

TAXONOMY, COMMON NAMES AND DISTRIBUTION OF FISH IN THE EASTERN ARM OF THE RIFT VALLEY DRAINAGE, KENYA

TAXINOMIE, NOMS COMMUNS ET DISTRIBUTION DES POISSONS DU BASSIN ORIENTALE DE LA RIFT VALLEY, KENYA

Daniel O. Okeyo

Faculty of Science and Technology, University of Fort Hare, Private Bag X1314, Alice 5700, Eastern Cape, Republic of South Africa; Email: dokeyo@ufh.ac.za

ABSTRACT

This paper attempts to update information on scientific and recommended English common names and the distribution of fish species of Kenya occurring in the Eastern Arm of the Rift Valley drainage system. At least 20 fish families from 35 genera and 66 species occur in the drainage system, with Lake Turkana catchment having the richest species diversity at 50 (76 %). Five (8 %) fish species have been introduced into the drainage, mostly for commercial purposes and sports, viz: in Lake Naivasha, largemouth bass, *Micropterus salmoides*; blue spotted tilapia, *Oreochromis leucostictus*; Athi River tilapia, *Oreochromis spilurus niger*; Zill's tilapia, *Tilapia zillii*; and in Lake Nakuru, a species tolerant to high salinities, the Lake Magadi tilapia, *Oreochromis alcalicus grahami*. These introductions may have caused, e.g., the extinction of the Naivasha lampeye, *Aplocheilichthys* sp. from Lake Naivasha. Most fishes occurring in the drainage are at times capable of living in both lacustrine as well as riverine conditions, except three (5 %), which tend to be entirely riverine. Two minnows, (i) Loveridge's barb, *Barbus loveridgii* occurs in Amala River, an affluent of Lake Baringo; and (ii) Newmayer's barb, *Barbus neumayeri* is spread out in several rivers, i.e., Suam in Mount Elgon, Subukia in the Lake Bogoria catchment, Seya in Isiolo district, Sinet near Loitoktok, Waseges in the Lake Bogoria catchment, and Kerio affluent in the Lake Turkana catchment. One cichlid, the Suguta tilapia, *Oreochromis niloticus sugutae* occurs in Suguta River and its tributaries. The exact distribution in northern Kenya of the Ethiopian barb, *Barbus intermedius intermedius* is lacking. Notes are included for selected fish species to clarify and to correct erroneous information occurring in the literature.

RESUME

Cette contribution essaye de mettre à jour l'information sur des noms scientifiques et noms communs anglais et la répartition géographique des espèces de poissons du Kenya au bras oriental du bassin versant de Rift Valley. Il y a au moins 20 familles dont 35 genres et 66 espèces de poissons dans ce bassin, la région du Lac Turkana étant la plus riche, avec 50 (76 %) espèces. Cinq (8 %) espèces ont été introduites dans ce bassin, surtout pour la pêche de loisir ainsi que commerciale, à savoir: au Lac Naivasha, Achigan à grande bouche, *Micropterus salmoides*; Tilapia aux points bleus, *Oreochromis leucostictus*; Tilapia d'Athi, *Oreochromis spilurus niger*; Tilapia de Zill, *Tilapia zillii*; et dans le Lac Nakourou, une espèce tolérante aux salinités élevées, Tilapia du Lac Magadi, *Oreochromis alcalicus grahami*. Ces introductions ont pu avoir causé, par exemple, l'extinction de l'aplochélidé de Naivasha, *Aplocheilichthys* sp.. La plupart des poissons qui se reproduisent dans le drainage sont parfois capables de vivre dans les lacs et les rivières, excepté trois (5 %), qui tendent à être entièrement riverine. Deux vairons, (i) *Barbus loveridgii* se trouve dans le fleuve d'Amala, un affluent du Lac Baringo; et (ii) *Barbus neumayeri* vit dans plusieurs fleuves: le Souam dans le Mont Elgon, le Subukia dans le Lac Bogoria, le Seya dans le Département d'Isiolo au barrage du Lac Bogoria, le Sinet près de Loitoktok, le Waseges dans le barrage du Lac Bogoria, et le Kerio dans le Lac Turkana.

Un cichlidé, le Tilapia de Suguta, *Oreochromis niloticus sugutae* vit dans le Suguta et ses tributaires. Le Barbeau, *Barbus intermedius intermedius*, n'a pas sa distribution au Kenya définie. Des notes sont incluses pour quelques espèces de poissons, qui clarifient et corrigent des informations publiées.

INTRODUCTION

The Eastern Arm of the Rift Valley begins in Jordan in the Middle East and extends southwards through East Africa and Mozambique into the Indian Ocean. The Eastern Arm is joined in Malawi by a Western Arm which arches northwards and ends in western Uganda. Low areas of the Rift Valley are characterised by a chain of saline or brackishwater lakes, high areas (escapements) supplying springs, streams and rivers, especially during rainy seasons. The chain of lakes found in the Kenyan portion of the Eastern Arm of the Rift Valley drainage are Turkana, Ogipi, Baringo, Bogoria, Nakuru, Elementaita, Naivasha, Magadi, Kabongo and Natron. The main rivers supplying the drainage are Turkwell, Suam, Kerio, Suguta, Seya, Sinet, Molo, Perakera, Subukia, Waseges, Njoro, Kariandusi, Malewa, Gilgil and South Uaso Nyiro.

The human population in Africa is predicted to increase by about 3 to 4 times by 2030, mainly in coastal regions and lake and river basins, and will bring about ecosystem degradation, along with exotic organisms (Craig, 1992). There is thus an urgent need to study the biodiversity of the watersheds of this region.

The current knowledge of the fish species of Kenya occurring in the Eastern Arm of the Rift Valley drainage is largely based on updates of comprehensive surveys carried out since the late 19th century (Kersten, 1869; Boulenger, 1909, 1911, 1915, 1916; Worthington and Ricardo, 1936; Trewavas, 1953; Copley, 1958; EAFRO, 1962; EAFRO, 1976; KMFRI, 1981). This study attempts to fill certain gaps by listing the scientific and recommended English common names and distribution of fish of this important and unique drainage of Kenya, thus complementing the study recently done on the fishes of Kenya in the Athi-Galana-Sabaki drainage systems (Okeyo, 1998). It is hoped that the results will be useful to fisheries managers, students of fish taxonomy and ecology, curators and researchers working on African fish.

METHODS

The Kenyan portion of the Eastern Arm of the Rift Valley forms one of the largest Kenyan drainages, especially in terms of the number of individual catchment areas and it consists of a series of lakes and rivers (Figure 1). Lake Turkana, like almost all Rift Valley lakes, is situated in an interior basin with no outlet. Its largest affluent is the Omo River in the North, which is situated entirely in Ethiopian territory. Rising from Mount Elgon in the southwest of Lake Turkana, is the Turkwell River which does not regularly reach the lake, but stays dry at time of reduced rainfall. This is also true for the Kerio and Suguta Rivers which flow northwards in the Rift Valley; especially, the Suguta only rarely reaches Lake Turkana.

Lake Baringo is situated in one of the interior basins of the Rift Valley. There are some smaller seasonal rivers, mainly in the south such as the Molo and the Perakera Rivers, bringing water into the lake. Lake Bogoria is normally a salt water lake, but the Waseges River, which enters the lake from the North, contains fresh water. The river dries up in dry periods. Ol Bolosat Swamp exists to the North-East of Lake Nakuru. The ecology of the swamps is not yet well studied. Lake Nakuru has only a very small catchment and dries up sometimes. The main natural drainage into Lake Nakuru is fed by the River Njoro; waste waters from Nakuru Town also contribute a great deal of inflows to the lake, sometimes polluting it. Lake Elementaita is a salt lake; the main drainage into Lake Elementaita is the River Kariandusi, originating from the Aberdare Mountain ranges. The river carries with it some effluent water of the Kariandusi Diatomite Mines and factories located nearby along the main Nairobi-Nakuru road. Other drainages into Lake Elementaita come from the opposite Mau Escapement. Lake Naivasha has fresh water; the Malewa and Gilgil Rivers bring water from the Aberdare Mountains into the lake. It is believed that the bulk of Lake Naivasha water is contributed

following Nelson (1994). In contrast to Nelson (1994), however, Myers (1929), Gery (1977) and Paugy (1986) were followed in accepting the characins, genus *Brycinus* Valenciennes in Cuvier and Valenciennes, 1849 as distinct from the genus *Alestes* Muller and Troschel, 1844. Distichodidae are treated as a family in accordance with Vari (1979). Mo (1991) was followed in recognising the family Claroteidae as separate from the family Bagridae. The Eastcoast lampeye, genus *Pantanodon*, is placed in the family Aplocheilichthyidae (topminnows or lampeyes) according to Sethi (1960) and in accordance with information from Meyer and Lydeard (1993). Mastacembelidae (spiny eels) was recognised as a family under the order Synbranchiformes, and not the order Perciformes, in accordance to Gosline (1983) and Travers (1984a, b). All spellings of fish names follow the original descriptions. The scientific name is followed by the most appropriate English common name where possible. Names of the authorities who recorded (original) information on respective fish species are included.

Data were also collected on the general distribution of fish in the drainage system with respect to the lakes, rivers and associated swamps of the drainage. This was aimed at providing general patterns of local fish distribution. However, data from the Southern Uaso Nyiro catchment area is not included in this contribution.

RESULTS AND DISCUSSION

Diversity

A total of at least 20 fish families with 35 genera and 66 species occur in the Kenyan portion of the Eastern Arm of the Rift Valley (Table 1). Of these, at least 17 (26 %) belong to the family Cyprinidae (barbs, minnows, labeos), 13 (20 %) are Cichlidae (cichlids), 9 (14 %) Characidae (characins), 3 (5 %) each of Mochokidae (squeakers, suckermouths) and Aplocheilichthyidae, 2 (3 %) each of Polypteridae (bichirs), Mormyridae (snoutfishes), Bagridae, Claroteidae, Clariidae (catfishes), and Centropomidae and 1 (2 %) each of Osteoglossidae (bonytongues), Gymnarchidae (gymnarchids), Distichodidae, Citharinidae, Schilbeidae (butter catfishes), Amphiliidae (mountain catfishes), Melapteruridae (electric catfishes), Centrarchidae (sunfishes, freshwater basses), and Tetraodontidae (puffers). At least 61 (92 %) fish species reported from the drainage occur in their natural water bodies; 5 (8 %) fish species with the highest number for commercial and sports values have been introduced into Lake Naivasha (e.g., Largemouth bass, *Micropterus salmoides* (Lacepede, 1802), Blue spotted tilapia, *Oreochromis leucostictus* (Trewavas, 1933), Athi River tilapia, *Oreochromis spilurus niger* (Gunther, 1894), Zill's tilapia, *Tilapia zillii* (Gervais, 1848) (Trewavas, 1933), and fish species tolerant to high salinities, i.e., Lake Magadi tilapia, *Oreochromis alcalicus grahami* (Boulenger, 1912), introduced into Lake Nakuru (Vareschi, 1979; Table 2). There were a few fish species which naturally occurred in the Lake Naivasha catchment area (e.g., lampeyes of the genus *Aplocheilichthys*, and Straightfin barb, *Barbus paludinosus* Peters, 1852). The Naivasha lampeye, *Aplocheilichthys* sp. has been extinct from the lake since the introductions.

Distribution

The general distribution (Table 2) of fish species of the drainage shows more concentration (at least 50 species or 76 %) in the Lake Turkana catchment area, 38 (58 %) of which are mainly lacustrine and which tend to be restricted only to the lake (e.g., Nile bichir, Sénégal bichir, African bonytongue, Ngai, Aba aba, Nile barb, Turkana barb, Turkana sardine, Turkana minnow, Nile ditichodus, Turkan citharine, Egyptian robber, Nile robber, Large-toothed Turkana robber, Large-scaled robber, Dwarf Turkana robber, Nurse tetra, Elongate tigerfish, Tigerfish, Elongate robber, Black Nile-catfish, Sudan catfish, Golden Nile-catfish, Egyptian buttercatfish, Whiptailed Nile-catfish, Vundu, Electric catfish, Dwarf Nile-catfish, Sudan squeaker, Nile squeaker, Turkana lampeye, Turkana perch, McConnel's haplo, Lake Rudolf haplo, Lake Turkana mouthbrooder, Nile jewel cichlid, Galilaea tilapia, Nile puffer). At least 14 (21 %) species in the Lake Turkana catchment area are lacustrine as well as riverine and may occur elsewhere in the drainage (e.g., Elephant-snout fish, Neumayer's barb, Midspot barb, Redeye labeo, Assuan labeo, Nile labeo, Nile minnow, Bottego's minnow, Giraffe

catfish, Sharptooth catfish, Omo lampeye, Nile perch, Turkana tilapia, Zill's tilapia). The bulk of Lake Turkana fishes are exploited commercially.

Table 1. Fishes of Kenya known to occur in the Eastern Arm of the Rift Valley drainage system. Fish families containing representatives of introduced fish species are designated by asterix (*).

Family	Genera	Species
Plopteridae	1	2
Osteoglossidae	1	1
Mormyridae	2	2
Gymnarchidae	1	1
Cyprinidae	5	17
Distichodidae	1	1
Citharinidae	1	1
Characidae	4	9
Bagridae	1	2
Claroteidae	2	2
Schilbeidae	1	1
Amphiliidae	1	1
Clariidae	2	2
Melapteruridae	1	1
Mochokidae	2	3
Aplocheilichthyidae	1	3
Centropomidae	1	2
Centrarchidae*	1	1
Cichlidae*	5	13
Tetraodontidae	1	1
TOTAL	35	66

Two (3 %) species occurring in the drainage (Line-spotted barb, *Barbus lineomaculatus* Boulenger, 1903, and Sharptooth catfish, *Clarias gariepinus* (Burchell, 1822), are caught exclusively within Lake Baringo and 4 (6 %) species occur in the Lake Baringo catchment area (Baringo barb, *Barbus intermedius australis* Banister, 1973, Zanzibar barb, *Barbus zanzibaricus* Peters, 1868, redeye labeo, *Labeo cylindricus* Peters, 1852, Baringo tilapia, *Oreochromis niloticus baringoensis* Trewavas, 1983).

No fishes naturally occur in Lake Bogoria; but 2 freshwater species occur in the Wasages River which enters the lake from the North (Neumayer's barb, *Barbus neumayeri* Fischer, 1884; Sharptooth catfish, *Clarias gariepinus* (Burchell, 1822). The river dries up in dry periods; but evidently there must remain some restwater pools for the fishes to prosper in the river. Lake Nakuru also experiences periods of drying. The sole species, repeatedly introduced but which is able to live in the alkaline waters of Lake Nakuru is the Lake Magadi tilapia, *Oreochromis alcalicus grahami* (Boulenger, 1912).

There are no fishes which naturally occur in the catchment area of the salty Lake Elementaita. There are, however recent reports of unidentified tilapia species, which may have been introduced (Kenneth Mavuti, University of Nairobi, Kenya, pers. comm.) through effluents from aquaculture ponds which exist at the banks of the lake's main drainage system, the River Kariandusi. Lake Magadi is the natural habitat for the Lake Magadi tilapia, *Oreochromis alcalicus grahami* (Boulenger, 1912). The life of the fish in the lake is only made possible by the springs which supply relatively fresh water. Lake Magadi has historically been the source for seedfish used for introduction into Lake Nakuru.

Table 2. Scientific, recommended English common names and authorities of fishes of Kenya in the Eastern Arm of the Rift Valley drainage system. Authority and date are isolated by a comma according to the International Code of Zoological Nomenclature (1985). Pagination is included for convenience. Fish species with uncertain occurrences are designated by question mark (?); (-) indicates no suggested common name. Included are some taxonomic notes on selected fish species; citations of distribution may refer to some synonyms.

No.	Order	Family	English name	Scientific name	Author	English name	Distribution
1	Polypteriformes	Polypteridae	Bichirs	<i>Polypterus bichir</i>	Geoffroy Saint Hilaire, 1802	Nile bichir	Lake Turkana (Boulenger, 1909: 7; Hopson and Hopson, 1982: 291).
2				<i>Polypterus</i> <i>Sénégalus</i> <i>Sénégalus</i>	Cuvier, 1829	Sénégal bichir	Lake Turkana (Boulenger, 1909: 15; Hopson and Hopson, 1982: 289)
3	Osteoglossiformes	Osteoglossidae	Bonytongues	<i>Heterotis niloticus</i>	(Cuvier, 1829)	African bonytongue	Lake Turkana (Boulenger, 1909: 151; Hopson and Hopson, 1982: 291)
4		Mormyridae	Snout fishes	<i>Hyperopisus bebe</i>	(Lacepède, 1803)	Ngai	Lake Turkana (Hopson and Hopson, 1982: 292)
5				<i>Murmyrous kannume</i>	Forsskal, 1775	Elephant-snout fish	Turkwell River and Lake Turkana (Hopson and Hopson, 1982: 290)
6		Gymnarchidae	-	<i>Gymnarchus niloticus</i>	Cuvier, 1829	Aba aba	Lake Turkana (Boulenger, 1909:145; Hopson and Hopson, 1982:294)
7	Cypriniformes	Cyprinidae	Barbs, minnows and labeos	<i>Barbus bynni</i>	(Forsskal, 1775)	Nile barb	Lake Turkana (Pellegrin, 1905; Hopson and Hopson, 1982: 309). Note: Pellegrin, 1905: 293 refers to it as <i>Barbus meneliki</i> .

Table 2. (cont.).

No.	Order	Family	English name	Scientific name	Author	English name	Distribution
8				<i>Barbus intermedius intermedius</i>	Ruppell, 1835	Ethiopia barb	Northern Kenya (Banister, 1973). Note: the date of publication of Rüppell paper is discussed by Banister (1973: 47) who assumed 1837 as the correct date. Lévêque and Daget in Daget <i>et al.</i> , 1984 (CLOFFA 1) assessed 1837 as the correct date of publication while in Daget <i>et al.</i> , 1986 (CLOFFA 3) the correct date of publication is dated 1835. Rüppell's article in fact should appear in volume 1 of the publication "Museum Senckenbergianum". This volume was published in at least two parts. The last part which completed the volume appeared in 1837 (Richter, 1935). This part contained the title page bearing the date year 1837. The first part, containing pages 1 to 116, and hence the article of Rüppell (pages 1-28), however was published already in 1836 (handwritten note in a copy of volume 2 of Mus. Senckenb. of the Zoologisches Museum Berlin, which is confirmed by Dean, 1917: 369). The publication date of the Museum Senckenbergianum article of Rüppell therefore is 1836 and not 1837 as assumed by Banister (1973) or listed in many library catalogues, including Richter (1935). Rüppell evidently wanted his article to be published as early as possible and did not want to wait until the regular issue of Mus. Senckenb. was distributed. On his own costs, and therefore not listed in Richter (1935) he ordered separates. Those preprints are clearly dated 1835 on the title page as cited in Banister (1973: 4). This date of publication is to be adopted as correct in the absence of evidence to the contrary, and hence the date of publication of the paper of Rüppell is 1835 according to article 21 (b) of the International Code of Zoological Nomenclature (1985).
9				<i>Barbus intermedius australis</i>	Banister, 1973	Baringo barb	Lake Baringo drainage. Note: Lake Baringo is the type locality.
10				<i>Barbus lineomaculatus</i>	Boulenger, 1903	Line-spotted barb	Lake Baringo (Mann, 1971: 30)
11				? <i>Barbus loveridgii</i>	Boulenger, 1916	Loveridge's barb	"Amala River", an affluent of Lake Baringo, Kenya (Greenwood, 1962; Mann, 1971). Note: This species is known from the types only (Greenwood, 1962: 182). The type locality "Amala River", is in doubt (Mann, 1971).

Table 2. (cont.).

No.	Order	Family	English name	Scientific name	Author	English name	Distribution
12				<i>Barbus neumayeri</i>	Fischer, 1884	Neumayer's barb	Suam River (Mount Elgon), Subukia River (Lake Bogoria drainage), River (Isiolo district), Sinet River near Loitoktok (Greenwood, 1962: Waseges River (Lake Bogoria drainage) (Mann, 1971: 29); Kerio aff Lake Turkana drainage. Note: The status of <i>Barbus neumayeri</i> is yet resolved; it is unclear if the species at present known under this name identical with the species as represented by the type specimens. At present species is considered to be <i>Barbus neumayeri</i> of which the specimen populations show a variable pattern of black spots along the midline. populations there are fish with three such black spots of irregular size spots may merge with each other and even form an interrupted longitudinal band. According to Fischer (1884: 31) the upper part of the body was black, the lower part light to whitish in the types of <i>Barbus neumayeri</i> size of the two types is 10.1 and 11 cm which is enormous for <i>Barbus neumayeri</i> in the present sense. The more recent collections from the Uaso Nyiro, Kenya, which are at the British Museum of Natural History (BMNH) contained barbs with well corresponding colouration as described by Fischer; the specimens, however, did not show a black midlateral band or black spots. It is therefore at present unclear if the black spotted/banded barbs previously described for East Africa, and the Southern Uaso Nyiro fish are colour morphs of one species only or if both are distinct.
13				<i>Barbus paludinosus</i>	Peters, 1852	Straightfin barb	Lakes and rivers in the drainage (Greenwood, 1962). Note: actually <i>Barbus paludinosus</i> occurs in lakes and rivers throughout Kenya.
14				<i>Barbus stigmatopygus</i>	Boulenger, 1903	Midspot barb	Lake Turkana drainage (Boulenger, 1911: 169; Hopson and Hopson, 1982: 312). Note: <i>Barbus wernerii</i> Boulenger, 1905 is a synonym of <i>Barbus stigmatopygus</i> according to Banister (1987).
15				<i>Barbus turkanae</i>	Hopson and Hopson in Hopson, 1982	Turkana barb	Lake Turkana. Note: Lake Turkana is the type area.
16				<i>Barbus zanzibaricus</i>	Peters, 1868	Zanzibar barb	Lake Baringo drainage.
17				<i>Chelaethiops bibie</i>	(De Joannis, 1835)	Turkana sardine	Lake Turkana (Hopson and Hopson, 1982: 314).
18				<i>Labeo cylindricus</i>	Peters, 1852	Redeye labeo	Lake Baringo drainage (Worthington and Ricardo, 1936: 385; Mann, 1971: 31); upper reaches of Turkwell/Kerio systems (Hopson and Hopson, 1982: 308).

Table 2. (cont.).

No.	Order	Family	English name	Scientific name	Author	English name	Distribution
19				<i>Labeo horie</i>	Heckel, 1846	Assuan labeo	Lake Turkana drainage (Worthington and Ricardo, 1936: 370; Hopson and Hopson, 1982: 307).
20				<i>Labeo niloticus</i>	(Forsskal, 1775)	Nile labeo	Lake Turkana (Reid, 1985: 66). Note: Hopson and Hopson mention <i>Labeo</i> species from the Lake Turkana drainage only: <i>Labeo cylindricus</i> Peters, 1852 from the upper reaches of rivers flowing into the lake and <i>Labeo horie</i> Heckel, 1946 from the lake itself. The problem concerning the identity of the Lake Turkana labeo(s) is therefore not sufficiently resolved.
21				<i>Leptocypris niloticus</i>	(De Joannis, 1835)	Nile minnow	Lake Turkana drainage (Worthington and Ricardo, 1936: 371; Hopson and Hopson, 1982: 312). Note: Hopson and Hopson, 1982: 312 recorded the name of the fish species as <i>Barilius niloticus</i> .
22				<i>Neobola bottegoi</i>	(Vinciguerra, 1895)	Bottego's minnow	Lake Turkana drainage, Omo River (Howes, 1984).
23				<i>Neobola stellae</i>	(Worthington, 1932)	Turkana minnow	Lake Turkana (Hopson and Hopson, 1982: 313). Note: Lake Turkana type area. Hopson and Hopson, 1982: 313 recorded the name of the species as <i>Engraulicypris stellae</i> .
24	Characiformes	Distichodidae	Distichodines	<i>Distichodus niloticus</i>	(Linnaeus, 1762)	Nile distichodus	Lake Turkana (Günther, 1896: 223; Hopson and Hopson, 1982: 307). Günther, 1896: 223 recorded the name of the fish species as <i>Distichodus rodolphi</i> .
25		Citharinidae	Citharines	<i>Citharinus citharus intermedius</i>	Worthington, 1932	Turkana citharine	Lake Turkana (Hopson and Hopson, 1982: 306). Note: Lake Turkana type area. This apparently is the fish species Hopson and Hopson, 1982: 306 recorded its name as <i>Citharinus citharus</i> .
26		Characidae	Characins	<i>Alestes baremoze</i>	(De Joannis, 1835)	Egyptian robber	Lake Turkana (Boulenger, 1909: 196; Hopson and Hopson, 1982: 299).
27				<i>Alestes dentex</i>	(Linnaeus, 1758)	Nile robber	Lake Turkana (Boulenger, 1909: 194; Hopson and Hopson, 1982: 299).
28				<i>Brycinus ferox</i>	(Hopson and Hopson in Hopson, 1982)	Large-toothed Turkana robber	Lake Turkana (Hopson and Hopson, 1982: 299). Note: Lake Turkana type area. The fish was originally described as <i>Alestes ferox</i> , but is now placed in the genus <i>Brycinus</i> by Lévêque <i>et al.</i> (1991: 134).
29				<i>Brycinus macrolepidotus</i>	(Valenciennes in Cuvier and Valenciennes, 1849)	Large scaled robber	Lake Turkana (Hopson and Hopson, 1982: 304). Note: Fowler (1936) reported this fish species also to occur in Lake Victoria, using only a specimen of a total length of 328 mm, collected from Kitala, Uganda; in Daget <i>et al.</i> (1984: 154) gives Lake Victoria as a locality; but these reports are doubtful. There is no substantiated indication that the fish is present in Lake Victoria.

Table 2. (cont.).

No.	Order	Family	English name	Scientific name	Author	English name	Distribution
30				<i>Brycinus minutus</i>	(Hopson and Hopson in Hopson, 1982)	Dwarf Turkana robber	Lake Turkana (Hopson and Hopson, 1982: 302). Note: Lake Turkana type area. The original name of the fish species was described as <i>Ale minutus</i> Hopson, 1982, which is currently placed in the genus <i>Brycinus</i> Lévêque <i>et al.</i> (1991: 134).
31				<i>Brycinus nurse</i>	(Ruppell, 1832)	Nurse tetra	Lake Turkana (Boulenger, 1909: 207; Pellegrin, 1935: 133; Hopson and Hopson, 1982: 298). Note: Pellegrin, 1935: 133 recorded the fish species as <i>Alestes nurse</i> var. <i>nana</i> Pellegrin, 1935 "Nanoropus (lac Rodolphe)".
32				<i>Hydrocynus forskahlii</i>	(Cuvier, 1819)	Elongate tigerfish	Lake Turkana (Boulenger 1909: 181; Hopson and Hopson 1982: 296; Boulenger (1909: 181) Recorded the fish species as <i>Hydrocyon forsk</i> Boulenger, 1909.
33				<i>Hydrocynus vittatus</i>	Castelnau, 1861	Tigerfish	Lake Turkana (Worthington and Ricardo, 1936; Hopson and Hopson 1982: 296). Note: Hopson and Hopson, 1982: 296 recorded the name of the species as <i>Hydrocynus lineatus</i> Hopson and Hopson, 1982; as to the of this species see Brewster (1986) and Paugy and Guegan (1989).
34				<i>Micralestes elongatus</i>	Daget, 1957	Elongated robber	Lake Turkana (Hopson and Hopson, 1982: 305). Note: Hopson and Hopson 1982: 305 recorded the name of the fish species as <i>Micralestes acuti</i> (Peters, 1952). <i>Micralestes acutidens</i> , however, does not naturally occur in the Nile System to which Lake Turkana belongs. The characin listed by Hopson and Hopson (1982: 305) under the name <i>Micralestes acutidens</i> is in fact <i>Micralestes elongatus</i> according to Paugy (1990: 80) and Lévêque <i>et al.</i> (1991).
35	Siluriformes	Bagridae	Bagrid catfishes	<i>Bagrus bajad</i>	(Forsskal, 1775)	Black Nile catfish	Lake Turkana (Worthington and Ricardo, 1936; Hopson and Hopson 1982: 315).
36				<i>Bagrus docmak</i>	(Forsskal, 1775)	Sudan catfish	Lake Turkana (Hopson and Hopson, 1982: 316).
37		Claroteidae	Calaritid catfishes	<i>Auchenoglanis occidentalis</i>	(Valenciennes in Cuvier and Valenciennes, 1840)	Giraffe catfish	Lake Turkana drainage (Vinciguerra, 1898: 250; Boulenger, 1911: 3; Hopson and Hopson, 1982: 318). Notes: Vinciguerra, 1898: 250 recorded the fish species name as <i>Oxyglanis sacchii</i> Vinciguerra, 1898 "fiume Murzu".
38				<i>Chrysichthys auratus</i>	(Geoffroy Saint Hilaire, 1809)	Golden Nile catfish	Lake Turkana (Hopson and Hopson, 1982: 317).
39		Schilbeidae	Butter catfishes	<i>Schilbe uranoscopus</i>	Ruppell, 1832	Egyptian butter catfish	Lake Turkana (Worthington and Ricardo, 1936; Hopson and Hopson 1982: 319).

Table 2. (cont.).

No.	Order	Family	English name	Scientific name	Author	English name	Distribution
40		Amphiliidae	Mountain catfishes	<i>Andersonia leptura</i>	(Boulenger, 1900)	Whiptailed Nile catfish	Lake Turkana (Hopson and Hopson, 1982: 320).
41		Clariidae	Catfishes	<i>Clarias gariepinus</i>	(Burchell, 1822)	Sharptooth catfish, Common catfish	All habitable lakes and rivers; Lake Turkana (Worthington and Rica 1936, Hopson and Hopson, 1982: 320); Suguta River (Mann, 1971: : Lake Baringo (Worthington and Ricardo, 1936); Waseges River, Lal Bogoria drainage (Mann, 1971: 32). Note: Occurs throughout the dr system. Mostly listed in the literature under its synonym <i>Clarias mossambicus</i> Peters, 1852 (Teugels, 1986). Hopson and Hopson, 19 recorded the fish species name as <i>Clarias lazera</i> Valenciennes, 1840 lake.
42				<i>Heterobranchus longifinis</i>	Valenciennes in Cuvier and Valenciennes, 1840	Vundu	Lake Turkana (Hopson and Hopson, 1982: 321)
43		Melapteruridae	Electric catfishes	<i>Malapterurus electricus</i>	(Gmelin, 1789)	Electric catfish	Lake Turkana (Pellegrin, 1935: 136; Hopson and Hopson, 1982: 320)
44		Mochokidae	Squeakers and suckermouths	<i>Mochokus niloticus</i>	De Joannis, 1835	Dwarf Nile-catfish	Lake Turkana (Vinciguerra, 1898: 254; Boulenger, 1911: 494; Hopson and Hopson, 1982: 325). Note: Vinciguerra, 1898: 254 recorded the name of the fish species as <i>Rhinoglanis vanmutelli</i> Vinciguerra, 1998 "lago Rodo Lake Turkana (Vinciguerra, 1898: 247; Hopson and Hopson, 1982: 325). Note: Vinciguerra, 1898: 247 recorded the name of the fish species as <i>Synodontis citernii</i> Vinciguerra, 1898.
45				<i>Synodontis frontotus</i>	Vaillant, 1895	Sudan squeaker	Lake Turkana (Günther, 1896: 222, pl. IX; Hopson and Hopson, 1982: 326). Note: Günther, 1896: 222, pl. IX recorded the name of the fish species as <i>Synodontis smithii</i> Günther, 1896.
46				<i>Synodontis schall</i>	(Bloch and Schneider, 1801)	Nile squeaker	Lake Turkana drainage (Hopson and Hopson, 1982: 326). Note: Lake Turkana is the type area. There is an <i>Aplocheilichthys</i> species in the basin (Mann, 1971: 32; Seegers, 1986, photo) which may be <i>Aplocheilichthys jeanneli</i> .
47				<i>Aplocheilichthys jeanneli</i>	(Pellegrin, 1935)	Omo lampeye	Lake Turkana (Hopson and Hopson, 1982: 326). Note: Lake Turkana is the type area.
48				<i>Aplocheilichthys rudolfianus</i>	(Worthington, 1932)	Turkan lampeye	Lake Turkana (Hopson and Hopson, 1982: 326). Note: Lake Turkana is the type area.
49				<i>Aplocheilichthys</i> sp.	"Naivasha" (Extinct species)	Naivasha lampeye	Lake Naivasha. Note: This fish species is extinct from the Lake Naivasha. This fish species was named <i>Aplocheilichthys antinorii</i> .

Table 2. (cont.).

No.	Order	Family	English name	Scientific name	Author	English name	Distribution
50		Centropomidae	Nile perch and related forms	<i>Lates (Lates) longispinis</i>	Worthington, 1932	Turkana perch	Lake Turkana (Hopson and Hopson, 1982: 328). Note: Lake Turkana type area.
51				<i>Lates (Lates) niloticus</i>	(Linnaeus, 1758)	Nile perch	Lake Turkana (Worthington, 1932: 133; Hopson and Hopson, 1982: 3). Note: Worthington, 1932: 133 recorded the name of the fish species as <i>niloticus rudolfianus</i> Worthington, 1932.
52		Centrarchidae	Sunfishes and freshwater basses	<i>Micropterus salmoides</i>	(Lacepède, 1802)	Largemouth bass	Introduced into Lake Naivasha.
53		Cichlidae	Cichlids	<i>Haplochromis (Thoracochromis) macconneli</i>	Greenwood, 1974	McConnel's haplo	Lake Turkana (Hopson and Hopson, 1982: 336). Note: Lake Turkana type area.
54				<i>Haplochromis (Thoracochromis) rudolfianus</i>	Trewavas, 1933	Lake Rudolf haplo	Lake Turkana (Hopson and Hopson, 1982: 334). Note: Lake Turkana type area.
55				<i>Haplochromis (Thoracochromis) turkanae</i>	Greenwood, 1974	Lake Turkana mouthbrooder	Lake Turkana (Hopson and Hopson, 1982: 335). Note: Lake Turkana type area.
56				<i>Hemichromis letourneuxi</i>	Sauvage, 1880	Nile jewel cichlid	Lake Turkana (Trewavas, 1933: 320, Fig. 4; Hopson and Hopson, 1982: 330). Note: Trewavas, 1933: 320, Fig. 4 recorded the name of the fish species as <i>Pelmatochromis exsul</i> Trewavas, 1933. Hopson and Hopson 1982: 330 recorded the name of the fish species as <i>Hemichromis bimaculatus</i> (Boulenger, 1915).
57				<i>Oreochromis alcalicus alcalicus</i>	(Hilgendorf, 1905)	Lake Natron tilapia	Lake Natron drainage: Shombole Swamps (Fischer 1884: 28; Coe 196). Note: Lake Natron drainage is the type area. Fischer 1884: 28 recorded name of the fish species as <i>Chromis niloticus</i> var. <i>mossambicus</i> Fischer 1884.
58				<i>Oreochromis alcalicus grahami</i>	(Boulenger, 1912)	Lake Magadi tilapia	Lake Magadi; introduced into Lake Nakuru in 1953, 1959 and 1962 (Vareschi 1979: 322). Note: Lake Magadi is the type area.

Table 2. (cont.).

No.	Order	Family	English name	Scientific name	Author	English name	Distribution
59				<i>Oreochromis leucostictus</i>	(Trewavas, 1933)	Blue spotted tilapia	Introduced into Lake Naivasha.
60				<i>Oreochromis niloticus baringoensis</i>	Trewavas, 1983	Baringo tilapia	Lake Baringo drainage (Worthington and Ricardo, 1936; Seegers, 1986).
61				<i>Oreochromis niloticus sugutae</i>	Trewavas, 1983	Suguta tilapia	Suguta river and tributaries. Note: Suguta River and tributaries is the type area.
62				<i>Oreochromis niloticus vulcani</i>	(Trewavas, 1933)	Turkana tilapia	Lake Turkana drainage (Arambourg, 1948: 472, pl. 38, figs. 1,5,6; pl. 39, fig. 5; Hopson and Hopson, 1982: 332). Note: Lake Turkana drainage is the type area. Arambourg, 1948: pl. 38, figs. 1,5,6; pl. 39, fig. 5 recorded the name of the fish species as <i>Tilapia crassispana</i> Arambourg, 1948 (fossil fish). Hopson and Hopson, 1982: 332 recorded the name of the fish species as <i>Sarotherodon niloticus</i> (Harbott, 1982).
63				<i>Oreochromis spilurus niger</i>	(Günther, 1894)	Athi River tilapia	Introduced into Lake Naivasha in 1925 (Trewavas, 1933: 312). Note: Trewavas, 1933: 312 recorded the name of the fish species <i>Tilapia nigra</i> (Boulenger, 1899).
64				<i>Sarotherodon galilaeus galilaeus</i>	(Linnaeus, 1758)	Galilaea tilapia	Lake Turkana (Worthington and Ricardo, 1936; Hopson and Hopson, 1982: 333).
65				<i>Tilapia zillii</i>	(Gervais, 1848)	Zill's tilapia	Lake Turkana (Boulenger, 1915: 199; Hopson and Hopson, 1982: 330; ? introduced into Lake Naivasha.
66	Tetraodontiformes	Tetraodontidae	Puffers	<i>Tetraodon lineatus</i>	Linnaeus, 1758	Nile puffer	Lake Turkana (Sterba, 1959: 605; Hopson and Hopson, 1982: 337). Note: Sterba, 1959: 605 recorded the name of the fish species as <i>Tetraodon fahaka rudolfianus</i> Sterba, 1959. Hopson and Hopson recorded the name of the fish species as <i>Tetraodon fahaka</i> Rüppell, 1829.

The Lake Natron basin occupies the largest part of the southern area of the Kenyan portion of the East Arm of the Rift Valley. The southern end of the Kenyan portion of the East Arm of The Rift Valley is concluded by this lake, and the Shombole Swamps which are situated to the North of the lake; the Shombole Swamps is home for one fish species, the Lake Natron tilapia, *Oreochromis alcalicus alcalicus* (Hilgendorf, 1905).

The exact distribution of 3 (5 %) species in the Kenyan portion of the Eastern Arm of the Rift Valley drainage is not determined in this paper. The occurrence of the Ethiopian barb, *Barbus intermedius intermedius* Rüppell, 1835, may spread out throughout northern Kenya and into Ethiopia, while the Straightfin barb, *Barbus paludinosus* Peters, 1852 and the Sharptooth catfish, *Clarias gariepinus* (Burchell, 1822), occur in almost all habitable lakes and rivers.

Endemism

There are at least 3, (5 %) species, 2 minnows and 1 cichlid, in the entire drainage system which are exclusively riverine: Loveridge's barb, *Barbus loveridgii* Boulenger, 1916, occurring in "Amala River", an effluent of Lake Baringo, Newmayer's barb, *Barbus neumayeri* Fischer, 1884, which is spread out in several rivers (Suam, Mount Elgon; Subukia, Lake Bogoria catchment; Seya, Isiolo District; Sinet, near Liotoktok; Waseges, Lake Bogoria catchment; Kerio affluent, Lake Turkana catchment), and Suguta tilapia, *Oreochromis niloticus sugutae* Trewavas, 1983, occurring in Suguta River and tributaries. These rivers dry up when rains are low, but some pools of water are maintained, which support the fish populations. It is not yet clear why the riverine fishes have not adapted to living in the lakes associating with these rivers.

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