

either sex not exceeding 2 mm. Distance of cloacal aperture of male from tip of tail about 0.5 mm. Distance of vulva from tip of tail about 1.5–3 mm.

Hosts: *Balænoptera physalus*, *B. musculus*, and (?) other whales.

2. *Crassicauda boopis*, sp. n.

[= *C. crassicauda* (Crepl.) of Leiper and Atkinson, 1914 & 1915.]

Spicules absent. Thickness of either sex may reach 3 mm. or more. Distance of cloacal aperture of male from tip of tail about 1.5 mm. Distance of vulva from tip of tail about 5–7 mm.

Only certain host: *Megaptera nodosa*.

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LVI.—*Freshwater Fishes from Madagascar.*

By C. TATE REGAN, F.R.S.

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I. A COLLECTION MADE BY THE HON. P. A. METHUEN.

A COLLECTION of fishes made in Madagascar in 1911 by the Hon. P. A. Methuen has been sent to me for determination by the Director of the Transvaal Museum, Pretoria. The list is as follows:—

Anguillidæ.

Anguilla mossambica, Peters.

Lake Alaotra and Ambatoharanana, E. Madagascar.

Syngnathidæ.

Doryichthys millepunctatus, Kaup.

Folohy, E. Madagascar.

Centropomidæ.

Ambassis commersonii, Cuv. & Val.

Folohy and Ambilo, E. Madagascar.

Liognathidæ.

Gerres filamentosus, Cuv. & Val.

Ambilo (lagoons).

Gerres methueni, sp. n.

Depth of body $2\frac{1}{4}$ in the length, length of head 3 to $3\frac{1}{4}$. Snout as long as or a little shorter than diameter of eye, which is 3 to $3\frac{1}{2}$ in the length of head and nearly equal to the interorbital width. Maxillary extending to below anterior $\frac{1}{4}$ of eye; 3 or 4 series of scales on cheek; 7 or 8 gill-rakers on lower part of anterior arch. 44 scales in a longitudinal series, 5 between lateral line and scaly sheath at base of spinous dorsal, 12 or 13 below lateral line, 7 or 8 from base of pectoral to middle of chest. Dorsal X 9; third spine nearly as long as or a little longer than second, $\frac{1}{2}$ to $\frac{2}{3}$ length of head. Anal III 7; second spine a little longer than third, $\frac{2}{3}$ to $\frac{1}{2}$ length of head. Pectoral longer than head, nearly or quite reaching origin of anal. Caudal widely forked. Caudal peduncle as long as or a little longer than deep. Dark longitudinal stripes along the series of scales.

Three specimens, 100 to 140 mm. in total length, from Folohy and lagoons at Ambilo, E. Madagascar.

This species is distinguished from *Gerres lineolatus*, Günth., by the deeper form and the shorter second dorsal spine.

Liognathus dussumieri, Cuv. & Val.

Ambilo (lagoons) and Folohy.

Monodactylidæ.

Monodactylus argenteus, Linn.

Ambilo (lagoons).

Cichlidæ.

Paratilapia polleni, Bleek.

Lakes Alaotra and Rasoabé, E. Madagascar; Andranolaho, S.W. Madagascar.

In seventeen specimens I count X-XII 9-12 dorsal and III 8-11 anal rays, 28 to 30 scales in a longitudinal series and 8 or 9 gill-rakers on the lower part of the anterior arch.

Ptychochromis oligacanthus, Steind.

Ambilo (brackish lagoons); Folohy; Lake Rasoabé.

In nine specimens I count XIII-XIV 11-13 dorsal and III 7-8 anal rays.

Paretroplus polyactis, Bleek.

Ambilo (brackish lagoons); Folohy; Lake Rasoabé.

In nine specimens I count XVI-XVII 16-19 dorsal and VII-VIII 14-16 anal rays.

Carangidæ.

Caranx melampygus, Cuv. & Val.

Ambilo.

Mugilidæ.

Mugil robustus, Günth.

Folohy.

Atherinidæ.

Atherina alaotrensis, Pellegr.

Lake Alaotra, Lake Rasoabé, and Ambatoharanana, E. Madagascar.

Bedotia madagascariensis, Regan.

Lake Rasoabé.

Eleotridæ.

Eleotris fusca, Bloch.

Ambilo and Lake Rasoabé, E. Madagascar; Andranolaho, S.W. Madagascar.

Eleotris legendrei, Pellegr.

Ambilo, Lake Alaotra, Ambohidratrimo and Ambatoharanana, E. Madagascar.

Eleotris tohizonæ, Steind.

Lake Alaotra.

Gobiidæ.

Gobius æneofuscus, Peters.

Ambatoharanana, E. Madagascar; Maroamalona, S.W. Madagascar.

Gobius giuris, Ham. Buchan.

Ambilo, E. Madagascar; Andranolaho and Maroamalona, S.W. Madagascar.

II. THE MADAGASCAR CICHLIDÆ.

The Cichlid fishes of Madagascar belong to three endemic genera, which are defined below.

1. PARATILAPIA, Bleek., 1868 (type *P. polleni*, Bleek.).

Dorsal X-XIII 9-12. Anal III 8-11. Scales cycloid or feebly denticulate, large (28-30); two lateral lines. Mouth terminal; end of maxillary exposed; teeth in jaws conical, in 3 to 5 series, outermost enlarged. Lower pharyngeals united by a straight suture to form a triangular plate; anterior teeth conical, posterior somewhat compressed and indistinctly bicuspid, hooked. Occipital and parietal crests ending above middle of orbits; a broad median depression in anterior part of frontals. Posterior part of parasphenoid forming a strong apophysis, compressed antero-posteriorly, ending in a pair of transverse oval facets for articulation of the upper pharyngeals. Vertebrae 27 (13+14); third with paired inferior apophyses; præcaudals with parapophyses from the fourth; ribs subsessile.

Madagascar; a single species.

This genus is closely related to *Pelmatochromis*, Steind., from the Congo and West Africa; as now restricted, *Pelmatochromis* includes only species with few vertebrae (25 to 27), short lower lateral line, and cycloid scales (species 4 to 21 of Boulenger's synopsis, with the addition of 5 placed in *Paratilapia*, viz., *P. cerasogaster*, *P. dorsalis*, *P. luebberti*, *P. corbali* and *P. thomasi*). In *Pelmatochromis* the pharyngeal apophysis of the parasphenoid is not so strong as in *Paratilapia* and the inferior apophyses of the third vertebra unite to form a median spine, but other differences from *Paratilapia* are unimportant.

2. PTYCHOCHROMIS, Steind., 1880 (type *Tilapia oligacanthus*, Bleek.).

Dorsal XIII-XV 10-14. Anal III 7-12. Scales finely denticulate, large (32-36); two lateral lines. Mouth terminal; end of maxillary exposed; teeth in jaws compressed, bicuspid, in 3 to 5 series, outermost enlarged, inner small. Lower pharyngeals united by a sinuous suture to form a triangular plate, with large rounded blunt teeth in the middle posteriorly and slender bicuspid teeth elsewhere. Occipital and parietal crests extending forwards to above middle of orbits; former high, ending behind a median depression on frontals. Posterior part of parasphenoid forming a strong apophysis with flattish heart-shaped articular surface for upper pharyngeals. Vertebrae 28 (14+14); third with inferior apophyses which unite below to form a median spine; præcaudals with parapophyses from the fourth; ribs, except the first, on parapophyses.

Madagascar; two species.

Related to *Tylochromis*, Regan, differing especially in having the teeth bicuspid instead of conical. *Tylochromis* occurs in West Africa, the Congo, and Tanganyika.

3. PARETROPLUS, Bleek., 1868 (type *P. damii*, Bleek.).

Dorsal XVI-XX 11-18. Anal VII-X 9-14. A scaly sheath at base of dorsal and anal fins. Scales cycloid, large (32-37); two lateral lines. Mouth terminal; end of maxillary exposed; teeth in jaws uniserial, compressed and somewhat spatulate; one or two median pairs enlarged. Lower pharyngeals united by a sinuous suture to form a strong triangular plate; most of the teeth stout, rounded, with flat surfaces. Occipital crest strong, extending forward to anterior end of frontals; parietal crests weak, ending above middle of orbits. Pharyngeal apophysis strong, formed by

parasphenoid only; articular surface broadly ovate, almost heart-shaped. Vertebrae 34 (17 + 17); fourth with a pair of very small inferior apophyses; præcaudals with parapophyses from the fourth; ribs subsessile.

Madagascar; two species.

This genus is quite distinct from any of the African genera, but is closely related to the Indian *Etroplus*, which differs from *Paretroplus* in its more generalized dentition, the jaws with 2 or 3 series of tricuspid teeth, those of the outermost series enlarged, in the adult truncate, often without lateral cusps, and the lower pharyngeal with most of the teeth slender, uni- or bicuspid, only the two middle rows being formed of large blunt teeth.

The Madagascar Cichlidæ belong to three endemic genera, two of which appear to be related to West-African genera, whilst the third is closely related to, but more specialized than, the only Indian genus of the family. Except the Cichlidæ, none of the families of fishes characteristic of the fresh waters of Africa occurs in Madagascar, which is populated chiefly by freshwater genera or species of marine families (Kuhliidæ, Atherinidæ, Eleotridæ). The Ostariophysii, which are dominant in the freshwater fauna of all other parts of the world except the Australian Region, are absent from Madagascar, except for two species of the endemic genus *Ancharius*, which belongs to the Ariidæ, one of the two families of Siluroids that form an exception to the rule that the Ostariophysii are strictly freshwater fishes.

The presence of Cichlidæ in Madagascar is probably due to the fact that some fishes of this family are found in waters of fairly high salinity. Species of each of the three Madagascar genera have been found in brackish lagoons on the coast, whilst *Etroplus suratensis* of India and Ceylon is characteristically an estuarine fish, and, according to Day, "extends its range into brackish or even saline water." It is evident that Madagascar has not been connected during the Tertiary with either Africa or India to an extent that sufficed for the passage of true freshwater fishes, but it may have received its Cichlidæ from Africa at a time when it was only narrowly separated from or even temporarily connected with that continent, and perhaps from India when the islands of the Indian Ocean were more extensive and a brackish-water fish might pass from one to another; this time can hardly have been later than the beginning of the Miocene.



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