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IV. *Second Contribution to the Ichthyology of Lake Tanganyika.—On the Fishes obtained by the Congo Free State Expedition under Lieut. Lemaire in 1898. By G. A. BOULENGER, F.R.S., F.Z.S.*

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[PLATES XVIII.—XX.]

THE extraordinary richness of Lake Tanganyika in Perciform fishes of the family *Cichlidæ*, first revealed by Mr. Moore's collection, reported upon in these Transactions, vol. xv. 1898, pp. 1–30, pls. i.–viii., is further shown by the collection made in July–August 1898 by the Lemaire Expedition at Moliro, at the southern extremity of the Lake, already explored by Mr. Moore. Although consisting of no more than 31 specimens, the collection entrusted to me for description by the Government of the Congo Free State contains the types of ten new species, three of which warrant the establishment of new genera. These new genera are of further interest in emphasizing a feature of the Tanganyika *Cichlidæ* to which I have drawn special attention in my previous contribution, p. 2, viz. the extent of the lateral lines in many of the forms discovered by Mr. Moore. The knowledge of forms with three lateral lines, a condition previously unrepresented in the *Cichlidæ*, adds force to the remarks I have made with regard to the morphological significance of the so-called “interrupted lateral line.”

The Lemaire collection is further valuable for the care with which coloured sketches of most of the fishes have been taken on the spot by M. Dardenne, the excellent artist attached to the expedition. These sketches have enabled me to represent some of the more strikingly coloured forms in chromolithography.

In addition to the definitions of the new species, I am able to draw up descriptions of the two species of *Ectodus* of which very incomplete definitions were given in the previous contribution, owing to the bad condition of the type-specimens. I have also added notes on the known species of which specimens are contained in the Lemaire collection, or of which coloured drawings, accompanied by an indication of the native names, have been supplied by M. Dardenne.

SERRANIDÆ.

1. LATES MICROLEPIS Blgr.

Originally described from young specimens, 155 millim. long. The adult, measuring 800 millim. and weighing 14 lbs., has, as could be expected, very different proportions and is of a uniform dark silvery colour. The eye is contained 9 times in the length of the head, which is $\frac{1}{3}$ of the total; longest dorsal spine $\frac{1}{2}$ length of head. Caudal peduncle and caudal fin as in the young.

Native name: "Sangala."

CICHLIDÆ.

2. LAMPROLOGUS LEMAIRII, sp. n. (Plate XVIII. fig. 1.)

A few moderately large curved canine teeth in front of each jaw, followed by a narrow band of minute teeth; lateral teeth very small. Depth of body $3\frac{1}{2}$ times in total length, length of head $2\frac{3}{4}$. Snout slightly longer than the diameter of the eye, which is $3\frac{1}{3}$ times in length of head and nearly double interorbital width; maxillary extending to slightly beyond vertical of anterior border of eye; cheeks and occiput naked; a few small deciduous scales on the opercles. Gill-rakers short, 9 on lower part of anterior arch. Dorsal XIX 7; spines equal from the fifth, which measures a little more than $\frac{1}{3}$ length of head and $\frac{3}{4}$ longest soft rays. Pectoral $\frac{3}{4}$ length of head. Ventral reaching origin of anal. Anal VIII 5; spines increasing in length to the last, which slightly exceeds longest dorsals. Caudal rounded. Caudal peduncle a little longer than deep. Scales 48 $\frac{10-11}{16}$; lat. I. $\frac{30}{17}$. Pale brown, most of the scales dark-edged; a blackish oblique bar from below the anterior third of the eye to the maxillary; a large blackish opercular spot; three oblique blackish bands, descending forwards, on each side of the back, extending on the base of the dorsal; dorsal and anal tipped with blackish.

Total length 107 millim.

A single specimen.

This species takes its place in the series between *L. moorii* and *L. congoensis*.

3. TELMATOCHROMIS TEMPORALIS Blgr.

Native name: "Muchétilla."

4. PARATILAPIA DEWINDTI, sp. n. (Plate XVIII. fig. 2.)

Teeth very small, in 3 or 4 series in both jaws, the outer scarcely larger and not tipped with brown. Depth of body equal to length of head, nearly 3 times in total

length. Snout with curved upper profile, shorter than the eye, the diameter of which is $2\frac{2}{3}$ to $2\frac{3}{4}$ in length of head and exceeds interorbital width; maxillary extending to below anterior fourth of eye; 2 or 3 series of scales on the cheek; large scales on the opercle. Gill-rakers rather long, lanceolate, 17 or 18 on lower part of anterior arch. Dorsal XII-XIII 12-13; spines increasing in length to the eighth or ninth, which measures $\frac{2}{3}$ or $\frac{1}{2}$ length of head and $\frac{3}{4}$ longest soft rays. Pectoral a little shorter than head, extending as far as origin of anal. Ventral produced into a long filament, extending beyond origin of anal. Anal III 9; third spine longest, $\frac{2}{3}$ length of head; middle soft rays produced, as long as or a little shorter than head. Caudal deeply emarginate, crescentic. Caudal peduncle $1\frac{1}{3}$ as long as deep. Scales finely denticulate on the edge, 37-38 $\frac{4}{13}$; lat. l. $\frac{29-30}{14-15}$; upper lateral line not reaching base of caudal. Grey above, white beneath; four yellowish stripes along each side; pectorals yellowish; other fins dark grey or blackish.

Total length 100 millim.

Three specimens.—Native name: "Likuko."

This species is named in memory of the distinguished young geologist, Dr. De Windt, attached to Lieut. Lemaire's expedition, who was accidentally drowned in Lake Tanganyika. It is very closely allied to *P. ventralis* Blgr., from which it differs in the dentition and in the shorter pectoral fin.

5. BATHYBATES FEROX Blgr.

Native name: "Musupa."

TREMATOCARA, g. n.

Closely allied to *Paratilapia*, but with the teeth very minute, in a narrow band in both jaws, the maxillary entirely concealed under the præorbital when the mouth is closed, the muciferous cavities of the top and sides of the skull and of the mandible extremely large, as in *Acerina*, and with a single, incomplete, lateral line.

6. TREMATOCARA MARGINATUM, sp. n. (Plate XIX. fig. 1.)

Depth of body $3\frac{1}{2}$ times in total length, length of head $2\frac{2}{3}$ to 3. Snout with curved upper profile, shorter than the eye, which is $2\frac{1}{2}$ in length of head and exceeds interocular width; mouth extending to below anterior border of eye; cheek naked; a few deciduous scales on the opercle; nasal, frontal, præ- and suborbital, præopercular, and mandibular bones with very large and deep cavities separated by narrow septa and

covered with a thin skin. Gill-rakers short, 10 on lower part of anterior arch. Dorsal X 11; spines $\frac{2}{3}$ length of head, a little shorter than longest soft rays. Pectoral acutely pointed, as long as head. Ventral reaching origin of anal. Anal III 10; third spine nearly as long as dorsals. Caudal with deep crescentic notch. Caudal peduncle $1\frac{1}{2}$ as long as deep. Scales cycloid, $30\frac{3}{8}$; lateral line reduced to a few (6 or 7) short tubes in the upper series. Pale brownish above, white beneath; a bluish lateral stripe; fins yellowish, dorsal and anal edged with blackish.

Total length 63 millim.

Two specimens.—Native name: "Lilowé."

GRAMMATOTRIA, g. n.

Body elongate; scales ctenoid; three incomplete lateral lines. Jaws narrow, with a band of minute conical teeth and an outer series of rather longer ones; maxillary concealed under the præorbital when the mouth is closed. A large papillose pad on each side of the pharynx, between the gills. Dorsal with 15 spines, anal with 3.

7. GRAMMATOTRIA LEMAIRII, sp. n. (Plate XVIII. fig. 3.)

Depth of body 4 times in total length, length of head 3. Snout with slightly convex upper profile, $1\frac{1}{2}$ diameter of eye, which is $3\frac{2}{3}$ in length of head and equals interocular width; maxillary extending to between nostril and eye; 3 series of scales on the cheek; opercle covered with scales. Gill-rakers short, 12 on lower part of anterior arch. Dorsal XV 14; spines slender, equal from the fifth, which measures nearly $\frac{1}{3}$ length of head; soft rays not longer than the spines. Pectoral acutely pointed, nearly as long as head, extending as far as origin of anal. Ventral reaching vent. Anal III 10; third spine a little stronger and shorter than longest dorsals. Caudal with deep crescentic notch. Caudal peduncle $2\frac{1}{3}$ as long as deep. Scales $55\frac{6-7}{13}$; lat. l. $\frac{48-52}{13-15}$. Pale brown above, yellowish beneath; a small dark brown opercular spot; a round brown spot on caudal peduncle at root of caudal fin; dorsal fin greyish, the soft portion with round white spots; other fins yellowish.

Total length 175 millim.

A single specimen.—Native name: "Murungi."

8. ECTODUS¹ DESCAMPSI Blgr. (Plate XIX. fig. 2.)

Depth of body $3\frac{1}{2}$ times in total length, length of head 3. Snout short, with curved

¹ To the generic characters as given in the original description must be added the presence of a large dermal pad in front of the upper part of the gill-arches, same as in *Pelmatochromis* and *Chromidotilapia*.

upper profile, slightly shorter than the eye, the diameter of which is $2\frac{1}{3}$ in length of head and equals $1\frac{1}{2}$ interorbital width; maxillary extending to between nostril and eye; two series of scales on the cheek; opercle naked. Gill-rakers short, 11 on lower part of anterior arch. Dorsal XIII 13; spines slender, increasing in length to the last, which is about $\frac{2}{3}$ length of head and little shorter than the soft rays. Anal III 8; third spine slightly shorter than longest dorsals. Pectoral obtusely pointed, $\frac{2}{3}$ length of head. Ventral reaching vent. Caudal emarginate. Caudal peduncle $1\frac{1}{2}$ as long as deep. Scales $35\frac{3}{11}$; at l. $\frac{27}{14}$. Pale brown above, yellowish beneath; fins yellow; a round blackish spot on the hinder part of the spinous dorsal.

Total length 60 millim.

A single specimen.

9. *ECTODUS MELANOGENYS* Blgr. (Plate XIX. fig. 3.)

Depth of body 5 to $5\frac{1}{4}$ times in total length, length of head $3\frac{1}{2}$. Snout long, with nearly straight upper profile, $1\frac{2}{3}$ diameter of eye, which is 4 times in length of head and equals or slightly exceeds interorbital width; maxillary extending to between nostril and eye; 3 series of scales on the cheek; deciduous scales on the opercle. Gill-rakers short, 12-13 on lower part of anterior arch. Dorsal XIII-XIV 17; spines slender, increasing in length to the last, which is about $\frac{2}{3}$ length of head; last soft rays produced, at least half length of head. Anal III 13; third spine $\frac{1}{3}$ length of head. Pectoral pointed, a little shorter than head. Ventral reaching origin of anal. Caudal deeply emarginate. Caudal peduncle twice as long as deep. Scales $43-44\frac{3-4}{10}$; lat. l. $\frac{30-31}{14-16}$. Grey above, white below; dorsal scales with a pale blue central spot; a blackish opercular spot; chin and branchiostegal membrane blackish; dorsal grey, with whitish streaks and spots, and a large oval blackish spot in the middle of the spinous portion; anal grey, streaked with whitish; pectoral and caudal yellowish, the latter with crescentic dark bands; ventral blackish at the end.

Total length 110 millim.

Two specimens.—Native name: "Losorella."

10. *ECTODUS LONGIANALIS*, sp. n. (Plate XIX. fig. 4.)

Depth of body 5 times in total length, length of head 3. Snout long, with slightly convex upper profile, $1\frac{1}{2}$ diameter of eye, which is $3\frac{1}{2}$ times in length of head and nearly $1\frac{1}{2}$ interorbital width; maxillary extending to between nostril and eye; 3 series of scales on the cheek; deciduous scales on the opercle. Gill-rakers short, 12 on lower part of anterior arch. Dorsal XV 15; spines slender, increasing in length to the

last, which is $\frac{1}{3}$ length of head; soft rays slightly longer, the last not produced. Anal III 17; third spine $\frac{1}{4}$ length of head. Pectoral pointed, $\frac{2}{3}$ length of head. Ventral nearly reaching origin of anal. Caudal deeply emarginate. Caudal peduncle twice as long as deep. Scales $44\frac{3}{9}$; lat. l. $\frac{31}{17-18}$. Brownish above, whitish beneath; a blackish opercular spot; a lateral series of rather indistinct dark spots; dorsal greyish; other fins yellow.

Total length 97 millim.

A single specimen, with the mouth and pharynx full of advanced embryos.

The characters of the 3 species of *Ectodus* may be contrasted as follows:—

E. descampsi. D. XIII–XIV 13–14. A. III 8. Sq. 34–35 $\frac{3}{10-11}$; lat. l. $\frac{27-28}{14-15}$.
Depth of body $3\frac{1}{2}$ – $3\frac{3}{4}$ in total length. Snout slightly shorter than eye.

E. melanogenys. D. XIII–XIV 16–17. A. III 13. Sq. 43–44 $\frac{3-4}{10}$; lat. l. $\frac{30-31}{14-16}$.
Depth of body 5 – $5\frac{1}{4}$ in total length. Snout much longer than eye.

E. longianalis. D. XV 15. A. III 17. Sq. $44\frac{3}{9}$; lat. l. $\frac{31}{17-18}$. Depth of body 5 in total length. Snout much longer than eye.

XENOTILAPIA, g. n.

Body moderately elongate; scales ctenoid; three lateral lines. Mouth small, very protractile; upper jaw with series of minute conical teeth; two mandibular teeth turned outwards, in a single series; maxillary concealed under the præorbital when the mouth is closed. A large papillose pad on each side of the pharynx, between the gills. Dorsal with 14 or 15 spines, anal with 3.

11. XENOTILAPIA SIMA, sp. n. (Plate XIX. fig. 5.)

Depth of body 4 times in total length, length of head $3\frac{1}{4}$. Snout very short and deep, with very steep convex upper profile; eye very large, oval, its diameter $\frac{2}{3}$ length of head and much greater than interorbital width; mouth nearly straight, horizontal, extending to below anterior border of eye; 3 or 4 series of scales on the cheek; deciduous scales on the opercle. Gill-rakers very short, broad, truncate, 9 on lower part of anterior arch. Dorsal XIV–XV 12; spines subequal from the fifth, $\frac{1}{3}$ length of head; longest soft rays $\frac{2}{3}$ length of head. Pectoral acutely pointed, as long as head. Ventral with the inner ray produced and reaching a little beyond origin of anal. Anal III 11; third spine $\frac{1}{3}$ length of head. Caudal with deep crescentic notch. Caudal peduncle twice as long as deep. Scales strongly ciliated, 40–41 $\frac{3-4}{10-11}$; lat. l. $\frac{21-22}{15-16}$.

Pale brownish, with a few round darker spots; a blackish opercular spot; a shining golden spot on the subopercle; dorsal greyish, other fins yellowish.

Total length 105 millim.

Two specimens.—Native name: "Lufuina."

12. *TILAPIA LABIATA* Blgr.

Native name: "Kobo."

13. *TILAPIA DARDENHII*, sp. n. (Plate XX. fig. 1.)

Teeth very small, in 4 or 5 series in both jaws, outer bicuspid, separated from the series of smaller tricuspid teeth by a rather wide interspace. Depth of body 3 to $3\frac{1}{2}$ times in total length, length of head $3\frac{1}{3}$ to $3\frac{1}{2}$. Snout with strongly curved upper profile, little longer than the diameter of the eye, which is $3\frac{1}{2}$ times in length of head and equal to or a little less than interorbital width; mouth small, $\frac{2}{3}$ width of head, extending to between nostril and eye; 5 or 6 series of scales on the cheek; large scales on the opercle. Gill-rakers short and thick, 13 on lower part of anterior arch. Dorsal XIX 10; sixth to ninth spines longest, not quite half length of head, a little shorter than longest soft rays. Pectoral acutely pointed, as long as or slightly shorter than the head, not extending to origin of anal. Ventral reaching vent or not quite so far. Anal III 8; third spine as long as and much stronger than longest dorsals. Caudal feebly emarginate. Caudal peduncle $1\frac{2}{3}$ or $1\frac{3}{4}$ as long as deep. Scales mostly ctenoid, $37\frac{5}{11}$; lat. l. $\frac{24-25}{17-19}$. Yellowish olive above, silvery beneath, with 10 or 11 dark dorsal cross-bars, the first between the eyes; yellowish streaks along the series of scales; fins yellowish, dorsal with some olive marblings, pectoral and anal red at the base.

Total length 155 millim.

Two specimens.—Native name: "Sangani."

14. *TILAPIA RUBROPUNCTATA*, sp. n. (Plate XX. fig. 2.)

Teeth very small, in 4 or 5 series in both jaws, outer bicuspid, separated from the series of smaller tricuspid teeth by a rather wide interspace. Depth of body 3 times in total length, length of head $2\frac{2}{3}$. Snout with straight upper profile, twice as long as diameter of eye, which is $4\frac{1}{2}$ times in length of head and equals interorbital width; mouth large, $\frac{3}{4}$ width of head, extending to between nostril and eye; a few deciduous scales on the cheek; large scales on the opercle. Gill-rakers short, rather slender, 12 or 13 on lower part of anterior arch. Dorsal XVI 9; spines equal in length from the

sixth or seventh, measuring $\frac{1}{3}$ length of head and $\frac{2}{3}$ longest soft rays. Pectoral obtusely pointed, $\frac{2}{3}$ length of head, not extending to origin of anal. Ventral reaching vent. Anal III 7; third spine a little shorter than longest dorsals. Caudal truncate. Caudal peduncle as long as deep. Scales mostly cycloid, a few on the sides of the body below the lateral line finely denticulate, 32-33 $\frac{4-5}{11-12}$; lat. l. $\frac{22}{12-13}$. Olive-brown above, pale yellow beneath; dark cross-bars on the back; each scale of the back and sides with a central vermilion spot; head spotted and marbled with dark purplish brown; lower jaw and lower part of opercular region bright yellow; dorsal and caudal fins bright yellow, spotted with dark brown; pectoral yellow; branchiostegal membrane, pectoral region, outer edge of ventrals, and anal vermilion-red.

Total length 120 millim.

Two specimens of this handsomely-coloured fish, which bears the native name "Kasanga Malengi" on M. Dardenne's coloured sketch.

15. *TILAPIA MICROLEPIS*, sp. n. (Plate XX. fig. 3.)

Teeth very small, in 4 series close together in both jaws, outer larger, bicuspid, with a principal and a small lateral cusp. Depth of body $3\frac{2}{3}$ to 4 times in total length, length of head 3. Snout with straight or slightly convex upper profile, once and a half the diameter of the eye, which is nearly 4 times in length of head and equals inter-orbital width; mouth moderate, its width $\frac{2}{3}$ that of the head, extending to between nostril and eye; 7 or 8 rows of scales on the cheek; larger scales on the opercle. Gill-rakers short, rather thick, 13 or 14 on lower part of anterior arch. Dorsal XVI-XVII 14-15; spines subequal in length from the fifth or sixth, measuring $\frac{1}{3}$ length of head and a little shorter than longest soft rays. Pectoral acutely pointed, $\frac{3}{4}$ length of head, not extending to origin of anal. Ventral widely separated from vent. Anal III 9; third spine as long as and a little stronger than longest dorsals. Caudal with deep crescentic notch. Caudal peduncle twice as long as deep. Scales cycloid, 80-90 $\frac{10}{29-30}$; lat. l. $\frac{46-49}{38-44}$. Pale olive-brown above, white below; faint dark bars across the back and four round dark spots on each side, the last at the root of the caudal; fins yellowish.

Total length 115 millim.

Two specimens.—Native name: "Mocupi."

As in *Tilapia desfontainesi*, the dentition of this species may be regarded as connecting *Tilapia* with *Paratilapia*.

16. *TILAPIA GRANDOCULIS*, sp. n. (Plate XIX. fig. 6.)

Teeth very small, in 4 or 5 series in both jaws, of outer series larger, bi- or tricuspid,

and very obtuse. Depth of body $3\frac{1}{2}$ times in total length, length of head 3. Snout short, with rounded upper profile; eye very large, a little longer than the snout, its diameter $2\frac{1}{2}$ in length of head, and slightly greater than the interorbital width; mouth small, $\frac{1}{2}$ width of head, extending to between nostril and eye; a few deciduous scales on the cheek; larger scales on the opercle. Gill-rakers very short, rather thick, 17 on lower part of anterior arch. Dorsal XIII 14; spines slender, equal in length from the seventh, measuring $\frac{2}{3}$ length of head, and a little shorter than longest soft rays. Pectoral falciform, slightly longer than the head, extending as far as origin of anal. Ventral prolonged in a long filament, extending beyond origin of anal. Anal III 10; third spine shorter but stronger than longest dorsals. Caudal with deep crescentic notch. Caudal peduncle a little longer than deep. Scales mostly ctenoid, $63\frac{25}{35}$; lat. 1. $\frac{58-60}{32-36}$. Brown above, with ill-defined darker spots, whitish beneath; pectorals yellowish; other fins blackish towards the edge.

Total length 115 millim.

A single specimen.

SILURIDÆ.

17. AUCHENASPIS BISCUTATA Geoffr.

Native name: "Porocco."

18. CHRYSICHTHYS CRANCHII Leach.

Two young specimens are in the collection. A larger specimen is represented in the series of drawings made by Mr. Moore.

19. SYNODONTIS MULTIPUNCTATUS Blgr.

The young (150 millim.) have the spots on the head and body larger and fewer. Native name: "Katétia."

CHARACINIDÆ.

20. ALESTES MACROLEPIDOTUS C. & V.

Native name: "Ilala."

21. ALESTES MACROPHthalmus Gthr.

Native name: "Laala."

CYPRINODONTIDÆ.

22. HAPLOCHILUS TANGANICANUS Blgr.

Native name: "Mohanga."

EXPLANATION OF THE PLATES.

PLATE XVIII.

- Fig. 1. *Lamprologus lemairii*, p. 88.
Fig. 2. *Paratilapia dewindti*, p. 88.
Fig. 3. *Grammatotria lemairii*, p. 90.

PLATE XIX.

- Fig. 1. *Trematocara marginatum*, p. 89. 1 *a.* Side view of head;
1 *b.* Lower view of head, enlarged.
Fig. 2. *Ectodus descampsi*, p. 90.
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PLATE XX.

- Fig. 1. *Tilapia dardennii*, p. 93.
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