

missing. Hind legs with the tibiæ conspicuously golden beneath beyond the middle; first tarsal joint pale golden beneath and at the sides on the basal third, second tarsal joint with a white ring as in the male. Wing-length 8 mm.

FORMOSA: Toa Tsui Kutsu, v. 1914, 1 ♀; Kankau, 1912, 2 ♂; and Toyenmongai, 1 ♂ (*H. Sauter*); also 1 ♂ without definite data. Co-types in the Berlin-Dahlem Museum, the Budapest Museum, and the British Museum.

This is apparently the species which Theobald described as *M. splendens*, Wied., in 1901. Although I have not seen the specimen on which this description is based, it is evident that the determination was erroneous, since Wiedemann states that the tufts of the seventh abdominal segment in his species are blackish. Through the kindness of Dr. H. Zerny, of the Vienna Museum, I have recently been able to examine Wiedemann's type ♂ of *M. splendens*. It proves to be identical with *M. regius* (Tennent), as might be supposed from the description.

LXVIII.—*The Cichlid Fishes of Lakes Albert Edward and Kivu.* By C. TATE REGAN, M.A., F.R.S.

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ONLY two or three species of Cichlidæ are known from Lake Albert, and these have also been found in the Bahr-el-Gebel. Lakes Albert Edward and Kivu appear to have a more interesting Cichlid fauna, each possessing a number of peculiar forms of *Haplochromis*, which appear to be more nearly related to species found in Lake Victoria than to those of the Nile.

*Synopsis of the Genera.*

I. Scales cycloid; pharyngeal apophysis formed by parasphenoid alone.  
1. *Tilapia*.

II. Scales more or less distinctly ctenoid; pharyngeal apophysis formed by parasphenoid in middle and basioccipital at sides.

Teeth conical, or outer bicuspid and inner tricuspid. 2. *Haplochromis*.  
An outer close-set series of enlarged teeth, with strongly incurved, flattened, rounded crowns, followed by 2 series of minute tricuspid teeth. 3. *Schubotzia*.



1. *TILAPIA*, A. Smith, 1840.

Scales cycloid. Teeth in several series, the outer usually bicuspid, the inner tricuspid.

Africa and Syria.

1. *Tilapia nilotica*, Linn.

Bouleng. Cat. Afr. Fish. iii. p. 162, fig. 106.

This species extends from the Nile through Lakes Albert, Albert Edward, and Kivu to Tanganyika.

2. *Tilapia eduardiana*, Bouleng., 1912.

Bouleng. Cat. Afr. Fish. iii. p. 166, fig. 107.

Lake Albert Edward watershed of Mount Ruwenzori and Lake Gangu.

Closely related to *T. variabilis* of Lake Victoria.

2. *HAPLOCHROMIS*, Hilgendorf, 1888.

Scales ctenoid. Teeth in 2 or more series, conical, or outer bicuspid and inner tricuspid.

Africa and Syria.

*Synopsis of the Species.*

## I. Albert Edward species.

## A. Jaws equal or lower feebly projecting.

## 1. 7 to 9 gill-rakers on lower part of anterior arch.

1. *schubotzi*.

## 2. 9 to 12 gill-rakers on lower part of anterior arch.

Eye  $3\frac{1}{2}$  in head (in specimens of 80 to 90 mm.);

maxillary not reaching eye ..... 2. *pappenheimi*.

Eye 3 in head (in a specimen of 80 mm.); scales

on chest very small, 8 between pectoral and pelvic fins. .... 3. *eduardii*.

Eye  $2\frac{3}{4}$  in head (in a specimen of 80 mm.); scales

on chest moderate, 4 between pectoral and pelvic fins. .... 4. *nigripinnis*.

B. Lower jaw distinctly projecting. .... 5. *squamipinnis*.

## II. Kivu species.

## A. Jaws equal or lower feebly projecting.

## 1. Teeth in 3 to 5 series, 40 to 60 in outer series of upper jaw (in specimens of 75 to 120 mm.); 7 to 9 gill-rakers on lower part of anterior arch.

Pectoral reaching vent, origin of anal, or a little

beyond ..... 6. *graueri*.

Pectoral reaching middle of anal ..... 7. *adolphi-frederici*.

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- 2 Teeth in 4 to 8 series, 40 to 70 in outer series of upper jaw (in specimens of 75 to 115 mm.); 9 to 11 gill-rakers on lower part of anterior arch ..... 8. *astatodon*.  
 2. Teeth in 3 or 4 series, 36 in outer series of upper jaw (in specimens of 120 to 125 mm.) ..... 9. *paucidens*.  
 B. Lower jaw distinctly projecting ..... 10. *vittatus*.

1. *Haplochromis schubotzi*, Bouleng., 1914.

*Tilapia martini* (part.), Bouleng. Cat. Afr. Fish. iii. p. 239.

*Haplochromis schubotzi*, Bouleng. t. c. p. 288, fig. 196.

*Haplochromis angustifrons*, Bouleng. t. c. p. 292, fig. 198.

*Pelmatochromis spekii* (part.), Bouleng. t. c. p. 416.

Depth of body  $2\frac{3}{5}$  to  $2\frac{4}{5}$  in the length, length of head  $2\frac{4}{5}$  to  $3\frac{1}{4}$ . Snout from shorter than to a little longer than diameter of eye, which is  $2\frac{3}{4}$  to  $3\frac{3}{4}$  in length of head, greater than præorbital depth, equal to or greater than depth of cheek; interorbital width 4 to 5 in length of head. Jaws equal or lower slightly projecting; maxillary about reaching vertical from anterior edge of eye; teeth conical or cuspidate, in 3 or 4 series, 36 to 60 in outer series of upper jaw. 3 or 4 series of scales on cheek. 7 to 9 gill-rakers on lower part of anterior arch. Pharyngeal teeth small. 31 to 33 scales in a longitudinal series, 5 to 7 from origin of dorsal to lateral line. Dorsal XIV–XVI 9–10; last spine  $\frac{2}{5}$  to  $\frac{1}{2}$  length of head. Anal III 8–9; third spine  $\frac{1}{3}$  to  $\frac{2}{5}$  head. Pectoral as long as or a little shorter than head, reaching anal. Caudal truncate. Caudal peduncle  $1\frac{1}{5}$  to  $1\frac{3}{5}$  as long as deep. Females silvery white; males often greyish, sometimes with indistinct cross-bars, usually with 2 bars across snout, 1 below eye, 1 on occiput, and 1 on nape, pelvic fins blackish, and ocelli on anal.

Lake Albert Edward.

Thirteen specimens, 70 to 135 mm. long.

2. *Haplochromis pappenheimi*, Bouleng., 1914.

*Tilapia pappenheimi* (part.), Bouleng. Cat. Afr. Fish. iii. p. 232, fig. 153.

Depth of body  $3\frac{1}{4}$  to  $3\frac{1}{2}$  in the length, length of head  $3\frac{1}{5}$  to  $3\frac{1}{3}$ . Snout as long as diameter of eye, which is  $3\frac{1}{2}$  in length of head,  $1\frac{1}{2}$  depth of præorbital, greater than depth of cheek, equal to interorbital width. Jaws equal or lower slightly projecting; maxillary not extending to below eye; teeth cuspidate, in 2 or 3 series, 46 in outer series of upper jaw. 3 or 4 series of scales on cheek. 9 to 11 gill-rakers on lower part of anterior arch. Pharyngeal teeth small. 33 scales in a longitudinal series, 6 or 7 from origin of dorsal to



lateral line, 5 or 6 between pectoral and pelvic fins. Dorsal XV-XVI 9-10; last spine  $\frac{2}{3}$  length of head. Anal III 8-9; third spine  $\frac{1}{3}$  to  $\frac{2}{5}$  head. Pectoral nearly as long as head, reaching vent or anal fin. Caudal truncate. Caudal peduncle  $1\frac{1}{2}$  to  $1\frac{3}{4}$  as long as deep. Silvery; dorsal greyish; caudal spotted.

Lake Albert Edward.

Four specimens, 80 to 90 mm. long.

### 3. *Haplochromis eduardii*, sp. n.

*Tilapia pappenheimi* (part.), Bouleng. Cat. Afr. Fish. iii. p. 232.

Depth of body 3 in the length, length of head 3. Snout shorter than diameter of eye, which is  $3\frac{1}{5}$  in length of head, twice depth of præorbital, greater than depth of cheek; interorbital width 4 in head. Jaws equal; maxillary extending to below anterior edge of eye; teeth cuspidate, in 3 series, 45 in outer series of upper jaw. 3 series of scales on cheek. 11 or 12 gill-rakers on lower part of anterior arch. Pharyngeal teeth small. 33 scales in a longitudinal series, 7 from origin of dorsal to lateral line, 8 between pectoral and pelvic fins. Dorsal XV 9; last spine nearly  $\frac{1}{2}$  length of head. Anal III 9; third spine  $\frac{2}{5}$  head. Pectoral nearly as long as head, reaching anal. Caudal truncate. Caudal peduncle  $1\frac{1}{2}$  as long as deep. Greyish, with bars across upper part of head and one below eye; two blackish blotches on basal part of spinous dorsal; pelvics blackish; ocelli on anal fin.

Lake Albert Edward.

A single specimen ( $\sigma$ ), 80 mm. long.

### 4. *Haplochromis nigripinnis*, sp. n.

*Tilapia pappenheimi* (part.), Bouleng. Cat. Afr. Fish. iii. p. 232.

Depth of body  $3\frac{1}{3}$  in the length, length of head 3. Snout shorter than diameter of eye, which is  $2\frac{3}{4}$  in the length of head,  $2\frac{1}{2}$  depth of præorbital, greater than depth of cheek; interorbital width  $4\frac{1}{2}$  in length of head. Jaws equal; maxillary extending to below anterior  $\frac{1}{4}$  of eye; teeth cuspidate, in 2 series, 60 in outer series of upper jaw. 3 series of scales on cheek. 11 gill-rakers on lower part of anterior arch. Pharyngeal teeth small. 33 scales in a longitudinal series, 4 or 5 from origin of dorsal to lateral line, and the same number between pectoral and pelvic fins. Dorsal XVI 9; last spine nearly  $\frac{1}{2}$  length of head. Anal III 9; third spine as long as last dorsal. Pectoral a little shorter than head, reaching vent. Caudal truncate. Caudal peduncle  $1\frac{1}{2}$  as



long as deep. Greyish; vertical and pelvic fins blackish, the dorsal pale at the base.

Lake Albert Edward.

A single specimen (♂), 80 mm. long.

5. *Haplochromis squamipinnis*, sp. n.

*Pelmatochromis spekii* (part.), Boulenger, Cat. Afr. Fish. iii. p. 417 (1915).

Depth of body nearly equal to length of head,  $2\frac{4}{5}$  in length of fish. Head  $2\frac{1}{4}$  as long as broad; upper profile slightly concave. Snout  $1\frac{1}{2}$  diameter of eye, which is  $4\frac{1}{3}$  in length of head, greater than præorbital depth, less than depth of cheek; interorbital width  $4\frac{2}{3}$  in length of head. Maxillary extending to vertical from anterior margin of eye; lower jaw projecting; teeth conical, 4 series in upper jaw, 3 in lower, 60 in outer series of upper jaw. 5 series of scales on cheek; 10 gill-rakers on lower part of anterior arch; pharyngeal teeth slender. Dorsal XV 10; last spine longest,  $\frac{1}{3}$  length of head; longest soft rays  $\frac{1}{2}$  length of head. Anal III 9; third spine stronger and nearly as long as last dorsal. Series of small scales on basal part of posterior half of dorsal and anal, between the rays. Pectoral  $\frac{4}{5}$  length of head, reaching origin of anal. Caudal truncate. Caudal peduncle  $1\frac{1}{3}$  as long as deep. 33 scales in a longitudinal series, 7 from origin of dorsal to lateral line. Silvery; back darker; vertical fins dusky; caudal with some clear spots; anal with 2 ocelli posteriorly.

Lake Albert Edward.

One specimen, 170 mm. in total length.

6. *Haplochromis graueri*, Bouleng., 1914.

*Tilapia burtoni* (part.), Bouleng. Cat. Afr. Fish. iii. p. 217.

*Haplochromis angustifrons*, var. *gracilior*, Bouleng. t. c. p. 293.

*Haplochromis graueri*, Bouleng. t. c. p. 298, fig. 202.

Depth of body  $2\frac{3}{4}$  to  $3\frac{1}{3}$  in length, length of head  $2\frac{2}{3}$  to 3. Snout from a little shorter to longer than diameter of eye, which is 3 to 4 in length of head, greater than depth of præorbital or cheek; interorbital width 4 to  $4\frac{1}{2}$  in length of head. Jaws equal or lower slightly projecting; maxillary extending to below anterior edge of eye or not quite so far; teeth cuspidate or conical, in 3 to 5 series, 40 to 60 in outer series of upper jaw. 3 or 4 series of scales on cheek. 7 to 9 gill-rakers on lower part of anterior arch. Pharyngeal teeth small. 32 to 33 scales in a longitudinal series, 5 or 6 from origin of dorsal to lateral line. Dorsal XIV-XVI 9-10;



last spine  $\frac{1}{3}$  to  $\frac{1}{2}$  length of head. Anal III 8; third spine  $\frac{1}{3}$  to  $\frac{1}{2}$  head. Pectoral nearly as long as head, reaching vent, origin of anal, or a little beyond. Caudal truncate. Caudal peduncle  $1\frac{1}{3}$  to  $1\frac{2}{3}$  as long as deep. Silvery or brownish; an opercular spot; soft dorsal and caudal sometimes spotted; males with a bar below eye, blackish pelvic fins, and ocelli on anal.

Lake Kivu.

Twelve specimens, 75 to 120 mm. long.

The caudal fin is broken into a rounded shape in the largest specimen.

7. *Haplochromis adolphi-frederici*, Bouleng., 1914.

*Tilapia adolphi-frederici*, Bouleng. Cat. Afr. Fish. iii. p. 220, fig. 143.

Apparently differs from *H. graueri* in the longer pectoral fin. The coloration is of the "bicolor" type, irregular black bars extending on to the vertical fins; but I have found in the Lake Victoria Cichlidæ that this occurs in individuals of several species.

8. *Haplochromis astatodon*, sp. n.

*Tilapia burtoni* (part.), Bouleng. Cat. Afr. Fish. iii. p. 217.

Depth of body  $2\frac{1}{2}$  to 3 in the length, length of head 3 to  $3\frac{1}{4}$ . Snout nearly as long as or a little longer than diameter of eye, which is  $3\frac{1}{3}$  to  $3\frac{3}{4}$  in length of head, greater than præ-orbital depth, nearly equal to depth of cheek; interorbital width  $3\frac{1}{4}$  to  $3\frac{3}{4}$  in length of head. Jaws equal anteriorly or lower slightly projecting; maxillary extending to below anterior edge or anterior  $\frac{1}{4}$  of eye; teeth cuspidate, in 4 to 8 series, 40 to 70 in outer series of upper jaw, the bicuspid teeth very variable in form, the cusps nearly equal in some specimens, in others the posterior cusp reduced and the anterior cusp long, oblique, and curved inwards, the teeth approaching the *Bayonia*, *Hemitilapia*, or *Schubotzia* types. 3 or 4 series of scales on cheek. 9 to 11 gill-rakers on lower part of anterior arch. Pharyngeal teeth small. 30 to 32 scales in a longitudinal series, 5 or 6 from origin of dorsal to lateral line. Dorsal XIV-XVI 8-9; last spine from less than  $\frac{2}{3}$  to  $\frac{1}{2}$  length of head. Anal III 8-9; third spine as long as or a little shorter than last dorsal. Pectoral a little shorter than head, not reaching anal. Caudal truncate. Caudal peduncle as long as or a little longer than deep. Body with or without cross-bars; an opercular spot and a bar below eye.

Lake Kivu.

Fifteen specimens, 75 to 115 mm. long.



9. *Haplochromis paucidens*, sp. n.

*Tilapia burtoni* (part.), Bouleng. Cat. Afr. Fish. iii. p. 217.

Depth of body  $2\frac{2}{3}$  to  $2\frac{4}{5}$  in the length, length of head  $3\frac{1}{3}$ . Snout slightly longer than diameter of eye, which is  $3\frac{2}{3}$  in length of head, greater than præorbital depth, equal to depth of cheek; interorbital width  $3\frac{1}{2}$  to  $3\frac{2}{3}$  in length of head. Jaws equal anteriorly; maxillary extending to below anterior edge of eye; teeth in 3 or 4 series, 36 in outer series of upper jaw, the anterior conical and rather strong. 3 or 4 series of scales on cheek. 9 gill-rakers on lower part of anterior arch. Middle pharyngeal teeth slightly enlarged, subconical. 32 or 33 scales in a longitudinal series, 7 from origin of dorsal to lateral line. Dorsal XV 10; last spine nearly  $\frac{1}{2}$  length of head. Anal III 9; third spine  $\frac{2}{5}$  head. Pectoral  $\frac{4}{5}$  length of head, not reaching anal. Caudal truncate. Caudal peduncle  $1\frac{1}{2}$  as long as deep. Dark cross-bars on body; 2 bars across snout and 1 below eye; an opercular spot; soft dorsal and caudal spotted.

Lake Kivu.

Two specimens, 120 and 125 mm. long.

10. *Haplochromis vittatus*, Bouleng., 1901.

*Paratilapia vittata*, Bouleng. Cat. Afr. Fish. iii. p. 330, fig. 221.

Depth of body 3 to  $3\frac{1}{2}$  in length, length of head  $2\frac{3}{5}$  to  $2\frac{4}{5}$ . Snout  $1\frac{1}{3}$  to  $1\frac{2}{3}$  diameter of eye, which is 4 to  $4\frac{1}{2}$  in length of head, greater than præorbital depth, about equal to depth of cheek; interorbital width 5 in length of head. Lower jaw projecting; maxillary extending to below anterior edge of eye; teeth conical, in 3 or 4 series, 40 to 60 in outer series of upper jaw. 3 to 5 series of scales on cheek. 8 to 11 gill-rakers on lower part of anterior arch. Pharyngeal teeth slender. 33 scales in a longitudinal series, 6 from origin of dorsal to lateral line. Dorsal XV-XVI 8-10; last spine  $\frac{1}{3}$  to  $\frac{2}{5}$  length of head. Anal III 8-9; third spine as long as or a little shorter than last dorsal. Pectoral  $\frac{2}{3}$  length of head, reaching vent or origin of anal. Caudal truncate. Caudal peduncle  $1\frac{1}{3}$  to  $1\frac{1}{2}$  as long as deep. A dark lateral stripe and another above upper lateral line.

Lake Kivu.

Four specimens, 80 to 125 mm. long.



3. SCHUBOTZIA, Bouleng., 1914.

Scales ctenoid. A close-set series of enlarged teeth, with strongly incurved, flattened, rounded crowns, followed by 2 series of minute tricuspid teeth.

Lake Albert Edward.

*Schubotzia eduardiana*, Bouleng., 1914.

*Schubotzia eduardiana*, Bouleng. Cat. Afr. Fish. iii. p. 500, fig. 347.

Near *Haplochromis schubotzi*, differing especially in the dentition.

Total length 95 mm.

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LXIX.—On a new Genus of Coccidæ from the Indian Region.

By E. E. GREEN, F.Z.S., F.E.S.

CRIBROLECANIUM, gen. nov. (subfamily *Lecaniinæ*).

Adult female with rudimentary limbs and antennæ. Spiracles communicating with the surface by means of a broad enclosed channel, the sides of which are studded with short glandular ducts. Dorsum with numerous, densely chitinous, perforated plates, arranged in more or less symmetrical series. Anal operculum surrounded by a densely chitinous area. Anal ring with ten or more setæ.

Nymph similar to adult, but with the limbs and antennæ still more rudimentary. Anal operculum not surrounded by a densely chitinous area.

Larva with fully developed limbs and antennæ. Dorsum with series of clustered pores in place of the cribriform plates.

Male not observed in any stage.

Type, *formicarum*.

*Cribrolecanium formicarum*, sp. n. (Figs. 1 & 2.)

Fully matured adult female dark castaneous; subcircular, strongly convex, almost hemispherical; densely chitinous. At this stage of development the structural characters are obscured by the heavy chitinization, but the dorsum is seen to be studded with small translucent pores, interspersed with definite denser areas upon which the pores are more closely crowded. Other characters can be observed more clearly by





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