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XXXII.—*The Classification of the Fishes of the Family Cichlidæ.*—II. *On African and Syrian Genera not restricted to the Great Lakes.* By C. TATE REGAN, M.A., F.R.S.

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SINCE my paper on the Tanganyika Cichlidæ (Ann. & Mag. Nat. Hist. (9) v. 1920, p. 33), I have published revisions of those of Lakes Edward and Kivu (Ann. & Mag. Nat. Hist. (9) viii. 1921, p. 632), of Nyassa (P. Z. S. 1921, p. 675), of L. Victoria (P. Z. S. 1922, p. 157), and of Madagascar (Ann. & Mag. Nat. Hist. (9) v. 1920, p. 422). There remain the Syrian and African Cichlids outside the Great Lakes, and it is the object of the present paper to give some account of these.

Synopsis of the Genera.

I. Articular surface for upper pharyngeals formed by parasphenoid, or parasphenoid and prootics; scales cycloid or feebly denticulate.

A. Pharyngeal apophysis, when distinct, longitudinally compressed, with transverse articular surface.

1. Teeth usually not conical.

Outer teeth bicuspid, inner tricuspid (some or all sometimes conical in adults of certain species); lower pharyngeal subtriangular ..

1. *Tilapia.*

Teeth setiform, with expanded tips, forming very broad bands; lower pharyngeal spoon-shaped.

2. *Chilochromis.*

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2. Teeth conical or cuspidate, in 3 to 5 series; frontal region humped; maxillary exposed 3. *Cyphotilapia*.
3. Teeth conical.
 - a. Occipital crest not extending forward to anterior end of interorbital region.
 - a. Upper lateral line well separated from dorsal fin.
Fourth vertebra with inferior apophyses; lower jaw strongly projecting 4. *Parachromis*.
 - Third vertebra with inferior apophyses; lower jaw not or scarcely projecting 5. *Pelmatochromis*.
 - β. Upper lateral line contiguous to dorsal fin.
 6. *Nannochromis*.
 - b. Occipital crest extending forward in advance of interorbital region; teeth small, forming broad bands.
 7. *Heterochromis*.
 - B. Pharyngeal apophysis strong, ending in a flat triangular or ovate articular surface; teeth conical; lower lateral line long.
 8. *Tylochromis*.
- II. Articular surface for upper pharyngeals formed by parasphenoid in the middle and basioccipital at sides.
 - A. Three anal spines.
 1. Teeth conical or compressed, with or without cusps, not incisor-like.
 - a. Third vertebra with inferior apophyses.
Teeth conical, mainly uniserial; middle pairs more or less enlarged; maxillary narrow, curved 9. *Hemichromis*.
 - Teeth in 2 or more series, conical or compressed, unicuspid, or outer bicuspid and inner tricuspid 10. *Haplochromis*.
 - b. Fourth vertebra with inferior apophyses.
Apophyses of fourth vertebra united below; pharyngeal teeth stout, blunt 11. *Sargochromis*.
 - Apophyses of fourth vertebra small, paired; pharyngeal teeth slender 12. *Serranochromis*.
 2. Teeth incisor-like, rather broad, entire or slightly notched.
 13. *Steatocranus*.
 - B. Four or more anal spines; strong anterior canines.
 14. *Lamprologus*.

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

Regan, Ann. & Mag. Nat. Hist. (9) v. 1920, p. 37.

This genus includes about 50 species from Africa and Syria; it corresponds to Boulenger's section I. (scales cycloid or feebly denticulate), with the following exceptions:—

1. *T. auromarginata* (*Otopharynx*).
2. *T. ovalis* (= *Haplochromis moffati*).

3. *T. steindachneri* (= *Sargochromis mellandi* + *Haplochromis acuticeps*).
4. *T. woosnami* (= *Haplochromis smithii*).
5. *T. jallæ*.
6. *T. humilis*.

I have not seen examples of the last two species, but probably they should be placed in *Haplochromis*.

Since the publication of Boulenger's Catalogue a number of species have been described from South Africa by Gilchrist and Thompson (Ann. S. Afric. Mus. xi.).

Of these *T. swierstræ*, *mackeani*, *sykesii*, *druryi*, and *kirkhami* appear to be nearly related to each other and to *T. melanopleura*; *T. intermedia* and *T. sheshekensis* may be synonyms of *T. andersonii*, and *T. arnoldi* may be a synonym of *T. natalensis*. *T. adolfi*, Steind. (Denkschr. Akad. Wien, cxii. 1916, p. 82, pl. v.), from E. Africa, does not seem to be distinct from *T. nilotica*.

2. CHILOCHROMIS, Bouleng., 1902 (type *C. duponti*, Bouleng.).

Differs from *Tilapia* in the dentition, in the pharyngeals, which are formed as in *Cyathopharynx*, and in the pharyngeal apophysis, which appears to have the same structure as in *Otopharynx*.

A single species from Portuguese Congo.

3. CYPHOTILAPIA, Regan, 1920 (type *Paratilapia frontosa*, Bouleng.).

Regan, Ann. & Mag. Nat. Hist. (9) v. p. 43.

Two species: one from Tanganyika, the other from the Upper Congo.

4. PARACHROMIS, gen. nov. (type *Hemichromis sacer*, Günth.).

Articular surface for upper pharyngeals formed by parasphenoid only. Vertebrae 29; fourth with a pair of apophyses which unite below. Mouth terminal; lower jaw strongly projecting; teeth in jaws conical, in 2 to 4 series, outer largest; pharyngeal teeth conical, the middle ones rather strong and blunt. Scales cycloid (30-32). Dorsal XIV 10-11. Anal III 8-9.

A single species from the Lake of Galilee.

5. PELMATOCHROMIS, Steind., 1894
(type *P. buettikoferi*, Steind.).

Articular surface for upper pharyngeals formed by parasphenoid only. Vertebrae 25 to 27; third with apophyses which unite below. Mouth terminal; lower jaw not or but little projecting; teeth conical, in 2 or more series. Scales cycloid. Dorsal XIII-XVIII 7-12. Anal III 6-9.

Congo and West Africa.

In addition to species 4 to 21 of Boulenger's Catalogue, this genus includes:—

Paratilapia cerasogaster, Bouleng.

„ *dorsalis*, Pellegr.

„ *corbali*, Bouleng.

„ *thomasi*, Bouleng.

„ *longipinnis*, Nichols & Griscom (? = *P. nigrofasciatus*).

? *Hemichromis schwebischi*, Sauv.

I suspect that the last may be a *Pelmatochromis* related to *P. guentheri*.

6. NANNOCHROMIS, Pellegr., 1904.

Scarcely distinct from *Pelmatochromis*.

Three species from the Congo.

7. HETEROCHROMIS, gen. nov.
(type *Paratilapia multidentis*, Pellegr.).

Pharyngeal apophysis formed by parasphenoid. Occipital crest very strong, extending forward in advance of interorbital region. Jaws with broad bands of small conical teeth. Pharyngeal teeth conical, those in the middle strong and blunt. Scales more or less distinctly denticulate, large (29-30). Dorsal XIV 14-15. Anal III 8-9.

A single species from the Congo, which is well distinguished from all other African Cichlidæ by the dentition, the shape of the head, the scaly soft dorsal and anal fins, and the separation of the lateral lines by three rows of scales. *Paratilapia xenodon*, Nichols & Griscom, is a synonym.

8. TYLOCHROMIS, Regan, 1920
(type *Pelmatochromis jentinki*, Steind.).

One species from Tanganyika and seven from the Congo and West Africa (cf. Regan, Ann. & Mag. N.H. (9) v. 1920, p. 163).

9. HEMICHROMIS, Peters, 1857
(type *H. fasciatus*, Peters).

This genus, with 2 species from Africa, differs slightly from *Haplochromis* in the dentition and in the structure of the maxillary.

10. HAPLOCHROMIS, Hilgend., 1888
(type *H. obliquidens*, Hilgend.).

Regan, P. Z. S. 1922, p. 160.

Numerous species in Victoria and Nyassa; the species not peculiar to the Great Lakes all belong to the subgenus *Ctenochromis*, Pfeffer, with an outer series of bicuspid or conical teeth and one or more inner series of tricuspid or conical teeth. They may be arranged as follows:—

I. S. Africa (Zambesi and southwards).

A. Soft dorsal with 12–15 rays; pharyngeal teeth obtusely conical.

1. Depth of præorbital not greater than diameter of eye.

Scales on chest rather small; 6 scales between pectoral and pelvic fins 1. *giardi*.

Scales on chest larger; 3 or 4 between pectoral and pelvic fins 2. *gibbiceps*.

2. Depth of præorbital a little greater than diameter of eye.

3. *smithii*.

3. Depth of præorbital much greater than diameter of eye.

4. *frederici*.

B. Soft dorsal with 8 to 12 rays.

1. 6 or 7 series of scales on cheek.

Caudal truncate 5. *jallæ*.

Caudal rounded 6. *humilis*.

2. 3 to 5 series of scales on cheek.

a. Maxillary extending to between nostril and eye; caudal peduncle longer than deep 7. *acuticeps*.

b. Maxillary about reaching vertical from anterior edge of eye.

a. 32 scales in a longitudinal series; caudal peduncle longer than deep.

Pharyngeal teeth of 2 median series strong, sub-conical; rest small, compressed, hooked 8. *multiocellatus*.

Lower pharyngeal with a group of stout, blunt teeth 9. *darlingi*.

β . 26 to 30 scales in a longitudinal series; caudal peduncle not longer than deep.

Scales on chest rather small; 5 or 6 scales between pectoral and pelvic fins 10. *swynnertoni*.

Scales on chest larger; 3 or 4 (rarely 5) scales between pectoral and pelvic fins 11. *moffati*.

II. Congo.

A. 4 or 5 scales from origin of dorsal to lateral line.

10-13 gill-rakers on lower part of anterior arch.

D. XIV-XVI 10-11. A. III 6-7 12. *fasciatus*.

7 or 8 gill-rakers on lower part of anterior arch.

D. XV-XVI 8-10. A. III 7 13. *stigmatogenys*.

7 gill-rakers on lower part of anterior arch. D. XII 9.

A. III 6 14. *oligacanthus*.

B. 6 or 7 scales from origin of dorsal to lateral line; 10-12 gill-rakers on lower part of anterior arch. D. XV-XVII 8-10. A. III 7-8. Cheek covered with scales.

15. *moeruensis*.

C. 8 or 9 scales from origin of dorsal to lateral line; 10 gill-rakers on lower part of anterior arch. D. (XVI) XVII-XIX 8-9. A. III 7-8. Lower part of cheek naked.

16. *polyacanthus*.

III. North and East Africa; Syria.

A. Caudal peduncle much longer than deep .. 17. *fuelleborni*.

B. Caudal peduncle about as long as deep.

1. Lower part of cheek naked 18. *pectoralis*.

2. Cheek covered with scales.

a. 3 or 4 scales between pectoral and pelvic fins; teeth in 3 or 4 series.

30 scales in a longitudinal series 19. *gigliolii*.

25 to 28 scales in a longitudinal series 20. *multicolor*.

b. 5 to 9 scales between pectoral and pelvic fins.

a. Pharyngeal teeth small and compressed, the middle ones sometimes larger and subconical.

Teeth in 2 series. D. XIII-XV 9-10. A. III

8-9. 29 or 30 scales in a longitudinal series .. 21. *bloyeti*.

Teeth in 3 or 4 series. D. XIV-XV 10. A. III

8-10. 30 scales in a longitudinal series 22. *wingatii*.

Teeth in 3 or 4 series. D. XIV-XVI 10-11. A.

III 9-11. 31 to 34 scales in a longitudinal series 23. *desfontainesii*.

β . Middle pharyngeal teeth stout and blunt.

Teeth in 2 or 3 series. D. XIV 9. A. III 8. 28

scales in a longitudinal series 24. *flavii-josephi*.

1. *Haplochromis giardi*, Pellegr., 1904.

Tilapia giardi, Bouleng. Cat. Afr. Fish. iii. p. 221, fig. 144.

Paratilapia carlottæ, Bouleng. t. c. p. 353, fig. 239.

Total length 255 mm.; three specimens examined.

Zambesi.

2. *Haplochromis gibbiceps*, Bouleng., 1911.

Paratilapia gibbiceps, Bouleng. Cat. Afr. Fish. iii. p. 354, fig. 240.

Total length 200 mm.; types examined.

L. Ngami Basin.

3. *Haplochromis smithii*, Casteln., 1861.

Tilapia woosnami, Bouleng. Cat. Afr. Fish. iii. p. 212, fig. 137.

Paratilapia smithii, Bouleng. t. c. p. 357, fig. 242.

Pelmatochromis robustus, Gilchr. & Thomp. Ann. S. Afric. Mus. xi. 1918, p. 538, fig. 154.

Total length 277 mm.; four specimens, including the type of *T. woosnami*.

L. Ngami Basin and Southern Rhodesia.

4. *Haplochromis frederici*, Casteln., 1861.

Paratilapia frederici, Bouleng. Cat. Afr. Fish. iii. p. 355, fig. 241.

Total length 210 mm.; two specimens examined.

L. Ngami Basin.

5. *Haplochromis jallæ*, Bouleng., 1896.

Tilapia jallæ, Bouleng. Cat. Afr. Fish. iii. p. 213.

Total length 75 mm.

Upper Zambesi.

6. *Haplochromis humilis*, Steind., 1866.

Tilapia humilis, Bouleng. Cat. Afr. Fish. iii. p. 213.

Total length 115 mm.

Angola.

7. *Haplochromis acuticeps*, Steind., 1866.

Tilapia steindachneri (part.), Bouleng. Cat. Afr. Fish. iii. p. 209.

Tilapia acuticeps (part.), Bouleng. t. c. p. 218, fig. 141.

Tilapia lucullæ, Bouleng. t. c. p. 224, fig. 146.

? *Tilapia ramsayi*, Gilchr. & Thomps. Ann. S. Afric. Mus. xi. 1918, p. 501, fig. 129.

Depth of body 3 to $3\frac{1}{2}$ in the length, length of head about 3. Snout with straight or slightly convex profile, once to $1\frac{1}{2}$ diameter of eye, which is $3\frac{1}{3}$ to $4\frac{1}{4}$ in length of head, equal to or greater than depth of præorbital or cheek; interorbital with $4\frac{1}{2}$ to 5 in length of head. Jaws equal

anteriorly; maxillary extending to between nostril and eye; an outer series of bicuspid teeth, followed by 1 or 2 series of smaller tricuspid teeth; 30 to 50 teeth in outer series of upper jaw. 3 to 5 series of scales on cheek. 8 to 10 gill-rakers on lower part of anterior arch. Pharyngeal teeth small, compressed, hooked. Scales cycloid or finely denticulate, 30 to 33 in a longitudinal series, 4 or 5 from origin of dorsal to lateral line, 6 to 8 between pectoral and pelvic fins. Dorsal XIV–XVI 9–12; last spine $\frac{1}{3}$ to $\frac{2}{5}$ length of head. Anal III 7–9; third spine stronger than and as long as last dorsal. Pectoral $\frac{3}{5}$ to $\frac{3}{4}$ head, not reaching anal. Caudal rounded. Caudal peduncle $1\frac{1}{4}$ to $1\frac{1}{2}$ as long as deep. Greyish; an opercular spot; soft dorsal and caudal with series of small spots.

Angola. Zambesi?

Seven specimens, 70 to 125 mm. in total length, from the Luculla and Que Rivers.

8. *Haplochromis multiocellatus*, Bouleng.

Pelmatochromis multiocellatus, Bouleng. Cat. Afr. Fish. iii. p. 409, fig. 279.

Very near *H. darlingi*, differing as follows:—Pharyngeal teeth small, compressed, hooked, only those of the 2 median series enlarged, stout, subconical. Pectoral $\frac{2}{3}$ length of head. Caudal peduncle only slightly longer than deep.

Luculla River, Angola.

The type measures 120 mm. in total length.

9. *Haplochromis darlingi*, Bouleng.

Pelmatochromis darlingi, Bouleng. Cat. Afr. Fish. iii. p. 410, fig. 280.
Paratilapia arnoldi, Gilchr. & Thomps. Ann. S. Afric. Mus. xi. 1918, p. 521.

Depth of body $2\frac{2}{3}$ to 3 in length, length of head about 3. Snout a little longer than diameter of eye, which is $3\frac{2}{3}$ in length of head, greater than præorbital depth, about equal to depth of cheek; interorbital width $4\frac{1}{2}$ to 5 in length of head. Jaws equal anteriorly; maxillary extending to vertical from anterior edge of eye; teeth conical, triserial, 50 to 60 in outer series of upper jaw. 4 series of scales on cheek. 7 to 10 gill-rakers on lower part of anterior arch. Middle pharyngeal teeth stout and obtuse. Scales cycloid or feebly denticulate, 32 in a longitudinal series, 4 from origin of dorsal to lateral line, 6 between pectoral and pelvic fins.

Dorsal XIV-XVI 11-12; last spine from less than $\frac{2}{3}$ to nearly $\frac{1}{2}$ length of head. Anal III 7-8; third spine stronger and as long as or a little shorter than last dorsal. Pectoral $\frac{3}{4}$ to $\frac{4}{5}$ head, reaching vent or origin of anal. Caudal subtruncate. Caudal peduncle $1\frac{1}{4}$ to $1\frac{1}{2}$ as long as deep. Dark cross-bars on body; vertical fins spotted.

N.E. Rhodesia.

The type and four specimens of 110 to 125 mm. received as *P. arnoldi*.

10. *Haplochromis swynnertoni*, Bouleng., 1907.

Tilapia swynnertoni, Bouleng. Cat. Afr. Fish. iii. p. 219, fig. 142.

Very near *H. moffati*, differing as follows:—Scales on chest smaller, 5 or 6 between pectoral and pelvic fins; 15 dorsal spines; pectoral $\frac{4}{5}$ length of head; caudal subtruncate instead of fully rounded; males with 2 to 4 ocelli on anal fin. This species is still closer to *H. callipterus*, Günth., of L. Nyassa and to *H. burtoni*, Günth., of Tanganyika. It differs from *H. bloyeti*, Sauv., of Tanganyika Territory, principally in having 4 series of teeth.

Buzi R., Portuguese E. Africa.

The types measure 85 to 95 mm. in length.

11. *Haplochromis moffati*, Casteln., 1861.

Tilapia ovalis (Steind., 1866), Bouleng. Cat. Afr. Fish. iii. p. 208, fig. 133.

Haplochromis moffati, Bouleng. t. c. p. 300, fig. 204.

Paratilapia luebberti (Hilgend., 1902), Bouleng. t. c. p. 350.

Depth of body $2\frac{1}{3}$ to 3 in length, length of head $2\frac{2}{3}$ to nearly 3. Snout as long as or longer than diameter of eye, which is $3\frac{1}{2}$ to 5 in length of head, equal to or greater than præorbital depth, in adult less than depth of cheek; interorbital width 4 to 5 in length of head. Jaws equal or lower projecting; maxillary about reaching vertical from anterior edge of eye; teeth conical or cuspidate, in 3 to 5 series, 36 to 60 in outer series of upper jaw. 3 to 5 series of scales on cheek. 7 to 10 gill-rakers on lower part of anterior arch. Pharyngeal teeth small. Scales cycloid or denticulate, 26 to 30 in a longitudinal series, 3 to 5 from origin of dorsal to lateral line, 3 or 4 (rarely 5) between pectoral and pelvic fins. Dorsal XIII-XV 9-11; last spine $\frac{1}{3}$ to $\frac{1}{2}$ length of head. Anal III 8-10. Pectoral shorter

than head, not reaching anal. Caudal rounded. Caudal peduncle as long as deep. Body with or without dark cross-bars; sometimes a lateral band; an opercular spot; a bar across præorbital; vertical fins usually spotted; dorsal dark-edged.

South Africa to Katanga and Rhodesia.

Numerous examples up to 120 mm. in total length.

12. *Haplochromis fasciatus*, Perugia, 1902.

Tilapia fasciata, Bouleng. Cat. Afr. Fish. iii. p. 215, fig. 139.

? *Paratilapia toddi*, Bouleng. t. c. p. 327.

Total length 105 mm. The type of *P. toddi* measures 150 mm.

Lower Congo: Kasai R.?

13. *Haplochromis stigmatogenys*, Bouleng., 1913.

Tilapia stigmatogenys, Bouleng. Cat. Afr. Fish. iii. p. 226, fig. 148.

Total length 105 mm.

Upper Congo.

14. *Haplochromis oligacanthus*, sp. n.

Depth of body 3 in length, length of head $2\frac{2}{3}$. Snout shorter than diameter of eye, which is 3 in length of head, twice præorbital depth, and $1\frac{1}{2}$ interorbital width. Jaws equal anteriorly; maxillary extending to below anterior edge of eye; teeth cuspidate, in 3 or 4 series; 46 in outer series of upper jaw. 5 series of scales on cheek. 7 gill-rakers on lower part of anterior arch. 28 scales in a longitudinal series, 4 from origin of dorsal to lateral line, 8 between pectoral and pelvic fins. Dorsal XII 9; last spine $\frac{1}{3}$ length of head. Anal III 6. Pectoral $\frac{2}{3}$ head. Caudal rounded, subtruncate. Caudal peduncle deeper than long. Dark cross-bars and an interrupted lateral band; an opercular spot; a blackish vertical bar below anterior part of eye, broadening on lower jaw; series of small spots on soft dorsal.

Banghi, Ubanghi R.

A single specimen, 47 mm. long, presented by Mons. A. Baudon; it differs from young *H. stigmatogenys* in the larger eye and fewer dorsal spines.

15. *Haplochromis moeruensis*, Bouleng., 1899.

Haplochromis moeruensis, Bouleng. Cat. Afr. Fish. iii. p. 307, fig. 207.

Total length 95 mm.

L. Mweru.

In the eight examples in the British Museum (Natural History), including the figured type, I count 10 to 12 gill-rakers on the lower part of the anterior arch. Boulenger gives the number as 7 to 10, and it seems probable that his original material included examples of *H. stigmatogenys*.

16. *Haplochromis polyacanthus*, Bouleng., 1899.

Tilapia stormsii, Bouleng. Cat. Afr. Fish. iii. p. 227, fig. 149.

Tilapia polyacanthus, Bouleng. t. c. p. 247, fig. 165.

Total length 115 mm.

Upper Congo and L. Mweru.

In this well-marked species the nuchal and pectoral scales are very small, the lower part of the cheek is naked, and the teeth are in several series. Of the six examples I have examined three have 17 dorsal spines, two 18, and one 19.

17. *Haplochromis fuellebornii*, Hilgend. & Pappenh., 1903.

Tilapia fuelleborni, Bouleng. Cat. Afr. Fish. iii. p. 222.

Apparently distinguished from other East African species by having the caudal peduncle much longer than deep.

Total length 43 mm.

Lake Rukwa.

18. *Haplochromis pectoralis*, Pfeff., 1893.

Tilapia pectoralis, Bouleng. Cat. Afr. Fish. iii. p. 237, fig. 156.

Depth of body nearly 3 in length, length of head $2\frac{2}{3}$. Snout as long as diameter of eye, which is 3 in length of head, twice depth of præorbital, greater than depth of cheek; interorbital width $4\frac{1}{2}$ in head. Jaws equal anteriorly; maxillary extending to vertical from anterior edge of eye; teeth cuspidate, in 4 series in upper jaw, 3 in lower, 40 in outer series of upper jaw. 3 series of scales on upper part of cheek, which is naked below. 8 or 9 gill-rakers on lower part of anterior arch. Pharyngeal teeth small. 30 scales in a longitudinal series, 6 from origin of dorsal to lateral line, 6 between pectoral and pelvic fins. Dorsal (XV) XVI 8 (9); last spine nearly $\frac{2}{3}$ length of head. Anal III 8. Pectoral $\frac{2}{3}$ length of head, reaching vent. Caudal subtruncate. Caudal peduncle as long as deep. About ten wavy dark cross-bars.

Tanganyika Territory.

One of the types, 63 mm. long.

19. *Haplochromis gigliolii*, Pfeff., 1896.*Hemichromis gigliolii*, Pfeffer, Thierw. O.-Afr. Fische, p. 24.*Paratilapia volmeringei*, Steind. Denksch. Akad. Wien, xcii. 1916, p. 80, pl. ii. fig. 3.

Depth of body 3 in length, length of head 3. Snout a little longer than diameter of eye, which is $4\frac{1}{2}$ in length of head, equal to depth of cheek, a little less than interorbital width. Jaws equal; maxillary extending to below anterior edge of eye; teeth conical or cuspidate, in 3 (or 4) series, 40 (to 54) in outer series of upper jaw. 4 series of scales on cheek. 10 gill-rakers on lower part of anterior arch. Pharyngeal teeth small. 30 scales in a longitudinal series, 4 from origin of dorsal to lateral line, 3 between pectoral and pelvic fins. Dorsal XV (XVI 9) 10; last spine $\frac{2}{5}$ head. Anal III (8) 9. Pectoral $\frac{3}{4}$ head, not reaching anal. Caudal rounded. Caudal peduncle as long as deep. A dark lateral band on posterior part of body.

Tanganyika Territory.

A specimen of 73 mm. from Dar-es-Salaam. The type measures 84 mm., and that of *P. volmeringei* 103 mm.

Perhaps not distinct from *H. moffati*, but as this E. African form appears to have received two names it is maintained until further material is available for comparison.

20. *Haplochromis multicolor*, Hilgend., 1903.*Paratilapia multicolor*, Hilgend. Sitzungsab. Ges. naturf. Fr. Berlin, 1903, p. 429.*Haplochromis strigigena* (part.), Bouleng. Cat. Afr. Fish. iii. p. 299, fig. 203.

Distinguished from *H. moffati* by the broader interorbital region, $3\frac{1}{2}$ in length of head, and from *H. wingatii* by the larger scales, 25 to 28 in a longitudinal series, 3 or 4 from origin of dorsal to lateral line, and the same number between pectoral and pelvic fins. Dorsal XIII-XV 8-10. Anal III 6-8. A continuous or interrupted lateral band.

Nile.

Numerous examples up to 70 mm. in total length, from Alexandria to Uganda.

21. *Haplochromis bloyeti*, Sauvage, 1883.*Hemichromis bloyeti*, Sauv. Bull. Soc. Philom. (7) vii. p. 159.*Ctenochromis strigigena*, Pfeff. Jahrb. Hamb. Wiss. Anst. x. 1893, p. 155, pl. ii. figs. 5-8.*Tilapia sparsidens*, Hilgend. Zool. Jahrb. Syst. xxii. 1903, p. 408.*Paratilapia kilossana*, Steind. Denkschr. Akad. Wien, xcii. 1916, p. 78, pl. ii. fig. 2.

Depth of body $2\frac{2}{3}$ to 3 in the length, length of head $2\frac{2}{3}$ to $2\frac{7}{8}$. Snout as long as or a little longer than diameter of eye, which is $3\frac{1}{2}$ to 4 in length of head, $1\frac{1}{2}$ præorbital depth, from a little less to a little greater than depth of cheek; interorbital width $3\frac{3}{4}$ to 4 in length of head. Jaws equal anteriorly; maxillary extending to below anterior edge of eye; teeth cuspidate or conical, in 2 series, 26 to 44 in outer series of upper jaw. 3 to 5 series of scales on cheek. 7 to 9 gill-rakers on lower part of anterior arch. Pharyngeal teeth small, the 2 middle series somewhat larger, subconical in adult. 29 or 30 scales in a longitudinal series, 4 to 6 from origin of dorsal to lateral line, 5 or 6 between pectoral and pelvic fins. Dorsal XIII-XV 9-10; last spine $\frac{1}{3}$ to more than $\frac{2}{5}$ length of head. Anal III 8-9; third spine $\frac{1}{3}$ to $\frac{2}{5}$ head. Pectoral shorter than head, not reaching anal. Caudal rounded or subtruncate. Caudal peduncle as long as deep. A dark bar below eye, more distinct in males; an opercular spot; series of spots on dorsal and caudal; males with ocelli on anal.

East Africa (Tanganyika Territory).

Nine specimens, 55 to 95 mm. long, including co-types of the species, of *C. strigigena* and of *P. sparsidens*.

22. *Haplochromis wingatii*, Bouleng., 1902.

Paratilapia wingatii, Bouleng. Ann. & Mag. Nat. Hist. (7) x. p. 264.

Depth of body $2\frac{2}{3}$ to 3 in the length, length of head $2\frac{2}{3}$ to 3. Snout as long as or a little longer than diameter of eye, which is $3\frac{1}{2}$ to 4 in length of head, $1\frac{1}{2}$ præorbital depth, equal to or a little greater than depth of cheek; interorbital width 4 in length of head. Jaws equal anteriorly; maxillary extending to vertical from anterior edge of eye; teeth in 4 series in upper jaw, 3 in lower, outer conical or bicuspid, 32 to 46 in outer series of upper jaw. 3 or 4 series of scales on cheek. 8 or 9 gill-rakers on lower part of anterior arch. Pharyngeal teeth small. 30 scales in a longitudinal series, 4 to 6 from origin of dorsal to lateral line, 6 or 7 between pectoral and pelvic fins. Dorsal XIV-XV 10; last spine about $\frac{2}{5}$ length of head. Anal III 8-10; third spine as long as last dorsal. Pectoral $\frac{3}{5}$ to $\frac{4}{5}$ head, not reaching anal. Caudal rounded. Caudal peduncle as long as deep. Greyish or brownish, with or without dark cross-bars and an interrupted lateral band; an opercular spot; 2 bars across snout and one below eye; pelvics blackish; one to three ocelli on anal fin.

Bahr-el-Gebel to Lake Edward.

The type, 70 mm. long, two specimens of 55 and 60 mm. from L. Albert, and one of 90 mm. from the Hima R., Mt. Ruwenzori.

23. *Haplochromis desfontainesii*, Lacep., 1802.

Haplochromis desfontainesii (part.), Bouleng. Cat. Afr. Fish. iii. p. 303, fig. 205.

Depth of body $2\frac{1}{3}$ to nearly 3 in length, length of head $2\frac{2}{3}$ to 3. Snout as long as or longer than diameter of eye, which is 4 to 5 in length of head, equal to or a little greater than præorbital depth, less than depth of cheek; interorbital width $3\frac{1}{2}$ to 4 in head. Jaws equal anteriorly; maxillary extending to below anterior edge of eye; teeth in 2 to 4 series, cuspidate or conical, 36 to 60 in outer series of upper jaw. 3 to 5 series of scales on cheek. 8 to 10 gill-rakers on lower part of anterior arch. Middle pharyngeal teeth slightly enlarged, conical in adult. 31 to 34 scales in a longitudinal series, 6 from origin of dorsal to lateral line. Pectoral scales very small; about 8 scales between pectoral and pelvic fins. Dorsal XIV–XVI 10–11; last spine $\frac{1}{3}$ to more than $\frac{2}{3}$ length of head. Anal III 9–11; third spine $\frac{2}{7}$ to $\frac{1}{3}$ head. Pectoral $\frac{2}{3}$ to $\frac{3}{4}$ length of head, not reaching anal. Caudal rounded. Caudal peduncle as long as deep or a little deeper than long. An opercular spot; a bar below eye; soft dorsal and caudal spotted.

Algeria and Tunis.

Seven examples from Tunis and Biskra, 60 to 140 mm. long.

24. *Haplochromis flavii-josephi*, Lortet, 1883.

Chromis flavii-josephi, Lortet, Arch. Mus. Lyon, iii. p. 141, pl. viii. fig. 2.

Depth of body $2\frac{3}{4}$ to 3 in the length, length of head $2\frac{3}{4}$. Snout a little longer than diameter of eye, which is 4 to $4\frac{1}{2}$ in length of head, $1\frac{1}{3}$ to $1\frac{1}{2}$ præorbital depth, equal to or a little less than depth of cheek; interorbital width $4\frac{1}{2}$ in length of head. Jaws equal anteriorly; maxillary extending to below anterior edge or anterior $\frac{1}{4}$ of eye; teeth in 2 or 3 series, cuspidate or conical, 34 to 46 in outer series of upper jaw. 4 series of scales on cheek. 7 or 8 gill-rakers on lower part of anterior arch. Lower pharyngeals strong, united by interlocking suture; middle teeth large and blunt. 28 scales in a longitudinal series, 6 from origin of dorsal to lateral line. Scales on chest small; 5 scales between pectoral and pelvic fins. Dorsal XIV 9; last spine $\frac{2}{5}$ length of head. Anal III 8; third spine $\frac{1}{3}$ head. Pectoral $\frac{2}{3}$ to $\frac{3}{4}$

length of head, reaching vent or origin of anal. Caudal rounded. Caudal peduncle as long as deep. Two bars across snout and one below eye; an opercular spot; traces of dark cross-bars on body; an interrupted lateral band; 2 or 3 ocelli on anal fin.

Syria.

Two specimens (♂s), types of the species, 60 and 85 mm. long.

Well distinguished from the preceding by the fewer scales and by the pharyngeal dentition.

11. *SARGOCHROMIS*, Regan, 1920 (type *Paratilapia codringtoni*, Bouleng.).

Fourth vertebra with a pair of apophyses that unite below. Teeth in jaws conical in the adult, sometimes cuspidate in the young. Pharyngeals massive, with stout, rounded teeth. Articular surface for upper pharyngeals broad, formed by prootics, parasphenoid, and basioccipital, its basioccipital portions nearly meeting behind parasphenoid. Scales cycloid. Dorsal XIV-XV 12-15. Anal III 8-10.

Synopsis of the Species.

I. 4 or 5 series of scales on cheek.

Depth of body 2 in length of fish 1. *codringtoni*.
Depth of body $2\frac{1}{3}$ to $2\frac{2}{3}$ in length 2. *mellandi*.

II. 6 or 7 series of scales on cheek 3. *angolensis*.

1. *Sargochromis codringtoni*, Bouleng., 1908.

Paratilapia codringtoni, Bouleng. Cat. Afr. Fish. iii. p. 352, fig. 238.

? *Paratilapia marginata*, Gilchr. & Thomps. Ann. S. Afr. Mus. xi. 1918, p. 531.

Zambesi.

2. *Sargochromis mellandi*, Bouleng., 1913.

Tilapia steindachneri (part.), Bouleng. t. c. p. 209, fig. 134.

Paratilapia mellandi, Bouleng. t. c. p. 358, fig. 243.

L. Bangwelu; Angola.

3. *Sargochromis angolensis*, Steind., 1865.

Pelmatochromis angolensis, Bouleng. t. c. p. 408, fig. 278.

Angola.

12. *SERRANOCHROMIS*, Regan, 1920 (type *Chromys thumbergi*, Casteln.).

Fourth vertebra with a pair of small apophyses. Teeth

conical. Pharyngeal apophysis formed by parasphenoid in middle and basioccipital at sides. Scales cycloid or feebly denticulate. Dorsal XIV-XVIII 13-16. Anal III 8-12.

Synopsis of the Species.

I. 5 or 6 series of scales on cheek; præmaxillary pedicels extending to between orbits 1. *macrocephalus*.

II. 7 to 10 series of scales on cheek.

Præmaxillary pedicels not reaching beyond anterior edge of orbits; head 2 to $2\frac{1}{4}$ as long as broad .. 2. *thumbergii*.

Præmaxillary pedicels extending to between orbits; head $2\frac{1}{2}$ to 3 as long as broad 3. *angusticeps*.

1. *Serranochromis macrocephalus*, Bouleng., 1899.

Paratilapia macrocephala, Bouleng. Cat. Afr. Fish. iii. p. 317, fig. 210.

Paratilapia longimanus, Bouleng. t. c. p. 319, fig. 212.

L. Mweru and R. Luapula; L. Ngami.

2. *Serranochromis thumbergii*, Casteln., 1861.

Paratilapia thumbergii, Bouleng. t. c. p. 328, fig. 220.

Paratilapia ellenbergeri, Gilchr. & Thomps. Ann. S. Afric. Mus. xi. 1918, p. 521, fig. 141.

Paratilapia zambesensis, Gilchr. & Thomps. t. c. p. 522, fig. 142.

Pelmatochromis ngamensis, Gilchr. & Thomps. t. c. p. 539, fig. 155.

Katanga and Angola to L. Nyassa.

3. *Serranochromis angusticeps*, Bouleng., 1907.

Paratilapia angusticeps, Bouleng. t. c. p. 321, figs. 213, 214.

L. Bangwelu; Angola; L. Ngami; Zambesi.

13. *STEATOCRANUS*, Bouleng., 1899

(type *Steatocranus gibbiceps*, Bouleng.).

A single species from the Congo, apparently related to *Haplochromis polyacanthus*, but distinguished by the incisor-like teeth.

14. *LAMPROLOGUS*, Schilthuis, 1891

(type *Lamprologus congolensis*, Schilth.).

This genus probably originated in Tanganyika, where the species are numerous and diversified. The three Congo species form a natural group with 5 to 7 anal spines, subacuminate caudal, second pelvic ray longest, etc. *L. obliquus*, Nichols & Griscom, 1917, is doubtfully distinct from *L. mocquardii*.



Regan, C. Tate. 1922. "The classification of the fishes of the family Cichlidae.--II. On African and Syrian genera not restricted to the great lakes." *The Annals and magazine of natural history; zoology, botany, and geology* 10, 249–264.

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