	15.6	9.6	8.0	9.8	8.8	-0.6	—	—	—	—	18	10	3	7	16	34	23	13	2	14
Petrochromis fasciolatus	HUMZ 137308	Pemba, D. R. Congo	0.5	Non-type	Male	93.7	38.6	29.5	15.0	11.5	59.4	16.6	31.1	26.4	21.3	24.5	17.7	11.0	8.5	10.6	10.2	-0.3	—	—	—	—	18	10	3	7	16	33	23	12	2	12
Petrochromis fasciolatus	HUMZ 138056	Pemba, D. R. Congo	—	Non-type	Male	105.0	41.6	33.4	16.1	12.3	64.2	18.1	31.8	31.5	22.5	27.0	19.4	13.0	9.8	11.9	11.2	-1.2	—	—	—	—	18	10	3	7	16	33	23	12	2	14
Petrochromis macrognathus	FAKU 50673	Luhanga, D. R. Congo	0.5	Holotype	Male	157.2	61.8	54.5	25.6	21.1	95.0	29.6	45.0	67.5	37.7	48.2	27.7	24.9	13.0	16.7	14.0	8.4	—	—	—	—	18	11	3	8	16	35	23	16	2	12
Petrochromis macrognathus	FAKU 50674	Luhanga, D. R. Congo	0.5	Paratype	Female	125.5	49.7	44.9	21.1	16.3	73.8	24.5	37.8	48.8	30.6	34.5	22.5	19.5	11.0	13.5	11.6	4.7	—	—	—	—	18	11	3	8	17	35	25	15	2	12
Petrochromis macrognathus	FAKU 50675	Luhanga, D. R. Congo	0.5	Paratype	Female	132.2	49.6	45.8	22.1	17.2	77.8	24.0	38.1	41.6	30.9	37.0	23.3	20.7	11.5	14.4	11.8	5.1	—	—	—	—	18	11	3	8	16	35	23	15	2	13
Petrochromis macrognathus	FAKU 51090	Luhanga, D. R. Congo	0.5	Paratype	Female	111.1	42.7	38.9	18.5	14.2	65.4	21.1	32.0	39.1	27.0	31.3	19.3	17.0	10.7	11.6	9.0	4.2	—	—	—	—	18	11	3	8	16	36	24	16	2	11
Petrochromis macrognathus	NSMT-P 21791	Luhanga, D. R. Congo	0.5	Paratype	Female	114.1	44.2	40.0	18.0	14.8	66.6	20.8	34.3	40.1	27.7	33.4	22.2	19.1	9.9	12.0	10.6	4.3	—	—	—	—	18	11	3	8	17	35	24	16	2	13
Petrochromis macrognathus	NSMT-P 21792	Pemba, D. R. Congo	1	Paratype	Male	158.6	63.8	54.4	26.4	20.7	97.7	32.0	44.7	67.4	37.0	43.3	—	25.6	12.1	17.7	15.3	5.5	—	—	—	—	18	11	3	9	17	35	24	14	2	12
Petrochromis macrognathus	Z 6211	Luhanga, D. R. Congo	—	Non-type	Male	160.9	59.4	55.2	27.1	21.2	91.0	31.2	43.0	57.4	35.5	41.1	28.7	25.3	12.1	17.8	14.6	6.5	—	—	—	—	18	11	3	8	17	35	24	15	2	13
Petrochromis macrognathus	Zm 284-a	Kasenga, Zambia	2	Non-type	Male	131.9	51.3	45.7	19.2	18.1	78.1	24.6	36.0	41.7	31.2	35.8	22.6	22.6	10.5	14.8	11.5	6.2	—	—	—	—	18	11	3	8	17	35	25	16	2	12
Petrochromis macrognathus	Zm 284-b	Kasenga, Zambia	2	Non-type	Female	107.8	41.1	34.6	17.5	15.0	65.6	21.2	28.4	29.0	23.3	27.7	17.8	15.5	8.8	11.0	9.2	3.5	—	—	—	—	19	11	3	8	16	37	25	16	2	11

Table S1 (Continued)

Species	Catalogue no.	Locality	Depth (m)	Type	Sex	Standard length (mm)	Body depth (mm)	Head length (mm)	Caudal-peduncle length (mm)	Caudal-peduncle depth (mm)	Dorsal-fin-base length (mm)	Anal-fin-base length (mm)	Pectoral-fin length (mm)	Pelvic-fin length (mm)	Shortest caudal-fin-ray length (mm)	Longest caudal-fin-ray length (mm)	Head width (mm)	Snout length (mm)	Eye length (mm)	Interorbital width (mm)	Lower-jaw length (mm)	Upper-jaw protrusion (mm)	Length of LPJ (mm)	Width of LPJ (mm)	Length of dentigerous area on LPJ (mm)	Width of dentigerous area on LPJ (mm)	Dorsal-fin spines	Dorsal-fin soft rays	Anal-fin spines	Anal-fin soft rays	Pectoral-fin soft rays	Scales in longitudinal line	Scales on upper lateral line	Scales on lower lateral line	Scale rows between lateral lines	Gill rakers on first ceratobranchial
Petrochromis macrognathus	Zm 284-c	Kasenga, Zambia	2	Non-type	Female	87.1	31.2	30.2	14.0	11.8	50.3	17.1	21.2	22.6	20.1	23.0	14.3	12.7	8.0	8.7	6.5	4.0	—	—	—	—	18	12	3	8	17	36	26	15	2	11
Petrochromis macrognathus	Zm 02170	Kasenga, Zambia	—	Non-type	Male	95.1	34.0	32.7	14.0	12.5	56.1	18.3	22.9	25.8	21.7	25.3	16.0	14.2	8.0	9.5	7.4	4.0	—	—	—	—	18	11	3	9	17	36	25	15	2	11
Petrochromis macrognathus	Zm 02573	Kasenga, Zambia	—	Non-type	Male	118.9	45.1	38.0	17.5	16.7	70.9	22.8	30.5	35.7	27.4	32.7	22.4	16.2	9.5	12.9	10.7	3.7	—	—	—	—	18	11	3	8	17	35	25	14	2	11
Petrochromis macrognathus	Zm 02574	Kasenga, Zambia	—	Non-type	Male	96.7	35.1	32.7	14.1	13.4	57.6	20.9	23.8	27.2	22.9	25.5	17.2	15.1	7.8	10.9	7.6	3.9	—	—	—	—	18	12	3	9	16	35	24	14	2	12
Petrochromis macrognathus	Zm 02578	Kasenga, Zambia	—	Non-type	Female	110.9	40.5	37.1	17.1	14.7	65.7	23.1	28.2	27.4	25.7	29.6	19.2	16.7	8.8	12.4	9.9	3.5	—	—	—	—	18	11	3	8	16	35	26	14	2	12
Petrochromis macrognathus	Zm 02579	Kasenga, Zambia	—	Non-type	Female	120.1	43.6	39.0	19.0	16.5	72.4	24.0	31.7	34.9	27.5	31.3	21.2	17.4	9.7	13.2	10.4	2.5	—	—	—	—	18	11	3	8	16	36	25	15	2	11
Petrochromis macrognathus	Zm 03532	Kasenga, Zambia	—	Non-type	Male	110.2	39.2	36.3	17.3	14.6	62.8	21.5	29.7	31.8	25.1	28.5	19.1	15.8	8.8	11.3	8.6	4.7	—	—	—	—	18	11	3	9	16	36	25	13	2	11
Petrochromis macrognathus	Zm 0127	Kasenga, Zambia	—	Non-type	Male	93.2	35.8	31.0	13.9	13.3	54.8	17.2	25.6	30.2	22.8	25.7	16.4	13.3	8.1	10.2	8.5	2.9	—	—	—	—	17	12	3	8	17	36	25	16	2	11
Petrochromis macrognathus	Zm 0323	Kasenga, Zambia	—	Non-type	Female	117.5	47.0	39.6	19.0	16.0	70.7	22.7	34.0	37.1	29.9	34.9	21.2	19.0	9.2	12.5	10.2	3.9	—	—	—	—	18	12	3	9	17	36	25	17	2	12
Petrochromis macrognathus	HUMZ 122890	Cape Kanchese, Sumbu, Zambia	—	Non-type	Female	127.8	45.8	42.8	18.7	16.5	73.4	23.8	36.0	44.0	31.5	35.7	21.1	20.5	11.1	13.4	11.6	3.5	—	—	—	—	18	11	3	9	16	36	25	15	2	12
Petrochromis macrognathus	HUMZ 122901	Cape Kanchese, Sumbu, Zambia	—	Non-type	Male	178.7	65.7	61.9	26.9	22.5	103.5	35.7	50.6	63.1	41.1	49.8	30.2	30.0	13.2	18.0	14.5	6.1	—	—	—	—	18	11	3	10	17	36	24	17	2	12
Petrochromis macrognathus	HUMZ 138694	Kahoma (?), D. R. Congo	—	Non-type	Male	147.7	52.9	49.5	26.6	18.0	83.4	25.5	39.2	49.7	31.3	39.5	25.1	22.0	11.5	16.2	12.2	5.4	—	—	—	—	18	11	3	8	16	36	25	17	2	14
Petrochromis orthognathus	MRAC 125.150	Bemba, km 155 route Uvira-Baraka, D. R. Congo	2-5	Holotype	Male	131.7	52.2	41.4	19.7	14.8	82.5	23.0	44.7	45.6	27.3	32.1	23.9	18.7	10.5	14.1	11.4	0.7	—	—	—	—	19	9	3	7	16	32	23	12	2	14
Petrochromis orthognathus	MRAC 125180	Entre Albertville et le camp Jacques, D. R. Congo	—	Non-type	Male	150.5	54.9	46.6	22.9	17.3	90.2	25.6	49.6	55.7	31.5	35.1	25.5	20.0	13.1	15.8	14.0	0.3	—	—	—	—	18	10	3	7	15	31	22	11	2	14
Petrochromis orthognathus	HUMZ 116553	Pemba, D. R. Congo	—	Non-type	Male	99.3	40.6	32.6	13.5	12.0	63.3	16.8	38.2	36.2	24.3	25.6	18.6	13.1	9.5	11.1	9.5	0.5	—	—	—	—	19	9	3	7	16	32	23	9	2	12
Petrochromis orthognathus	HUMZ 116674	Pemba, D. R. Congo	—	Non-type	Female	129.9	51.2	41.7	18.0	14.7	77.0	20.6	39.4	39.5	26.7	30.5	22.5	18.0	11.9	15.3	12.8	0.7	—	—	—	—	18	9	3	7	14	33	23	11	2	13
Petrochromis orthognathus	HUMZ 118079	Pemba, D. R. Congo	—	Non-type	Female	92.7	37.7	29.2	13.6	10.7	59.4	15.0	32.7	29.9	21.0	23.0	16.5	11.9	8.2	9.8	8.4	0.4	—	—	—	—	19	10	3	7	15	33	24	11	2	13
Petrochromis orthognathus	HUMZ 118086	Pemba, D. R. Congo	—	Non-type	Female	107.1	42.1	34.5	15.8	12.2	66.0	18.5	36.9	34.4	22.5	25.1	18.6	14.8	9.6	11.6	9.8	0.7	—	—	—	—	19	9	3	7	15	33	23	11	2	13
Petrochromis orthognathus	HUMZ 127387	Gitaza, Burundi	12	Non-type	Female	108.5	44.2	35.2	15.5	12.3	64.9	17.2	35.9	32.9	23.8	25.9	19.3	15.7	10.0	12.5	10.0	0.4	—	—	—	—	19	8	3	7	15	32	24	10	2	13
Petrochromis orthognathus	HUMZ 127388	Gitaza, Burundi	12	Non-type	Male	123.9	49.8	39.4	19.3	14.6	77.9	21.4	42.3	46.6	26.0	29.5	23.1	16.3	11.0	14.3	11.8	0.8	—	—	—	—	18	9	3	7	15	31	21	10	2	14
Petrochromis orthognathus	HUMZ 127390	Gitaza, Burundi	12	Non-type	Female	101.1	42.0	32.6	14.7	12.5	60.8	16.9	32.6	30.0	22.2	23.4	17.5	13.1	9.4	11.1	8.7	0.7	—	—	—	—	19	8	3	7	14	32	22	11	2	11
Petrochromis orthognathus	HUMZ 127423	Moguruka near Nyanza, Burundi	—	Non-type	Female	99.8	38.0	32.9	14.4	11.4	60.5	17.6	35.6	29.2	21.6	23.5	17.7	13.0	10.0	10.6	10.2	0.5	—	—	—	—	18	10	3	7	16	32	23	11	2	13
Petrochromis orthognathus	HUMZ 127426	Moguruka near Nyanza, Burundi	—	Non-type	Male	109.9	41.5	33.6	15.0	12.9	69.2	19.8	38.1	35.1	27.1	28.3	19.2	14.5	10.1	11.5	9.1	0.9	—	—	—	—	19	9	3	7	16	33	23	11	2	14
Petrochromis orthognathus	HUMZ 127427	Moguruka near Nyanza, Burundi	—	Non-type	Male	130.4	49.2	39.8	19.3	15.0	81.8	24.1	42.6	39.5	28.6	31.4	22.8	16.7	11.6	14.3	12.1	0.4	—	—	—	—	18	9	3	7	15	32	23	11	2	13
Petrochromis orthognathus	HUMZ 127510	Moguruka near Nyanza, Burundi	—	Non-type	Male	134.9	50.5	41.4	19.6	15.3	83.3	22.6	44.7	57.9	29.0	32.4	23.0	17.2	12.2	14.5	11.8	1.0	—	—	—	—	18	9	3	7	16	32	23	11	2	11
Petrochromis orthognathus	HUMZ 127511	Moguruka near Nyanza, Burundi	—	Non-type	Male	97.2	36.9	30.2	14.1	11.8	61.6	17.3	30.2	33.9	21.5	23.4	17.0	12.1	9.3	10.4	8.7	0.6	—	—	—	—	19	9	3	7	15	32	24	10	2	12
Petrochromis orthognathus	HUMZ 127697	Muzimu, D. R. Congo	4-5	Non-type	Female	116.0	43.0	39.1	18.0	12.9	67.8	18.6	40.5	36.4	24.9	—	19.7	14.8	11.5	12.0	9.8	—	—	—	—	—	18	9	3	7	15	32	23	9	2	11
Petrochromis orthognathus	HUMZ 127699	Muzimu, D. R. Congo	4-5	Non-type	Female	92.6	37.5	29.5	13.1	11.4	59.1	15.4	34.0	30.0	21.1	23.5	17.5	11.7	9.6	10.3	9.4	0.5	—	—	—	—	19	9	3	7	16	32	25	11	2	13
Petrochromis orthognathus	HUMZ 127714	Muzimu, D. R. Congo	4-5	Non-type	Male	105.9	43.6	33.7	14.6	12.9	68.6	17.4	38.8	42.6	24.3	27.4	19.0	13.9	9.7	12.0	10.5	0.8	—	—	—	—	19	8	3	7	15	32	23	11	2	12
Petrochromis orthognathus	HUMZ 127719	Muzimu, D. R. Congo	4-5	Non-type	Male	124.0	48.2	38.2	19.1	14.3	81.2	19.9	42.4	44.9	27.9	30.5	22.6	16.2	10.7	13.5	11.1	0.5	—	—	—	—	20	8	3	7	15	33	24	11	2	14
Petrochromis orthognathus	HUMZ 127720	Muzimu, D. R. Congo	4-5	Non-type	Male	134.8	50.6	41.1	19.3	15.0	83.3	22.5	45.2	49.7	28.5	32.7	23.6	17.5	11.3	14.6	10.7	1.2	—	—	—	—	19	9	3	7	15	33	23	12	2	12
Petrochromis orthognathus	TT 1213	purchased in Katonga Marchet, Kigoma, Tanzania	—	Non-type	Female	106.8	41.5	33.4	15.5	13.2	66.1	19.9	35.8	30.1	22.9	25.0	19.2	13.2	9.9	11.7	10.4	1.0	—	—	—	—	19	9	3	7	16	32	23	10	2	14
Petrochromis orthognathus "ikola"	MRAC 92081.0592	Mpimbwe Hills, southern part of Shashete Bay, Tanzania	—	Non-type	Male	127.1	51.7	41.4	19.2	13.7	81.7	22.6	42.5	45.0	26.6	29.2	22.1	17.6	12.0	14.8	12.0	1.5	—	—	—	—	19	9	3	7	16	33	23	13	2	13
Petrochromis orthognathus "ikola"	MRAC 92081.0743	Just south of Karema, Tanzania	—	Non-type	Female	91.8	36.4	30.8	14.1	10.3	57.0	15.6	33.2	31.0	—	—	15.4	11.6	9.5	9.7	8.6	1.2	—	—	—	—	19	8	3	7	15	32	24	12	2	12
Petrochromis orthognathus "ikola"	MRAC 92081.0865	Just south of Mkangasi, Tanzania	—	Non-type	Female	88.4	35.5	29.3	13.1	9.6	55.6	16.9	29.9	29.6	18.0	20.1	15.1	11.4	9.1	9.0	8.2	1.1	—	—	—	—	19	9	3	7	15	32	24	12	2	12
Petrochromis orthognathus "ikola"	MRAC 92081.1023	Just south of Bulu Point, Tanzania	—	Non-type	Male	95.9	37.1	30.0	13.6	11.4	60.3	16.4	32.1	31.2	19.5	22.0	16.5	12.0	9.3	9.2	8.5	1.2	—	—	—	—	19	9	3	7	15	33	23	12	2	13
Petrochromis orthognathus "ikola"	MRAC 92081.1242	? ± 3km north of Kabwe, Tanzania	—	Non-type	Male	108.0	43.3	35.7	14.3	12.7	66.4	17.8	38.0	39.0	23.0	24.0	19.1	14.2	10.7	11.8	10.4	1.3	—	—	—	—	18	9	3	7	16	32	23	10	2	13
Petrochromis orthognathus "ikola"	MRAC 92081.1433	Kiti Point, southern shore, Tanzania	—	Non-type	Male	84.2	33.6	26.4	12.1	9.8	53.6	14.1	30.2	30.0	19.2	21.6	13.6	9.6	8.2	7.9	7.2	0.9	—	—	—	—	18	10	3	7	15	32	24	11	2	12
Petrochromis polyodon	BMNH 1898.9.9:59	Kinyamkolo, Mpulungu, Zambia	—	Syntype	Male	79.6	32.9	28.3	12.2	11.3	48.9	15.3	24.7	28.5	20.2	22.8	15.0	10.3	8.1	9.2	8.2	2.1	—	—	—	—	17	10	3	8	16	34	23	15	2	12
Petrochromis polyodon	BMNH 1898.9.9:60	Mbity Rocks, Mpulungu, Zambia	—	Syntype	Female	108.1	41.3	38.2	18.1	14.2	61.0	18.0	35.9	30.2	26.0	—	19.3	16.5	10.6	11.9	11.0	3.0	—	—	—	—	19	9	3	7	16	34	24	15	2	11
Petrochromis polyodon	MRAC 106532	Albertville (= Kalemie), pier, D. R. Congo	—	Non-type	Female	138.7	54.4	47.5	21.3	16.9	79.1	26.7	45.2	42.1	32.6	37.0	24.0	20.6	11.9	14.8	13.0	2.5	—	—	—	—	17	11	3	8	17	35	24	14	2	12
Petrochromis polyodon	MRAC 92081.1360	Masaka Point, Tanzania	—	Non-type	Male	77.3	30.2	26.9	12.4	9.9	43.5	14.0	24.2	26.4	—	—	12.9	11.1	7.6	8.7	6.8	3.2	—	—	—	—	18	9	3	8	15	34	24	14	2	11
Petrochromis polyodon	HUMZ 127424	Moguruka near Nyanza, Burundi	—	Non-type	Male	162.2	62.6	52.1	25.9	19.4	92.2	27.2	49.7	63.3	35.3	42.3	28.2	24.2	12.9	21.1	14.1	3.1	—	—	—	—	18	9	3	7	16	35	24	14	2	10
Petrochromis polyodon	HUMZ 127425	Moguruka near Nyanza, Burundi	—	Non-type	Male	162.3	65.4	51.3	26.0	20.3	95.1	29.1	51.6	60.8	35.8	46.0	29.2	24.0	13.2	20.0	15.4	3.5	—	—	—	—	18	9	3	7	16	34	23	13	2	11
Petrochromis polyodon	HUMZ 127715	Cape Muzimu, D. R. Congo	5	Non-type	Male	109.3	44.0	36.4	18.2	13.7	66.0	19.4	37.0	45.3	26.4	32.1	19.7	15.8	9.3	13.0	9.7	2.2	—	—	—	—	18	9	3	8	16	35	23	15	2	12
Petrochromis polyodon	HUMZ 127722	Cape Muzimu, D. R. Congo	5	Non-type	Female	109.3	42.0	38.3	16.5	13.4	62.2	20.2	36.7	40.4	26.0	32.5	19.6	16.7	10.4	13.0	8.7	3.7	—	—	—	—	17	10	3	8	16	34	22	14	2	10
Petrochromis polyodon	HUMZ 127723	Cape Muzimu, D. R. Congo	5	Non-type	Male	134.9	56.3	44.7	19.0	15.9	81.3	22.8	45.9	59.7	31.5	40.1	23.8	20.8	11.5	16.4	12.2	3.8	—	—	—	—	18	10	3	8	16	35	24	13	2	11
Petrochromis polyodon	HUMZ 127724	Cape Muzimu, D. R. Congo	5	Non-type	Male	142.9	59.4	46.3	22.3	17.7	85.9	26.6	51.6	55.2	33.4	42.5	25.9	21.4	12.1	18.5	11.0	5.0	—	—	—	—	18	9	3	8	16	35	23	14	2	12
Petrochromis polyodon	HUMZ 137101	Pemba, D. R. Congo	1	Non-type	Male	158.1	64.4	51.3	24.6	19.0	95.3	27.3	54.4	77.2	37.1	47.5	28.0	24.5	13.0	18.9	14.6	5.0	—	—	—	—	18	9	3	8	16	34	23	12	2	10
Petrochromis polyodon	HUMZ 137110	Pemba, D. R. Congo	1	Non-type	Male	93.1	38.9	32.0	15.7	11.6	55.4	17.8	32.9	37.3	23.6	27.5	17.9	13.3	9.0	11.1	8.5	2.7	—	—	—	—	18	9	3	8	16	36	25	15	2	10
Petrochromis polyodon	HUMZ 137309	Pemba, D. R. Congo	0.5	Non-type	Female	107.8	44.8	36.8	16.3	13.9	65.5	18.8	40.0	39.0	26.2	33.0	21.1	16.6	9.6	14.6	9.6	2.6	—	—	—	—	18	9	3	8	16	35	24	14	2	11
Petrochromis polyodon	Zm 93792-a	Kasenga, Zambia	1-3	Non-type	Male	165.7	71.4	53.6	26.6	22.1	100.5	31.0	53.1	76.8	36.4	43.9	29.7	25.7	12.9	20.6	16.6	4.2	—	—	—	—	18	9	3	8	16	34	23	15	2	12
Petrochromis polyodon	Zm 93792-b	Kasenga, Zambia	1-3	Non-type	Male	179.8	72.0	59.9	28.5	23.4	113.1	33.4	53.7	66.7	39.2	44.6	30.1	29.0	13.3	20.9	18.1	2.9	—	—	—	—	18	10	3	8	16	34	23	15	2	10
Petrochromis polyodon	Zm 93792-f	Kasenga, Zambia	1-3	Non-type	Female	149.6	59.8	54.0	23.0	19.3	89.0	25.1	50.7	56.0	37.1	41.3	25.8	26.4	12.6	19.5	16.0	3.0	—	—	—	—	18	9	3	8	16	34	22	13	2	11
Petrochromis polyodon	Zm 93792-g	Kasenga, Zambia	1-3	Non-type	Male	115.2	46.2	39.6	18.1	14.5	66.3	21.0	37.0	51.1	25.2	30.2	20.0	17.2	10.2	13.5	9.3	3.2	—	—	—	—	18	9	3	8	16	34	23	14	2	9
Petrochromis polyodon	Zm 93792-h	Kasenga, Zambia	1-3	Non-type	Female	103.6	43.4	36.6	16.5	13.3	62.1	19.5	34.8	34.6	24.6	28.5	18.2	15.1	10.0	11.9	8.5	3.2	—	—	—	—	18	9	3	8	16	34	23	13	2	13
Petrochromis polyodon	Zm 93792-i	Kasenga, Zambia	1-3	Non-type	Female	101.6	42.7	34.3	16.6	14.0	61.5	18.2	33.2	36.2	23.7	27.9	17.8	14.6	9.3	11.7	8.8	2.1	—	—	—	—	18	9	3	8	16	35	26	15	2	8
Petrochromis polyodon	TT 1216	purchased in Katonga Marchet, Kigoma, Tanzania	—	Non-type	Female	116.0	42.3	37.2	18.9	14.1	67.9	20.7	37.3	39.4	25.7	30.5	19.7	16.2	10.1	12.8	10.4	2.3	—	—	—	—	18	10	3	8	17	35	23	13	2	11
Petrochromis trewavasae trewavasae	MRAC 106.574	Moliro, D. R. Congo	1-2	Holotype	Male	87.7	36.4	30.4	11.5	10.6	55.8	17.3	26.4	—	19.0	—	15.8	13.6	7.8	11.2	7.6	2.4	—	—	—	—	19	9	3	8	15	35	24	13	2	10
Petrochromis trewavasae trewavasae	MRAC 82.12.P.75	Chipimbi, Zambia	—	Non-type	Male	120.1	52.0	42.3	16.7	16.0	77.5	21.8	41.0	53.8	27.1	42.0	22.4	20.7	9.7	17.3	13.1	3.6	—	—	—	—	20	8	3	8	16	34	27	12	2	10
Petrochromis trewavasae trewavasae	MRAC 82.12.P.76	Chipimbi, Zambia	—	Non-type	Male	120.0	49.1	42.1	17.3	15.1	73.8	20.2	37.5	42.1	26.4	43.0	21.3	20.2	10.2	16.2	12.0	3.4	—	—	—	—	19	9	3	8	15	34	24	12	2	11
Petrochromis trewavasae ephippium	MRAC 82-12-P-105	Ubwari face est., D. R. Congo	—	Non-type	Female	137.4	57.1	48.1	21.8	17.5	85.2	23.1	50.3	—	—	—	23.7	21.3	12.2	16.2	13.2	3.3	—	—	—	—	19	9	3	7	16	34	22	13	2	10

Table S1 (Continued)

Species	Catalogue no.	Locality	Depth (m)	Type	Sex	Standard length (mm)	Body depth (mm)	Head length (mm)	Caudal-peduncle length (mm)	Caudal-peduncle depth (mm)	Dorsal-fin-base length (mm)	Anal-fin-base length (mm)	Pectoral-fin length (mm)	Pelvic-fin length (mm)	Shortest caudal-fin-ray length (mm)	Longest caudal-fin-ray length (mm)	Head width (mm)	Snout length (mm)	Eye length (mm)	Interorbital width (mm)	Lower-jaw length (mm)	Upper-jaw protrusion (mm)	Length of LPJ (mm)	Width of LPJ (mm)	Length of dentigerous area on LPJ (mm)	Width of dentigerous area on LPJ (mm)	Dorsal-fin spines	Dorsal-fin soft rays	Anal-fin spines	Anal-fin soft rays	Pectoral-fin soft rays	Scales in longitudinal line	Scales on upper lateral line	Scales on lower lateral line	Scale rows between lateral lines	Gill rakers on first ceratobranchial
Petrochromis trewavasae ephippium	HUMZ 116592	Pemba, D. R. Congo	—	Non-type	Male	77.1	32.2	25.4	10.8	9.6	47.1	14.5	25.5	32.5	18.9	23.3	13.9	11.1	7.5	8.7	5.6	1.7	—	—	—	—	19	9	3	7	16	34	24	12	2	12
Petrochromis trewavasae ephippium	HUMZ 116661	Pemba, D. R. Congo	—	Non-type	Female	77.3	32.9	26.1	11.5	10.0	48.2	14.6	28.3	31.0	19.6	25.8	14.3	10.5	7.7	9.0	6.6	1.6	—	—	—	—	19	9	3	7	15	34	23	13	2	10
Petrochromis trewavasae ephippium	HUMZ 127700	Cape Muzimu, D. R. Congo	4-5	Non-type	Male	100.4	41.9	32.4	13.9	12.5	64.0	17.9	32.9	40.3	23.5	30.1	18.1	13.5	8.7	12.1	9.8	1.9	—	—	—	—	19	9	3	7	16	34	25	14	2	10
Petrochromis trewavasae ephippium	HUMZ 127921	Cape Muzimu, D. R. Congo	4-5	Non-type	Male	153.3	59.3	49.5	24.3	19.1	92.7	26.2	53.8	78.8	33.9	45.5	29.1	23.0	12.2	18.7	13.4	2.9	—	—	—	—	18	9	3	7	16	35	22	13	2	11
Petrochromis trewavasae ephippium	HUMZ 127922	Cape Muzimu, D. R. Congo	4-5	Non-type	Male	112.7	45.3	36.4	18.6	13.8	69.2	18.7	37.6	46.0	25.8	34.0	20.2	16.5	9.9	14.5	9.3	2.8	—	—	—	—	19	9	3	8	15	34	24	15	2	11
Petrochromis trewavasae ephippium	HUMZ 136368	Pemba, D. R. Congo	0.5	Non-type	Female	145.3	58.2	47.2	23.0	17.1	86.5	24.7	46.0	57.3	33.4	48.4	25.4	21.4	11.9	16.8	11.9	3.3	—	—	—	—	19	10	3	7	16	35	24	11	2	10
Petrochromis trewavasae ephippium	HUMZ 138051	Pemba, D. R. Congo	—	Non-type	Female	84.0	35.4	27.3	11.4	10.5	51.3	15.0	27.6	30.7	20.7	27.0	15.7	11.2	8.2	10.0	6.9	2.3	—	—	—	—	18	10	3	7	16	34	22	14	2	9
Petrochromis trewavasae ephippium	HUMZ 138053	Pemba, D. R. Congo	—	Non-type	Female	125.1	51.2	40.6	19.0	15.8	78.5	21.6	39.5	57.3	28.9	37.7	21.9	17.9	10.0	14.5	10.1	2.1	—	—	—	—	19	9	3	7	15	34	22	13	2	11
Petrochromis trewavasae ephippium	Zm 93793-a	Kasenga, Zambia	1-3	Non-type	Female	141.0	57.4	50.2	21.5	17.6	87.0	24.8	44.8	54.0	31.0	41.7	23.4	22.7	11.5	17.9	12.7	4.6	—	—	—	—	19	9	3	7	16	35	24	16	2	10
Petrochromis trewavasae ephippium	Zm 93793-b	Kasenga, Zambia	1-3	Non-type	Female	128.9	56.2	44.2	20.5	16.2	83.1	22.5	43.0	50.1	29.3	38.1	23.0	19.9	10.8	16.8	11.2	2.4	—	—	—	—	18	9	3	7	15	34	24	15	2	10
Petrochromis trewavasae ephippium	Zm 93793-c	Kasenga, Zambia	1-3	Non-type	Female	132.5	54.3	47.3	21.5	17.4	84.0	24.6	41.8	54.8	29.5	38.0	24.6	21.2	11.4	17.2	13.2	3.3	—	—	—	—	19	8	3	7	15	35	25	14	2	12
Petrochromis trewavasae ephippium	Zm 93793-d	Kasenga, Zambia	1-3	Non-type	Male	127.1	52.8	42.4	15.6	16.1	82.0	23.4	42.0	53.7	28.0	36.6	22.2	20.4	10.0	14.9	11.3	3.7	—	—	—	—	19	9	3	8	15	34	25	13	2	11
Petrochromis trewavasae ephippium	Zm 93793-e	Kasenga, Zambia	1-3	Non-type	Female	125.0	48.0	40.6	18.3	14.8	79.7	22.8	39.7	44.4	27.1	35.5	21.7	18.6	10.5	14.7	9.8	2.9	—	—	—	—	19	9	3	7	15	35	24	13	2	10
Petrochromis trewavasae ephippium	Zm 93793-f	Kasenga, Zambia	1-3	Non-type	Male	98.9	42.9	32.9	15.0	12.4	65.0	17.5	30.7	31.9	22.9	28.0	17.4	13.8	9.0	12.2	8.7	2.6	—	—	—	—	19	9	3	7	15	35	23	15	2	14
Petrochromis trewavasae ephippium	Zm 93793-g	Kasenga, Zambia	1-3	Non-type	Male	94.4	41.4	32.8	12.4	12.0	62.9	17.2	31.9	36.3	22.7	27.3	17.2	14.0	9.0	11.5	7.6	2.3	—	—	—	—	19	9	3	7	15	34	23	13	2	12
Petrochromis trewavasae ephippium	Zm 93793-h	Kasenga, Zambia	1-3	Non-type	Female	86.6	37.0	29.1	13.4	10.9	53.7	15.0	28.5	33.7	20.2	24.5	15.0	12.1	8.0	10.0	7.0	2.7	—	—	—	—	18	9	3	7	15	34	23	13	2	10
Petrochromis trewavasae "Moshi Yellow"	TT 1214	purchased in Katonga Marchet, Kigoma, Tanzania	—	Non-type	Male	130.8	52.6	42.4	19.7	15.9	78.9	23.6	43.4	50.7	30.3	37.8	22.4	20.5	10.5	15.5	11.0	3.3	—	—	—	—	19	8	3	7	15	34	26	14	2	12
Petrochromis trewavasae "Moshi Yellow"	TT 1215	purchased in Katonga Marchet, Kigoma, Tanzania	—	Non-type	Male	113.0	44.2	37.1	16.5	14.1	70.5	23.5	37.6	43.9	25.4	33.3	20.3	16.2	9.6	13.4	9.9	3.0	—	—	—	—	19	9	3	8	15	34	23	14	2	13

BMNH: The Natural History Museum, London, UK
FAKU: Fish collection of Kyoto University, Kyoto and Maizuru, Japan
HUMZ: Laboratory of Marine Biodiversity, Graduate School of Fisheries Science, Hokkaido University, Hakodate, Japan
LPJ: Lower pharyngeal jaw
MRAC: Royal Museum for Central Africa, Tervuren, Belgium
NSMT-P: Department of Zoology, National Science Museum, Tokyo, Japan
TT: private collection of T. Takahashi, Kyoto University, Kyoto, Japan
Z, Zm: private collection of M. Hori, Kyoto University, Kyoto, Japan

Table S2 Samples used for the phylogenetic analysis

	Names in the present study	Names in Koblmüller et al. (2010)	Catalogue no.	Locality	Accession no. of DDBJ or GenBank	
					ND2	CR
Ingroup (Tropheini)	*Chromis horei**	*Ctenochromis horei*	6621	Katete	GQ995716**	GQ995825**
			6636	Mbita Island W	GQ995717**	GQ995826**
			6637	Mbita Island W	GQ995718**	GQ995827**
	Interochromis loocki	*Interochromis loockii*	6650	Kalambo Lodge	GQ995742**	GQ995851**
			6653	Wonzye	GQ995743**	GQ995852**
			6654	Wonzye	GQ995744**	GQ995853**
			6658	Wonzye	GQ995745**	GQ995854**
			8037	Wonzye	GQ995746**	GQ995855**
			8258	Mtosi	GQ995747**	GQ995856**
	Limnotilapia dardennii	*Limnotilapia dardennii*	6645	Kalambo Lodge	GQ995722**	GQ995831**
			7190	Mpulungu	GQ995723**	GQ995832**
			7191	Mpulungu	GQ995724**	GQ995833**
	Lobochilotes labiatus	*Lobochilotes labiatus*	6619	Chimba	GQ995725**	GQ995834**
			6625	Chimba	GQ995726**	GQ995835**
			6628	Mbita Island E	GQ995727**	GQ995836**
			6655	Wonzye	GQ995728**	GQ995837**
	*Paratilapia pfefferi**	*Gnathochromis pfefferi*	6614	Kalambo Lodge	GQ995719**	GQ995828**
			6615	Kalambo Lodge	GQ995720**	GQ995829**
			6618	Chimba	GQ995721**	GQ995830**
	Petrochromis famula	*Petrochromis famula*	6613	Kalambo Lodge	GQ995729**	GQ995838**
			6620	Chimba	GQ995730**	GQ995839**
			6627	Chimba	GQ995731**	GQ995840**
			7376	Mpimbwe	GQ995732**	GQ995841**
			8241	S of Isonga	GQ995733**	GQ995842**
			8252	Mahale N	GQ995734**	GQ995843**
	Petrochromis fasciolatus	*Petrochromis fasciolatus*	6626	Chimba	GQ995799**	GQ995908**
			6638	Mbita Island W	GQ995793**	GQ995902**
			6657	Wonzye	GQ995800**	GQ995909**
			7058	Kalambo	GQ995801**	GQ995910**
			7061	Wonzye	GQ995794**	GQ995903**
			7062	Kalambo Lodge	GQ995795**	GQ995904**
			8031	Kalambo Lodge	GQ995796**	GQ995905**
			8032	Kalambo Lodge	GQ995797**	GQ995906**
			8033	Kalambo Lodge	GQ995798**	GQ995907**
			8035	Kalambo Lodge	GQ995802**	GQ995911**
	Petrochromis horii n. sp.	Not used in Koblmüller et al. (2010)	MRAC B3-03-P-04	Kasenga	AB850665	AB850680
			MRAC B3-03-P-05	Kasenga	AB850666	AB850681
			MRAC B3-03-P-06	Kasenga	AB850667	AB850682
			MRAC B3-03-P-07	Kasenga	AB850668	AB850683
			BMNH 2013.2.13.1	Kasenga	AB850669	AB850684
			BMNH 2013.2.13.2	Kasenga	AB850670	AB850685
			BMNH 2013.2.13.3	Kasenga	AB850671	AB850686
			BMNH 2013.2.13.4	Kasenga	AB850672	AB850687
			BMNH 2013.2.13.5	Kasenga	AB850673	AB850688
	Petrochromis macrognathus	Not used in Koblmüller et al. (2010)	Zm 02170	Kasenga	AB850674	AB850689
			Zm 02573	Kasenga	AB850675	AB850690
			Zm 02574	Kasenga	AB850676	AB850691
			Zm 02578	Kasenga	AB850677	AB850692
			Zm 02579	Kasenga	AB850678	AB850693
			Zm 03532	Kasenga	AB850679	AB850694
	Petrochromis cf. macrognathus	*Petrochromis cf. macrognathus*	8248	Mahale N	GQ995770**	GQ995879**
	Petrochromis orthognathus	*Petrochromis orthognathus*	61	Kavalla	GQ995737**	GQ995846**
			149	Ikola	GQ995738**	GQ995847**
			8239	Mpimbwe	GQ995739**	GQ995848**
			8242	S of Isonga	GQ995740**	GQ995849**
			8247	N of Mabilibili	GQ995741**	GQ995850**
	Petrochromis polyodon	*Petrochromis polyodon*	6612	Kalambo Lodge	GQ995749**	GQ995858**
			6622	Katete	GQ995750**	GQ995859**
			6629	Nakaku	GQ995751**	GQ995860**
			6630	Nakaku	GQ995752**	GQ995861**
			6631	Nakaku	GQ995753**	GQ995862**
			6632	Nakaku	GQ995754**	GQ995863**
			6633	Nakaku	GQ995755**	GQ995864**
		Petrochromis cf. polyodon	7374	Nkondwe Island	GQ995756**	GQ995865**
			7375	N of Mpimbwe	GQ995757**	GQ995866**
			8236	Mpimbwe	GQ995774**	GQ995883**
			8238	Mpimbwe	GQ995775**	GQ995884**
			8243	S of Isonga	GQ995767**	GQ995876**
			8249	Mahale N	GQ995768**	GQ995877**
			8261	Mtosi	GQ995769**	GQ995878**
		Petrochromis sp. "macrognathus rainbow"	8257	Mtosi	GQ995771**	GQ995880**
			8259	Mtosi	GQ995772**	GQ995881**
			8260	Mtosi	GQ995773**	GQ995882**
		Petrochromis sp. "Texas Longola"	8234	Longola	GQ995766**	GQ995875**
	Petrochromis trewavasae	*Petrochromis ephippium*	6656	Isanga	GQ995735**	GQ995844**
			7063	Kalambo Lodge	GQ995736**	GQ995845**
		Petrochromis trewavasae	69***	Location unknown	GQ995759**	GQ995868**
			143***	Zaire	GQ995760**	GQ995869**
			6617	Chimba	GQ995761**	GQ995870**
		Petrochromis sp. "Moshi yellow"	7377	S of Karema	GQ995758**	GQ995867**
			8235	Mpimbwe	GQ995764**	GQ995873**
			8245	N of Mabilibili	GQ995762**	GQ995871**
			8246	N of Mabilibili	GQ995763**	GQ995872**
			8250	Mahale N	GQ995765**	GQ995874**
	Petrochromis sp. "Katete"	*Petrochromis* sp. "Katete"	6623	Katete	GQ995748**	GQ995857**
	Pseudosimochromis curvifrons	*Pseudosimochromis curvifrons*	6624	Katete	GQ995776**	GQ995885**
			6646	Kalambo Lodge	GQ995777**	GQ995886**
			7059	Kasenga Rocks	GQ995778**	GQ995887**
			7060	Location unknown	GQ995779**	GQ995888**
	Simochromis babaulti	*Simochromis babaulti*	8240	Kekese	GQ995784**	GQ995893**
			8255	Mahale N	GQ995786**	GQ995895**
			8256	Mahale N	GQ995785**	GQ995894**

Table S2 (continued)

	Names in the present study	Names in Koblmüller et al. (2010)	Catalogue no.	Locality	Accession no. of DDBJ or GenBank	
					ND2	CR
	Simochromis diagramma	*Simochromis diagramma*	6649	Kalambo Lodge	GQ995790**	GQ995899**
			8038	Wonzye	GQ995791**	GQ995900**
			8244	S of Isonga	GQ995792**	GQ995901**
	Simochromis marginatus	*Simochromis marginatus*	64	Ubwari	GQ995789**	GQ995898**
			8253	Mahale N	GQ995787**	GQ995896**
			8254	Mahale N	GQ995788**	GQ995897**
	Simochromis pleurospilus	*Simochromis pleurospilus*	6611	Kalambo Lodge	GQ995780**	GQ995889**
			6616	Kalambo Lodge	GQ995781**	GQ995890**
			6639	Mbita Island W	GQ995782**	GQ995891**
			8039	Mbita Island W	GQ995783**	GQ995892**
	Tropheus duboisi	*Tropheus duboisi*	76	Bemba	GQ995804**	GQ995913**
			85***	Maswa	GQ995806**	GQ995915**
			91***	Maswa	GQ995807**	GQ995916**
			101	Bemba	GQ995805**	GQ995914**
			3441	Location unknown	GQ995803**	GQ995912**
			4518	Halembe	GQ995808**	GQ995917**
			4519	Halembe	GQ995809**	GQ995918**
	Tropheus species complex	*Tropheus brichardi*	Tr10	Bulombora	GQ995817**	GQ995926**
		Tropheus moorii	4300	Mbita Island W	GQ995810**	GQ995919**
		Tropheus polli	5447	Kekese	GQ995818**	GQ995927**
			5448	Kekese	GQ995819**	GQ995928**
		Tropheus sp.	Tr8	Kapampa	GQ995816**	GQ995925**
			4370***	Kachese	GQ995811**	GQ995920**
			4374***	Mpimbwe	GQ995812**	GQ995921**
			4376***	Bemba	GQ995813**	GQ995922**
			4385	Nakaku	GQ995814**	GQ995923**
		Tropheus sp. "Kirschfleck"	4520***	Mabilibili	GQ995815**	GQ995924**
Outgroup	*Astatotilapia burtoni*	*Astatotilapia burtoni*	7054		GQ995713**	GQ995822**
			7055		GQ995714**	GQ995823**
			7056		GQ995715**	GQ995824**
	Aulonocara sp.	*Aulonocara* sp.	6662***		GQ995712**	GQ995821**
	Copadichromis borleyi	*Copadichromis borleyi*	6661***		GQ995711**	GQ995820**

* Generic allocation has not been resolved, so the combination shown in the original description of the species is tentatively used.
** Koblmüller et al. (2010)
*** Samples obtained through ornamental fish trade.