

5. FISHES.

BY

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The first fishes from the fresh waters of the Kilimandjaro district were collected by Dr. G. A. FISCHER and subsequently in the year 1883 described by Dr. J. G. FISCHER.¹ They only numbered four species viz. *Tilapia nilotica*, *Clarias robecchi* (= *Cl. mossambicus* FISCHER nec PETERS), *Barbus pagenstecheri* and *B. neumayeri*, the two last being described as new. A few years later GÜNTHER² described four new species, *Tilapia hunteri*, *Synodontis punctulatus*, *Labeo montanus* and *Barbus jacksoni*.

In the year 1896 PFEFFER³ enumerated 101 species of fresh water fishes belonging to the fauna of German East Africa. The following year he published a new list with the number increased to 103.⁴ There are, however, in these lists no direct additions to the fauna of the Kilimandjaro district, although some species are recorded from places situated not far from the same, as for instance *Barbus vincigerrai* and *B. jacksoni* from the Wembere steppe, *B. oxyrhynchus* and *B. quadripunctatus* from Korogwe in Usambara, *Chiloglanis deckenii* and some other silurids, and *Barbus salmo* from Pangani river.

In the year 1903 BOULENGER described⁵ four new species of *Barbus* from Kilimandjaro viz. *B. percivali*, *lumiensis*, *lineomaculatus* and *amphigramma*, and recorded at the same time *Discognathus dembeensis* as new to the district, and *Labeo montanus* and *Tilapia hunteri* as refound.

Through Professor SJÖSTEDT'S collections the ichthyological fauna of the Kilimandjaro-Meru district and Usambara has received some interesting additions. Eleven species are represented (viz. 6 from Kilimandjaro-Meru and 5 from Usambara), four of these are more or less new and one cannot be determined with certainty on account of the youth of the specimens. Of the 6 species from Kilimandjaro-Meru not less than three species have been described from Mount Kenya viz. *Discognathus hindii*, *Barbus hindii* and *Amphilius grandis*, one, *Barbus percivali* is known from Kilimandjaro before, one *Clarias mossambicus* is rather more widely distributed from the Wembere steppe to Mozambique, and the sixth is new but its nearest relative *Barbus macropristis* has been

¹ Jahresb. Hamb. wiss. Anst. f. 1883. Hamburg 1884.

² Proc. Zool. Soc. 1889.

³ Die Thierwelt Ost-Afrikas. Berlin 1896.

⁴ Arch. f. Naturgeschichte. Jahrg. 63. Bd. 1.

⁵ Ann. Mag. Nat. Hist (7) Vol. XI.

described from Lake Victoria. The fishes of the Kilimandjaro-Meru district are probably not all known yet. From the notes above it will appear, that hitherto about 18 species of fish have been recorded, and of them not less than 9 belong to the genus *Barbus*, which has produced a very great quantity of different forms in Africa. It is highly probable that many of these are restricted to a very limited area of distribution and that a great number ought to be regarded rather as local races or geographic subspecies, than as real species. This is, however, a very difficult question, and the problem cannot be satisfactorily solved before a rich material from different waters and representing different sizes and ages has been collected. Until this has been done it only remains to describe and report upon the additions of material which has been obtained.

The fish fauna of Usambara appears to be rather unexplored as yet. Of the five species collected there by Professor SJÖSTEDT only one *Barbus jacksoni* from Mombo represented a species which was known before (from Kilimandjaro and the Wembere steppe). Three species are new and described below, the fifth would probably have proved to be new as well, if the material had admitted a satisfactory determination.

Fam. Characinidae.

Petersius tangensis n. sp.

18 specimens collected in a pool on inundated ground at Tanga, June 1905.

Depth of body about four times in total length without caudal, length of head $4\frac{1}{4}$ (in small specimens hardly 4 times). Mouth oblique lower jaw, however, hardly extending beyond snout. Diameter of eye $2\frac{3}{4}$ in length of head (in small specimens $2\frac{1}{2}$). Interorbital space about equal to $\frac{3}{4}$ diameter of eye. Snout shorter than eye. Dorsal fin with 10 rays 8 of which are branched. Its height almost equal to the length of head. Its origin is situated in about equal distance from anterior border of eye and middle of the root of caudal. Adipose fin small and slender its height hardly equal to $\frac{3}{4}$ the diameter of eye. Its distance from the rayed dorsal about $2\frac{1}{2}$ times the length of the base of the latter. Anal with 19 rays 17 of which are branched. Pectoral not quite as long as head, and not quite reaching the base of the ventrals, which just reach the vent. Caudal deeply forked, outer rays twice as long as middle rays. Caudal peduncle about $1\frac{1}{2}$ times as long as high. Lateral line with 36 scales. $6\frac{1}{2}$ scales between lateral line and origin of dorsal $2\frac{1}{2}$ between lateral line and base of ventral.

Silvery, probably with the back light olivaceous or greenish in life. A darker silvery band along the side above the lateral line separates the less shiny lower parts from the olivaceous back. Total length with caudal in the longest specimen 57 mm.

The only other species of *Petersius* from East Africa *P. conserialis* is easily distinguished from this one by its smaller eye ($3\frac{1}{2}$ times in length of head), longer anal (21 rays) smaller number of scales in the lateral line (33), greater height of body (only $2\frac{2}{3}$ times in total length) etc.

In general appearance *P. tangensis* may be most similar to *P. modestus* BOULENGER from Congo, Lake Leopold, but the former has a longer caudal peduncle. The lat-

ter has a greater number of anal rays (23) and of scales in the lateral line (40) and its height is only contained $3\frac{1}{3}$ times in the total length. *P. leopoldianus* BOULENGER from the same locality as *P. modestus* has a greater number of anal rays (22—23), a smaller number of scales in the lateral line (30—31), its body has a different shape, being expanded at the base of the anal fin. The remaining four species have a greater depth of body and at the same time fewer scales, except *P. hilgendorfi*, from Lake Leopold, which has about the same number of scales but a longer anal fin with 23—26 rays.

The six species of *Petersius* known up to 1899 are reviewed by BOULENGER in *Annales du Musée du Congo*, zool. T. I Fasc. 4. A seventh species *P. grandis* from Southern Cameroon is described by the same author in *The Annals and Magazine of Nat. Hist.* (7) Vol. 12 1903.

Fam. Cyprinidae.

Discognathus hindii BOULENGER.

Discognathus Hindii BOULENGER *Proc. Zool. Soc.* 1905 vol. I, p. 62.

1 specimen from a small tributary to the river Sanya, Kilimandjaro low lands $\frac{1}{9}$ 1906. — 1 specimen from the river Sanya, Kibonoto $\frac{28}{2}$ 1906.

This species also is described from the Kenya district »from the head-waters of Nyiro River at an altitude of 7,000 feet». (*Proc. Zool. Soc.* 1905 Vol. 1, p. 62.) A synopsis of the other 6 african species of this genus has been communicated by BOULENGER in *Proc. Zool. Soc.* 1903 II p. 331.

This genus is not recorded by PFEFFER in »Die Thierwelt Ost-Afrikas».

Barbus macropristis meruensis n. subsp.?

9 specimens from the river Ngare na nyuki, coming from the Meru mountain, $\frac{25}{10}$ 1905. D. III, 7, S. III, 5, L. lat. 36—38.

Depth of body $3\frac{2}{3}$ to about 4 times; length of head about 4 times in total length without caudal. Snout and diameter of eye subequal about $3\frac{3}{4}$ to 4 times in head; interorbital width $2\frac{1}{2}$ times in head. Anterior barbel about as long as $\frac{1}{2}$ diameter of eye, posterior about equal to diameter of eye. Last simple ray of dorsal not quite as long as head, rather strongly serrated behind along its outer two thirds. Ventrals situated in advance of dorsal. Depth of caudal peduncle about $\frac{4}{7}$ of its length. 7 scales between lateral line and origin of dorsal, 3 between lateral line and ventrals. Silvery with a dark band along the side above the lateral line, a black spot at the base of the caudal, lateral line blackish. Largest specimen 75 mm.

This fish is no doubt very closely allied to *Barbus macropristis* BOULENGER from Lake Victoria and perhaps only a local variety of the same. The latter species has the »last simple ray very strong, bony, strongly serrated behind, nearly as, long as or a little longer than head», and no markings. The differences may perhaps be due to different age as BOULENGER'S specimens were a little larger, (128 mm.), or the specimens from the small waters of the Meru may always remain in a juvenile stage compared with those of the great lake.

Barbus percivali BOULENGER.

Barbus Percivali, BOULENGER Ann. & Mag. Nat. Hist., (7), vol. XI 1903 p. 52.

6 specimens from the river Sanya, Kibonoto, ²⁸/₇ 1905.

BOULENGER has described this species »from the Nairobi River, Kilimandjaro 6,500 feet».¹ The five smaller specimens of this collection agree entirely with the original description. The sixth which is a little larger than BOULENGER's types, and measures 89 mm. has a little different proportions. The description of the species may thus be somewhat widened with the following addition: Depth of body equal to length of head $3\frac{1}{2}$ to 4 times in total length. Posterior barbel $1\frac{1}{3}$ to nearly 2 diameters of eye.

Professor SJÖSTEDT has communicated about the habitat of this fish the following notes: »The specimens were caught in a small tributary to the river Sanya. In the clear and cold water of this shallow river, which was slowly running over stony ground, this fish lived in small schools swimming near the bottom and looking like roaches. The river runs from the mountain towards the steppe and is surrounded by woods.»

Barbus jacksoni GÜNTHER.

Barbus Jacksoni GÜNTHER Proc. Zool. Soc. 1889 p. 72.

3 specimens from Mombo River, June 1906. Caught with hook and line with flies used for bait. D. III, 7. A. III, 5. L. lat. 37.

Depth of body about $3\frac{1}{2}$ times in total length without caudal. Length of head 4 to $4\frac{1}{5}$ times in total length without caudal. Snout a little shorter than eye which is contained about $3\frac{1}{2}$ times in length of head. Interorbital width about $2\frac{1}{2}$ times in length of head. Anterior barbel a little shorter than eye, posterior about $1\frac{1}{3}$ times as long as eye. Third simple dorsal ray strongly ossified, not serrated, longer than head, second not much more than $\frac{1}{3}$ of the length of the third. Origin of dorsal behind base of ventrals. Free edge of dorsal emarginate. Longest anal ray about $\frac{2}{3}$ of length of head or a little more. Pectoral not reaching ventral. Depth of caudal peduncle contained from $1\frac{3}{4}$ to nearly 2 times in its length $6\frac{1}{2}$ scales from lateral line to origin of dorsal and $3\frac{1}{2}$ scales to base of ventral.

Silvery, olive above, 3 dark spots on the side, the first above the 7:th, the second above the 15:th or 16:th scale, and the third at the base of the caudal.

Largest specimen 116 mm.

This fish agrees with *B. jacksoni* according to the original description² except that GÜNTHER says »the origin of the dorsal fin is opposite to the root of the ventral». If this is to be taken literally, the fish from Mombo differs in having the origin of the dorsal behind the vertical through the base of the ventrals. The posterior barbel is also longer in the fish from Mombo, but I do not think that these small differences are of specific value. This fish was common in Mombo river.

¹ Ann. Mag. Nat. Hist. (7) XI, 1903.

² Proc. Zool. Soc. 1889.

Barbus hindii BOULENGER.*Barbus Hindii* BOULENGER Proc. Zool. Soc. 1902 p. 222.

3 specimens from the river Sanya, which unfortunately have been spoiled agree as far as can be judged from general proportions, number of rays of dorsal and anal fins etc. with this species.¹ The fourth dorsal spine is, however, not quite so long as the head and the barbels appear to be even shorter than in the fish from Mount Kenya, thus still smaller than in its ally *B. tanensis* GÜNTHER.

This fish was seen in small schools swimming near the bottom. It was caught on hooks baited with dragonflies.

Barbus usambaræ n. sp.

1 specimen from a pool on inundated ground, June 1905, Tanga. D. III 7. A. III 5. L. lat. 3.

Depth of body $3\frac{3}{4}$ times in total length without caudal; length of head 4 times in total length without caudal. Snout much shorter than eye which is contained about $3\frac{1}{2}$ times in length of head. Interorbital width about $2\frac{3}{7}$ times in length of head. Barbels short, posterior longer, about equal to diameter of eye. Origin of dorsal equally distant from snout and root of caudal. Last simple ray of dorsal not enlarged, not serrated a little shorter than head; dorsal not emarginate. Ventrals situated in front of the vertical through the origin of the dorsal. Pectoral not reaching base of ventral, tip of ventral just reaching vent. Caudal peduncle almost twice as long as deep. 6 scales between lateral line and origin of dorsal, 3 scales between lateral line and base of ventral. Silvery, a somewhat darker lateral streak, a black spot at the root of the caudal, a cloudy spot at the base of anal.

Length of specimen 44 mm.

This species is apparently related to *B. amphigramma* BOULENGER² from Nairobi River, Kilimandjaro, which, however, has 35—36 scales in the lateral line which is blackish, snout and eye equal, length of head shorter than depth of body, shorter barbels, 4 scales between lateral line and ventral.

The 10 species of *Barbus* hitherto known from the Kilimandjaro-Meru district may be distinguished with the aid of the following table.

I. Last simple ray of dorsal enlarged, serrated behind.

a) more than 35 scales in lateral line

B. macropristis meruensis.

b) less than 32 scales in lateral line.

1) about 30 scales in lat. line

*) Dorsal III, 8, Anal II 6

B. neumayeri.

**) » III, 6—7, Anal III 5

B. percivali.

2) 27 scales in lat. line.

B. lumiensis.

II. Last simple ray of dorsal, enlarged but not serrated behind.

¹ Conf. Proc. 200 l. Soc. 1902.

² Ann. Mag. Nat. Hist. (7) Vol. XI.

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|----------|--|---------------------------|
| a) 37 | scales in lat. line; dorsal III, 9 | <i>B. jacksoni.</i> |
| b) 25—29 | » » » » » III, 7 | <i>B. hindii.</i> |
| III. | Last simple ray of dorsal not enlarged and not serrated. | |
| a) | dorsal IV, 9, anal III, 6 | <i>B. pagenstecheri.</i> |
| b) | dorsal III, 8, anal III, 5, lat. line 30 | <i>B. lineomaculatus.</i> |
| c) | dorsal III, 7, anal III 5. | |
| 1) | 35—36 scales in lat. line | <i>B. amphigramma.</i> |
| 2) | 30 » » » » » | <i>B. usambaræ.</i> |

As probably several more species of *Barbus* are to be found in this district this table is certainly not sufficient but only of preliminary use.

Fam. Siluridæ.

Clarias mossambicus PETERS.

Clarias mossambicus PETERS. Reise nach Mozambique. Zool. IV Flussfische p. 32. Taf. VI Berlin 1868.

7 specimens collected the 30th of July 1905 in the small lakes at Meru.

This species as well as *Cl. robecchii* VINCIGUERRA (= *Cl. microphthalmus* PFEFFER) have been recorded from German East Africa before. The latter species is recognized by its less granulated head, smaller eyes etc.

The colour of the living specimens was very dark slaty, lighter below, the eyes blackish brown. The small shallow lakes and stagnant pools in which they lived had muddy bottom and brown water, and were surrounded by woods, grass and *Scirpus* grew at the shores. The fishes rose to the surface emitting bubbles of air and producing a noticeable smacking sound.

The meat of the fish was fat like that of eel. The fishes bite readily at the hook and were caught on a long line with hooks stretched over a small bay. They took the bait best just after sunrise and just before sunset.

Amphilius grandis BOULENGER.

Amphilius grandis BOULENGER Proc. Zool. Soc. 1905, Vol. I p. 63

3 specimens from Kibonoto, Fugga River. Aug. 1905.

These specimens measure from 118 to 164 mm. The length of the type-specimen was 180 mm. The species was discovered »from the Chania River of Tetse, Tana system in cold water, at an altitude of 7,000 feet» in the Kenya district, British East Africa. When describing this species BOULENGER has given a key¹ to the seven species of the genus *Amphilius*. Two more of the same have been found in East Africa viz. *A. platyichir* GÜNTHER from the region between Lake Tanganyika and Lake Nyassa, and *A. uranoscopus* PFEFFER² from Ushanda and Mhonda, German East Africa.

¹ Proc. Zool. Soc. 1905. Vol. I. Part. I.

² Thierwelt Ost Africas.

The present specimens of *A. grandis* are light brownish, indistinctly spotted with darker, the spots having a tendency of becoming confluent to bands along the lateral line and on the back on either side of the dorsal fin.

Fam. **Cyprinodontidæ.**

Fundulus palmqvisti¹ n. sp.

28 specimens (mostly small) from an inundated cocoa plantation at Tanga ⁵/₆ 1905.

Upper surface of head broad and flat, its upper contour straight or even a little concave. Body compressed at once behind the occiput.

Depth of body less than length of head, the former is contained from $2\frac{3}{4}$ to 3 times, the latter about $3\frac{1}{2}$ times in total length without caudal. Snout equal to or a little longer than the diameter of eye, which is contained about 4 times in length of head and $1\frac{2}{3}$ times in interorbital width. Dorsal with 16 rays, its origin is situated in about the same distance from the hindmargin of the eye and the middle of the base of the caudal a little in front of the vertical through the origin of the anal; its longest rays in the male about ⁵/₆ of the length of head. Anal with 15 rays, its origin a little behind that of the dorsal and its rays a little shorter in the male. Anal rays beset with short spines. Pectoral about ²/₃ of length of head, reaching base of ventrals in male. Caudal peduncle longer than deep. Lateral line 27—28 (3—4 smaller caudal scales not counted) 10 scales between ventrals and origin of dorsal.

Every scale of the male has near its posterior margin a carmine red band and these bands are connected with each other so as to form continuous, transversal, somewhat wavy red bands across the body in similar number as the transverse series of scales. These bands are less bright just behind the head. Caudal fin bright red; anal and dorsal fins with carmine red spots in the shape of short streaks on the rays a little weaker on the web but connected into irregular bands across the fins.

Female uniformly coloured, probably greenish in life, without markings. The largest male measures from tip of snout to end of caudal fin 42 mm. This *Fundulus* is nearly related to *F. güntheri* PFEFFER but the latter has a greater number of scales (30—32) in the lateral line and depth of body greater than the length of head which is $3\frac{1}{3}$ times in total length without caudal. The situation of the origin of dorsal and anal fins is also different in *F. güntheri* in which both begin at the same vertical. The anal rays are longer in *F. palmqvisti*, being almost equal to the depth of the body, but in *F. güntheri* according to the available figures² very much less. According to the same the caudal fin of *F. güntheri* is more rounded and in *F. palmqvisti* more squarely truncate, and at the same time it has no dark margin or spots in the latter species.

Of *F. melanospilus* PFEFFER only the female is known and it is blackspotted. *F. tæniopygus* from Victoria Nyassa differs in its colour as well, and in the male not only anal but also dorsal rays are beset with small spines.

¹ Named in honour of Mr. G. Palmqvist, the mæcenas of the expedition.

² PFEFFER: Die Fische Ost Afrikas p. 47, Fig. 19; GÜNTHER and PLAYFAIR: The Fishes of Zanzibar Pl. XVII fig. 2.

Fam. **Gobiidae.****Gobius** sp.

Among the *Fundulus* specimens were found two small specimens of *Gobius*, but they are too young to be properly described and I think it therefore most suitable only to mention shortly them this way.

List of species of fishes hitherto known from the Kilimandjaro-Meru district.

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| 1. <i>Labeo montanus</i> (GÜNTHER). | 10. <i>Barbus pagenstecheri</i> J. G. FISCHER. |
| 2. <i>Discognatus dembeensis</i> RÜPPEL. | 11. » <i>lineomaculatus</i> BOULENGER. |
| 3. » <i>hindii</i> BOULENGER. | 12. » <i>amphigramma</i> BOULENGER. |
| 4. <i>Barbus macropristis meruensis</i> LÖNNBERG. | 13. <i>Clarias mossambicus</i> PETERS. |
| 5. » <i>neumayeri</i> J. G. FISCHER. | 14. » <i>robecchi</i> VINCIGUERRA. |
| 6. » <i>percivali</i> BOULENGER. | 15. <i>Amphilius grandis</i> BOULENGER. |
| 7. » <i>lumiensis</i> BOULENGER. | 16. <i>Synodontis punctulatus</i> GÜNTHER. |
| 8. » <i>hindii</i> BOULENGER. | 17. <i>Tilapia nilotica</i> (HASSELQVIST). |
| 9. » <i>jacksoni</i> GÜNTHER. | 18. » <i>hunteri</i> GÜNTHER. |



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