

scales. The mouth, also, is smaller and directed more upward than in others. The teeth are apparently larger than *A. monticola*.

"Color in alcohol uniform pale brownish.

"The dorsal fins were apparently black in life."

In their last sentence the authors themselves draw already the attention on the characters in which this species, of which they give a figure, differs from all other species of *Agonostoma*.

We doubt the correctness, that it is an *Agonostoma*, as in that genus, at least in the indo-pacific species, the upper lip is thick, the mandible covered with a thick, callous, trenchant lower lip, the mouth is nearly horizontal, the lower jaw is never projecting but more or less included. The ventrals are more abdominal than in the figure; the pectorals falciform, inserted much higher; the caudal emarginate. We even doubt that the described species belongs to the *Mugilidae* at all, as the first dorsal has five spines instead of four, as in all *Mugilidae*; as the ventrals have, according to the figure, one spine and 4 rays, while in all *Mugilidae* the ventrals have 1. 5. Further on account of the character of the caudal peduncle, of the pectorals and their base, of the construction of the operculum, which are different from those of the *Mugilidae*.

We suppose that some mistake must have taken place. The figure has a superficial likeness with *Carassiops*.

4. Fam. ATHERINIDAE.

More or less elongate, subcylindrical or somewhat compressed, covered with cycloid or ctenoid scales of moderate or small size. No lateral line but the posterior lateral scales may have a pit or a rudimentary tube; a silvery band along the sides, sometimes underlaid by black pigment. Eyes lateral, without gelatinous eyelids. Cleft of mouth moderate, extending to or beyond anterior margin of eye. Mouth usually terminal, more or less oblique; intermaxillaries more or less protractile, maxillaries without supplemental bone. Jaws equal or not. Teeth usually small, on jaws, also on vomer, palatines and pterygoids where they may be wanting. First dorsal with 4-8 weak spines or 4-5 undivided rays or 1 spine and 3-6 undivided rays, only in one genus 5 strong spines. It is situated before, opposite to or behind anus. Second dorsal removed from first,

opposite to anal, which is usually longer, has a single weak spine but resembles it otherwise. Ventral fins small, usually abdominal. Pelvic bones connected by ligament to the cleithra. Pectorals moderate or small, inserted high up. Caudal emarginate. Third and fourth superior pharyngeals of each side ankylosed, bearing teeth. Lower pharyngeals separate. No filtering apparatus. Gillopenings wide. Gillmembranes not connected, free from isthmus. Branchiostegals 5 or 6. Gillrakers usually long and slender. Vertebrae numerous, 32-60.

Carnivorous fishes of small size, often living in shoals along the coasts of tropical and temperate seas, some entering rivers, other living only in fresh water.

Synopsis of the indo-australian Atherinidae.

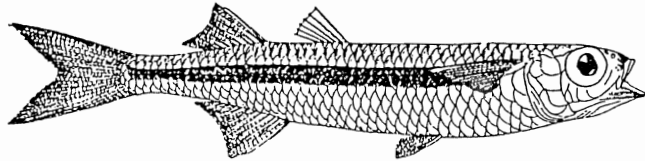
- I. Origin of anal far distant from first dorsal.
 - 1. Vent about in middle of distance between snout and caudal. Origin of first dorsal above, slightly before or behind vent. Caudal peduncle as long as or longer than anal. More than 12 long slender gillrakers. A. I. 10-18 (indo-australian species of) *Atherina* p. 268.
 - 2. Vent in posterior half of distance between snout and caudal. Origin of first dorsal before vent, its hindborder above it. Caudal peduncle longer than anal, about 10 very short and thick gillrakers. A. I. 8-10 *Cratrocephalus* p. 277.
- II. Origin of anal only slightly behind first dorsal.
 - 1. Vent in posterior half of distance between snout and caudal. Origin of first dorsal before vent. Caudal peduncle shorter than anal. 15-20 long gillrakers. A. I. 11-13 *Telmatherina* p. 278.
- III. Origin of anal at least before hindborder of first dorsal.
 - 1. Vent in posterior half of distance between snout and caudal. Origin of first dorsal above or behind vent. Caudal peduncle as long as or longer than anal. A. I. 9-12. Small, elongate. *Pseudomugil* p. 282.
 - 2. Vent in anterior half of distance between snout and caudal. Origin of first dorsal somewhat before, generally behind vent, its hindborder always behind it. Caudal peduncle shorter than anal. A. I. 17-30. *Melanotaeniinae* p. 286.

AS 615

1. *Atherina* (Artedi) Linné.

(Linné, Syst. nat. ed. No. 1758, p. 315).

Physoclistic; more or less elongate, subcylindrical or compressed; covered with cycloid or ctenoid scales of moderate or small size. No perforated lateral line. A silvery band along the side, sometimes underlaid by black pigment. Head flattened above. Eyes lateral, well developed, without a gelatinous eyelid. A pair of not widely separated nostrils between snout and eye. A spinous dorsal of 5 to 8 more or less flexible spines, situated before or opposite to anus. It is entirely separated

Fig. 70. *Atherina valenciennesi* Blkr. n. s.

from the second dorsal, which is formed by branched rays. Anal with a weak spine; usually longer than the soft dorsal, which it otherwise resembles. Ventral fins abdominal, small, with a spine and 5 branched rays. Pectorals moderate or small, inserted high up. Jaws about equal. Cleft of mouth straight, terminal, oblique, moderate, extending to or beyond anterior margin of eye, bordered by mandibles and intermaxillaries, which may be protractile; the maxillaries are excluded. Teeth usually small, on jaws, also on vomer, palatines and pterygoids, where they may be wanting. Vertebrae with the parapophysis co-ossified with the centra; numerous: 32 to 60. Parietals present; no splenial; pterotic not reaching basioccipital. Gill-openings wide, gillmembranes not connected, free from isthmus; 5 or 6 branchiostegal rays. Four gills, a slit behind the fourth.

Carnivorous fishes of small size, living in shoals in temperate and tropical seas near the coast, in brackish water, several species even entering fresh water.

Key to the indo-australian species of *Atherina*.

- I. Origin of first dorsal about opposite to anus, which is situated 1 or 2 scales behind tip of ventrals. Vertical through origin of first dorsal much nearer to base of ventrals than to anal. *A. temmincki* p. 269.

II. Anus conspicuously before first dorsal; situated between ventrals, at least between their tip. Vertical through origin of first dorsal nearer to anal than to base of ventrals.

1. Pectorals 5 times or less in total length. Tip of ventrals reaching vertical through origin of first dorsal. That vertical separated from vertical through anus by 3 scales. Lateral scales 34—36 *A. eendrachtensis* p. 270.
2. Pectorals more than 5 times in total length. Tip of ventrals only by exception reaching vertical through origin of first dorsal.
 - a. Vertical through anus and vertical through origin of first dorsal separated by 7—8 scales. *A. valenciennesi* p. 272.
 - b. Vertical through anus and vertical through origin of first dorsal separated by 3—4 scales.
 - α. Lateral scales 42—45. Origin of first dorsal opposite to 15th (16th) scale, that of second dorsal opposite to 25th (26th) scale. Anus opposite to 12th—14th scale *A. forskåli* p. 274.
 - β. Lateral scales 35—40. Origin of first dorsal opposite to 13th—14th scale, that of second dorsal opposite to 21st—23rd scale. Anus opposite to 9th—10th scale *A. duodecimalis* p. 275.

1. *Atherina temmincki* Blkr.

- ?*Atherina brachypterus* Bleeker, Nat. Tijdschr. Ned. Indië II. 1851, p. 243.
Atherina Temminckii Bleeker, Nat. Tijdschr. Ned. Ind. V. 1853, p. 506.
Atherina Temmincki Jordan & Seale, Proc. U.S. Nat. Mus. Wash. XXVIII. 1905, p. 774.
 ?*Atherina usila* Jordan & Seale, Bull. Bur. Fish. Wash. XXV. (1905) 1906, p. 216.
Atherina temminckii Evermann & Seale, Bull. Bur. Fish. Wash. XXVI. 1906, p. 59.
Atherina Temminckii Max Weber, Siboga-Expeditie, Fische 1913, p. 135.
Atherina temmincki Max Weber, Revision indo-austr. Art. v. *Atherina*, Zoolog. Mededeel. Mus. Leiden VI. 1921, p. 52.

D¹. VI; D². I—II. 8—9; A. II. 10—11; V. I. 5; P. I—II, 15—17; L.l. 40—44; L.tr. 6.

Somewhat cylindrical, back broad, flat, breadth of trunk equal to or somewhat less than its height. Height 6½ to nearly 8 in total length. Head 4.5 to slightly more than 5 in total length; pointed, its upper surface nearly flat and rectilinear; jaws equal; mouth small; maxillary obliquely ascending, reaching frontborder of eye; snout much shorter than eye, about 3.8—4 times in head. Eye 2.5 to less than thrice in head,

equal to or shorter than interorbital space and about equal to postorbital part of head. Origin of first dorsal opposite to 14th, usually 15th scale, and about opposite to anus; its vertical much nearer to origin of ventrals than to that of anal. Anus about 1 or 2 scales distant from end of ventrals. Origin of second dorsal opposite to (25th) 26th scale and to first $\frac{1}{4}$ of anal; its distance from origin of first dorsal somewhat shorter than length of head; both fins separated by 7 interdorsal scales. There are 17—19, usually 18 scales between first dorsal and occiput. Pectorals 6.6 to 7.7 in total length, their tip reaching 8th or 9th scale. Distance of origin of second dorsal from root of caudal equal to or somewhat longer than head. Scales entire. Caudal peduncle measured behind second dorsal about $\frac{2}{3}$ of length of head. About 21—22 gillrakers on lower limb of first arch, the longest somewhat shorter than pupil. Teeth in jaws very small and in narrow bands, those on vomer, palatines and pterygoids more conspicuous and stronger. Lateral band silvery, about $1\frac{1}{2}$ times as broad as pupil, its upper border with a blackish hue; the scales above it with bluish email-coloured points on a dark ground; they may be confluent along the border of the scales; fins hyaline, the upper border of the pectorals and the caudal with a dark hue. Length 100 mm. [Specimens of BLEEKER's collection seen by us].

Habitat: Pulu Weh!; Sumatra (Priaman); Pulu Babi (Telok Berandang!); Java (Batavia); Island Kawassang (Paternoster Islands!); Flores!; Adonare!; Timor; Sumba!; Celebes (Makassar, Badjoa, Menado); Saleyer!; Siao!; Ternate; Gisser!; Ceram (Kawa!); Island Fau near Gebe!; Kei Islands (Tual!); Kur Island!. — Philippines, ?Samoa (*Atherina nisila* Jordan & Seale).

2. *Atherina eendrachtensis* Q. & G. ¹⁾

Atherina eendrachtensis Quoy & Gaimard, Voyage de Freycinet, Zoologie 1824, p. 334.
Atherina eendrachtensis Cuvier & Valenciennes, Hist. Nat. Poissons X. 1835, p. 456.
 ?*Atherina himanensis* Bleeker, Journ. Indian Archipelago II. 1848, p. 637 ²⁾.

1) We have changed the original specific name *eendrachtensis* in *eendrachtensis*, as it is derived from the old dutch name "het land Eendracht" for Australia; *eendrachtensis* does not belong to any language.

2) The type of this species is lost and the diagnosis very incomplete, but it contains characters, which make it possible, that it was based on a specimen or specimens of *A. eendrachtensis* (Q. G. (see M. Weber, Revision etc. l. s. c. p. 46).

Atherina eendrachtensis Bleeker, Arch. néerl. sc. nat. Haarlem XIII. 1878, p. 53 (name only).
Atherina eendrachtensis Sauvage, in Grandidier, Hist. nat. Madagascar XVI. Poissons 1891, p. 406.
 ?*Atherina eendrachtensis* Kendall & Goldsborough, Mem. Mus. Comp. Zool. Harvard College XXVI. No. 7, 1911, p. 254 ¹⁾.
Atherina eendrachtensis Max Weber, Siboga-Expeditie Fische, 1913, p. 136.
Atherina eendrachtensis de Beaufort, Bijdr. Dierkunde Afl. 19, Amsterdam 1913, p. 106.
Atherina eendrachtensis Max Weber, Revision indo-austr. Art. v. *Atherina*, Zoolog. Mededeel. Mus. Leiden VI. 1921, p. 47.

D¹. (IV) V; D². II. 7—8; A. II. 9—12; P. I. 14; V. I. 5.
 L. l. 34—36 et parvi; L. tr. 6.

Compressed, height about 5 to 5.5 times in total length. Head and anterior part of back stout, flattened, broad, its breadth above pectorals about $\frac{2}{10}$ shorter than height on that place. Head 4.2 to 4.5 in total length, 3.2 to 3.7 times in length without caudal; its upper surface broad, flat, even slightly concave, rectilinear to broad, blunt snout, which is shorter than half length of eye; mouth small, upper jaw somewhat prominent, maxillary obliquely ascending, nearly reaching vertical through frontborder of pupil. Eye about 2.3 to 2.5 in head, equal to interorbital space but longer than postorbital part of head. Origin of first dorsal opposite to 12th, usually 13th scale, in small specimens midway between root of caudal and anterior part of pupil. With increasing length the anterior end of that measurement is shifted backward to hindborder of eye, so that finally the origin of the first dorsal is midway between hindborder of eye and root of caudal ²⁾. The vertical through that origin is much nearer to anal than to base of ventrals. Origin of second dorsal opposite to 20th scale and to anterior third of anal. Anus opposite to 9th, usually 10th scale, 3 scales before vertical through origin of first dorsal, situated between posterior half to ultimate quarter of ventrals, the tips of which reach the said vertical or nearly so. Origin of first dorsal from that of second dorsal a distance contained about 1.7 to

1) The authors unite under this species a number of specimens from Fiji, Caroline and Marshall Islands. Of some of them a few characteristics are notified; these specimens certainly do not belong to *eendrachtensis* (Q. G. but possibly to *A. temmincki* Blkr. But the descriptions are too incomplete to settle this question.

2) As in *A. duodecimalis*, we suppose that in the short synopsis given by SAUVAGE (l. c. p. 406) of the species of *Atherina*, in the Paris Museum "bord postérieur de l'oeil" stands for "bord antérieur".

1.8 times in length of head. Both fins are separated by 5 (by exception 6) interdorsal scales. There are 16 scales between first dorsal and occiput. Distance of origin of second dorsal from dorsal root of caudal shorter than head. Pectorals falcate, 4.5 to 4.8 in total length; their tip reaching 9th to 12th, usually 10th scale. Caudal peduncle, measured behind dorsal, about equal to half length of head. Scales entire, in old specimens somewhat crenulated. About 23 gillrakers on lower limb of first arch, the longest about $\frac{1}{3}$ the length of the eye. Teeth in jaws in a rather broad band, its breadth increasing with age, they are relatively strong on vomer, palatines and pterygoids. Silvery lateral band usually rather narrow and dorsally bordered with black, which may be as broad as the silvery band below it. In the middle of the lateral band a longitudinal series of diffuse dark brown dots, one on each succeeding scale; a second series in the ventral border of the silvery band or somewhat below it and reaching lower surface of caudal peduncle; a third series, still shorter, about one scale below the second series. Scales above the lateral band dusky and more or less edged with dark brown, more pronounced on median and anterior part of back and on upper surface of head; tip of snout and of mandible dusky. Base of pectorals and their upper half dusky as also the other fins, especially the caudal. Length 116 mm.

Habitat: Nias!; Sailus ketjil (Paternoster Islands!); Sumbawa!; Celebes (Menado!); Island Biaru!; Ceram!; Banda!; Aru Islands (Dobo!); Waigeu!; New Guinea [VALENCIENNES]. — South West Australia.

Note. This species is widely distributed through the Archipelago. It was therefore remarkable that BLEEKER had not received it from one of the many places wherefrom he got collections. Apparently he did not recognise it; for the Museum of Amsterdam possesses two badly preserved specimens from BLEEKER's collection named by him *Ath. duodecimalis* C. V. which really belong to *Ath. eendrachtensis*.

3. *Atherina valenciennesi* Blkr. 1). [Fig. 70, p. 268].

Atherina Valenciennesi Bleeker, Nat. Tijdschr. Ned. Indië V. 1853, p. 507.
Atherina Valenciennesi Bleeker, ibid. XX. 1859—1860, p. 203.

1) BLEEKER himself corrected the wrongly spelt specific name "*Valenciennesi*" and altered it in "*Valenciennesi*".

Atherina Valenciennesi Max Weber, Siboga-Expeditie, Fische 1913, p. 136.
Atherina valenciennesi Max Weber, Revision indo-austr. Art. v. *Atherina*, Zoolog. Mededeel. Mus. Leiden VI. 1921, p. 52.

D¹. V—VI; D². II. 7—8; A. II. 11; P. I. 13—14; V. I. 5; L.l. 41—43; L.tr. 6.

Compressed, its greatest breadth about $1\frac{1}{2}$ times in its height, which goes $6\frac{1}{2}$ times or somewhat more in total length. Head 5.3—5.8 in total length, pointed; its upper surface nearly flat, anteriorly only slightly declivous, jaws equal; mouth small; maxillary strongly ascending, reaching frontborder of eye or slightly passing it. Snout much shorter than eye, somewhat more or less than 4 times in head. Eyes 2.3 to nearly 3; equal to or shorter than interorbital space, which has a large thin scale; postorbital part of head about equal to eye. Origin of first dorsal opposite to 15th or 16th scale, its vertical much nearer to anal than to origin of ventrals and nearer to base of caudal than to end of snout, 3 to 4 scales distant from tips of ventrals and (6) 7 to 8 scales behind anus. Origin of second dorsal opposite to 24th, 25th or 26th scale, its distance from origin of first dorsal contained 1.2 to 1.3 in length of head; both fins separated by 5 to 6 interdorsal scales. Anus opposite to 8th or 10th scale and situated in anterior third or in middle of length of ventrals. Pectorals 5.7—6.6 in total length, their tip reaching 9th or 10th scale, reaching therefore or surpassing vertical through anus. Distance of origin of second dorsal from caudal about $\frac{1}{5}$ of length of head longer than that length. Length of caudal peduncle measured behind second dorsal equal to head without snout or somewhat longer. Scales crenulated. About 18—20 scales between first dorsal and interorbital space. About 22 gillrakers on lower limb of first arch, their greatest length somewhat less than pupil. Teeth very small in bands on jaws, vomer, pterygoids and palatines. Lateral band silvery, black above; occupying nearly the entire third series of scales. The scales above it with black points, especially the median series of back and the neighbouring series of scales with black edges and longitudinal markings. Caudal dusky, with a diffuse blackish border. Length 95 mm. [Specimens of BLEEKER's collection seen by us].

Habitat: Singapore; Sumatra (Padang); Java (Batavia!, Samarang!, Surabaya!, Pekalongan!, Panarukan!, Karang Bol-

long); Borneo (Kota Baru!, Balik-papan!); Celebes (Makassar!); Flores!; Biaru Island!

4. *Atherina forskåli* Rüpp.

- Atherina Forskåli* Rüppell, Neue Wirbelth. Fische 1835, p. 132.
Atherina forskåli Cantor, Journ. Asiat. Soc. Bengal XVIII. (1849) 1850, p. 1085.
Atherina lacunosa Bleeker, Nat. Tijdschr. Ned. Indië V. 1853, p. 504.
Atherina pinguis Bleeker, Acta Soc. Sc. Indo-Neerland. VIII. 1860, 8ste Bijdr. vischfauna Sumatra, p. 84.
 ?*Atherina forskåli* Günther, Cat. Brit. Mus. III. 1859—1861, p. 397.
Atherina pinguis Klunzinger, Abh. zool. bot. Gesellsch. Wien XX. 1870, p. 833 (p.p.).
Atherina forskali Day, Fishes of India 4°, 1878—1888, p. 345.
Atherina Forskåli Klunzinger, Fische d. Roth. Meeres 1884, p. 130.
 ?*Atherina forskalii* Seale, Philippine Journ. of Sc. V. No. 4, 1910, p. 268.
Atherina Forskåli Max Weber, Siboga-Expeditie, Fische 1913, p. 134.
Atherina forskali Jordan & Hubbs, Ann. Carnegie Mus. Vol. XI. Nos. 3 & 4, 1917, p. 462.
Atherina forskåli Max Weber, Revision indo-austr. Arten v. *Atherina*, Zoolog. Mededeel. Mus. Leiden VI. 1921, p. 47.

D¹. V; D². II. 8; A. II. 11—13; P. I. 13—15; V. I. 5. L. I. 42—45; L.tr. 6.

Compressed, its greatest breadth about 1½ times in its height. Height 4.7 to 6.4 times in total length, according to size. Head 4.3 to 4.9 in total length, pointed, its upper surface flattened but slightly convex in interorbital part, wherefrom it is decidedly declivous to point of snout. Mouth comparatively large, the jaws equal, the maxillary reaching to below pupil or nearly so. Snout much shorter than eye, more or less than 4 times in head. Eye 2.5—2.7, about equal to post-orbital part of head and to interorbital space. Origin of first dorsal opposite to 15th, by exception to 16th scale, midway or somewhat nearer to root of caudal than to frontborder of eye; its vertical much nearer to anal than to base of ventrals, and about 2 scales behind anus. Origin of second dorsal opposite to 24th to 26th, usually to 25th scale and to about end of anterior third of anal; its distance from origin of first dorsal contained 1.3 to 1.6 in head. Both fins are separated by 6 to 8, usually 7 interdorsal scales. Distance of origin of second dorsal from caudal equal to or longer than head. Length of caudal peduncle, measured dorsally, shorter than distance from point of snout to hindborder of eye, about twice in length of head. Pectorals 5.3 to 6.5 in total length; their tips reaching

8th, 9th or usually 10th scale. Anus opposite to 12th or 14th, usually to 13th scale, situated between tips of ventrals or immediately behind their end, about 2 scales before vertical through first dorsal. Scales entire or somewhat sinuated, about 18 to 20 between first dorsal and head, a very large and rounded one on interorbital space, behind it a longitudinal one on nape. About 20 gillrakers on lower limb of first arch, the longest about equal to half length of eye. Teeth in rather broad bands on jaws, pterygoids, palatines and vomer. Sides of head and lower surface of body silvery, not sharply defined from the broad silvery lateral band, the upper part of which shows an indistinct dark band. Above it the scales have broad brown borders and brown points. Fins dusky, usually more pronounced on hindborder of caudal; upper half of pectorals often with blackish points. Upper surface of head more or less blackish as also ventral border of lower jaw. Length 130 mm.

Habitat: Singapore; Pulu Weh!; Simalur!; Pulu Babi (Telok Berandang!); Sumatra (Olehleh!, Pulu Pangang!, Trussan, Padang, Benkulen); Java (Samarang!, Batavia); Bawean Island; Kawassang (Paternoster Islands!); Bali; Celebes (Makassar!, Bonthain, Badjoa, Menado!); Flores (South coast!); Sumba (South coast!); Timor; Buton!; Ternate; Ambon!; Kajoa!; Obi major!; Banda!; Island Fau near Gebe!; Aru Islands!; Waigeu (Saonek!); Goram Islands; New Guinea. — Red Sea, Zanzibar, Madagascar, Mauritius, Nicobars, Andamans, Pinang, Tonkin, Philippines, New Caledonia(?), New Hebrides(?), Aneiteum(?).

5. *Atherina duodecimalis* (C.V.) Blkr.

- ?*Atherina duodecimalis* Cuvier & Valenciennes, Hist. Nat. Poissons, X. 1835, p. 458.
Atherina duodecimalis Bleeker, Nat. Tijdschr. Ned. Indië II. 1851, p. 485.
Atherina duodecimalis Günther, Cat. Brit. Mus. III. 1859—1861, p. 400.
 ?*Atherina duodecimalis* Day, Fishes of India 4°. 1878—1888, p. 345.
Atherina duodecimalis Sauvage, Hist. nat. Madagascar XVI. Poissons 1891, p. 406.
 ?*Atherina duodecimalis* Bean & Weed, Proc. U. S. Nat. Mus. Wash. 42, 1912, p. 596.
Atherina pinguis Max Weber, Siboga-Expeditie, Fische 1913, p. 135.
Atherina duodecimalis Max Weber, ibid, p. 136.
Atherina duodecimalis de Beaufort, Bijdr. Dierkunde Af. 19, Amsterdam 1913, p. 105.
Atherina temminckii de Beaufort, l.c. (p. p.).
Atherina duodecimalis Max Weber, Revision indo-austr. Arten v. *Atherina*, Zoolog. Mededeel. Mus. Leiden VI. 1921, p. 47.

D¹. V—VI; D². II. 8 (I. 9); A. II. 9—12 (13); P. I. 13—15; L.I. 35—38 (40); L.tr. 6.

Compressed, its greatest breadth about $1\frac{1}{2}$ times in its height. Height 5.4—6 in total length, less than 4 times without caudal. Head 4.3—4.6 in total length, bluntly pointed, its upper surface flat, slightly declivous. Mouth rather small, lower jaw somewhat prominent, strongly ascending, reaching to frontborder of eye or somewhat passing it. Snout short, about half length of eye, more than 4 times in head. Eye 2.2—2.4, conspicuously longer than postorbital part of head and interorbital space, which is somewhat concave. Origin of first dorsal opposite to 13th or 14th scale, about in the middle between frontborder of eye and caudal; its vertical 3—4 scales behind anus and much nearer to anal than to base of ventrals. Origin of second dorsal opposite to 21st to 23rd scale and to about the first $\frac{1}{5}$ of anal; its distance from origin of first dorsal 1.5 to 1.7 times in length of head. Both fins are separated by 5 interdorsal scales. Distance of origin of second dorsal from caudal longer than head. Length of caudal peduncle measured behind dorsal, longer than head. Pectorals more than 5 to 6 times in total length; their tips reaching 9th or 10th scale. Anus opposite to 9th or 10th scale, situated in middle or past middle of length of ventrals, their end reaching vertical through first dorsal or nearly so. Scales entire or some of them slightly indented; about 16 to 17 before first dorsal and usually 2 large ones on interorbital space and occiput. About 20 gillrakers; the longest equal to half length of eye. Teeth in rather narrow bands on jaws, palatines, pterygoids and vomer. In alcohol yellowish brown, with a silvery hue below the lateral silvery band, the upper part of which is transparent darkish. The scales above it have a lighter or darker margin of different breadth, formed by more or less numerous dark brown points. Fins more or less dusky, especially the caudal and the base of the pectorals. Length 97 mm. [Specimens of BLEEKER's collection seen by us].

Nom. indig.: Lumbungan (Batavia); Kaluna (Saparua).

Habitat: Singapore; Pulu Weh!; Simalur!; Nias!; Sumatra (Benkulen, Telok Betong, Trussan, Padang); Riouw Archipelago; Banka; Biliton; Natuna-Islands; Java (Batavia!); Bawean Island; Borneo (Kota baru!); Bali; Lombok; Sumbawa; Sumba!; Flores!; Adonare!; Celebes (Makassar!, Bonthain, Menado); Buton!; Timor (South coast!); Ambon!; Ceram!; Batjan; Ter-

nate; Waigeu!; Goram Island; Saparua Island; Aru Islands!; New Guinea (Doreh). — Ceylon.

2. *Craterocephalus* Mc Culloch.

(Mc CULLOCH, Proc. Royal Soc. Queensland XXIV. 1912, p. 48.

JORDAN & HUBBS, Stanford University Publications, 1919, p. 44).

Elongate, somewhat compressed. Mouth very small, oblique, bordered by intermaxillaries; the maxillaries behind them, not reaching frontborder of eye. Intermaxillaries very protractile, straight. Very small teeth in both jaws, none on palate. First dorsal with 6—8 flexible spines, its origin well behind that of ventrals, second dorsal with one spine and 7—9 rays. Anal with a weak spine and 8—10 soft rays, its origin somewhat in advance of that of second dorsal. Ventrals with a slender spine and 5 soft rays. Pectorals inserted rather high up, above the middle of the height of the body. Caudal forked. Scales smooth or somewhat crenulated behind, rather large, 31—39 between head and caudal, extending to between eyes on the head. Cheeks and operculum scaly. Lateral line absent or scales pierced by a simple pore. Gillrakers very short, thick, pointed, about ten on lower limb of first arch. Gillmembranes free from isthmus and from each other. Vertebrae 37.

Distribution: Freshwater of Australia. One species in Southern New Guinea.

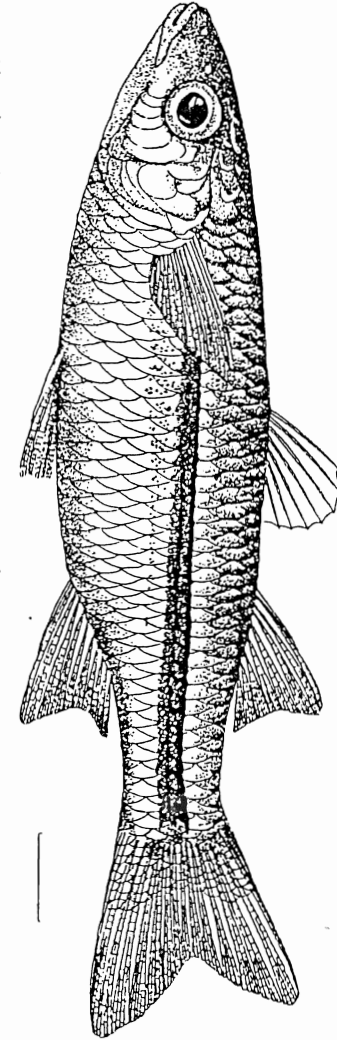


Fig. 71. *Craterocephalus nonhuysi*
(M. Weber) $\times 1.2$.

1. *Craterocephalus nouhuysi* (M. Web.). [Fig. 71, p. 277].

Atherinichthys Nouhuysi Max Weber, Notes Leyden Mus. XXXII. 1910, p. 229. — Nova Guinea IX. Zool. Livr. 4, 1913, p. 555.
Craterocephalus nouhuysi Jordan & Hubbs, Stanford University Publications, 1919, p. 46 (name only).

D¹. 6—7; D². I. 8—9; A. I. 10; P. I. 13—15; V. I. 5; L. I. 36—39; L. tr. $7\frac{1}{2}$ — $9\frac{1}{2}$.

Elongate, somewhat compressed, belly before ventrals more flattened, back and head somewhat rounded. Height 4—4.3, 4.6—5.4 in length with caudal. Hqd. 3.6—4.1, 4.5—5.2 in length with caudal. Eye about 3.5, shorter than snout and almost 1.5 in rounded interorbital space, which is about equal to postorbital part of head. Mouth small, oblique. Intermaxillaries very protractile, almost straight. Maxillaries broadened in their proximal part; almost entirely covered by the praeorbital when the mouth is closed. Lips somewhat swollen. Very fine teeth on the inner side of the jaws. Palate edentulous. One row of large scales on praeoperculum. Operculum scaly. 14—17 scales before dorsal. The scales reach to between eyes. Origin of first dorsal well behind that of ventrals. Origin of second dorsal somewhat behind that of anal. Pectorals as long as or somewhat longer than head without snout. Caudal forked. Colour of alcohol specimens yellowish brown, lighter below. A silvery lateral band from head to caudal. Sometimes a dark blotch at base of caudal. Fins hyaline. Length 120 mm.

Habitat: Southern New Guinea (Lorentz river and its tributaries!).

Fresh water.

3. *Telmatherina* Boulenger.

(BOULENGER, Proc. Zool. Soc. London 1897, p. 428).

Compressed, more or less elongate. Mouth small, oblique, bordered by intermaxillaries and mandibles. Intermaxillaries with a gentle curve, the symphyseal part more or less expanded horizontally. Maxillaries rodlike, hidden below praeorbital when the mouth is closed. Small, pointed teeth on intermaxillaries and mandibles. None on palate. Teeth on tongue. First dorsal consisting of 4—7 simple flexible rays, its origin slightly behind that of ventrals. Second dorsal with one simple ray and 8—11 branched rays, its origin slightly behind that of anal. Anal

with a feeble spine and 11—13 branched rays. Ventrals with a weak spine and 5 rays situated far behind origin of pectorals. Pectorals without spine. Caudal forked. Anus below first dorsal, at some distance before anal. Scales cycloid, with faint crenulations at their hindborder. Lateral line absent, indicated by some of the scales having a pit. Gillmembranes free]from

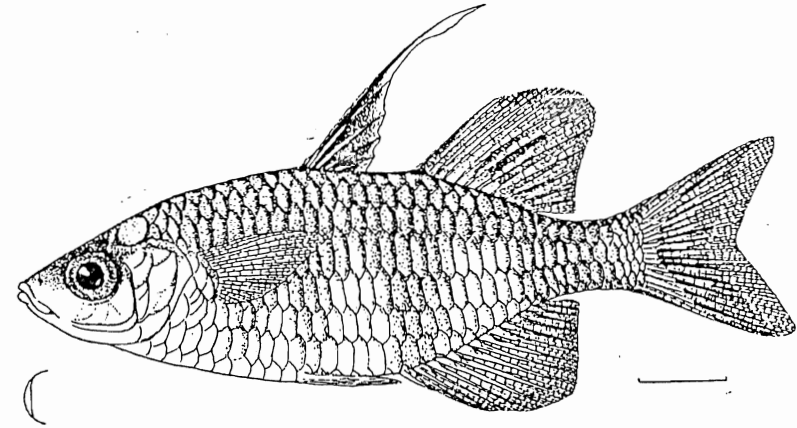


Fig. 72. *Telmatherina celebensis* Blgr. $\times 1.4$.

isthmus and from each other. 15—20 gillrakers on lower branch of first arch, slender, denticulated, almost as long as gillfringes.

Distribution: Lakes Matano and Towuti in the interior of Celebes.

Key to the indo-australian species of *Telmatherina*.

A. Snout equal to or shorter than eye. Less elongate, when specimens of equal length are compared.

1. A. I. 13—15. L. tr. $7\frac{1}{2}$ —8. Pectorals as long as head without snout. *T. celebensis* p. 279.

2. A. I. 11. L. tr. $6\frac{1}{2}$. Pectorals shorter than head without snout. *T. bonti* p. 280.

B. Snout longer than eye. More elongate, when specimens

of equal length are compared. A. I. 12—13. L. tr. $7\frac{1}{2}$. *T. abendanoni* p. 281.

1. *Telmatherina celebensis* Blgr. [Fig. 72, p. 279].

Telmatherina celebensis Boulenger, Proc. Zool. Soc. London 1897, p. 428.

Telmatherina celebensis Max Weber, Bijdragen Dierkunde, Afl. 19, Amsterdam, 1913, p. 206 (pro parte).

D¹. 6—7; D². I. 8—11; A. I. 13—15; P. I. 14—15; V. I. 5; L.l. 32—34; L. tr. 7 $\frac{1}{2}$ —8.

Compressed, somewhat elongate. Dorsal and ventral profile evenly convex. Height 2.8—3.9, 3.6—4.8 in length with caudal. Head 3.2—3.4, 4.1—4.3 in length with caudal. Eye about 3, somewhat longer than or equal to snout, equal to or slightly less than interorbital space, which is less than postorbital part of head. Mouth small, oblique, reaching to about half length of snout. Intermaxillaries gently curved, the symphyisial part more or less horizontal. Jaws equal in front. Small pointed teeth in both jaws, none on palate. Small teeth on hinderpart of tongue. One row of scales on preoperculum. Operculum with rather large scales. Dorsal separated by 14—16 scales from head (12 in all specimens examined from Lake Towuti). Origin of dorsal more or less behind origin of ventrals. Origin of second dorsal behind that of anal. First ray of first dorsal prolonged into a long filament in males, which reaches to end of second dorsal or even farther. Anal spine short, as long as that of ventrals, scarcely shorter than eye. Pectorals as long as head without snout. Caudal forked. Scales slightly crenulated along their hindmargin. Lateral line only indicated by some of the scales having a pit. Colour of alcohol specimens yellowish, browner above, the scales pigmented along their border giving a reticulate appearance to the back. In males there are moreover three more or less distinct brown crossbands, the first behind pectorals, the second between the two dorsals and the third running from hinderpart of second dorsal to anal. First dorsal blackish, the filamentous part white, second dorsal blackish except a broad white terminal margin, caudal and anal with a black medial crossband. In females these markings are much fainter or almost obsolete. Length 92 mm.

Nom. indig.: Opudi (Lake Matano).

Habitat: Celebes (lakes Matano! and Towuti!).

Fresh water.

2. *Telmatherina bonti* n. sp.

Telmatherina celebensis Max Weber, Bijdragen Dierkunde, Afl. 19, Amsterdam, 1913, p. 206 (pro parte).

D¹. V—VII; D². I. 8; A. I. 11; P. I. 13; V. I. 5; L.l. 31—32; L. tr. 6 $\frac{1}{2}$.

Rather compressed, elongate. Height 3.3—3.5, 3.6—4.2 in length with caudal. Head 3.1—3.2, 3.4—3.9 in length with caudal. Eye more than 3, longer than snout and less than interorbital space, which is equal to postorbital part of head. Mouth small, reaching somewhat farther than half length of snout. Intermaxillaries gently curved, the symphyisial part more or less horizontal. Jaws equal in front. Minute teeth in a narrow band in the jaws. No teeth on palate. A patch of teeth on tongue. Preoperculum with one row of scales. One very large and several smaller scales on operculum. Dorsal separated by 12 scales from head, the foremost scale on occiput larger than the others. Origin of dorsal more or less behind that of ventrals. Origin of second dorsal behind that of anal. None of the rays prolonged in the two small specimens examined. Anal spine short, about equal to that of ventrals, shorter than eye. Pectorals shorter than head without snout. Caudal forked. Colour of alcohol specimens yellowish, somewhat darker above, where the scales are pigmented along their margins. A faint lateral black band, running from below dorsal to base of caudal. Length 60 mm.

Nom. indig.: Bonti-bonti (Towuti).

Habitat: Celebes (Lake Towuti!).

Note. One of us draw already attention to the fact, that the specimens called *bonti* by the inhabitants at lake Towuti, differ by having less anal rays from typical *T. celebensis*. We find some other differences (lateral line, length of pectorals) which seem us sufficient to describe them here as a separate species.

3. *Telmatherina abendanoni* M. Web. [Fig. 73, p. 281].

Telmatherina Abendanoni Max Weber, Bijdragen Dierkunde, Afl. 19, Amsterdam, 1913, p. 208.

D¹. 4—6; D². I. 9—10; A. I. 12—13; P. I. 12; V. I. 5; L.l. 33—34; L. tr. 7 $\frac{1}{2}$.

Compressed, elongate. Height 3.7—3.8, 4.6—4.8 in length with caudal. Head 3.1—3.5, 3.8—4.4 in length with caudal. Eye 3.7—4, shorter than snout, which is pointed and somewhat shorter than interorbital space, which is equal to postorbital part of head. Mouth rather small, reaching scarcely to vertical through middle of snout. Intermaxillaries gently curved, their symphyisial part somewhat expanded horizontally. Narrow

bands of small teeth in both jaws. None on palate. Teeth on the tongue. One row of scales on praeperculum. Operculum with rather large scales. Dorsal separated by 13—14 scales from head. Origin of dorsal more or less behind that of ventrals. Origin of second dorsal behind that of anal. First ray of dorsal somewhat produced (in males only?). Anal spine short, about equal to that of ventrals, shorter than eye. Pec-

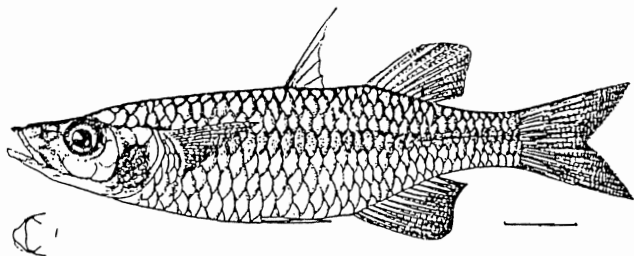


Fig. 73. *Telmatherina abendanoni* M. Weber. n. s.

torals as long as head without snout. Caudal forked. Colour of preserved specimens yellowish, the scales margined with brown, broader so on the back, where the pigment extends below the centre of the scales, the back being therefore darker. Fins somewhat dusky. Length 88 mm.

Habitat: Celebes (Lake Matano!).

4. *Pseudomugil* Kner.

(KNER, Novara Expedition, Fische, 1865—1867, p. 275).

Small, elongate fishes. Much compressed in their hinderpart, less so in the anterior half. Mouth small or large, very oblique, nearly vertical, bordered by mandibles, the symphysis of which is prominent, and by the intermaxillaries; maxillaries hidden when the mouth is closed. Small curved teeth in both jaws, some of them caniniform in males. Palate toothless. First dorsal consisting of 4—5 undivided rays; in indo-australian species far behind origin of ventrals, its origin before, above or somewhat behind that of anal or nearly so. Second dorsal with 6—8 branched rays, its origin behind that of anal. Anal with a slender spine and 9—12 rays. Ventrals abdominal. Fins with elongate rays in males. Caudal emarginate. Scales rather large, cycloid, much larger on head, where they reach to hinderpart

of crown and on opercles. Lateral line absent. Gillmembranes free from isthmus and from each other.

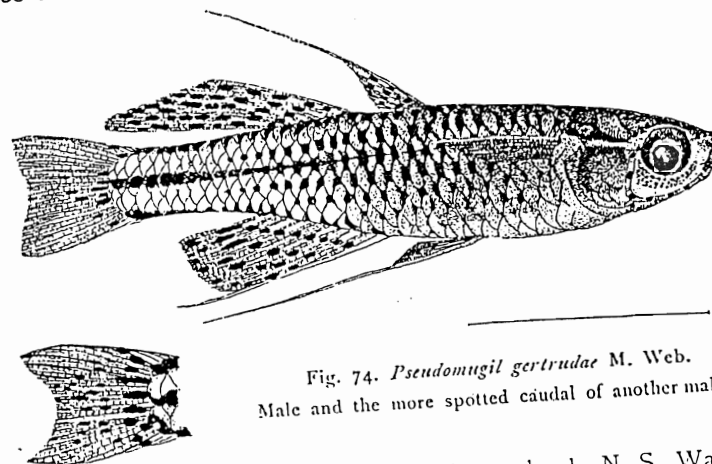


Fig. 74. *Pseudomugil gertrudae* M. Web.
Male and the more spotted caudal of another male.

Distribution: Freshwater of Queensland, N. S. Wales, Aru-Islands and Southern New Guinea.

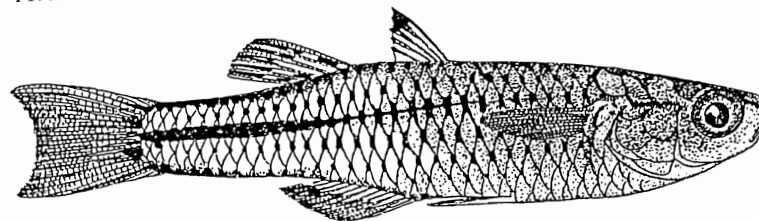


Fig. 75. *Pseudomugil gertrudae* M. Web. Female.

Key to the indo-australian species of *Pseudomugil*.

1. Origin of first dorsal well in advance of that of anal.
Mouthopening small. *P. gertrudae* p. 283.
 2. Origin of first dorsal above or slightly behind or
before that of anal. Mouthopening large. *P. novae-guineae* p. 284.
1. *Pseudomugil gertrudae* M. Web. 1) [Figs. 74, 75, p. 283].
Pseudomugil Gertrudae Max Weber, Abhandl. Senckenb. Naturf. Gesellsch.
XXXIV. 1911, p. 23.

1) The specific name "*gertrudae*" is wrongly changed by JORDAN & HERRIS (Monograph, review of Atherinidae, Stanford University Publications 1919, p. 28) in "*gertrudei*".

D¹. 5; D². 6; A. I. 9—10; P. 9; V. 1.5; L.l. circa 30; L.tr. 6 $\frac{1}{2}$.

Rather clogate, compressed, more so in the posterior half of the fish. Upper profile nearly straight or slightly convex from snout to dorsal, lower profile slightly convex. Height more than 4, 5 in length with caudal. Head 3.8, 4.6 in length with caudal. Eye much longer than snout, somewhat less than interorbital space, which is equal to postorbital part of head. Mouthopening small, very oblique, not reaching vertical through frontborder of eye. Intermaxillaries and lower jaw with a row of very pointed teeth, which are somewhat curved backwards. Origin of first dorsal two or three scales in front of that of anal, separated by 10 scales from the large scales on crown. In males the dorsal and anal fins are much higher than in females, moreover the first ray of first dorsal, anal, ventrals and sometimes also of pectorals is prolonged into a long filament. Pectorals slightly shorter than head. Caudal emarginate. Yellowish, a dark lateral band from below first dorsal to caudal, widening posteriorly. Caudal peduncle with a similar median dorsal and ventral band, which are continued along base of dorsal and anal. Body covered with elongate dark blotches, corresponding with the scales and partly anastomosing, through which the body has a reticulate appearance. Fins more or less dusky in females, with a few black blotches on base of caudal and on second dorsal. In males both dorsals, anal and in a less degree caudal covered with blotches, which are arranged in longitudinal rows. Length 35 mm.

Habitat: Aru-Islands (Island Terangan!).

Fresh water.

2. *Pseudomugil novae-guineae* M. Web. [Fig. 76, p. 285].

Pseudomugil novae-guineae Max Weber, Nova Guinea V. Livr. 2, 1908, p. 232. — Abhandl. Senckenb. Naturf. Gesellsch. XXXIV. 1911, p. 25. — Nova Guinea IX. Livr. 4, 1913, p. 556.

D¹. 4; D². 8; A. I. 12; P. 10; V. 1.5; L.l. 31—32; L.tr. 6 $\frac{1}{2}$.

Elongate, compressed, more so in the posterior half of the fish. Upper profile nearly straight from snout to dorsal, lower profile slightly convex. Height about 5, 5.5 in length with caudal. Head nearly 4—4.5, 4.5 to more than 5 in length with caudal. Eye about 2.5, equal to postorbital part of head and to interorbital space. Mouthopening very oblique, rather large, not reaching vertical through frontborder of eye. Symphysis

of lower jaw forming the point of the head. Intermaxillaries and lower jaw with a narrow band of pointed teeth, which are curved backwards. In the male some of the teeth are larger and more or less caniniform. Origin of first dorsal above, slightly before or behind that of anal, separated by about 16 scales from the large scales of crown. In males the rays of the first dorsal are much prolonged and those of second dorsal and anal are also much longer than in females. Pectorals only slightly shorter than head. Caudal emarginate. Colour of alcohol specimens light yellowish, a dark lateral band begins

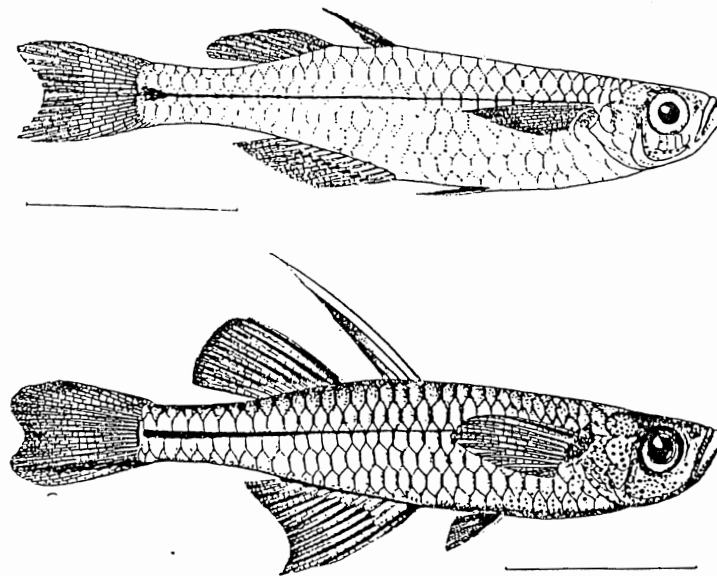


Fig. 76. *Pseudomugil novae-guineae* M. Weber. $\times 3$.
Upper figure female, lower figure male.

before the middle of the body and ends broadening posteriorly, at base of caudal. Oblique dark, more or less complete lines, crossing each other and corresponding with the borders of the scales, give to the body a reticulate appearance. First dorsal black, other fins dusky with a black intramarginal band on the anal, more developed in males than in females. Length 43 mm.

Habitat: South New Guinea (river Wagani!, Lorentz river!); Aru-Islands!

Fresh water.

Subfam. Melanotaeniinae.

Much compressed, oblong. Height increasing with age and dorsal and ventral profile getting more convex, especially the ventral profile; the dorsal profile generally sloping down in an almost straight line to snout. Head more or less pointed, its crown flattened; the jaws being equal or the upper one the longer, the lower one included; the upper one may also fit into a sinuation of the lower jaw. Mouthopening moderate or small, reaching frontborder of eye or not so far. Lips thickened or not. Intermaxillaries bordering the mouth-opening, gently curved or with an abrupt bent between their horizontal and lateral part. Maxillaries rodlike, thin, slightly visible or not when mouth is closed. Teeth conical, pointed, in one or more rows in jaws, often extending on outside of

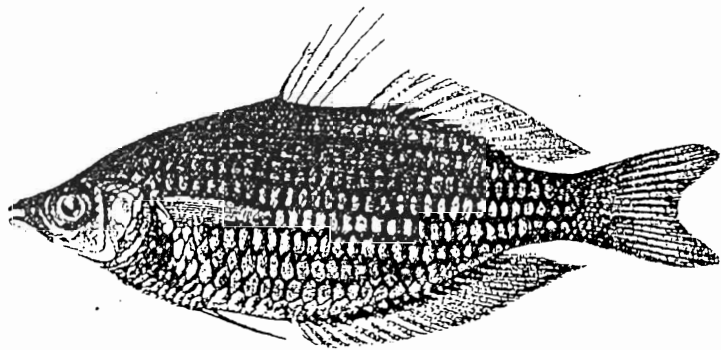


Fig. 77. *Melanotaenia patoti* M. Web. n. s.

lips; on vomer, palatines and tongue present or absent. First dorsal composed by exception of 4 to 5 strong spines, usually of 1 spine and 3—6 more or less flexible, undivided rays; its origin above or behind anus. Second dorsal with one spine and 8—17 soft rays, the posterior ones may be prolonged. Anal with one spine and 17—30 soft rays, the most posterior of which may also be prolonged; its origin before, below or behind that of the first dorsal. Ventrals with 1 spine and 5 rays, their origin below or behind that of pectorals. Scales regularly or irregularly arranged; 30—60 in a row between head and caudal; smooth or with faint or deep crenulations along their hindmargin. Lateral line absent or indicated by a shallow pit on some of the scales. 5 or 6 branchiostegals.

12—16 short dentated, or 30 long and slender gillrakers on the lower part of the anterior arch.

Rather small fishes, living in rivulets, streams and lakes of Australia, New Guinea and neighbouring islands (Aru-Islands, Waigeu).

Note. The indo-australian genera and species of Melanotaeniinae are also treated by JORDAN & HUBBS (A monograph. review of the family of *Atherinidae*, Stanford University Publications 1919). As the authors had not the benefit to see the species themselves, their treatment of them is a replica of that of C. T. REGAN. His descriptions are quoted under the genera and species named on the following pages. We therefore did not think it necessary to quote also the identical names used again by JORDAN & HUBBS.

Key to the indo-australian genera of
Melanotaeniinae.

- I. Scales regularly arranged, 30—44 in a row between head and caudal, smooth or with faint crenulations.
 - A. Intermaxillaries with an abrupt bent between their horizontal and lateral part. L.l. 30—39.
 - a. Teeth not extending on outside of lips, which are not thickened. Mouthopening rather small, not reaching vertical through frontborder of eye. *Melanotaenia* p. 287.
 - b. Teeth extending on outside of lips, which are thickened. Mouthopening comparatively large, reaching to vertical through frontborder of eye or nearly so. *Rhombattractus* p. 296.
 - B. Intermaxillaries without an abrupt bent between their horizontal and lateral part. L.l. 40—44.
 - a. First dorsal with 4—5 spines. Palate toothless. *Centratherina* p. 305.
 - b. First dorsal with one spine and 3—5 soft rays. Teeth on vomer. *Chilatherina* p. 307.
- II. Scales irregularly arranged, 55—60 in a row between head and caudal, deeply crenulated along their hindmargin. *Glossolepis* p. 309.

1. *Melanotaenia* Gill.

(GILL, Proc. Acad. Philadelphia 1862, p. 280; MAX WEBER, Nova Guinea V. Livr. 2, 1908, p. 238).

Nematocentris Peters, Monatsber. Akad. Berlin 1866, p. 516.

Strabo Kner & Steindachner, Sitzungsber. Akad. Wien L.V. 1866, p. 372.
Zantecla Castelnau, Proc. Zool. Soc. Victoria II. 1873, p. 88.
Aida, *Neotherina* Castelnau, Research Fish. Austral. 1875, p. 10, p. 31.

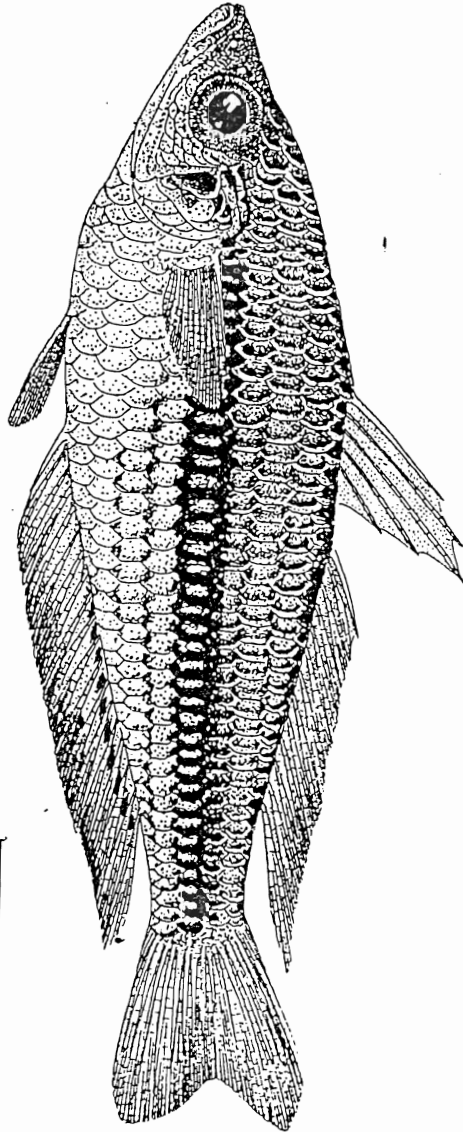


Fig. 78. *Melanotaenia ogylybi* M. Web.

Much compressed, oblong, the height increasing with age. Dorsal and ventral profile more or less convex. Jaws equal, or lower jaw included. Intermaxillaries with an abrupt bent between their horizontal and lateral part. Lips not thickened. Mouth moderate, mouthopening not reaching to vertical through front border of eye. Pointed teeth in one or more rows in jaws. Teeth on vomer; those on palatines and tongue present or absent. First dorsal with one spine and 3—6 flexible, undivided rays, which may be prolonged into filaments. Second dorsal with a more or less curved spine and 9—12 soft rays, the hinder ones of which may be elongated, as well as those of the anal, which has one rather weak spine and 17—22 soft rays. Origin of anal below or somewhat behind that of first dorsal. Ventrals with a slender spine and 5 soft rays, originating somewhat behind the pectorals, which have no spine. Caudal forked.

Scales smooth or with shallow crenulations at their hindborder, moderate, 30—36 between head and caudal. Lateral line absent or indicated by some of the scales having a shallow pit. Five or six branchiostegals. Twelve to 16 short, dentated gillrakers on the lower part of the anterior arch.

Distribution: Freshwater of New Guinea, Aru Islands and Australia south to Sydney.

Key to the indo-australian species of
Melanotaenia.

- I. Praedorsal scales 24—31. L.l. 37—40.
 - 1. Pectorals much longer than head without snout. Caudal peduncle 1.5 as long as high. Mouthopening with a very slight downward curve, when seen in front. Base of anal longer than distance from origin of first to end of second dorsal. Jaws equal *M. multisquamata* p. 290.
 - II. Praedorsal scales less than 24. L.l. less than 37. Base of anal equal to distance from origin of first to end of second dorsal (or in *dumasi* eventually slightly longer).
 - A. Upper jaw slightly prominent. Pectorals longer than head without snout. Mouthopening a horizontal straight line when seen in front. *M. dumasi* p. 290.
 - B. Jaws equal, or lower jaw slightly prominent. Pectorals equal to head without snout.
 - 1. Mouthopening a horizontal straight line, when seen in front. Jaws equal. One row of scales below eye. *M. patoti* p. 291.
 - 2. Mouthopening with a gentle downward curve, the upper jaw fitting into a sinuation of the lower jaw.
 - a. Lower jaw slightly prominent. Origin of dorsal and anal opposite. One row of scales below eye. L.l. 30—33. Caudal with black blotches *M. maculata* p. 292.
 - b. Jaws equal. Origin of dorsal somewhat before that of anal. Two rows of scales below eye. L.l. 34—36. Caudal uniform. *M. ogylybi* p. 293.
- Doubtful species { *M. loriae* p. 294.
M. (?) rubrostriata p. 295.

1. *Melanotaenia multisquamata* n.sp.

D¹. I. 4; D². I. 9—10; A. I. 19—20 (21); P. I. 13—14; V. I. 5; L.l. 37—40; L.tr. 13—14.

Dorsal profile evenly convex, in older specimens much more elevated than in young ones. Ventral profile convex, especially so in older specimens. Height 2.5—2.8, 3.2—3.5 in length with caudal. Head 3.2—3.7, 4.2—4.6 in length with caudal. Eye 3.2—3.7, less than snout and than interorbital space, 1.4—1.6 in postorbital part of head. Mouthopening with a very slight downward curve in the middle, when seen in front. Jaws equal. Mouthopening reaching to about half length of snout. A row of strong conical teeth in the upper jaw, followed by smaller ones inside, especially well developed near the symphysis. Lower jaw with similar small teeth. A transverse patch of small teeth on vomer. Small teeth on palatines and on base of tongue. Subocular part of cheeks with two rows of scales. Large scales on operculum, excepting the superior ones, which are small. First dorsal separated by 24—31 scales from occiput. Spine of first dorsal strong, longer than postorbital part of head, somewhat shorter than that of second dorsal, which is still stronger and more curved. Anal spine rather strong, curved, shorter than postorbital part of head, about equal to length of operculum. Length of base of anal longer than distance between origin of first dorsal and end of second dorsal. Origin of first dorsal somewhat behind that of anal. Second dorsal and especially anal very high, the longest rays of anal as long as head, often much longer and almost equal to height of body. Pectorals not as long as head, but much longer than head without snout. Ventrals as long as head without snout. Caudal peduncle 1.5 times as long as high. Caudal forked. Scales conspicuously crenulated at their hindborder. Colour of preserved specimens pinkish, some rows of scales of the sides with more or less conspicuous dark pigmentation. First dorsal dusky. Distal part of second dorsal, anal and ventrals dusky or blackish. Pectorals and caudal hyaline. Length 140 mm.

Habitat: North New Guinea (Idenburg river!), collected by Jhr. W. C. VAN HEURN.

2. *Melanotaenia dumasi* M. Web.

Melanotaenia Dumasi Max Weber, Nova Guinea V. Livr. 2, 1908, p. 240. — Nova Guinea IX. Livr. 4, 1913, p. 558.

Anisocentrus rubrostriatus Tate Regan, Trans. Zool. Soc. London XX: Part 6, 1914, p. 281 (pro parte).

D¹. I. 4—5; D². I. 9—12; A. I. 17—21; P. I. 11—13; V. I. 5; L.l. 33—35; L.tr. 12—13.

Dorsal profile ascending almost in a straight line from snout to first dorsal in specimens of moderate size, but strongly convex behind nape in large specimens. Ventral profile convex. Height 2.2—3, 2.8—3.8 in length with caudal. Head 3.1—4, 4—5 in length with caudal. Eye 2.3—6.7, about equal to snout and considerably less than interorbital space. Mouthopening a straight line, when seen in front. Upper jaw slightly prominent. Mouthopening reaching to about half length of snout. An outer row of strong, more or less curved teeth in the jaws, followed by smaller ones inside. Small teeth on vomer, palatines and base of tongue. Subocular part of cheeks with two rows of scales. Large scales on operculum, excepting the superior ones, which are smaller. First dorsal separated by 17—20 scales from occiput. Spine of first dorsal equal to or longer than postorbital part of head, longer than that of second dorsal, which is thicker and more curved and much shorter than that of anal, which is about as long as eye. Length of base of anal equal to or somewhat longer than distance between origin of first dorsal and end of second dorsal. Origin of first dorsal somewhat behind or above that of anal. Pectorals curved, longer than head without snout. Caudal peduncle slightly longer than high, as high as long or higher than long (in large specimens). Scales crenulated at their hindborder. Colour of alcohol specimens brownish above, lighter below, the scales silvery in the lower part of the body, the longitudinal series being separated by wine-red stripes in fresh specimens. A more or less distinct darkish longitudinal band on the tail. Fins dusky. Length 150 mm.

Habitat: South New Guinea (rivers Wa Udu!, Wagani!, Lake Jamur!, Lorentz river!, Setakwa river).

Freshwater.

3. *Melanotaenia patoti* (M. Web.) [Fig. 77, p. 286].

Rhombatraetus patoti Max Weber, Zool. Anz. XXXII. 1907, p. 403; Abh. Senckenb. Naturf. Gesellsch. XXXIV. 1911, p. 26.

Melanotaenia nigrans Tate Regan, Trans. Zool. Soc. London XX. Part 6, 1914, p. 279 (pro parte).

D¹. I. 3—4; D². I. 11—12; A. I. 18—20; P. I. 13; V. I. 5; L.l. 35; L.tr. 11—12.

Dorsal profile somewhat convex between occiput and dorsal. Upper profile of head slightly concave. Ventral profile convex. Height 2.4—2.8, 2.8—3.3 in length with caudal. Head 3.5—3.8, 4.1—4.7 in length with caudal. Eye more or less than 3, about equal to snout and considerably less than interorbital space. Mouth a straight line when seen in front. Jaws equal. Mouth-opening reaching to middle of snout or somewhat farther. A row of pointed teeth in both jaws, some smaller teeth behind this row, forming several rows near the symphysis of the lower jaw. Small teeth on vomer and on palatines. No teeth on tongue. Subocular part of cheeks with one row of scales. Large scales on operculum, excepting the superior ones, which are smaller. First dorsal separated by 15—17 scales from occiput. Spine of first dorsal longer than that of second dorsal and of anal, about equal to postorbital part of head. Origin of anal below or slightly behind that of first dorsal. Length of base of anal about equal to distance between origin of first dorsal and end of second dorsal. Pectorals curved, about as long as head without snout. Caudal peduncle longer than high. Scales smooth, some of them with faint crenulations on their hindborder. Colour of alcohol specimens brownish, lighter below. Third and 4th longitudinal row of scales blackish with a silvery gloss, the 6th and 7th form silvery bands. In fresh specimens these 5 bands are separated by wine-red lines. Fins dusky, wine red in life. Length 100 mm.

Habitat: Aru-Islands!

Freshwater.

4. *Melanotaenia maculata* M. Web.

Melanotaenia maculata Max Weber, Nova Guinea V. Livr. 2, 1908, p. 239. — Nova Guinea IX. Livr. 4, 1913, p. 557.
Melanotaenia nigrans Tate Regan, Trans. Zool. Soc. London XX. Part 6, 1914, p. 279 (pro parte).

D¹. I. 4—6; D². I. 10—11 (12); A. I. 19—22; P. I. 13; V. I. 5; L.l. 30—33; L.tr. 12—13.

Dorsal profile convex between occiput and first dorsal, less so in young specimens. Upper profile of head concave. Ventral profile convex. Height 2.3—3, 3.2—3.8 in length with caudal. Head 3.3—3.7, 4.5 to nearly 5 in length with caudal. Eye

more or less than 3, about equal to snout and almost 1.5 in interorbital space. Mouth with a gentle downward curve when seen in front, the upper jaw fitting into a sinuation of the lower jaw. Lower jaw slightly prominent. Mouthopening reaching to about middle of length of snout. Small teeth in jaws, only near symphysis in more than one series. Small teeth on vomer, a few on palatines and on base of tongue. Subocular part of cheeks with one row of scales anteriorly, two rows posteriorly. Large scales on operculum, excepting the superior ones, which are smaller. First dorsal separated by 16—19 scales from occiput. Spine of first dorsal about equal to postorbital part of head, longer than anal spine and about as long as that of second dorsal, which is thicker. Origin of anal opposite to that of first dorsal. Length of base of anal about equal to distance between origin of first dorsal and end of second dorsal. Pectorals curved, as long as head without snout. Caudal peduncle as high as long or higher than long. Scales slightly crenulated behind. Colour of alcohol specimens brownish yellow above, lighter below. Scales lighter in the middle, by which a reticulated aspect is produced, especially distinct on the caudal peduncle, where the longitudinal rows of scales are separated by black stripes. Fins dusky. Second dorsal, anal and caudal chequered with dusky and white. Length 100 mm.

Habitat: South New Guinea (Merauke!).

In freshwater-marshes and ditches.

5. *Melanotaenia ogilbyi* M. Web. [Fig. 78, p. 288].

Melanotaenia Ogilbyi Max Weber, Notes Leyden Mus. XXXII. 1911, p. 230. — Nova Guinea IX. Livr. 4, 1913, p. 560.
Melanotaenia nigrans Tate Regan, Trans. Zool. Soc. London XX. Part 6, 1914, p. 279 (pro parte).

D¹. I. 4—6; D². I. 11 (12); A. I. 17—18 (19); P. I. 11; V. I. 5; L.l. 34—36; L.tr. 10¹/₂.

Rather elongate, upper and lower profile not much convex. (Only small specimens are known). Height 2.7—3, 3.4—3.8 in length with caudal. Head 3.6—3.9, 4.5—4.8 in length with caudal. Eye more or less than 3, equal to or somewhat longer than snout and about 1.3 in interorbital space. Mouthopening with a gentle downward curve when seen in front, the upper jaw fitting into a sinuation of the lower jaw. Jaws equal. Mouthopening reaching almost to vertical through frontborder

of eye. Small teeth in jaws, vomer and base of tongue. Subocular part of cheeks with two rows of scales, posteriorly 3 rows. Large scales on operculum, excepting the superior ones, which are smaller. First dorsal separated by 16—17 scales from occiput. Spine of first dorsal slender, almost as long as snout and eye together, longer than that of second dorsal, which is more curved and much longer than that of anal, which is about equal to eye. Length of base of anal about equal to distance between beginning of first dorsal and end of second dorsal. Origin of first dorsal somewhat in front of that of anal. Pectorals curved, as long as head without snout. Caudal peduncle longer than high. Scales slightly crenulated behind. Colour of alcohol specimens brownish above, light yellow below, the two colours separated by a dark longitudinal band, having the breadth of two scales, and running from operculum to base of caudal. The longitudinal rows of scales below it are separated by narrow dark stripes, which are more or less distinct. Fins more or less dusky, with a darker marginal border. Sometimes a row of black spots at base of anal (males?). Length 68 mm.

Habitat: South New Guinea (marshes along Lorentz river!).
Freshwater.

Doubtful species.

6. *Melanotaenia loriae* (Perugia).

Aristeus Loriae Perugia, Ann. Mus. Civ. Genova (2) XIV. 1894, p. 549.
Rhombattractus loriae Douglas Ogilby, Proc. Linn. Soc. N.S. Wales XXI. prt. 2, 1896, p. 134.

D¹. I. 5; D². I. 13; A. I. 22; L.l. 28.

"Height $2\frac{1}{3}$ in total length. Head 4 in total length. Eye little less than $\frac{1}{3}$ of head, which is strongly flattened. The interorbital space is $1\frac{1}{3}$ diameter of eye. The arcuate profile gives to the body an almost perfectly oval shape. The second dorsal has the rays prolonged; when bent backwards they surpass the middle of the caudal. Colour of alcohol specimens mahogany on the back, golden on the sides, with 7 straight longitudinal bands. The fins are hyaline, with a narrow black border. Length 110 mm." [After PERUGIA, not seen by us].

Habitat: South New Guinea (Inawi).
Freshwater.

Note. TATE REGAN, who examined a specimen of this species, united it with *M. nigrans* Rich. As however REGAN unites a number of species under this name, which according to us have the value of separate species, we don't know where to place it, as PERUGIA'S description is too short. If there were really only 28 scales in the L.l., the species would easily be distinguishable, but we suppose this is a misprint, as otherwise REGAN would not have united it with *M. nigrans*, for which he gives: L.l. 33—37.

7. *Melanotaenia*(?) *rubrostriata* Ramsay & Ogilby.

Nematocentris rubrostriatus Ramsay & Douglas Ogilby, Proc. Linn. Soc. N. S. Wales 2. I. 1886, p. 14.

Rhombattractus rubrostriatus Douglas Ogilby, Proc. Linn. Soc. N. S. Wales XXI. (part 2) 1896, p. 134.

? *Anisocentrus rubrostriatus* Tate Regan, Trans. Zool. Soc. London XX. Part 6, 1914, p. 281 (pro parte).

D¹. I. 5; D². I. 11; A. I. 20; V. 1.5; P. 11; C. 16; L.l. 32; L.tr. 11; Vert. 33.

"Length of head $4\frac{1}{2}$, of caudal fin 5, height of body $3\frac{2}{5}$ in the total length. Eyes large, their diameter $2\frac{2}{5}$ in the length of the head, $\frac{4}{5}$ of a diameter from the end of the snout, and one diameter apart. Upper jaw slightly overhanging the lower; maxilla does not reach to the front margin of the eye. Profile in front of the first dorsal straight, or if anything slightly convex. Both jaws entirely covered with closely set short sharp recurved teeth; a similar patch on the head of the vomer. The rays of the second dorsal are equal in height to those of the first which are not filamentous: the anal commences behind the origin of the first dorsal fin. Ventrals inserted far behind the base of the pectorals: caudal forked. Scales with crenulated edges, covering the cheeks, opercles and upper part of the head to the middle of the interorbital space; the anterior occipital scales large and prominent; there are 15 scales in front of the first dorsal fin. Colors, silvery, with nine broad red longitudinal bands: the dorsals and anal dusky washed with red, the second dorsal having a basal row of brilliant crimson spots. The specimen measures ± 69 mm." [After RAMSAY and DOUGLAS OGILBY, not seen by us].

Habitat: New Guinea (Strickland river).

Note. It is impossible to give this species even its correct generic position after the short description of the authors. As OGILBY, one of the authors, placed the species later on (vide syn.) in the genus *Rhombatractus*, we don't know why TATE REGAN united it with *M. dumasi* under the name of *Anisocentrus rubrostriatus*. He did not see typical specimens and based his description on two co-types of *M. dumasi* and on 5 specimens from the Setakwa-River. Moreover he gives as habitat: Aru-Islands; we don't know on whose authority. Later on (Proc. Zool. Soc. 1914, p. 339), TATE REGAN got informations about the type of the species from MC CULLOCH and writes: "the type of *N. rubrostriatus* Rams. & Ogilb. is damaged about the mouthparts; a figure of the upper jaw is sufficient to indicate that examples I have recently described as belonging to this species, are correctly determined." As the origin of the dorsal is situated above or somewhat behind that of anal in *M. dumasi*, whereas it is — according to the authors — before that of anal in *N. rubrostriatus*, we think it safer to keep them apart, till lastnamed species is better known.

2. *Rhombatractus* Gill (Weber).

(GILL, American Naturalist 1894, p. 709;
MAX WEBER, Nova Guinea V. Livr. 2, 1908, p. 233).
Rhombosoma Tate Regan, Trans. Zool. Soc. London XX.
part 6, 1914, p. 283.

Much compressed, oblong, the height increasing with age. The dorsal profile sloping gently upwards from head to dorsal in small specimens, usually much elevated and convex in old specimens. Ventral profile convex, much so in old specimens. Upper jaw the longer. Mouth comparatively large, reaching to vertical through frontborder of eye or nearly so. Intermaxillaries with an abrupt bent between their horizontal and lateral part. Lips thickened. Pointed conical teeth in several rows in the jaws, extending to the outside of the lips. A patch of teeth on vomer. Teeth on palatines more or less conspicuous, teeth on base of tongue present or absent. First dorsal with one spine and 3—5 flexible rays. Second dorsal with one spine and 11—17 soft rays. Anal with a weak spine and 18—30 soft rays. Origin of anal in advance of that of first dorsal, below it or somewhat behind it. Ventrals with a slender spine and 5 soft rays, beginning somewhat behind origin of pectorals, which have no

spine. Caudal forked. Scales smooth or with faint crenulations at their hindborder, moderate, 32—39 in a row between head and caudal. Lateral line absent or indicated by some scales having a shallow pit. Six branchiostegals.

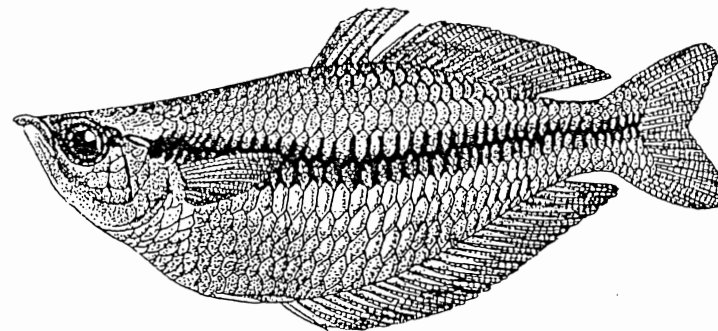


Fig. 79. *Rhombatractus kochi* M. Web. $\times \frac{3}{4}$.

Distribution: Freshwater of New Guinea, Waigeu and Aru Islands.

Note: The genus *Rhombosoma* Tate Regan (Trans. Zool. Soc. London XX. prt 6, 1914, p. 283) is synonymous with *Rhombatractus* as described by M. WEBER (Nova Guinea V. Livr. 2, 1908, p. 233). REGAN substituted the new name on the following reasons: GILL created the name *Rhombatractus* to replace CASTELNAU's name *Aristeus*, which was preoccupied. The species described by CASTELNAU, and which is the type of *Aristeus* Castelnau, is *Aristeus fitzroyensis*. According to REGAN *A. fitzroyensis* is a *Melanotaenia*; *Rhombatractus* is therefore synonymous with *Melanotaenia*, which name is the older. DOUGLAS OGILBY (Proc. Linn. Soc. N. S. Wales 1896, p. 125) is of the same opinion. GILL however (Amer. Naturalist 1894, p. 709), in creating the name *Rhombatractus*, does not mention a type, but says that it is a substitute for the group called *Aristeus* by CASTELNAU. The diagnosis of *Rhombatractus*: "Melanotaeniines with a much compressed rhombofusiform body, emarginate dorsal-rostral contour, and no distinct lateral band" is applicable as well to older specimens of *Melanotaenia* as of *Rhombatractus*. There is therefore in our diagnosis, giving above, nothing against the use of the genus name *Rhombatractus* in the sense of M. WEBER for those species, which later are called *Rhombosoma* by REGAN.

Key to the indo-australian species of
Rhombatractus.

- I. Lower jaw somewhat prominent. L.I. 30—32. Origin of anal opposite to that of first dorsal. Anal with 17—21 rays. Pectorals shorter than head without snout. *Rh. praecox* p. 298.
- II. Upper jaw prominent. L.I. 32—40.
- A. Second dorsal with 18—21 rays. L.I. 38—40. Origin of anal in front of first dorsal. Pectorals equal to head without snout. A vertical black band between black lateral band and base of anal *Rh. vanheurni* p. 299.
- B. Second dorsal with less than 18 rays. L.I. with less than 40 scales. Origin of anal in front of, opposite to or somewhat behind that of first dorsal. Pectorals longer than head without snout. No vertical black band.
1. L.I. 37—39. Origin of anal decidedly in front of that of first dorsal. 17—19 praedorsal scales.
- a. Dorsal profile convex. Caudal peduncle as high as long or higher than long. Second dorsal with 15—17 rays. A. I. 23—30. *Rh. lorentzi* p. 300.
- b. Dorsal profile straight or even concave. Caudal peduncle longer than high, in very large specimens as high as long. Second dorsal with 11—14 rays. A. I. 21—25. *Rh. kechi* p. 302.
2. L.I. 32—36. Origin of anal below or slightly before or behind that of first dorsal. 15—16 praedorsal scales.
- a. Caudal peduncle considerably higher than long, longer than high in small specimens. Snout shorter, more obtuse. Second dorsal with 11—13 rays. No teeth on tongue. Spine of first dorsal much shorter than that of anal. *Rh. catherinae* p. 303.
- b. Caudal peduncle as long as high, higher than long in very large, longer than high in small specimens. Snout longer, more pointed. Second dorsal with 12—16 rays. A patch of teeth on base of tongue. Spine of first dorsal much longer than that of anal *Rh. goldiei* p. 304.

1. *Rhombatractus praecox* n. sp.

D¹. I. 3—5; D². I. 10—14; A. I. 17—21; P. I. 11—13; V. I. 5;
L.I. 30—32; L.tr. 11—12.

Dorsal and ventral profile convex, somewhat less so in very small specimens. Height 2.1—2.9, 2.8—3.7 in length with caudal. Head 3.4—3.8, 4—4.5 in length with caudal. Eye 2.7—3.2, equal to or somewhat more than snout, 1.2—1.3 in postorbital part of head, which is equal to or slightly longer than interorbital space. Lower jaw somewhat prominent. Mouth-opening not reaching quite to vertical through frontborder of eye. Lips not thickened, except somewhat at symphysis of jaws. Very small teeth in several rows on jaws, extending on outside of lips on vomer and (?) on palatines. Tongue smooth. One row of scales on suborbital part of cheeks. Operculum with large scales excepting the superior ones, which are small. Dorsal separated by 14—16 scales from occiput. Spine of first dorsal equal to or slightly longer than postorbital part of head, longer than spine of second dorsal, which is again longer than anal spine. Origin of anal opposite to that of first dorsal. Length of base of anal longer than distance between origin of first dorsal and end of second dorsal. Pectorals somewhat shorter than head without snout. Scales smooth or with faint crenulations at their hindborder. Caudal peduncle longer than high in small specimens, as high as long in larger specimens. Colour of preserved specimens brownish, darker above. A faint narrow blackish longitudinal band is sometimes visible. Fins dusky. In some specimens the second dorsal and the anal have a red marginal band and the ventrals are also tinged with red. Length 61 mm.

Habitat: North New Guinea (Mamberamo-river!), collected by Jhr. W. C. VAN HEURN.

Note. A remarkable peculiarity of this species is, that the elevated rhombic form is attained at a much smaller size than in all other species of *Melanotaeniinae* known to us.

2. *Rhombatractus vanheurni* n. sp.

D¹. I. 4—5; D². I. 18—21; A. I. 24—26; P. I. 13—14; V. I. 5;
L.I. 38—40; L.tr. 12—13.

Dorsal and ventral profile evenly convex in the young, when older the back is more arched and the greatest convexity of the ventral profile more forward, so that the form of the fish is more rhombic. Height 2.7—3.2, 3.1—3.9 in length with caudal. Head 3.4—3.7, 4.1—4.3 in length with caudal. Eye 3.4—4.8 in head; 1.2 (in small specimens) to nearly twice

(in large specimens) in snout, which is somewhat more than interorbital space and about equal to postorbital part of head. Upper jaw prominent. Mouthopening reaching to vertical through frontborder of eye in young specimens, in older ones not so far. Pointed conical teeth in several rows in the jaws, extending on the lips, which are swollen, especially in their anterior part. An elongate patch of teeth on vomer, a smaller one on each palatine and on tongue. Three to four rows of scales on subocular part of cheeks. Operculum with large scales, the superior rows much smaller. Dorsal separated by 15—17 scales from occiput. Spine of first dorsal somewhat shorter than or (in young specimens) equal to postorbital part of head; much longer than that of second dorsal. Spine of anal about as long as that of second dorsal and equal to eye. Origin of first dorsal slightly, to one eye-diameter in front of origin of anal. Length of base of anal only slightly less than distance between origin of first dorsal and end of second dorsal. Length of pectorals equal to head without snout. Scales with faint crenulations along the hindborder. Height of caudal peduncle 1.2 in its length, 1.5 in young specimens. Colour of formal alcohol specimens yellowish, anterior part of back dark, a black lateral band, widening posteriorly, from snout, through eye to middle of base of caudal. A more or less well developed vertical black band runs from the lateral one to the base of anal. Often a few narrower bands, parallel to the vertical one, before or behind it. Operculum with a bluish black patch below the lateral band. Fins more or less dusky, often with a pink hue, probably the remains of a brighter colouring during life. Length 160 mm. 1).

Habitat: North New Guinea (Idenburg river!, Doorman river!).

3. *Rhombatractus lorentzi* M. Web. [Fig. 80, p. 301].

Rhombatractus Lorentzi Max Weber, Nova Guinea V. Livr. 2, 1908, p. 236. — Ibid. IX. Livr. 4, 1913, p. 564.

Rhombosoma lorentzii Tate Regan, Trans. Zool. Soc. London XX. prt. 6, 1914, p. 284.

D¹. I. 4—5; D². I. 15—17; A. I. 23—30; P. I. 14; V. I. 5; L.l. 38; L.tr. 12—13.

Dorsal profile sloping down from dorsal to occiput in a slightly

1) We have the pleasure to dedicate this species to Jhr. W. C. VAN HEURN, the indefatigable Zoologist of the dutch North New Guinea Expedition (Mamberamo Expedition) of 1920—1921.

convex line in young specimens, stronger convex in old specimens, with a concavity behind head. Height 2.3—3.2, 2.7—4 in length with caudal. Head 3.4—3.9, 4—4.8 in length with caudal. Eye 3.5—4.1, about 1.5 in snout, which is equal to interorbital space and somewhat less than postorbital part of head. Upper jaw prominent. Mouthopening reaching almost or entirely to vertical through frontborder of eye. Pointed, conical teeth in several rows in the jaws, extending to the lips, which are thickened, especially in their anterior part. A large patch of teeth on vomer, on palatines and on base of tongue. Three to four rows of scales on subocular part of cheeks. Operculum with large scales, excepting the superior ones, which are small. Dorsal separated by 18—19 scales from occiput. Spine of first dorsal somewhat shorter than or equal to post-

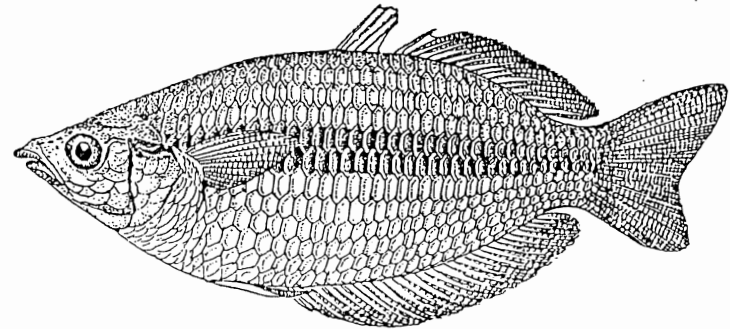


Fig. 80. *Rhombatractus lorentzi* M. Web. $\times \frac{1}{8}$.

orbital part of head, much longer or as long as that of second dorsal, which is slightly or much longer than that of anal. Anal spine equal to or longer than eye. Origin of anal about the length of snout in advance of origin of first dorsal. Length of base of anal much longer than distance between origin of first dorsal and end of second dorsal. Pectorals somewhat longer than head without snout. Scales nearly smooth or with faint crenulations along the hindborder. Caudal peduncle as high as long or higher than long. Colour of alcohol specimens light brownish above, silvery white below, sometimes with a partly developed lateral band, which is at least as broad as one scale. Fins somewhat dusky. Length 142 mm.

Habitat: North New Guinea (rivers Sermowai!, Tawarin! and Mamberamo!).

4. *Rhombatractus kochi* M. Web. [Fig. 70, p. 297].

Rhombatractus Kochii Max Weber, Nova Guinea V. Livr. 2, 1908, p. 237. —
Nova Guinea IX. Livr. 4, 1913, p. 562.

Rhombosoma novae-guineae Tate Regan, Trans. Zool. Soc. XX. Part 6, 1914,
p. 283 (pro parte).

D¹. I. 4—5; D². I. 11—14 (15); A. I. 21—25; P. I. 14; V. I. 5;
L.l. 37—39; L.tr. 11—14.

Dorsal profile in young and middle sized specimens nearly a straight line, sloping from dorsal to snout, in large specimens with a concavity at nape. Ventral profile convex or very convex. Height 2.3—3.4, 2.7—4.3 in length¹ with caudal. Head 3.4—4, 4.3—4.9 in length with caudal. Eye 3—4, shorter or much shorter than snout, more or less than 1.5 in interorbital space, which is equal to or shorter than postorbital part of head. Upper jaw prominent. Mouth opening reaching to front border of eye or not so far in large specimens. Curved conical teeth in several rows in the jaws, extending on the outside of the lips, especially in their anterior part, which is thickened. A transverse patch of teeth on vomer. Teeth on palatines and on base of tongue. Two or three rows of scales on the subocular part of the cheeks. Large scales on operculum, small ones on its superior part. Dorsal separated by 17—19 scales from occiput. Spine of first dorsal shorter or longer than postorbital part of head, longer than that of second dorsal and much longer than that of anal, which is equal to or shorter than eye. Length of base of anal longer than distance between origin of first dorsal and end of second dorsal. Origin of anal 2—4 scales in front of that of first dorsal, less in small specimens. Pectorals longer than or equal to head without snout. Scales nearly smooth or somewhat crenulated at their hind border. Caudal peduncle longer than high, in very large specimens as high as long or even somewhat higher than long. Colour of alcohol specimens brownish above, yellowish below, the two colours separated by a longitudinal dark band, which has the breadth of about two scales and runs from behind eye to caudal peduncle. It is often indistinct or interrupted in the middle. Second dorsal and anal with a marginal and a basal darker band. Other fins more or less dusky. Length 177 mm.

Habitat: Dutch South New Guinea (Merauke river!, Lorentz river!, Beaufort river!, brook at Etna Bay!).

Freshwater.

5. *Rhombatractus catherinae* de Bft.

Rhombatractus catherinae de Beaufort, Zool. Anz. XXXVI. 1910, p. 250. —
Bijdragen tot de Dierkunde Afl. 19, Amsterdam, 1913, p. 106.

Rhombosoma novae-guineae Tate Regan, Trans. Zool. Soc. XX. Part. 6, 1914,
p. 283 (pro parte).

D¹. I. 3—5; D². I. 11—13; A. I. 19—23; P. I. 12—13; V. I. 5;
L.l. 32—35; L.tr. 12 (11¹/₂).

Dorsal profile nearly straight, sloping down from dorsal to snout, a little more convex in large specimens. Ventral profile strongly convex in large specimens. Height in smaller specimens (to 100 mm.) 2.5—3.2, 3—3.75 in length with caudal, in specimens above 100 mm. 2.2—2.5, 2.7—3 in length with caudal. Head 3.2—3.7, 4—4.5 in length with caudal. Eye 3—3.8, about 1.5 in interorbital space, which is about equal to postorbital part of head. Snout rather obtuse, 2.6—3 in head and only a little longer than eye. Upper jaw prominent. Mouth opening reaching to vertical through front border of eye. Conical teeth in several rows in the jaws, extending to the outside of the lips, which are thickened, especially in their anterior part. A patch of teeth on the vomer and perhaps a few on the hinder part of the palatines, none on tongue. Two rows of scales on suborbital part of cheeks. Operculum with large scales, excepting the superior ones, which are small. Dorsal separated by 16 scales from occiput. Spine of first dorsal scarcely longer than that of second dorsal, shorter than postorbital part of head and much shorter than that of anal, which is about equal to eye. Origin of anal opposite to that of first dorsal. Length of base of anal longer than distance between origin of first dorsal and end of second dorsal. Pectorals longer than head without snout. Scales nearly smooth, with indication of crenulations. Caudal peduncle longer than high in small specimens, in large specimens considerably higher than long. Colour of alcohol specimens brown or yellowish brown on the back, ventrally yellow or whitish. A broad black lateral band, at least as broad as one scale, runs from the hind border of the eye over the base of the pectoral to the caudal. Fins dusky, base of second dorsal and anal darker. In life the lateral band is dark blue and the scales have wine-red margins, which form about 8 longitudinal stripes. Proximal part of anal and second dorsal wine-red. Length 119 mm.

Habitat: Waigau!

Freshwater.

6. *Rhombatractus goldiei* (Macleay).

- Aristeus goldiei* Macleay, Proc. Linn. Soc. N. S. Wales VIII. 1883, p. 269.
 ?*Nematocentris novae-guineae* Ramsay & Douglas Ogilby, Proc. Linn. Soc. N. S. Wales 2. I. 1886, p. 13.
Aristeus Goldiei Perugia, Ann. Mus. Civ. Genova (2) XIV. 1894, p. 548.
Rhombatractus goldiei Douglas Ogilby, Proc. Linn. Soc. N. S. Wales XXI. part 2, 1896, p. 134.
 ?*Rhombatractus novae-guineae* Ogilby, Proc. Linn. Soc. N. S. Wales XXI. part 2, 1896, p. 134.
Rhombatractus affinis Max Weber, Nova Guinea V. Zool. Livr. 2, 1908, p. 234. — ibid. IX. Livr. 4, 1913, p. 565.
Rhombatractus weberi Tate Regan, Ann. Mag. Nat. Hist. (8) I. 1908, p. 155.
Rhombatractus senckenbergianus Max Weber, Abh. Senckenb. Naturf. Gesell. XXXIV. 1911, p. 25.
Rhombosoma novae-guineae Tate Regan, Trans. Zool. Soc. London XX. Part 6, 1914, p. 283 (pro parte).
Rhombosoma goldiei Tate Regan, Proc. Zool. Soc. London 1914, p. 339.

D¹. I. 4—5; D². I. 12—16; A. I. 18—24; P. I. 14; V. I. 5; L.l. 34—36; L.tr. 11—12.

Dorsal profile a nearly straight line, sloping from dorsal to snout, in older specimens somewhat concave behind head. Ventral profile convex or very convex. Height 2.5—3.1, 2.9—3.8 in length with caudal. Head 3.2—3.5, 4 or somewhat more in length with caudal. Eye 3—4, shorter or much shorter than snout, which is about equal to postorbital part of head and to interorbital space. Upper jaw prominent. Mouth opening reaching to front border of eye or not so far in larger specimens. Curved conical teeth in several rows in the jaws, extending on the outside of the lips, especially in their anterior part, which is thickened. A transverse patch of teeth on vomer. Few teeth on palatines. A patch of teeth on base of tongue. Two or three rows of scales on suborbital part of cheeks. Large scales on operculum, smaller ones on their superior part. Dorsal separated by 15—16 scales from occiput. Spine of first dorsal about equal to postorbital part of head, longer than that of second dorsal, and much longer than that of anal, which is about equal to eye. Length of base of anal equal to or slightly longer than distance between origin of first dorsal and end of second dorsal. Origin of anal below, somewhat before or somewhat behind that of first dorsal. Pectorals curved, somewhat longer than head without snout. Scales slightly crenulated at their hind border. Caudal peduncle as high as long or somewhat higher than long in large specimens, longer than

high in smaller specimens. Colour of alcohol specimens brownish above, lighter and more or less silvery below, the two colours separated by a longitudinal black band, which has the breadth of about two scales and runs from behind eye to middle of base of caudal; it is generally broader and more distinct in its posterior part. Above the anal a more or less distinct second band, parallel to the first and sometimes only indicated by a black patch or totally absent. Fins more or less dusky, base of second dorsal and anal generally darker. Length 135 mm.

Habitat: New Guinea (rivers Timena!, Sekanto!, Bégowri!, Sermowai!, river near Njao!, river Wagami!, river Mimika, Strickland and Goldie river, Sageri); Aru-Islands!

Note. Specimens from the Aru-Islands (*R. senckenbergianus*) seem to be a little more elongate. Height 3.5—3.75, more than 4—4.5 in length with caudal. As the largest specimen known from the Aru-Islands is 92 mm. and considering the well known variability in the height of these fishes, we don't think the difference sufficient to keep them apart.

3. *Centratherina* Tate Regan.

(TATE REGAN, Trans. Zool. Soc. London XX. prt. 6, 1914, p. 283).

Much compressed, elongate. Dorsal profile sloping down in an almost straight line to snout. Ventral profile convex. Head rather pointed, flat above. Upper jaw prominent. The inter-

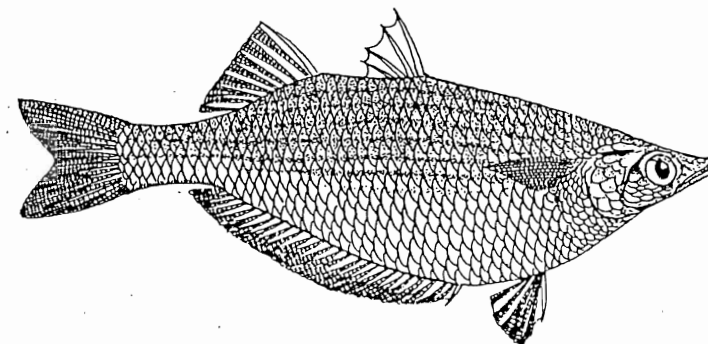


Fig. 81. *Centratherina crassispinosa* (M. Web.) $\times \frac{3}{4}$.

maxillaries are gently curved, without abrupt bent between their horizontal and the lateral part. Lips thickened. Jaws with several rows of pointed teeth, extending to the outside of the

lips. Palate and tongue toothless. First dorsal consisting of 4 or 5 spines, the first of which is by far the stronger. Second dorsal with a spine and 8—11 rays. Anal with a weak spine and 23—26 divided rays. Origin of anal well in advance of that of first dorsal. Ventrals with a slender spine and 5 soft rays, beginning somewhat behind origin of pectorals, which have no spine. Caudal forked. Scales nearly smooth, 40—44 in a row between head and caudal. Lateral line absent. Five (?) branchiostegals.

Distribution: Freshwater of Northern New Guinea.

1. *Centratherina crassispinosa* (M. Web.) [Fig. 81, p. 305].

Rhombattractus crassispinosus Max Weber, Nova Guinea IX. Livr. 4, 1913, p. 567.
Centratherina crassispinosa Tate Regan, Trans. Zool. Soc. London XX. prt. 6, 1914, p. 283.

D¹. IV—V; D². I. 8—12; A. I. 23—26; P. I. 13—14; V. I. 5;
L.l. 40—44; L.tr. 12½—13.

Height 3—3.2, 3.6—4.2 in length with caudal. Head 4—4.3, 4.8—5.2 in length with caudal. Eye 3.3—4, shorter than snout, which is equal to interorbital space but shorter than postorbital part of head. Mouth opening not reaching to front border of eye. Three to four rows of scales on suborbital part of cheeks. Scales on operculum large, excepting the superior ones, which are small. Dorsal separated from occiput by 21—26 scales. First spine of first dorsal stronger than the other ones, as long as, somewhat shorter or longer than that of second dorsal, which is curved and thicker than those of first dorsal and about as long as head without snout or as postorbital part of head. Anal spine much weaker, not much longer than eye. The origin of the anal is 4—6 (in large specimens 2) scales in front of that of dorsal. Pectorals somewhat falciform, as long as head without snout. Scales nearly smooth. Caudal peduncle slender, considerably longer than high. Colour of alcohol specimens light brownish, yellowish below with a silvery hue. Traces of a lateral dark band. Fins hyaline or dusky, upper and lower border of caudal more or less blackish. Length 127 mm.

Habitat: North New Guinea (river Tawarin!, river Ser-mowai!, Kaiserin Augusta-river!).

Fresh water.

4. *Chilatherina* Tate Regan.

(TATE REGAN, Trans. Zool. Soc. London XX. prt 6, 1914, p. 282).

Much compressed, oblong. Dorsal profile strongly elevated and convex in old specimens, less so in young ones. Ventral profile much convex. Head rather pointed. Upper jaw more or less prominent. The intermaxillaries are gently curved, without abrupt bent between the horizontal and the lateral part. Lips more or less thickened, especially the upper lip. Jaws with several rows of pointed teeth, reduced to one row laterally. Teeth on vomer and base of tongue; those on palatines absent or present. First dorsal with a spine and 3—5 soft undivided rays. Second dorsal with one curved spine and 10—16 soft rays. Anal with a weak spine and 22—25 soft rays.

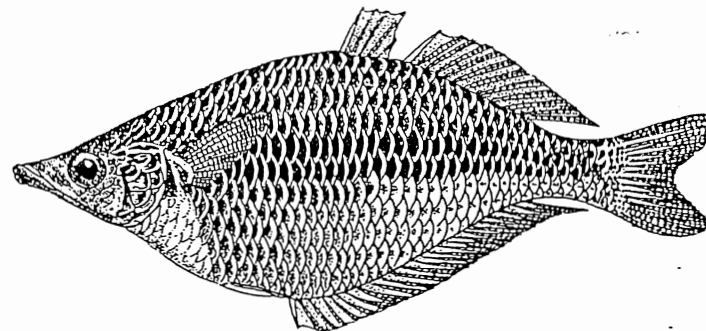


Fig. 82. *Chilatherina sentaniensis* (M. Web.) $\times \frac{9}{10}$.

Origin of anal in advance of that of first dorsal. Ventrals with a slender spine and 5 soft rays, beginning somewhat behind origin of pectorals, which have no spine. Caudal deeply forked. Scales smooth or indistinctly crenulated at their hindmargin; rather small, 40—42 in a row between head and caudal. Lateral line absent or indicated by some scales having a shallow pit. Six branchiostegals. About 14 short gillrakers on the lower part of the anterior arch.

Distribution: Freshwater of Northern New Guinea.

Key to the indo-australian species of
Chilatherina.

1. Head 4.3—5.8. 19—21 scales in front of dorsal. 13—16 soft dorsal rays. *Ch. fasciata* p. 308.
2. Head less than 4. 22—27 scales in front of dorsal. 10—12 soft dorsal rays. *Ch. sentaniensis* p. 309.

1. *Chilatherina fasciata* (M. Web.).

Rhombattractus fasciatus Max Weber, Nova Guinea IX. Livr. 4, 1913, p. 565.
Chilatherina fasciata Tate Regan, Trans. Zool. Soc. London XX. Part 6, 1914,
 p. 282.

D¹. I. 4—5; D². I. 13—16; A. I. 23—25 (26); P. I. 14—15;
 V. 1.5; L.l. 40—42; L.tr. 12—13.

Dorsal profile somewhat convex behind nape; ventral profile strongly convex. Head pointed. Height 3—5.3, 6—6.3 in length with caudal. Head 4.3—5.8, 5.2—7.2 in length with caudal. Eye 3—3.2, somewhat less than interorbital space, which is about equal to snout. Upper jaw prominent. Mouth opening reaching behind middle of length of snout, but not to frontborder of eye. Maxillary not visible when the mouth is closed. Upper lip thickened. Jaws with several series of strong pointed teeth anteriorly, diminishing in number posteriorly, forming a single series on the lateral part of the intermaxillaries and extending outside the mouth on the upper lip and less so on the lower lip. The intermaxillaries are gently curved, not abruptly bent from a horizontal into a lateral oblique part. Small teeth on vomer and on base of tongue. None on palatines. Two, and posteriorly three rows of scales on subocular part of cheeks. Large scales on operculum, smaller ones on its superior part. First dorsal separated by 19—21 scales from occiput. Spine of first dorsal longer than postorbital part of head, longer than that of second dorsal, which is more curved and much longer than that of anal, which is about as long as eye. Length of base of anal considerably longer than distance between origin of first dorsal and end of second dorsal. Origin of anal beginning 2—4 scales before that of first dorsal. Pectorals curved, equal to or longer than head without snout. Scales smooth or indistinctly crenulated at their hindborder. Caudal peduncle much longer than high. Colour of alcohol specimens brownish above, lighter below, with a more or less distinct longitudinal black band and a series of transverse narrow bands, forming about right angles with the longitudinal band in the lower half of the body. These bands are sometimes obsolete. Fins dusky. Length 131 mm.

Habitat: Northern New Guinea (Mamberamo! and Idenburg river!, river Sermowai and its tributaries!, river near Njao!, tributary of Kaiserin Augusta river!).

Fresh water.

2. *Chilatherina sentaniensis* (M. Web.) [Fig. 82, p. 307].

Rhombattractus sentaniensis Max Weber, Nova Guinea V. Livr. 2, 1908, p. 235. —
 Nova Guinea IX. Livr. 4, 1913, p. 564.
Chilatherina sentaniensis Tate Regan, Trans. Zool. Soc. London XX. Part 6,
 1914, p. 282.

D¹. I. 3—4; D². I. 10—12; A. I. 22—24; P. I. 12; V. 1.5;
 L.l. 41—42; L.tr. 13.

Dorsal profile somewhat convex behind nape; ventral profile strongly convex. Head pointed. Height 2.4—3.3, 2.7 to 4 in length with caudal. Head somewhat more or less than 3.5, 3.9—4.3 in length with caudal. Eye 3.5 to nearly 4, nearly 1.5 in snout, which is somewhat longer than interorbital space. Upper jaw slightly prominent. Mouth opening reaching behind middle of length of snout, but not to frontborder of eye. Anterior end of maxillary generally visible, when the mouth is closed. Jaws with several rows of pointed teeth extending anteriorly to the outside of the lips, which are thickened. Small teeth on vomer, palatines and on base of tongue. The intermaxillaries are gently curved, without abrupt bent between their horizontal and the lateral part. Two rows of scales on postocular part of cheeks. Large scales on operculum, smaller ones on its superior part. First dorsal separated by 22—27 scales from occiput. Spine of first dorsal longer than that of second dorsal, much longer than that of anal, which is shorter than eye. Length of base of anal much more than distance between origin of first dorsal and end of second dorsal. Origin of first dorsal about 5—6 scales behind that of anal. Pectorals curved, as long as head without snout. Scales smooth or indistinctly crenulated. Caudal peduncle longer or much longer than high. Colour of alcohol specimens reddish brown above, silvery below, with a more or less distinct longitudinal black band and sometimes with narrow cross-bars on the lower half of the body. Fins blackish. Length 110 mm.

Nom. indig.: Séu (Lake Sentani).

Habitat: North New Guinea (Lake Sentani!, river Sekanto!).

Fresh water.

5. *Glossolepis* M. Weber.

(M. WEBER, Nova Guinea V. Livr. 2, 1908, p. 241).

Much compressed, oblong. The dorsal profile much elevated

behind head, convex, especially in older specimens. Ventral profile convex. Upper jaw very slightly prominent. Intermaxillaries with an abrupt bent between their horizontal and lateral part. Lips not thickened. Mouthopening moderate, not reaching to vertical through frontborder of eye. Jaws with several rows of conical, rounded teeth, which extend somewhat on the lips, especially near symphysis of intermaxillaries. Vomer

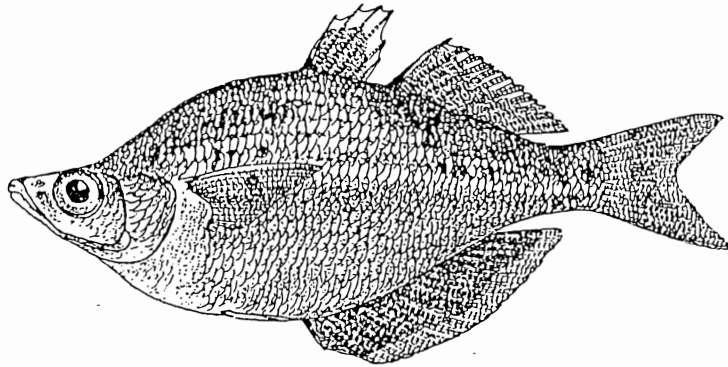
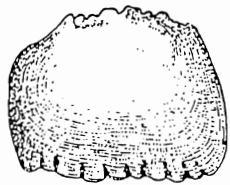


Fig. 83. *Glossolepis incisus* M. Web. n. s.
With figure of a magnified scale.



with a transverse band of teeth. A band of teeth on palatines and on tongue. First dorsal with one strong spine and 3—5 much weaker ones. Second dorsal with a rather long curved spine and 9—10 rays. Anal with a weak spine and 20—23 rays, its origin before that of first dorsal. Ventrals with a slender spine and 5 rays, originating slightly behind origin of pectorals. Pectorals without spine. Caudal deeply forked. Scales irregularly arranged, deeply crenulated along their hindmargin, rather small, 55—60 between head and tail. No lateral line. Six branchiostegals. About 30 rather long and slender gillrakers on the lower part of the anterior arch.

Distribution: Northern New Guinea.

Fresh water.

1. *Glossolepis incisus* M. Web. [Fig. 83, p. 310].

Glossolepis incisus M. Weber, Nova Guinea V. Livr. 2, 1908, p. 241. — Ibid. IX. Livr. 4, 1913, p. 562.

Glossolepis incisus Tate Regan, Trans. Zool. Soc. London XX. prt 6, 1914, p. 281.

D¹. IV—VI; D². I. 9—10; A. I. 20—23; P. 1. 14; V. I. 5; L.l. 55—60; L.tr. circa 17.

Height 2.3—2.8, 2.9—3.4 in length with caudal. Head 3.3—4, 4—5 in length with caudal. Eye 2.5 to more than 3, longer than or equal to snout, which is equal to or somewhat shorter than slightly concave interorbital space and considerably shorter than postorbital part of head. Mouthopening reaching farther back than middle of length of snout. Three rows of scales on subocular part of cheeks. Dorsal separated by 40—42 scales from occiput. First spine of first dorsal longer or shorter than that of second dorsal, longer than or equal to postorbital part of head. Anal spine as long as eye. Origin of first dorsal somewhat behind that of anal. Pectorals somewhat falciform, considerably longer than head without snout. Caudal peduncle much longer than high. Reddish brown, with a silvery hue, fins blackish in their proximal part. Length 145 mm.

Habitat: New Guinea (Lake Sentani!, pond near Humboldt Bay!).

Fresh water.