



Length of head  $4\frac{3}{4}$  to 5, height of body 5 in the total. *Eye*—with a moderately broad posterior adipose lid and a narrow anterior one; diameter  $3\frac{1}{2}$  to  $3\frac{3}{4}$  in length of head,  $\frac{3}{4}$  diam. from end of snout, and  $1\frac{1}{2}$  to  $1\frac{3}{4}$  apart. Interorbital space nearly flat. Extremity of maxilla not concealed by preorbital, which is scaled, angularly bent and serrated. Uncovered space on chin elongate and tongue-shaped. A transverse groove in front of vomer. *Teeth*—small in both jaws. *Fins*—first dorsal spine as long as head behind eyes, and  $\frac{1}{5}$  higher than rays of second dorsal. Second dorsal commences slightly behind origin of anal, and is one third higher than long. First dorsal begins above 10th, second above 20th scale of lateral line. Caudal emarginate. *Scales*—slightly ctenoid, no elongate one in the axilla, or along the base of first dorsal; fine ones over second dorsal, anal, and caudal fins. *Colour*—greyish, shot with purple and silver, becoming lighter on sides and below, each scale has usually a deep central black spot; fins stained with grey.

*Hab.* Bombay and western coast of India, more especially in the cold months; attaining at least 2 feet in length.

#### 1177. (9.) *Mugil kelaartii*.

*Mugil kelaartii*, Günther, *Catal.* iii, p. 429; Day, *Fish. India*, p. 352, pl. lxxv, fig. 1.

*Bhūdavi*, Marāthi.

D. 4 |  $1/8$ . P. 15. A.  $3/9$ . C. 17. L. 1. 33. L. tr. 10.

Length of head  $4\frac{1}{2}$  to 5, height of body  $4\frac{1}{2}$  to 5 in the total length. *Eye*—with narrow posterior and anterior adipose lids; diameter 4 in length of head, nearly 1 diam. from end of snout, and  $1\frac{2}{3}$  apart. Interorbital space convex. Profile from occiput to snout rather convex. Preorbital bent, having a slight notch, serrated inferiorly and posteriorly, and leaving the extremity of the bent maxilla visible. Uncovered portion of chin long, narrow, lanceolate, and constricted on either side about its middle. A shallow groove before vomer. *Teeth*—minute in the upper jaw. *Fins*—dorsal spines of moderate strength, longest  $\frac{2}{5}$  length of head, and nearly as high as second dorsal; base of second dorsal equals  $\frac{2}{5}$  height. Origin of first and second dorsals above 10th and 20th scales of lateral line respectively. Pectoral inserted above middle of depth of body. Anal has its anterior  $\frac{1}{3}$  in advance of origin of second dorsal. Caudal emarginate. *Scales*—an elongate pointed one in the axilla; second dorsal, anal, and caudal densely scaled. *Colour*—silvery, becoming lighter on sides and beneath, a darkish spot in axilla; tips of dorsals and caudal dark.

*Hab.* Seas of India, Philippines.

#### 1178. (10.) *Mugil jerdoni*.

*Mugil jerdoni*, Day, *Fish. India*, p. 352 (see synonym.).





/8. P. 16. A.  $3\frac{9}{10}$ . C. 15. L. 1. 31-32. L. tr. 10.

Length of head 5 to  $5\frac{1}{2}$ , height of body 5 in the total length. *Eye*—with a broad posterior and narrow anterior adipose lid; diameter  $3\frac{1}{2}$  in length of head,  $\frac{1}{2}$  diam. from end of snout, and  $1\frac{1}{2}$  apart. Interorbital space slightly convex. Preorbital strongly bent and serrated, leaving the end of the bent maxilla visible. Uncovered space at chin narrow, rounded anteriorly, pointed posteriorly. A slight groove in front of vomer. *Teeth*—distinct in upper jaw. *Fins*—dorsal spines stout, longest  $\frac{2}{3}$  height of body, and slightly higher than second dorsal. First and second dorsal arise over 10th and 19th scales of lateral line respectively. Pectoral inserted above middle of depth of body. Anal of same height as second dorsal, its anterior  $\frac{1}{2}$  is before the origin of that fin; third anal spine  $\frac{3}{4}$  to  $\frac{2}{3}$  length of head. *Scales*—no elongate axillary scale; second dorsal, anal, and caudal densely scaled. *Colour*—steel-blue along back, silvery white on sides and below; cheeks tinged yellow, a black spot over centre of eye. Both dorsals with their extremities rather stained with grey, caudal and pectoral dark-edged; sometimes a diffused dark-bluish spot on opercle; ventrals and anal white.

*Hab.* Seas of India; growing to at least 6 inches in length.

1179. (11.) *Mugil dussumieri*.

*Mugil dussumieri*, *Cuv. & Val. H. N. Poiss.* xi, p. 147; *Day, Fish. India*, p. 352, pl. lxxiv, fig. 4 (see synonym.).

*Korul*, Chittagong; *Nga-kam-byen*, Arracanese; *Nga-kaboolee*, Burmese.

D. 4 | 1/8. P. 16. A.  $3\frac{9}{10}$ . C. 15. L. 1. 29-31. L. tr. 11.

Length of head 5 to  $5\frac{1}{4}$ , height of body  $4\frac{1}{2}$  to 5 in the total length. *Eyes*—with a broad posterior and narrow anterior adipose lid; diameter 4 to  $4\frac{1}{4}$  in length of head,  $\frac{3}{4}$  to 1 diam. from end of snout, and 2 apart. The profile from first dorsal to the snout nearly straight. Preorbital scaled, bent, emarginate, and denticulated both below and behind; end of maxilla not concealed. The uncovered space on the chin is lanceolate. *Teeth*—distinct in upper jaw. *Fins*—dorsal spines strong, the first the longest, equalling length of head behind middle of eye, and rather higher than second dorsal. The two dorsals arise above 9th and 20th scales of lateral line. Pectoral inserted above middle of body, and reaching to seventh scale of lateral line. Half of anal vertically before commencement of second dorsal; third anal spine  $\frac{3}{8}$  length of head. Caudal emarginate. *Scales*—no enlarged elongate one in the axilla, but one at base of first dorsal and ventral fins; second dorsal, anal, and caudal densely scaled. *Colour*—dull greenish above, becoming lighter on sides and beneath; outer edge of caudal dark.

*Hab.* Seas of India, entering fresh water.



1180. (12.) *Mugil subviridis*.

*Mugil subviridis*, Cuv. & Val. H. N. Poiss. xi, p. 115; Day, India, p. 353.

D. 4 | 1/8. P. 16. A. 3/9. C. 15. L. 1. 30. L. tr. 11.

Length of head 5, of caudal fin  $6\frac{1}{2}$ , height of body  $4\frac{2}{3}$  in the total length. *Eyes*—with a broad posterior and narrow anterior adipose lid; diameter of eye 4 in length of head,  $\frac{3}{4}$  diam. from end of snout, and  $1\frac{1}{4}$  apart. Preorbital strongly bent and serrated, end of maxilla visible. Uncovered space below chin narrow and lanceolate. *Teeth*—absent. *Fins*—10th and 20th scales of lateral line correspond to origins of first and second dorsals. Pectoral reaches to seventh scale of lateral line. *Scales*—exposed portion angular. Second dorsal and anal densely scaled. No elongate axillary scale. *Colour*—as in *M. dussumieri*.

*Hab.* The type specimen of Cuvier and Valenciennes described above was from the Ganges.

1181. (13.) *Mugil oeur*. (Fig. 114.)

*Mugil oeur*, Forsk. Descr. Anim. p. 74, no. 109 c.

*Mugil oeur*, Day, Fish. India, p. 353, pl. lxxv, fig. 3, Suppl. p. 800 (see synon.).

D. 4 | 1/8. P. 15. A. 3/8. C. 15. L. 1. 42-44. L. tr. 14.

Length of head  $4\frac{1}{2}$  to  $4\frac{2}{3}$ , height of body  $5\frac{1}{3}$  to  $5\frac{2}{3}$  in the total length. *Eyes*—with broad anterior and posterior adipose lids, both reaching pupil; diameter  $4\frac{2}{3}$  in length of head, 1 diam. from end of snout, and  $2\frac{1}{3}$  apart. Interorbital space flat; dorsal profile from snout to base of first dorsal nearly straight. Upper lip thin. Mandibles have two small open glands beneath. Uncovered space on chin rather broad and rounded anteriorly, narrow and lanceolate pos-

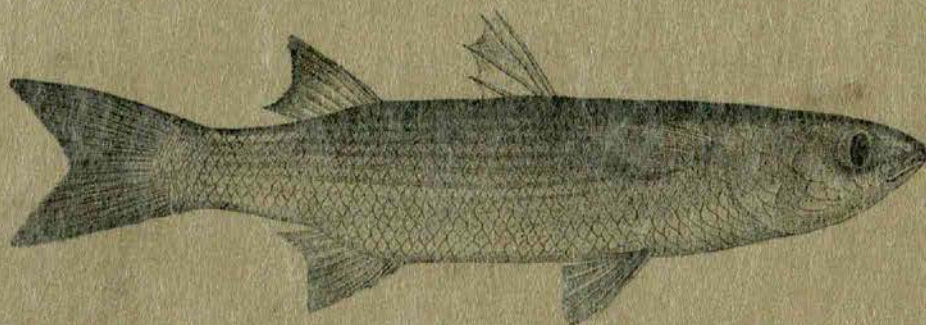


Fig. 114.—*Mugil oeur*.

teriorly. *Teeth*—distinct in both jaws. *Fins*—the first and second dorsal fins commence above the 12th and 25th scales of lateral line; first dorsal spine as long as head behind eye, slightly exceeding height of second dorsal. Pectoral situated above middle of body and extending to 11th scale of lateral line. Anal arises opposite second dorsal and is of equal height, but its base is slightly longer; both





fines of the pectoral. Caudal with pointed lobes. Scales—rounded, a ray on the pointed axillary one and another along base of first dorsal. None on second dorsal and anal. Colour—greyish all over, silvery on sides and beneath, a dark line along each side of the body in upper half of body. Cheeks golden. Pectoral fin with an oblique deep blue band across the base, outer third dark with a light margin. Second dorsal and caudal grey; anal yellowish with a dark mark along its centre, and a light edge. Some specimens have a black edge to caudal fin.

*Hab.* Red Sea, seas of India to China and Japan; attaining at least 3 feet in length.

#### 1182. (14.) *Mugil corsula*.

*Mugil corsula*, *Ham. Buch. Fish. Ganges*, pp. 221, 381, pl. ix, fig. 97; *Day, Fish. India*, p. 354, pl. lxxi, fig. 6 (see synon.).

*Kakunda*, Oorish; *Hurd-wah-re*, Panj.; *Corsula* and *In-ge-lee*, Beng.; *Undala*, Hind.; *Nga-sheng*, Burmese.

D. 4. | 1/7-8. A. 3/9. C. 15. L. 1. 48-52. L. tr. 15. Cæc. pyl. 2.

Length of head  $4\frac{1}{2}$  to  $4\frac{3}{4}$ , height of body 6 to  $6\frac{1}{2}$  in the total length. Eyes—without adipose lids, elevated, their upper margin being above the level of the flat, interorbital space; diameter 7 in length of head, 1 diam. from end of snout, and 1 to  $1\frac{1}{2}$  apart. Head depressed, dorsal profile nearly straight; upper jaw the longer and overhung by snout. Upper lip thick. Teeth—a single row in either jaw. Fins—first dorsal commences above 16th scale of lateral line, second above 34th; spines about  $\frac{1}{2}$  as long as head excluding the snout; first seven anal rays anterior to second dorsal. Caudal slightly emarginate. Scales—finely ctenoid, a slightly raised line along middle of each; a few on second dorsal, anal, and caudal fins. No elongate axillary scale. Colour—dull brown superiorly, lighter along abdomen; dorsal and caudal fins stained with grey. Eyes golden. Peritoneum black.

These fish swim with their eyes just above the surface of the water, giving the appearance of a number of tadpoles. Immediately they are disturbed they dive down with great rapidity.

*Hab.* Rivers and estuaries of Bengal and Burma, found far above tidal influence in fresh water; attaining 18 inches or more in length, and excellent eating.

#### 1183. (15.) *Mugil hamiltonii*.

*Mugil hamiltonii*, *Day, P. Z. S.* 1869, p. 614; *Fish. India*, p. 354, pl. lxxv, fig. 5.

D. 4 | 1/8. P. 13. A. 3/9. C. 15. L. 1. 44. L. tr. 18.

Length of head  $4\frac{1}{4}$  to  $4\frac{1}{2}$ , height of body  $4\frac{1}{2}$  to 5 in the total length. Eyes—without adipose lids; diameter  $3\frac{1}{2}$  to 4 in length of head, 1 diam. from end of snout, and  $1\frac{1}{3}$  apart. Interorbital space slightly convex; preorbital not notched but strongly denticulated.





Uncovered space on chin very narrow and lanceolate with a strong spine. *Teeth*—none visible. *Fin.* 1 arises above 17th scale of lateral line, longest spine of head behind middle of eye; second dorsal as high commences over anterior third of anal. Caudal rather lunate. *Scales*—strongly ctenoid, with a raised line along each, no enlarged one in axilla; 34 rows between snout and base of first dorsal, a few on vertical fins. *Colour*—silvery, shot with gold, leaden along upper half of body.

*Hab.* Rivers of Burma; attaining to about  $4\frac{1}{2}$  inches in length.

#### 1184. (16.) *Mugil seheli*.

*Mugil seheli*, *Forsk. Deser. Anim.* p. 73, no. 109 b; *Day, Fish. India*, p. 355 (see synonym.).

*Magi*, Oorah.

D. 4 | 1/8. P. 15. A. 3/9. C. 16. L. 1. 42-43. L. tr. 13-14.

Length of head  $4\frac{2}{3}$  to 5 ( $6\frac{1}{8}$ ), height of body  $4\frac{2}{3}$  to  $5\frac{1}{2}$  in the total length. *Eyes*—without adipose lids; diameter  $3\frac{1}{2}$  to 4 in length of head,  $\frac{1}{2}$  diam. from end of snout, and  $1\frac{1}{2}$  to 2 apart. *Fins*—first dorsal not quite so high as second, which is a little lower than anal. The two dorsals commence over 12th and 24th scales of lat. line. Anal commences slightly before second dorsal. Caudal emarginate. *Scales*—21 or 22 between snout and base of first dorsal; soft dorsal and anal scaly. A long axillary scale. *Colour*—silvery, bluish-green tinge along head and back; a black mark in axilla. Ventrals white.

*Hab.* From Red Sea through seas of India to the Malay Archipelago; attaining at least a foot in length.

#### 1185. (17.) *Mugil crenilabris*.

*Mugil crenilabris*, *Forsk. Deser. Anim.* p. 73, no. 109; *Day, Fish. India*, p. 355, *Suppl.* p. 800 (see synonym.).

D. 4 | 1/8. P. 17. A. 3/9. C. 16. L. 1. 41. L. tr. 13.

Length of head  $4\frac{2}{3}$  to 5, height of body  $4\frac{2}{3}$  to 5 in the total length. *Eyes*—without adipose lids; diameter  $3\frac{1}{2}$  in length of head,  $\frac{3}{4}$  diam. from end of snout, and  $1\frac{3}{4}$  apart. Profile from upper edge of snout to base of first dorsal nearly straight; snout obtuse, projecting beyond mouth. Upper lip very thick, forming the end of the snout, and having about five rows of soft tubercles along its lower fourth, the inferior branched at their extremities; lower lip thick, reflected, deficient opposite the notched symphysis, thickly studded with tubercles along its upper exposed surface. Free space beneath chin narrow. *Teeth*—none visible. *Fins*—first dorsal spines not strong, and  $\frac{3}{4}$  height of second dorsal. The two dorsals arise above 13th and 24th scales of lat. line respectively. Pectoral reaches to fifteenth scale of lateral line and is inserted above middle of depth of body. Anal arises opposite second dorsal and is of same height.





Caudal deeply forked. Scales—second dorsal, anal, and base of caudal scaled. No enlarged axillary scale. Colour—greenish brown along back, dull white on sides and below. A black spot at upper base of pectoral.

*Hab.* Red Sea to the Andamans and Nicobars. I captured one specimen  $4\frac{1}{2}$  inches in length at the Andamans.

1186. (18.) *Mugil cascasia*.

*Mugil cascasia*, *Ham. Buch. Fish. Ganges*, pp. 217, 380; *Day, Fish. India*, p. 355, pl. lxxv, fig. 6 (see *synon.*).

*Cuck-se* or *Buah*, *Punj.*

D. 4 | 1/8. A. 3/8-9. L. 1. 36-39. L. tr. 16-18. C. p. 2 (short).

Length of head  $4\frac{1}{2}$ , height of body  $4\frac{1}{2}$  to  $5\frac{1}{4}$  in the total length. *Eyes*—without adipose lids; diameter  $3\frac{1}{2}$  to 4 in length of head,  $\frac{3}{4}$  to 1 diam. from end of snout, and  $1\frac{1}{2}$  apart. Head flat above; mandibular angle very obtuse. Upper lip placed obliquely so that it does not form part of front of snout. Preorbital large, slightly bent, serrated along lower margin and with three denticulations at posterior extremity. Opercle with a strong spine. Uncovered space on chin somewhat lanceolate. *Teeth*—minute, but present in both jaws. *Fins*—first dorsal begins above 7th scale of lateral line, second above 24th; sixteen scales between first dorsal and snout; second spine the longest, equalling length of head excluding snout and one third higher than second dorsal. Second dorsal arises opposite anal. Pectoral in middle of depth of body, and having a short, angular, somewhat large but not elongate axillary scale. Caudal lunate. Scales—very strongly ctenoid, a few over bases of vertical fins. Colour—yellowish olive along top of head, greyish on back and upper third of side, with many fine black dots; silvery white in lower two thirds. Uncovered space on chin, eyes, base of pectoral, and centre of base of caudal gamboge-yellow; cheeks silvery; fins uncoloured.

*Hab.* Upper waters of Ganges and Jumna, as low down as Patna; also in the Indus and Brahmapootra. This species does not appear to exceed 4 inches in length, and is considered very bad eating.

1187. (19.) *Mugil cæruleo-maculatus*.

*Mugil cæruleo-maculatus*, *Lacép. H. N. Poiss.* v, pp. 385, 389; *Day, Fish. India*, p. 356 (see *synon.*).

D. 4 | 1/8. P. 17. A. 3/9. C. 14. L. 1. 38. L. tr. 12.

Length of head 5 to  $5\frac{2}{5}$ , height of body  $4\frac{1}{4}$  to  $4\frac{2}{3}$  in the total length. *Eyes*—without adipose lids; diameter 4 in length of head, nearly 1 diam. from end of snout, and 2 apart. Interorbital space slightly convex, its width about  $\frac{1}{2}$  length of head. Upper lip thick, placed obliquely so that it does not form part of front end of snout. Preorbital not notched, serrated posteriorly; maxilla





hidden. Uncovered portion of chin very narrow; a deep groove across the palate in front of the vomer. *Teeth*—minute. *Fins*—first dorsal commences midway between the snout and base of caudal; spines stout, not quite so high as second dorsal, but equaling length of postorbital portion of head; second dorsal commences opposite anal, they are of equal height and scaled. First and second dorsal arise over 12th and 24th scales of lat. line respectively. Caudal lunate. *Scales*—cycloid. An elongate, pointed scale in the axilla. *Colour*—silvery, light on sides and beneath; a black spot at upper edge of base of pectoral.

*Hab.* Mauritius, and from Bombay through the seas of India to the Malay Archipelago. At the Andamans I have taken this fish up to 13 inches in length, but it is said to grow very much larger.

#### 1188. (20.) *Mugil amarulus*.

*Mugil amarulus*, Cuv. & Val. H. N. Poiss. xi, p. 133; Day, *Fish. India*, p. 356.

D. 4 | 1/8. P. 16. A. 3/9. C. 15. L. 1. 36. L. tr. 12.

Length of head  $4\frac{1}{4}$ , of caudal fin  $4\frac{1}{2}$ , height of body  $4\frac{1}{4}$  in the total length. *Eyes*—without adipose lids; diameter 4 in length of head, 1 diam. from end of snout, and  $1\frac{1}{4}$  apart. Preorbital strongly bent and serrated, end of maxilla visible; the mandibles form rather an obtuse angle, are notched at their point of junction, and have a distinct knob. Upper lip moderately thick, placed obliquely so as not to form end of snout. Uncovered space below the chin narrow, and constricted in its middle. A groove before vomer. *Teeth*—minute in lower jaw. *Fins*—dorsal spines weak, the fin commences midway between front edge of the eye and base of caudal fin, length of spines equals postorbital portion of head; second dorsal rather higher. First and second dorsals commence over 11th and 24th scales of lat. line respectively. Pectoral inserted above middle of body. Anal arises slightly in advance of second dorsal, than which it is rather higher. Caudal lunate. *Scales*—a short pointed one in axilla; 18 rows between the snout and base of first dorsal. Second dorsal and anal thickly scaled. *Colour*—bluish above, light on the sides and beneath, a dark spot at upper edge of base of pectoral; cheeks with a golden tinge; caudal with a dark outer edge.

*Hab.* Seas of India to Java.

#### 1189. (21.) *Mugil labiosus*.

*Mugil labiosus*, Cuv. & Val. H. N. Poiss. xi, p. 125; Day, *Fish. India*, p. 357 (see synonym.).

D. 4 | 1/8. P. 15. A. 3/9. C. 15. L. 1. 36. L. tr. 11–12.

Length of head  $4\frac{1}{2}$  to 5, of caudal fin  $5\frac{1}{4}$ , height of body  $4\frac{1}{2}$  in the total length. *Eyes*—without adipose lids, diameter 3 in length of head,  $\frac{3}{4}$  diam. from end of snout, and  $1\frac{1}{2}$  apart. Interorbital space flat. Profile from snout to dorsal fin rather steep. Pre-





orbital with a very large and deep notch on its anterior surface; smooth except its posterior extremity, which is serrated; extremity of maxilla visible. Free space below chin long, narrow, lanceolate, and with a row of glands along either side. Upper lip forming end of snout, thick and fringed; lower lip also thick and fringed, except opposite symphysis; these fringes decrease with age. On lower surface of head is a triangular scaleless spot, the base formed by the lower jaw, the apex below middle of eyes. *Teeth*—absent. *Fins*—first dorsal commences midway between hind edge of eye and base of caudal fin and over 12th scale of lat. line, second over 24th scale; second dorsal rather lower than first, commencing over middle of anal. Pectoral reaches to eleventh scale. Caudal emarginate. *Scales*—cycloid, densely covering vertical fins; 22 rows between snout and base of first dorsal. *Colour*—dark grey above, dull white on sides and beneath; a dark black spot at base of pectoral.

*Hab.* Red Sea, seas of India and the Malay Archipelago. Specimens from  $3\frac{1}{4}$  to  $4\frac{3}{4}$  inches in length were taken at the Andamans. The fringes to the lips existing in my small specimen appear to be absent in adults.

1190. (22.) *Mugil borneensis*. (Fig. 115.)

*Mugil borneensis*, Bleeker, *Batavia Nat. Tijdsch.* ii, 1851, p. 201; Day, *Fish. India*, p. 357, pl. lxxvi, fig. 1 (see synonym.).

D. 4 | 1/8. P. 15. A. 3/9. C. 17. L. 1. 33-34. L. tr. 10-11.

Length of head  $4\frac{1}{2}$  to  $4\frac{2}{3}$ , of caudal fin 5, height of body  $4\frac{1}{2}$  to  $4\frac{3}{4}$  in the total length. *Eyes*—without adipose lids; diameter  $3\frac{1}{4}$  to 4 in length of head,  $\frac{3}{4}$  to 1 diam. from end of snout, and  $1\frac{1}{2}$  apart. Preorbital scaled, slightly emarginate, serrated inferiorly, posteriorly it is truncated and denticulated; extremity of maxilla visible.

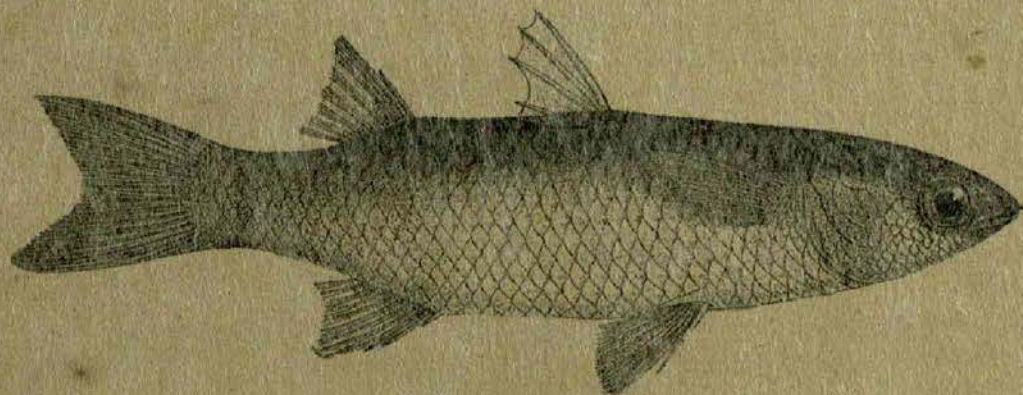


Fig. 115.—*Mugil borneensis*.

Upper lip moderately thick, forming part of anterior profile; lower lip not notched above symphysis but with a tubercle. The mandibles join at rather an acute angle; the uncovered space below the chin narrow and lanceolate. A groove before vomer. *Teeth*—fine ones in upper jaw. *Fins*—first dorsal commences midway





between front edge of eye and base of caudal fin and over 11th scale of lat. line, second over 23rd scale; first dorsal not quite so high as second, first spine strongest, as high as second and equal to length of head behind middle of eye. Height of second dorsal nearly double length of base. First third of anal anterior to second dorsal; two fins equally high, base of anal much longer (in some of Dr. Bleeker's specimens first two thirds of anal are anterior to origin of second dorsal). Caudal lunate. Scales—with their exposed portion rounded, 21 rows between snout and first dorsal. A short, scarcely pointed scale in axilla. Second dorsal and anal with fine scales. Colour—silvery, both dorsals and caudal with dark outer edges.

*Hab.* Seas of India, Calcutta to the Malay Archipelago.

1191. (23.) *Mugil olivaceus*.

*Mugil olivaceus*, Day, *Fish. India*, p. 357.

D. 4 | 1/8. A. 3/9. C. 17. L. 1. 34. L. tr. 11. Cæc. pyl. 4.

Length of head  $5\frac{1}{4}$ , of caudal fin 5, height of body  $4\frac{2}{3}$  in the total length. Eyes—without adipose lids; diameter 4 in length of head, nearly 1 diam. from end of snout, and  $1\frac{3}{4}$  apart. Preorbital slightly emarginate, truncated posteriorly, and serrated; end of maxilla visible. Upper lip moderately thick and forming end of snout. Lower lip notched; a tubercle above symphysis of lower jaw. Uncovered space below chin rather narrow and lanceolate. No groove before vomer. Teeth—in upper jaw. Fins—first dorsal arising rather nearer base of caudal fin than end of snout, as high as second dorsal or as length of head behind middle of eyes; second dorsal about twice as high as its base is long. First and second dorsals arising over 11th and 22nd scales of lat. line respectively. Anal  $\frac{3}{4}$  as long as high, with its first  $\frac{3}{4}$  in advance of second dorsal, which it equals in height. Caudal emarginate. Scales—exposed portions forming half an irregular hexagon, 21 rows between snout and base of dorsal fin. Scales on second dorsal and anal. A short angular scale in axilla. Colour—olive along back, lighter on sides and beneath; a dull blotch in axilla; second dorsal and caudal dark externally, anal white.

*Hab.* Seas of India, ascending rivers.

1192. (24.) *Mugil buechanani*.

*Mugil buechanani*, Bleeker, *Batav. Genootsch. Verhand.* xxv, *Beng. en Hind.* p. 99; Day, *Fish. India*, p. 358 (see synonym.).

D. 4 | 1/8. P. 15. A. 3/9. C. 14. L. 1. 32-35. L. tr. 11-12.

Length of head  $4\frac{2}{3}$ , of caudal fin  $4\frac{1}{5}$ , height of body  $4\frac{2}{3}$  in the total length. Eyes—without adipose lids; diameter 4 in length of head,  $\frac{3}{4}$  diam. from end of snout. Profile from dorsal fin to snout descends in a curve; interorbital space slightly convex. Snout obtuse; upper lip thin and forming end of snout. Preorbital with a slight notch, its extremity rounded and denticulated; end of





maxilla slightly or not at all concealed. The mandibles form an obtuse angle. Uncovered space below chin very narrow. *Fins*—first dorsal somewhat nearer base of caudal than end of snout, its spines equal length of postorbital portion of head and are one third shorter than rays; second dorsal twice as high as long, it and the anal arise opposite each other and are of equal height. First and second dorsals arise over 8th and 19th scales of lat. line respectively. Pectoral inserted above middle of body, it reaches ninth scale of lateral line. Caudal deeply forked. *Scales*—not angular, 19 rows between snout and base of first dorsal. Second dorsal and anal scaled. A short, pointed axillary scale. *Colour*—greenish above, silvery on sides and beneath, a dark spot at upper base of pectoral.

*Hab.* East coast of Africa and seas of India, ascending rivers, and attaining above a foot in length.

#### 1193. (25.) *Mugil troschelii*.

*Mugil troschelii*, Bleeker, *Batavia Nat. Tijdsch.* xvi, p. 277; *Day, Fish. India*, p. 358 (see synonym.).

D. 4 | 1/8. A. 3/9. C. 15. L. 1. 31-33. L. tr. 11. Cæc. pyl. 4.

Length of head  $4\frac{2}{3}$  to 5, of caudal fin 5 to  $5\frac{1}{3}$ , height of body  $4\frac{2}{3}$  to 5 in the total length. *Eyes*—without adipose lids; diameter  $3\frac{1}{2}$  in length of head, nearly 1 diam. from end of snout, and  $1\frac{1}{2}$  apart. Interorbital space nearly flat. Preorbital scaled, emarginate, and strongly notched along its lower and posterior edges; maxilla bent, and its end covered. Upper lip moderately thick and forming end of snout. Mandibles form an obtuse angle. Uncovered space below chin narrow, elongate, and constricted anteriorly, and constricted along sides. *Teeth*—distinct in upper jaw—first dorsal arises midway between front edge of eye and base of caudal fin, its spines rather strong, three fifths length of head, and as high as second dorsal. Second dorsal twice as high as long, emarginate. First dorsal arises over 9th, second over 18th scale of lat. line. Anal has its anterior third or half in front of base of second dorsal, it is one fourth higher than its base is long, lower edge emarginate. Caudal lunate. *Scales*—18 or 19 rows between snout and base of first dorsal. Second dorsal and anal scaled. A short scale in axilla. *Colour*—silvery, sometimes a darkish spot at upper edge of base of pectoral fin.

*Hab.* Seas of India to the Malay Archipelago.

#### 1194. (26.) *Mugil oligolepis*.

*Mugil oligolepis*, Bleeker, *Batavia Nat. Tijdsch.* xvi, p. 275; *Day, Fish. India*, p. 358, pl. lxxvi, fig. 2 (see synonym.).

D. 4 | 1/8. A. 3/9. C. 16. L. 1. 26-28. L. tr. 10.

Length of head  $4\frac{2}{3}$ , height of body  $3\frac{2}{3}$  in the total length. *Eyes*—without adipose lids; diameter  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout, and  $1\frac{1}{2}$  apart. Interorbital space nearly flat.





Dorsal profile from above pectoral to snout rather steep. Pre-orbital strongly bent, but scarcely notched, serrated at posterior extremity; end of maxilla just visible. Upper lip thin. *Teeth*—not visible. *Fins*—first dorsal spine as long as head excluding snout, rather higher than second dorsal. Second dorsal one third higher than long, it commences behind first third of anal, the latter is higher than second dorsal; 9th and 17th scales of lateral line correspond with origins of the two dorsal fins. Caudal emarginate. *Scales*—none enlarged in axilla. *Colour*—silvery.

*Hab.* Seas and estuaries of India to the Malay Archipelago.

1195. (27.) *Mugil waigiensis*.

*Mugil waigiensis*, Quoy & Gaim. *Voy. Uranie et Phys.*, Poiss. p. 337, pl. 59, fig. 2; Day, *Fish. India*, p. 359, pl. lxxiii, fig. 4 (see synonym.).

*Peddaraki soveré*, Tel.

D. 4 | 1/7-8. A. 3/8. L. 1. 26-27. L. tr. 9. Cæc. pyl. 10. Vert. 11/13.

Length of head  $4\frac{2}{3}$  to 5, height of body 5 to  $5\frac{1}{4}$  in the total length. *Eyes*—without adipose lids; diameter  $4\frac{1}{4}$  to  $4\frac{1}{2}$  in length of head, 1 to  $1\frac{1}{4}$  diam. from end of snout, and 2 apart. General appearance short and stout with a depressed head. Snout obtuse; the mandibles form a very obtuse angle. Preorbital bent, not notched, but strongly serrated; lower extremity of maxilla visible. *Teeth*—fine ones in upper jaw. *Fins*—dorsal spines stout, second longest and nearly half height of body, but only two thirds as high as second dorsal; origins of first and second dorsal fins correspond to 8th and 17th scales of lateral line. Anal third of anal before origin of dorsal fin, the two fins of equal height. Caudal slightly emarginate. *Scales*—some minutely ctenoid, they are arranged over the vertical fins; no distinctly elongate one in the axilla. Cæcal appendages bifurcate. *Colour*—brownish above, dull white below, a dark streak along each row of scales; fins generally deep black.

*Hab.* Red Sea, seas of India to the Malay Archipelago, China, and beyond. This species ascends rivers during the rainy season as high as the tides reach; attains a foot or more in length, and is good eating.

Family XXXVII. AULOSTOMATIDÆ.

*Fistulariæ*, pt., Müll.; *Aulostomatoidei*, pt., Bleeker.

Branchiostegals five to seven; pseudobranchiæ. Gills four. Body very elongate; the anterior bones of the skull produced, forming a long tube, having a small mouth at its anterior extremity. Teeth small. Spinous dorsal, when present, formed of isolated spines; soft dorsal and anal of moderate length; ventrals abdominal, with six rays, no spine, and separated from the pubic bones,





which are attached to the humeral arch. Scales small or none, but parts of the skeleton or dermal productions may take the form of external plates. Air-bladder large. Pyloric appendages few. Vertebrae numerous.

*Geographical Distribution.* Tropical and subtropical coasts of Atlantic, Indian, and Pacific Oceans.

1. Genus **FISTULARIA**, Linn.

Syn. *Solenostomus*, sp., Klein & Gronov.; *Cannorhynchus*, Cantor.

Branchiostegals seven. Mouth slightly cleft. Dorsal and anal fins composed entirely of undivided rays; caudal forked, with one or two of its median rays very elongate and filiform. No scales, but some bony casing behind the head above and below.

*Geographical Distribution.* Tropical Atlantic and Indian Oceans.

1196. (1.) **Fistularia serrata**. (Fig. 116.)

*Fistularia serrata*, Cuv. *Règn. Anim.* 1817, ii, p. 349; Day, *Fish. India*, p. 360, pl. lxxvi, fig. 3 (see synon.).

*Gorum*, Tel.; *Tol*, Marāthi.

D. 13-15. P. 13. V. 1/5. A. 14-15. - C. 10/1/10.

Length of head  $2\frac{1}{2}$  in total to end of tail (excluding the filament). *Eyes*— $1\frac{1}{2}$  to  $1\frac{3}{4}$  diameters in postorbital length of head.

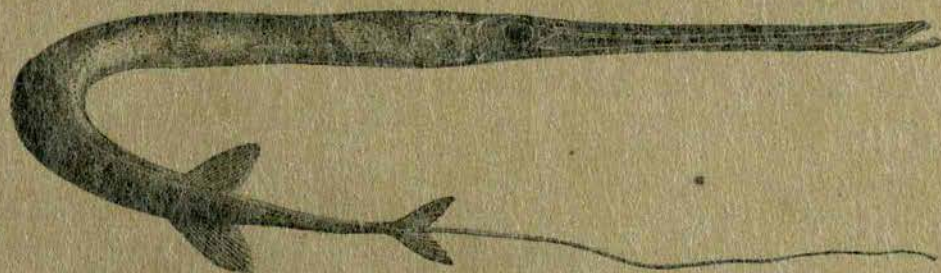


Fig. 116.—*Fistularia serrata*.

A serrated ridge from anterior upper angle of eye to nostril, and continued along the outer margin of the snout, decreasing in strength and finally ceasing about the middle of its length. *Fins*—the rays undivided. *Colour*—brown, dirty white beneath; occasionally light spots on back and sides.

*Hab.* East coast of Africa, seas of India, Malay Archipelago, China, and New Holland. At the Andaman Islands I found this fish frequenting the most muddy localities; it is common at Madras.





## Family XXXVIII. CENTRISCIDÆ.

*Fistularia*, pt., Müller; *Amphisiloidei*, pt., Bleeker.

Branchiostegals three or four; pseudobranchiæ. Gills four. Anterior bones of the skull produced, forming a long tube, having a small mouth at its anterior extremity. Teeth absent. Two dorsal fins, the first short and having one of its spines strong; the soft dorsal and anal of moderate extent; ventrals abdominal, spineless, and rudimentary. Scales, if present, small; the body usually covered with a cuirass or with ossifications which are not confluent. Air-bladder large. Pyloric appendages absent. Vertebrae few.

*Geographical Distribution.* Atlantic, Mediterranean, and Indo-Pacific.

1. Genus **AMPHISILE** (Klein), Cuv.

Branchiostegals three or four; pseudobranchiæ. Gill-openings of moderate width. Body elongate and strongly compressed. A dorsal cuirass formed by portions of the skeleton. Two dorsal fins situated far back; ventrals rudimentary.

*Geographical Distribution.* Indo-Pacific Ocean.

1197. (1.) *Amphisile scutata*. (Fig. 117.)

*Centriscus scutatus*, Linn. *Syst. Nat.* i, p. 415.

*Amphisile scutata*, Day, *Fish. India*, p. 361, pl. lxxvi, fig. 5 (see *synon.*).

*Moasa*, Arab.

B. iii. D. 3 | 10-12. P. 10. V. 3. A. 12. C. 10. Vert. 6/14.

Length of head  $3\frac{1}{4}$ , height of body 7 in the total length. *Eyes*— $1\frac{1}{2}$  diameters in postorbital length of head; interorbital space concave. Body strongly compressed. The dermal skeleton ends behind in a long spine, close beneath which are the three spines



Fig. 117.—*Amphisile scutata*.

of the first dorsal fin; below these again is the second dorsal, whilst the caudal appears on the lower surface of the body just behind the anal. Ventrals rudimentary and situated on the cutting abdominal edge. *Colour*—whitish, shot with pink.

Seas of India to China.





## Family XXXIX. OPHIOCEPHALIDÆ.

*Labyrinthici*, pt., Cuv.

Branchiostegals five; pseudobranchiæ absent. Gills four. Body elongate, subcylindrical anteriorly; head depressed, having superiorly somewhat plate-like scales. Eyes lateral. Gill-openings wide, the membranes of the two sides connected beneath the isthmus. A cavity exists above and accessory to the true gill opening, but although some thin bony laminae are present, no suprabranchial organ is developed. Teeth in the jaws, vomer, and palate. A single, long, spineless dorsal fin, and a similar though shorter anal. Ventrals thoracic or absent; when present consisting of six rays, the outer of which is unbranched and sometimes articulated at its extremity. Lateral line abruptly curved or almost interrupted. Air-bladder present. Pyloric appendages, when present, few.

The *Ophiocephalidæ*, having hollow cavities in their heads, and an amphibious mode of respiration, are able to exist for lengthened periods out of their native element, and can travel some distance over the ground, especially when it is moist. They are able to progress in a serpentine manner, chiefly by means of their pectoral and caudal fins, first one of the former being advanced, and then its fellow.

These fishes appear to be monogamous, some breeding in grassy swamps or the edges of tanks, some in wells or stone-margined receptacles for water, and others again in holes in river-banks. The varieties which live in tanks and swamps keep much to the shallow and grassy edges.

Amongst the fish which I myself saw exhumed from the mud of a dried-up tank were some *Ophiocephali*; they are also recorded by the natives of India as descending with downpours of rain.

*Geographical Distribution.* Freshwater fishes distributed throughout Baluchistan, Afghanistan, India, Burma, Ceylon, China, Siam, and the Malay Archipelago, from elevated localities and the most remote islands.

*Uses.* All these fishes are of little use to man, except as food for the poor, and are only taken in small quantities. They inhabit rivers being better suited to fresh water than to salt water, as *Murrel* in Northern India.

Ventral fins present. They inhabit sluggish rivers.

Ventral fins present. They inhabit sluggish rivers.



*Synopsis of Indian Species.*

- A. Scales on head moderate, 9 or 10 between orbit and angle of preopercle, 15 or 16 between dorsal fin and snout.
- a. Ventral more than half length of pectoral.
- a'. Height of body  $\frac{1}{2}$  total length.
- A black white-edged ocellus on tail. 1. *O. marulius*, p. 360.
- No ocellus ..... 2. *O. leucopunctatus*, p. 361.
- a". Height of body  $\frac{3}{4}$  length to base of caudal fin ..... 3. *O. pseudomarulius*, p. 361.
- b. Ventral  $\frac{2}{3}$  length of pectoral ..... 4. *O. barca*, p. 361.
3. Scales on head small, 16 or 17 between orbit and angle of preopercle, 22 between dorsal and snout ..... 5. *O. micropeltes*, p. 362.
- C. Nine scales between orbit and angle of preopercle, 18-20 between dorsal and snout ..... 6. *O. striatus*, p. 363.
- D. Scales on head large, 4 or 5 between orbit and angle of preopercle, 12 or 13 between dorsal fin and snout.
- A. 27. Ventral  $\frac{1}{2}$  length of pectoral ..... 7. *O. stewartii*, p. 363.
- A. 21-23. Ventral  $\frac{2}{3}$  length of pectoral ..... 8. *O. gachua*, p. 364.
- A. 21-23. Ventral  $\frac{3}{4}$  length of pectoral ..... 9. *O. punctatus*, p. 364.

1198. (1.) *Ophiocephalus marulius*.

*Ophiocephalus marulius*, Ham. Buch. Fish. Ganges, pp. 65, 367, pl. 17, fig. 19; Day, Fish. India, p. 363, pl. lxxvi, fig. 1 (young) (see synonym.).

*Hoovina marul*, Can.; *Pu verarl*, Tam.; *Pu marl*, Hind.; *Pala chapa*, Tel.; *Choaree verarl* and *Curavu*, Mal.; *Kubrah*, Saur., and *Dowluh*, Punj.; *Holee mach*, Chittagong; *Nga-yan-daing*, Burm.; *Ha-al*, Assam.; *Sach*, Oorlah.

D. 45-55. A. 28-36. L. 1. 60-70. L. tr.  $4\frac{1}{2}$ - $6\frac{1}{2}$ /13-11 or  $5\frac{1}{2}$ - $8\frac{1}{2}$ /13-11.

Length of head from 4 to 5, of caudal fin 6 to  $7\frac{1}{2}$ , height of body 7 to  $7\frac{1}{2}$  in the total length. Eyes—diameter 7 (5 in the young) in length of head, 1 to  $1\frac{1}{2}$  diam. from end of snout and also anary. Greatest width of the head equals  $\frac{1}{2}$  of body. Head, but in numerous villiform rows. Throat, three as long as anterior row of about 12 large teeth. Opercle moderate size; 16 rows of bony scutes. Faintly marked with dark spots between eye and angle of mouth. Pectoral fins 16 or 18 rows of rays. Ventrals frequently passes direct to the water. Back fins 16 or 18 rows of rays. A dark band passing along the side of the body. There are five or six dark spots on the lower surface of the abdomen orange; the dorsal and caudal fins are black.

Fig. 117. *Ophiocephalus marulius*.

At the first dorsal fin below these again. There are five or six dark spots on the lower surface of the abdomen orange; the dorsal and caudal fins are black.

around the snout.

cross of the





pearly-white spots. There is generally a large black ocellus at upper part of base of caudal fin, which is grey; ventrals orange.

*Hab.* Fresh waters, principally rivers, from Ceylon and India to China; attaining as much as four feet in length. These fish take a live bait pretty well.

I am doubtful whether the two next species, *O. leucopunctatus* and *O. pseudomarulius*, might not be considered varieties of *O. marulius*.

1199. (2.) *Ophiocephalus leucopunctatus*.

*Ophiocephalus leucopunctatus*, *Sykes*, *Tr. Z. S.* ii, p. 352, pl. 60, fig. 3;  
*Day*, *Fish. India*, p. 364, pl. lxxvii, fig. 1 (see synonym.).

*Sowarah*, Tel.; *Maral*, Maráthi.

D. 47-53. A. 28-35. L. 1. 59-60. L. tr.  $4\frac{1}{2}$ - $6\frac{1}{2}$ /13-11 or 5-8/13-11.

Length of head 4, height of body 7 to  $7\frac{1}{4}$  in the total length. *Eyes*—diameter 8 in length of head,  $1\frac{1}{2}$  diam. from end of snout, and  $1\frac{1}{2}$  to 2 apart. *Teeth*—about ten conical, widely separated teeth in lower jaw. *Fins*—dorsal commences over end of opercle; ventral  $\frac{2}{3}$  as long as pectoral. *Scales*—as in *O. marulius*. *Colour*—back greyish green, descending in bars on to an orange abdomen; numerous white spots on body, sometimes with black margins; caudal and posterior portions of dorsal and anal black, with numerous white spots.

*Hab.* Coromandel and Western coasts of India, some of the rivers in the Deccan and the Cauvery in Mysore. This species is also said to be found in China. It attains 3 feet or more in length.

1200. (3.) *Ophiocephalus pseudomarulius*.

*Ophiocephalus pseudomarulius*, *Günther*, *Catal.* iii, p. 478; *Day*, *Fish. India*, p. 364.

D. 52. P. 17. V. 3. A. 35. C. 15. L. 1. 64. L. tr. 6-7/14-10.

Length of head  $3\frac{1}{4}$ , height of body  $4\frac{2}{3}$  in the total length to base of caudal fin. *Eyes*—diameter 7 in length of head, 1 diam. from end of snout, and  $1\frac{3}{4}$  apart. *Teeth*—an inner row of six or eight, rather widely separated and conical, in the lower jaw. *Fins*—dorsal commences above base of pectoral. Pectoral  $\frac{1}{2}$  as long as head; ventral  $\frac{3}{4}$  of pectoral. *Scales*—16 rows between snout and base of dorsal fin; 10 between eye and angle of preopercle. *Colour*—grey superiorly, lighter along the sides and beneath. "A black, white-edged ocellus superiorly on the basal portion of the caudal fin" (*Günther*, l. c.).

*Hab.* India.

1201. (4.) *Ophiocephalus barca*. (Fig. 118.)

*Ophiocephalus barca*, *Ham. Buch. Fish. Ganges*, pp. 67, 367, pl. 35 fig. 20; *Day*, *Fish. India*, p. 365, pl. lxxvii, fig. 2 (see synonym.).





D. 47-52. P. 16. A. 34-36. C. 19. L. 1. 60-65. L. tr. 5-6/13.

Length of head 4 to  $4\frac{1}{2}$ , of caudal fin  $4\frac{1}{2}$  to  $5\frac{1}{2}$ , height of body  $5\frac{1}{2}$  to  $7\frac{1}{2}$  in the total length. *Eyes*—diameter 7 to  $7\frac{1}{2}$  in length of head,  $1\frac{1}{2}$  to 2 diam. from end of snout, and 2 apart. *Teeth*—amongst the small ones are a few, widely separated and conical, in an inner row in the lower jaw, two or three large teeth on vomer, and a few on the palatines. *Fins*—dorsal commences above posterior extremity of opercle and is almost  $\frac{3}{4}$  as high as body. Ventral  $\frac{2}{3}$  of length of pectoral. Caudal rounded. *Scales*—15 rows between snout and base of dorsal fin, 9 rows between eye and angle of preopercle; larger in anterior part of body than in posterior.

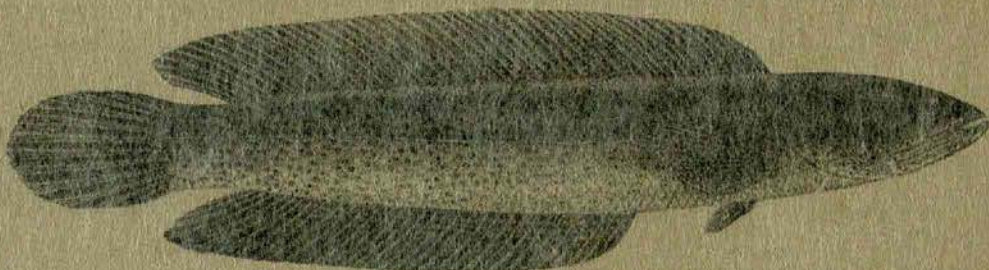


Fig. 118.—*Ophiocephalus barca*.

*Colour*—dark violet superiorly, becoming dull white shot with purple beneath; the whole back and sides covered with large black blotches, also some on dorsal, caudal, and anal fins, each of which has a red edge; pectorals reddish, with numerous black spots.

*Hab.* Large rivers of the Bengal Presidency, North-Western Provinces, and Assam; attaining three feet in length.

1202. (5.) *Ophiocephalus micropeltes*.

*Ophiocephalus micropeltes* (Kuhl & v. Hass.), Cuv. & Val. H. N. Poiss. vii, p. 427; Day, Fish. India, p. 365, pl. lxxvii, fig. 4 (see synon.).

D. 43-46. A. 27-30. L. 1. 95-110. L. tr. 7-8/13-12. Vert. 53.

Length of head  $3\frac{1}{2}$  to  $3\frac{2}{3}$ , of caudal fin  $6\frac{1}{2}$  to  $7\frac{1}{2}$ , height of body 6 to  $6\frac{1}{2}$  in the total length. *Eyes*—diameter  $8\frac{1}{2}$  in length of head (7 in the young), 2 to 3 diam. from end of snout, 2 to  $2\frac{1}{4}$  apart. *Teeth*—a widely separated conical row in lower jaw, vomer, and palatines. *Fins*—dorsal commences above last fourth of opercles, and is of equal height to the anal or  $\frac{1}{2}$  height of body. Ventral about half as long as pectoral. Caudal fan-shaped. *Scales*—22 rows between snout and base of dorsal fin, 16 or 17 between eye and angle of preopercle. *Lateral line*—descends gently to a little behind end of pectoral, then becomes straight. *Colour*—varies considerably. In the adult greyish brown, with the head, back, and sides sprinkled with small brown spots; dorsal fin grey, with three or four narrow dark bands and a white outer edge; anal grey, with a white margin; caudal grey, spotted with black, and having a narrow white outer edge. In the young, and up to 12, 14, or even





18 inches in length, the back is greyish, sides orange-scarlet; a black band through the eye to upper half of caudal fin, and a second from angle of the mouth to lower half. In some, vertical bars are also present.

*Hab.* Malabar and Western coast of India, Siam to the Malay Archipelago; attaining at least three feet in length.

1203. (6.) *Ophiocephalus striatus*.

(*Ophiocephalus striatus*, Bloch, *Ich.* t. 359; Day, *Fish. India*, p. 366 (see synon.).)

*Morru*, Murl, *Dheri murl*, Hind.; *Sol* and *Chena*, Beng.; *Verarl* and *Wrahl*, Mal.; *Verarl* and *Currupe verarl*, Tam.; *Sowarah*, Tel.; *Sola*, Oorah; *Koochina murl*, Canarese; *Loolia*, *Hál-pat-málu*, Singhalese; *Nga-ain-di*, Mugh; *Dákhu*, Maráthi; *Nga yan* and *Nga yan khoun-g-to*, Burmese.

D. 37-45. A. 23-26. L. 1. 50-57. L. tr.  $4\frac{1}{2}$ -7/9-7, or  $5\frac{1}{2}$ -8/10-9.

Length of head  $3\frac{1}{3}$  to 4, of caudal fin 6, height of body 6 to 8 in the total length. *Eyes*—6 to 7 in length of head, 1 diam. from end of snout, and  $1\frac{1}{2}$  apart. *Teeth*—an inner conical row in lower jaw, cardiform on palatines. *Scales*—on summit of head large and irregularly shaped; 18 to 20 rows between snout and origin of dorsal fin; 9 rows between eye and angle of preopercle. The number of rows between lateral line and dorsal fin appears subject to variation. *Lateral line*—curves downwards below twelfth dorsal ray. *Colour*—dark greyish or blackish superiorly, dirty white or yellowish white beneath; cheeks and lower surface of mouth streaked and spotted with grey; bands of grey or black from sides to abdomen. Some spots and bars at posterior end of dorsal fin, ventrals and anal greyish, with some whitish lines or spots along base of latter. In the young there is occasionally a large black ocellus at end of base of dorsal, and the body may be destitute of any marks.

*Hab.* Fresh waters throughout the plains of India, Ceylon, Burma, China, and the Philippines, especially delighting in swamps and grassy tanks; attaining 3 feet or more in length. These fishes take a bait very readily, especially a frog, and are said to rise to a salmon-fly.

1204. (7.) *Ophiocephalus stewartii*.

*Ophiocephalus stewartii*, Playfair, *P. Z. S.* 1867, p. 14, pl. 3; Day, *Fish. India*, p. 367, pl. lxxvii, fig. 3.

*Sen-ga-lee*, Assam.

D. 39-40. P. 17. V. 6. A. 27. C. 14. L. 1. 47-50. L. tr.  $4\frac{1}{2}$ - $5\frac{1}{2}$ /9-7.

Length of head 4, of caudal fin  $5\frac{1}{2}$ , height of body 7 to 8 in the total length. *Eyes*—diameter  $6\frac{1}{2}$  in length of head,  $1\frac{1}{4}$  diam. from end of snout, and 2 apart. *Teeth*—some conical in the lower jaw, also on vomer and palate. *Fins*—dorsal commences over





base of pectoral, is  $\frac{2}{3}$  as high as body and higher than anal. Ventral about  $\frac{1}{3}$  as long as pectoral. Scales—13 rows between snout and base of dorsal, five between eye and angle of preopercle. Colour—purplish black superiorly, lighter on sides and beneath; many scales on body with a round black mark. Fins dark, the pectoral in the young yellow in its lower half, with a blue basal spot, external to which it has several vertical black bands; dorsal edged with yellow.

*Hab.* Cachar and Assam, in both running and standing water, growing to about 10 inches in length.

#### 1205. (8.) *Ophiocephalus gachua*.

*Ophiocephalus gachua*, Ham. Buch. Fish. Ganges, pp. 68, 367, pl. 21, fig. 21; Day, Fish. India, p. 367 (see synon.).

*Kora motta*, Tel.; *Dheri dhok*, Hind.; *Karavu*, Mal.; *Para korava*, Tam.; *Kanayá*, Singhalese; *Mah korava*, Can.; *Chenga* or *Chayung*, Oorlah; *Doarraah*, Punj.; *Chen-gah*, Assam.

D. 32-37. P. 15. A. 21-23. C. 12. L. 1. 40-45. L. tr. 3-4/7-6.

Length of head  $3\frac{1}{2}$  to  $4\frac{1}{4}$ , of caudal fin  $5\frac{1}{2}$  to 6, height of body 6 in the total length. Eyes—diameter 6 in length of head, 1 diam. from end of snout, and from  $1\frac{1}{4}$  to  $1\frac{1}{2}$  apart. Teeth—an inner row, widely separated and conical, in lower jaw, some also on vomer and palatines. Fins—pectoral as long as head behind eyes, ventral  $\frac{2}{3}$  length of pectoral. Scales—broad and irregular on summit of head; 4 or 5 rows between orbit and angle of preopercle; 12 between snout and base of dorsal fin. Lateral line—bends downwards after about 12 scales. Colour—varies materially, according to the water in which the fish resides: usually greenish, lighter beneath; dorsal, caudal, and anal slate-coloured, with orange margins; pectoral with a black base, transversely barred (except in some Andaman specimens), and having a slight reddish or orange edge. In the young there is often a large ocellus with a light edge on the last five dorsal rays; caudal barred. Occasionally the body is spotted with white, or even orange.

*Hab.* Fresh waters throughout India, Ceylon, Burma, and the Andamans, also near Gwádar on the Mekran coast; attaining at least 13 inches in length.

#### 1206. (9.) *Ophiocephalus punctatus*.

*Ophiocephalus punctatus*, Bloch, Ich. t. 358; Day, Fish. India, p. 367, pl. lxxviii, fig. 1 (variety) (see synon.).

*Phool dhok*, Hind.; *Korava* and *Para korava*, Tam.; *Beli-korava*, Canarese; *Muttah*, Tel.; *Gorissa*, Gurrie, and *Cartua gorai*, Oorlah and Assamese; *Dulloonga*, Punj.; *Nga-ain*, Mugh; *Nga rynoock* and *Chankee*, Arracan; *Nga panau*, Burm.; *Dhoalee*, Sind.; *Black caboose* of Europeans.





D. 29-32. P. 17. A. 21-23. C. 12. L. 1. 37-40. L. tr. 4-5/9 | 9/6.

Length of head  $3\frac{1}{3}$  to  $3\frac{2}{3}$ , of caudal fin  $5\frac{1}{4}$  to  $6\frac{1}{4}$ , height of body  $5\frac{1}{2}$  to 7 in the total length. *Eyes*—diameter 7 to  $8\frac{1}{2}$  in length of head, 1 to  $1\frac{1}{2}$  diam. from end of snout, and  $1\frac{2}{3}$  to 2 apart. *Teeth*—a posterior row of four or five conical ones in lower jaw. *Fins*—pectoral half length of head or even more, reaching to above origin of anal; ventral  $\frac{3}{4}$  as long as pectoral. Dorsal  $\frac{2}{3}$  height of body, and a little higher than anal. *Scales*—on summit of head large and of irregular shapes; 12 rows between snout and origin of dorsal, five rows between eye and angle of opercle. *Lateral line*—with a slight curve above fourth anal ray. *Colour*—varies with the water. Back greenish, becoming yellow on sides and abdomen, with a dark stripe along side of head; several bands from back pass downwards to middle of body. Fins spotted, vertical fins with a narrow light edge and dark basal band; ventrals white or grey. Some specimens have scattered black spots over the body and head.

*Hab.* Fresh waters, generally in the plains of India, stagnant preferred to running. This species attains to about a foot or a little more in length. I found a female, in February, containing upwards of 4700 large, besides some small ova. Ceylon (Günther).

## 2. Genus CHANNA, Gronovius.

Differs from *Ophiocephalus* in the absence of ventral fins and caecal appendages.

*Geographical Distribution.* Ceylon and China.

### 1207. (1.) *Channa orientalis*. (Fig. 119.)

*Channa orientalis*, Bl. Schn. p. 496, t. 90, fig. 2; Day, Fish. India, p. 368, pl. lxxviii, fig. 2 (see synonym.).

D. 34. P. 14. A. 22. C. 14. L. 1. 41. L. tr.  $3\frac{1}{2}$ - $4\frac{1}{2}$ /7-6.

Length of head  $3\frac{2}{3}$  to  $4\frac{1}{3}$ , height of body  $6\frac{1}{2}$  to 8 times in total length. *Eyes*—diameter 5 in length of head, 1 diam. from end of snout, and  $1\frac{1}{2}$  apart. *Teeth*—some enlarged in the lower jaw.



Fig. 119.—*Channa orientalis*.

*Fins*—pectoral equals length of postorbital portion of head. *Scales*—with longitudinal striated and raised lines. *Colour*—dirty greenish superiorly, dull white or brown on sides and beneath;





there appear to be some darkish spots on the body and fins. Pectoral with vertical bars on its basal third.

*Hab.* Fresh waters of Ceylon.

## Family XL. LABYRINTHICI.

*Anabantidae*, pt., Richardson; *Spirobranchidae*, pt., Swainson; *Labyrinthibranchii*, pt., Owen; *Osphromenoides*, pt., Bleeker.

Pseudobranchiæ rudimentary or absent. Gills four. Body compressed, oblong, or elevated. Eyes lateral. Gill-opening rather narrow, the membranes united below the isthmus. A cavity above the third or upper portion of the first branchial arch contains an elaborate apparatus consisting of thin laminae of bone, covered by a vascular mucous membrane, and employed for respiratory purposes. Number of dorsal and anal spines variable; ventrals thoracic. Scales ctenoid and of moderate size. Lateral line interrupted or absent. Air-bladder present or absent. Pyloric appendages when present few.

*Geographical Distribution.* Freshwater and estuary fishes of Asia and South Africa. They can live a considerable period out of their natural element, as they are able to respire atmospheric air directly. They comprise both vegetable and animal feeders, and are often acclimatized in other countries. When domesticated they are subject to considerable variation.

*Uses.* All are considered good for eating.

### *Synopsis of Indian Genera.*

- |   |                  |
|---|------------------|
| A. Teeth on palate; opercles and preorbital serrated.               | 1. ANABAS.       |
| B. No teeth on palate.  |                  |
| V. 1/5. Dorsal and anal spines much more numerous than rays         | 2. POLYACANTHUS. |
| V. 1/5. Spines either fewer than rays, or very little more numerous | 3. OSPHROMENUS.  |
| Ventral reduced to a single filiform ray                            | 4. TRICHOGASTER. |

### 1. Genus **ANABAS**, Cuvier.

Branchiostegals six. Superbranchial organ well developed. Branchial arches with toothed tubercles. Mouth rather small. Opercles and preorbital serrated. Teeth villiform in jaws and on the anterior and posterior extremities of the vomer; none on the pectoral fins. Dorsal fin single, the spinous portion of greater extent than the soft; anal spines numerous, but fewer than the dorsal. Scales ctenoid, rather large. Lateral line interrupted. Air-bladder bifid posteriorly, with either extremity produced. Pyloric appendages few or absent.





*Geographical Distribution.* India, the Malay Archipelago, and the Philippine Islands; most numerous in the maritime provinces and the deltas of the larger rivers.

1208. (1.) *Anabas scandens*. (Fig. 120.)

*Perca scandens*, Daldorff, *Trans. Linn. Soc.* iii, 1797, p. 62.

*Anabas scandens*, Day, *Fish. India*, p. 370, pl. lxxviii, fig. 3 (see *synon.*).

*Undee-collee*, Mal.; *Pauni-eyri* and *Sennal*, Tam.; *Coi* and *Corvu*, Beng., Assam., and Oorah; *Nga-pri*, Arracan; *Nga-bye-na*, Burm.; *Kavaya* or *Kawhy-ya*, Singhalese.

D.17-18/8-10. A.9-10/9-11. L.1.28-32. L.tr.3-4 | 9-10. C.p.0-3.

Length of head  $3\frac{1}{2}$  to  $3\frac{2}{3}$ , height of body 3 to 4 in the total length. *Eyes*—diameter  $4\frac{1}{2}$  to 5 in length of head,  $\frac{3}{4}$  to 1 diam. from end of snout, and  $1\frac{1}{2}$  to 2 apart. Preorbital strongly denticulated; posterior edge of opercle, also of sub- and interopercles strongly spinous, shoulder-scale generally with two or three denticulations. *Teeth*—villiform in jaws, the outer row rather the largest; a small patch on front end of vomer, none on palatines. *Fins*—spinous portion of the dorsal fin  $\frac{5}{8}$  of entire length at the

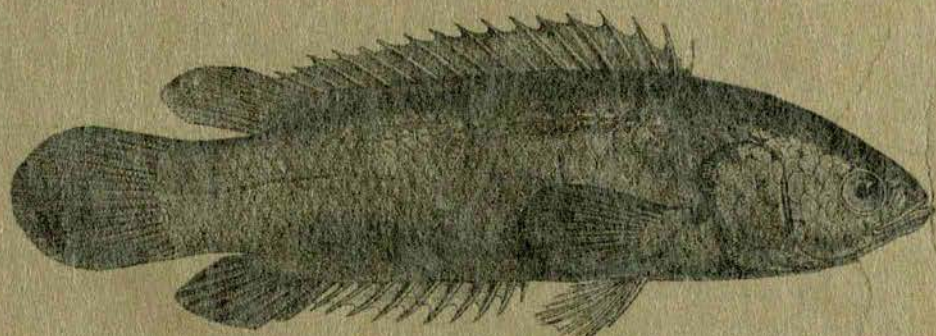


Fig. 120.—*Anabas scandens*.

base, soft portion higher than spinous. *Scales*—some over soft dorsal, caudal, anal, and base of pectoral. *Lateral line*—interrupted about seventeenth scale. *Colours*—rifle-green, becoming lighter on abdomen. During life there are usually four wide vertical body-bands, and a dark stripe from the angle of the mouth to the preopercle. The *young* have a black blotch or side of base of eye, surrounded by a light, sometimes yellow ring; usually they have a black spot at the end of the opercle.

*Hab.* Estuaries and fresh waters of India, and Burma, the Malay Archipelago and Philippines; attaining at least  $8\frac{1}{2}$  inches in length. The breeding-season is about June and July.

2. Genus **POLYACANTHUS**, Cuvier & Valenciennes.

Branchiostegals six; pseudobranchiæ glandular or absent. Body





oblong, compressed. Mouth small and but little retractile. Opercles spineless. Teeth small and fixed in the jaws; palate edentulous. Dorsal fin single, the spinous portion of much greater extent than the soft; the anal similar; ventral with one spine and five well-developed rays, some of which are usually elongate. Scales rather large, ctenoid. Lateral line interrupted, sometimes partially or even entirely absent. Air-bladder simple. Pyloric appendages, when present, few.

*Geographical Distribution.* Fresh waters and estuaries along the coasts of Southern India and Ceylon, but usually not far inland. Also in the Malay Archipelago.

*Synopsis of Indian Species.*

- D. 14-16/5-7. Greenish, a scarlet ventral ray . . . 1. *P. cupanus*, p. 368.  
D. 16-17/8-10. Olive . . . . . 2. *P. signatus*, p. 369.

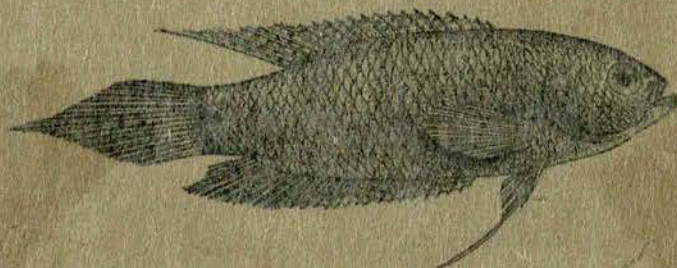
1209. (1.) *Polyacanthus cupanus*. (Fig. 121.)

*Polyacanthus cupanus*, *Cuv. & Val. H. N. Poiss.* vii, p. 357; *Day, Fish. India*, p. 371, pl. lxxviii, fig. 4 (see synonym.).

*Caringanah* and *Wunnuttee*, Mal.; *Punnah* and *Panni*, Tam.; *Ta-but-ti*, Can. and Mal.; *Heb-bu-ti*, Tel.

D. 14-17/5-7. P. 10. A. 16-19/9-11. C. 13. L. 1. 29-32. L. tr. 4/7-8.

Length of head 4 to 5, height of body 4 in the total length. *Eyes*—diameter 4 to 5 in length of head, 1. diam. from end of snout and apart. Preorbital serrated. Posterior half and angle of preopercle finely serrated, as also the subopercle and posterior half of interopercle. *Fins*—dorsal spines not so high as rays; caudal wedge-shaped. *Lateral line*—a single round hole in each scale, ceasing about fourteenth scale. *Colour*—rifle-green, the prolonged ventral ray scarlet; caudal barred in spots, as is also the



121.—*Polyacanthus cupanus*.

dorsal, more especially the soft portion, a round dark spot at base of caudal, and numerous small spots on the head. *Variety*—rose-coloured, with two horizontal black bands, one from above orbit to upper part of caudal fin, the other from angle of mouth through eye to lower part of same fin; head and cheeks spotted.

*Hab.* Malabar and Coromandel coasts, often found in ditches, paddy-fields, and shallow waters, generally within or not far





removed from tidal influence, but I have likewise taken it in the Bhayani at Mettupálaiyam and along the base of the Gháts in Canara. It lurks under stones or amongst weeds, and grows to about 3 inches in length.

1210. (2.) *Polyacanthus signatus*.

*Polyacanthus signatus*, Günther, *Catal.* iii, p. 379; Day, *Fish. India*, p. 371.

Portolotta, Singalese (Boake).

9-17/8-10. A.14-16/10-12. L.1.29-32. L.tr.4/9. Vert.10/16.

Length of head  $3\frac{1}{2}$  to  $4\frac{1}{2}$ , height of body  $3\frac{1}{3}$  to  $3\frac{1}{2}$  in the total length. Eyes—diameter  $4\frac{1}{2}$  to 5 in length of head, 1 diam. from end of snout, and 1 apart. Lower edge of preorbital very finely serrated; angle of opercle finely serrated, other opercles entire. Teeth—villiform, outer row in jaws rather enlarged, some specimens have a caniniform tooth on either side of middle of lower jaw. Fins—dorsal spines stout, rather short, increasing in length to the last; soft portions of dorsal and anal elongate and pointed from the prolongation of their central rays; outer ventral ray prolonged into two filaments. Caudal with its central rays longest. Lateral line—sub-interrupted. Colour—reddish olive in spirit; probably greenish during life; a round blackish spot on middle of base of soft dorsal.

Hab. Ceylon and Java; attaining at least 5 inches in length.

3. Genus *OSPHROMENUS* \* (Commerson), Lacépède.

Syn. *Trichopus*, Lacép.; *Ctenops*, McClelland; *Trichopsis*, Kner.

Branchiostegals six. Body moderately elevated, compressed. Opercle without a spine; opercular pieces serrated in the immature. Mouth small, oblique, protractile. Small and fixed teeth in the jaws, none on the palate. One dorsal fin, its spinous portion sometimes in excess, but generally less in extent than its soft part. Anal spines in varying numbers. Outer ventral ray

\* *OSPHROMENUS OLFA*, Commerson.

*Osphromenus olfa*, Hardwicke, *Zool. Journ.* iv, p. 313; Day, *Fish. Ind.* p. 372, pl. lxxix, fig. 6 (see synon.).

*Osphromenus gourami*, Cuv. & Val. *Poiss.* vii, p. 377, pl. 1<sup>re</sup> (immature).

D. 11-14/11-12. A. 9-12/19-21. L. 1.30-38. L. tr. 5-8/13. Vert.

The abdominal profile more convex than the dorsal. Fins—

g above origin of anal, in anterior half of body; spines

to last, sixth and seventh rays longest; first ventral ray

Colours—greenish brown, lighter below; four or five

immature.

ina, and fresh waters of the Malay Archipelago

Cayenne, Australia, and introduced into some

Calcutta, Madras, and the Neilgherries. Attains 20 inches in length, and is excellent eating when kept in clean water.

OL. II.





long, filiform, the remainder being generally rudimentary. Scales ctenoid, and of moderate size. Lateral line, when present, uninterrupted. Air-bladder present. Pyloric appendages two.

*Geographical Distribution.* South-eastern Asia and Malay Archipelago. One species has been introduced into India; and another is found in Assam, N.E. Bengal, Sikkim, and Nepal.

*Uses.* Excellent as food.

1211. (1.) *Osphromenus nobilis*. (Fig. 122.)

*Otenops nobilis*, McClelland, *Cal. Jour. Nat. Hist.* v, p. 281, fig. 1.

*Osphromenus nobilis*, Day, *Fish. India*, p. 372, pl. lxxviii, fig. 5 (see synonym.).

D.5-6/7-8. P.12. A.5/23-25. C.16. L.1.28-31. L.tr.6/12. C.p.2.

Length of head  $3\frac{1}{2}$  to 4, height of body 3 to  $3\frac{1}{4}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head,  $1\frac{1}{4}$  diam. from end of snout and also apart. The posterior extremity of the intermaxillaries reaches to opposite the front edge of the eye, the maxilla  $\frac{1}{4}$  of the same distance. Preorbital rather large and

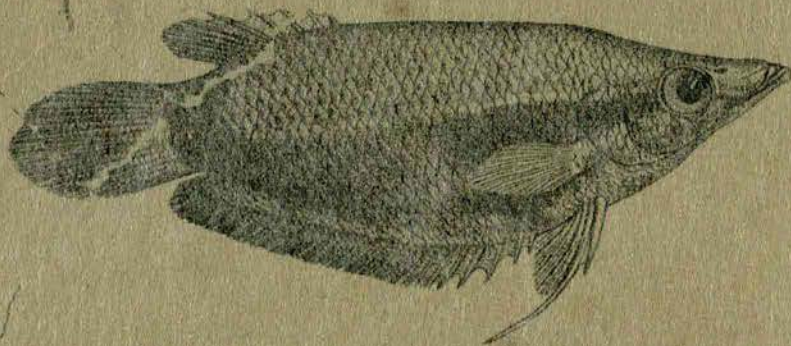


Fig. 122.—*Osphromenus nobilis*.

coarsely serrated, also the lower edge of the preopercle. *Fins*—dorsal small, and situated in posterior third of body. Outer ventral ray prolonged in some specimens. Anal commences close behind end of ventral spine, and is continued almost to caudal, from which is separated by a notch. *Scales*—ctenoid, extending over bases of vertical fins. *Colour*—brown; a silvery-white band, usually interrupted, passes from eye to middle of tail; a second similar on pectoral along side, and a third at base of anal. Some black light-edged ocellus at upper part of base of caudal

fishes of N.E. Bengal and Assam, extending into the latter and attaining at least 4 inches in length.

Genus **TRICHOGASTER**, Bl. Schm.

Synonym: *Trichogaster* & Val.

Branchial rays five; branchial arches with toothed tubercles.





Opercle entire; preopercle usually serrated. Cleft of mouth small, jaws little protractile. A single dorsal fin, the spinous portion more developed than the soft; anal similar, but of greater extent. Ventral consisting of a single elongate filiform ray. Teeth small in the jaws; vomer and palatines edentulous. Lateral line, when present, interrupted. Air-bladder divided posteriorly into two portions. Pyloric appendages few. Intestines with many convolutions.

The numbers of spines and rays in the dorsal and anal fins are subject to considerable variation in species of this genus, and the character of the caudal is not invariably constant. The subopercle may be serrated or entire. The lateral line has been said to be present in some, absent in others; on this, however, undue stress has been laid.

*Geographical Distribution.* Large rivers and waters in their vicinity throughout Sind, the Punjab, N.W. Provinces, Bengal, Assam, and Burma, but not south of the Kistna river, throughout the Madras Presidency, along the western coast, or in Ceylon.

*Synopsis of Indian Species.*

- |   |                                  |
|---|----------------------------------|
| A longitudinal band on side .....   | 1. <i>T. chuna</i> , p. 371.     |
| Eight to ten oblique dark bands; dorsal elongate and pointed behind ..... | 2. <i>T. labiosus</i> , p. 372.  |
| Fourteen or more oblique orange bands on sides.                           | 3. <i>T. fasciatus</i> , p. 372. |
| Sides transversely banded with scarlet and light blue .....               | 4. <i>T. latus</i> , p. 373.     |

1212. (1.) *Trichogaster chuna*.

*Trichopodus chuna*, Ham. Buch. *Fish. Ganges*, pp. 121, 372.

*Trichogaster chuna*, Day, *Fish. India*, p. 373, pl. lxxix, fig. 3 (see *synon.*).

*Bah-say-lee* or *Bainsa-saylee*, Assam.; *Chuna kholisha*, Bilk Songtak, Kalak at Goalpara (H. B.).

D. 17-18/7-8. P. 9. V. 1. A. 17-20/11-15. L. 1. 27-29. L. tr. 5/10.

Length of head  $3\frac{1}{2}$  to 4, height of body  $2\frac{1}{2}$  to  $2\frac{3}{4}$  in the total length. *Eyes*—diameter  $2\frac{1}{4}$  to 3 in length of head,  $\frac{1}{2}$  to  $\frac{3}{4}$  diam. from end of snout, and 1 apart. *Fins*—dorsal spines increasing in length to last, which equals postorbital length of head, and is  $\frac{2}{3}$  as high as soft dorsal, which is longest in its middle. Caudal slightly emarginate. *Scales*—ctenoid, but slightly extended over soft portion of anal fin so as to form a short sheath for the spines. *Lateral line*—present. *Colour*—dull greenish, lighter along abdomen; a dark, sometimes black band from eye along side to lower half of tail. A dark band in upper third of dorsal, and another along the base of that fin; anal banded similarly to dorsal, a dark band along base of soft portion. Caudal sometimes with a black spot at its base, last third rather dark, occasionally with two or three transverse bands.





*Hab.* From the Brahmaputra at Dibrugarh, Upper Assam, to the Hooghly at Calcutta. Out of 20 specimens the largest is 1·8 inches in length.

1213. (2.) *Trichogaster labiosus*.

*Trichogaster labiosus*, Day, *Fish. India*, p. 374, pl. lxxix, fig. 4.

D. 17/9. P. 10. V. 1. A. 17-18/18. C. 15. L. 1. 30. L. tr. 5-6/12.

Length of head  $4\frac{1}{4}$ , height of body  $2\frac{3}{4}$  to  $3\frac{1}{4}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout, and  $1\frac{1}{2}$  apart. Preorbital denticulated. Preopercle very slightly rounded at angle, lower margin rather strongly serrated. Lips very thick and covered with papillæ (as in *Labeo*). *Fins*—dorsal spines increase in length to last, which is  $\frac{2}{3}$  as long as head; soft dorsal pointed, third to fifth rays elongate, and from two to three times as long as last spine. Soft portion of anal elongate, but not to so great an extent as soft dorsal. Caudal wedge-shaped. *Scales*—a few over base of anterior anal spines, increasing posteriorly, soft portion of fin densely scaled; fewer scales on soft dorsal. *Colour*—greenish superiorly, lighter beneath, eight to ten obliquely vertical dark bars on sides. A light yellowish-red band, dark-edged posteriorly, from eye across lower jaw behind the lip. Fins dark, outer edge of anal yellowish red.

*Hab.* Burma, found in the Irrawaddy at Rangoon, and at least as high as Mandalay. Grows to over 3 inches long.

1214. (3.) *Trichogaster fasciatus*. (Fig. 123.)

*Trichogaster fasciatus*, Bl. Schn. *Syst. Ich.* p. 164, t. 36; Day, *Fish. India*, p. 374, pl. lxxviii, fig. 6 (see synonym.).

*Kussuah* and *Coilia*, Oorlah; *Ponundi*, Tel.; *Kien-gee*, Punj.; *Pich-ru*, Sind.; *Koh-tee-hona*, Assam.; *Nga-pin-thick-kouk* and *Nga-phyin thaleh*, Burm.

D. 15-17/9-13. A. 15-18/14-19. L. 1. 29-31. L. tr.  $4\frac{1}{2}$ - $5\frac{1}{2}$ /11-12.

Length of head  $3\frac{3}{4}$  to  $4\frac{1}{4}$ , height of body  $2\frac{3}{4}$  to  $3\frac{1}{4}$  in the total length. *Eyes*—diameter  $3\frac{1}{4}$  to  $3\frac{1}{2}$  in length of head,  $\frac{3}{4}$  to 1 diam. from end of snout, and  $1\frac{1}{2}$  to  $1\frac{3}{4}$  apart. Lower limb of preopercle serrated, and sometimes a few serrations on subopercle. *Fins*—last dorsal spine longest and equal to postorbital length of head; the soft portion in some is rounded, in others more pointed and even  $\frac{1}{4}$  longer than last spine; soft anal resembles soft dorsal; caudal notched or cut square. *Scales*—few on vertical fins of Assam specimens, more on those from Calcutta or Ganjam. *Colour*—greenish above, dirty white below; a green spot on either gill-cover; eyes red; fourteen or more orange bands descend obliquely downwards and backwards from back to abdomen; ventral fin





edged with red and variegated with black, green, and white; dorsal and caudal fins spotted with orange. Immature specimens with a black spot at root of caudal fin.

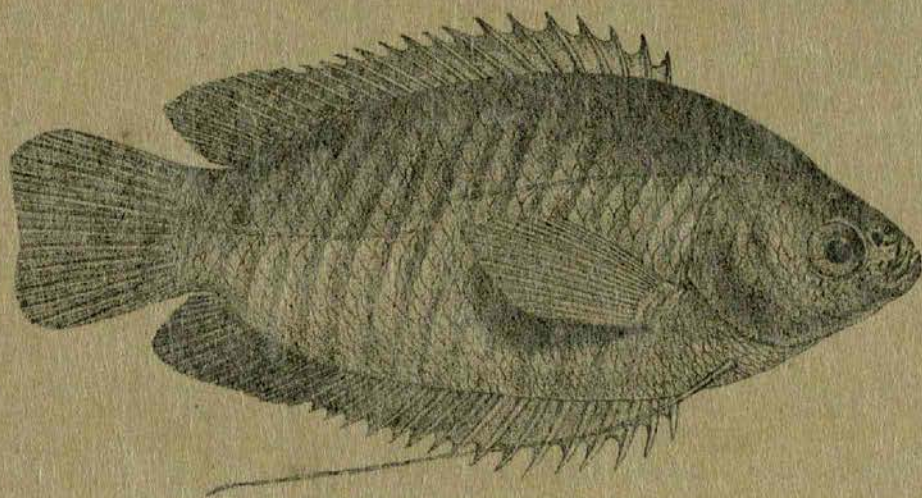


Fig. 123.—*Trichogaster fasciatus*.

*Hab.* The Coromandel coast as far south as the River Kistna, the estuaries of the Ganges; Cachar, Assam, Punjab, N.W. Provinces, Sind, and Burma; attaining to 5 inches in length.

1215. (4.) *Trichogaster lalius*.

*Trichopodus lalius*, Ham. Buch. Fish. Ganges, pp. 120, 372.

*Trichogaster lalius*, Day, Fish. India, p. 375, pl. lxxix, fig. 5 (see synon.).

*Kung-gee*, Punj.; *Lal kholisha*, Assam.

D. 15-16/7-8. P. 10. A. 17-18/13-14. L. l. 26-28. L. tr.  $4\frac{1}{2}$ - $5\frac{1}{2}$ /10.

Length of head  $3\frac{1}{3}$  to  $3\frac{1}{2}$ , height of body  $2\frac{1}{3}$  to  $2\frac{3}{4}$  in the total length. *Eyes*—diameter  $3\frac{1}{4}$  to  $3\frac{1}{2}$  in length of head,  $\frac{1}{4}$  diam. from end of snout, and 1 apart. Preorbital denticulated; lower limb of preopercle serrated, subopercle entire. *Fins*—dorsal spines increase in length to last; soft dorsal and anal rounded, not produced. Caudal rounded, in large specimens cut square, or even very slightly notched. *Scales*—covering soft dorsal, and very densely the soft portion of anal, they form a high sheath to the anal spines. *Colour*—vertically banded with scarlet and light blue, half of each scale of either colour. Dorsal and caudal fins barred in scarlet dots. Anal with a dark band along its base, and a red outer edge.

*Hab.* Ganges and Jumna rivers, very common at Calcutta, also in Sind; attaining nearly 2 inches in length.





## Family XLI. TRACHYPTERIDÆ.

*Tanioidei*, pt., Cuv.; *Gymnetridæ*, pt., Swainson.

Pseudobranchiæ present. Body elongate and strongly compressed. Gill-openings wide; gills four. Eyes lateral. Cleft of mouth slight. Dentition feeble. Dorsal fin single, occupying the whole back, composed of rays that are neither branched nor articulated, anterior portion detached; anal absent; caudal not in the longitudinal axis of the fish, or rudimentary; ventrals thoracic. Scales absent. Pyloric appendages numerous. Vertebrae many. Bones soft.

*Geographical Distribution.* All oceans, chiefly at great depths.

1. Genus **REGALECUS**, Brünn.

Syn. *Gymnetrus*, Bl. Schn.

Ventral in the form of a single filament with a dilated extremity. Caudal fin, if present, minute.

1216. (1.) **Regalecus russellii**. (Fig. 124.)

*Gymnetrus russellii* (Shaw), Cuv. & Val. *H. N. Poiss.* x, p. 377.

*Regalecus russellii*, Day, *Fish. India*, p. 376, pl. lxxix, fig. 2, *Suppl.* p. 800 (see synonym.).

B. v. D. 4-5/320. P. 11. V. 1. C. 4.

Body lanceolate, smooth, without scales. Mouth small, oblique. *Teeth*—absent. *Fins*—four or five rays on the head, at first distinct, subsequently uniting and forming a long filament; second dorsal extends from neck to near caudal fin, the middle rays the longest. Pectorals short. Caudal distinct from dorsal, consisting of four rays united into one filament. *Colour*—pale silver; dorsal fin with a dark edge.



Fig. 124.—*Regalecus russellii*.

A fish described and figured by Russell, 2 feet 8 inches long, was captured on the outside of the surf at Vizagapatam, March 1788. The species does not appear to have been subsequently observed.

*Hab.* Vizagapatam.

## Family XLII. GLYPHIDODONTIDÆ.

*Sciænoidæ*, pt., Cuv.; *Labroidæ ctenoidæ*, Müller; *Ctenolabridæ*, Owen; *Pomacentridæ*, Günther.

Pseudobranchiæ present. Gills three and a half. Eyes lateral.





Body more or less short and compressed. Teeth in jaws feeble, palate edentulous; inferior pharyngeal bones coalescing, with or without a median longitudinal suture. A single dorsal fin with the spinous part well developed; the soft anal similar to the soft dorsal, and with two or three spines; ventrals thoracic, 1/5. Scales etenoid. Air-bladder present. Pyloric appendages few.

*Geographical Distribution.* Tropical seas; a few species in temperate regions.

Müller separated from the rest of the Acanthopterygian fishes under the name of *Pharyngognathi* the families (such as *Pomacentridæ* or *Glyphidodontidæ*, *Labridæ* and *Chromidæ*) which had the inferior pharyngeal bones coalesced. Subsequently it was pointed out by Kner that in the genus *Gerres* (*Percidæ*, see Vol. I. p. 535) several species have this conformation, but that *G. macrosoma* has not. Professor Peters has shown that *G. plumieri* and some other East-Indian species are also exceptions. A structural peculiarity which is insufficient for generic distinction in the case of *Gerres* cannot be employed for dividing the Acanthopterygian order of fishes into two.

#### *Synopsis of Indian Genera.*

- |   |                   |
|---|-------------------|
| A. All the opercles denticulated.                 |                   |
| Preorbital denticulated, but without a spine.     | 1. AMPHIPRION.    |
| Preorbital ending behind in a long spine . . .    | 2. PREMNAS.       |
| B. The preoperculum serrated, other opercles not. |                   |
| Teeth in a villiform band . . . . .               | 3. TETRABRACHIUM. |
| Teeth in a single row . . . . .                   | 4. POMACENTRUS.   |
| C. None of the opercles serrated.                 |                   |
| Teeth compressed . . . . .                        | 5. GLYPHIDODON.   |
| Teeth conical. . . . .                            | 6. HELIASTES.     |

#### 1. Genus **AMPHIPRION**, Bl. Schn.

Syn. *Coracinus*, sp., Gronov.; *Prochilus* (Klein), Cuv.

Branchiostegals five. All the opercles and preorbital denticulated, the denticles on the opercle and subopercle being almost spinose. Teeth in the jaws in one row, conical and small. Scales of moderate or rather small size. Dorsal fin with from 9 to 11 spines; anal with two. Lateral line ceases in a tubular form below the end of the dorsal fin, or is continued lower down in the form of a simple orifice in each scale. Air-bladder present. Pyloric appendages few.

The fishes forming this genus have as a rule very vivid and decided colouring, vertical bands of a more or less white tint being present in the majority and more vivid in the young than in adults, consequently their presence alone should not be accepted as sufficient to constitute a species. The caudal fin seems more rounded in the young than in adults.

*Geographical Distribution.* Red Sea, east coast of Africa, seas of India, Malay Archipelago, and Western Pacific.



*Synopsis of Indian Species.*

- Dull yellow, a dark blotch on side ..... 1. *A. ephippium*, p. 376.  
Dark, with two white cross bands; caudal yellow. 2. *A. sebae*, p. 377.  
Yellow, three white, black-edged cross bands. 3. *A. percula*, p. 377.  
Dark, with two milk-white cross bands; caudal  
with white upper and lower edges ..... 4. *A. bifasciatus*, p. 378.  
Orange, a blue band from snout to dorsal .... 5. *A. acallopistus*, p. 378.

1217. (1.) *Amphiprion ephippium*. (Fig. 125.)

*Lutjanus ephippium*, Bloch, *Ich.* iv, p. 121, t. 201, fig. 2.

*Amphiprion frenatus*, Brevoort, *Amer. Exp. China & Japan*, p. 263, pl. vi, fig. 4.

*Anthias clarkei*, Bennett, *Fish. Ceylon*, p. 29, pl. 29.

*Amphiprion ephippium*, *frenatus*, & *clarkei*, Day, *Fish. India*, p. 378, pl. lxxx, figs. 1, 2 (see synon.).

D. 10-11/17-15. A. 2/14-15. L. l. 50-55. L. tr. 7/18. Cæc. pyl. 2.

Length of head  $3\frac{1}{2}$  to  $3\frac{3}{4}$ , height of body  $2\frac{1}{2}$  to  $2\frac{3}{4}$  in the total length. *Eyes*—diameter 4 in length of head, 1 diam. from end of snout, and  $1\frac{1}{2}$  apart. *Fins*—dorsal spines nearly as high as the rays, no notch between the two; caudal more rounded in the immature than in the adult. *Colour*—very various, mostly dull yellow, with a dark blotch on the side which runs into the general colour, outer edge of ventrals brown. The variety *A. frenatus* is

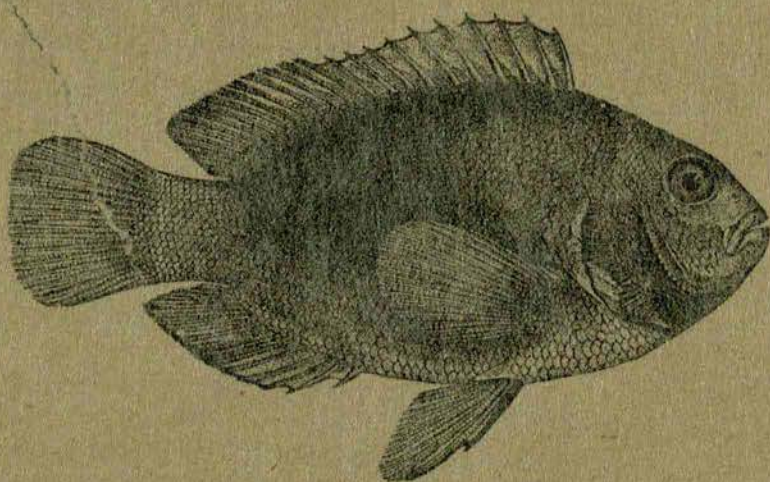


Fig. 125.—*Amphiprion ephippium*.

brownish orange, becoming lighter on abdomen and free portion of tail; a blackish blotch descends from below last dorsal spines and first few rays to middle of sides. A pearl-coloured or bluish band of varying width from nape over opercles; ventrals externally blackish. In the variety *A. clarkei* there are three milk-white cross bands, the first in front of dorsal fin, over opercles; the second from last five dorsal spines to the front of base of anal; the third crosses free portion of tail.





*Hab.* Andamans and Nicobars, to the Malay Archipelago and Australia, Madagascar, &c.

1218. (2.) *Amphiprion sebæ*.

*Amphiprion sebæ*, Bleeker, *Batavia Nat. Tijdsch.* iv, p. 478; *Day, Fish. India*, p. 378, pl. lxxx, fig. 3, *Suppl.* p. 800 (see *synon.*).

D. 10-11/14-15. P. 20. A. 2/12-13. C. 15. L. 1, 50-55. L. tr. 6/18.

Length of head 4 to  $4\frac{1}{2}$ , height of body  $2\frac{3}{4}$  to 3 in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout and also apart. *Fins*—dorsal spines increasing in length to fourth, which is about  $\frac{1}{3}$  length of head, posteriorly they decrease so that the fin is deeply notched, soft dorsal  $\frac{1}{2}$  higher than spinous. Caudal cut square, or emarginate in adult. *Colour*—brownish black, with two broad milk-white cross bands, the anterior from nape to subopercle, covering most of the opercle; the second from last three dorsal spines and four first rays to a little in front of vent, superiorly it covers upper third of soft dorsal. End of free portion of tail and caudal fin canary-yellow. A young specimen  $\frac{3}{4}$  of an inch in length had snout, muzzle, and chest dull yellow, pectoral greenish, its base black.

*Hab.* Andamans to the Malay Archipelago.

1219. (3.) *Amphiprion percula*.

*Lutjanus percula*, Lacép. *H. N. Poiss.* iv, pp. 239, 240.

*Amphiprion percula*, *Day, Fish. India*, p. 379, pl. lxxx, fig. 4 (see *synon.*).

*Eá-ole-jo-do-dah*, Andam., or "Turtle's stomach," because generally found inside *Actinæ*, which are looked upon as those organs.

D. 10-11/14-15. P. 17. A. 2/11-12. C. 15. L. 1, 50-60. L. tr. 7-8/21-23.

Length of head  $3\frac{2}{3}$  to 4, height of body  $2\frac{2}{3}$  to 3 in the total length. *Eyes*—diameter  $3\frac{1}{2}$  to 4 in length of head, 1 diam. from end of snout and also apart. *Fins*—dorsal spines strong, second to fourth highest, but not equalling soft dorsal. Caudal wedge-shaped or rounded. *Lateral line*—ceases below about the fourth dorsal ray, and from the thirtieth to thirty-fourth scale. *Colour*—bright yellow, with three broad milk-white black-edged cross bands, the anterior convex, over hind part of head; the second from middle of dorsal fin to vent, and the posterior one over free portion of tail. Pectoral and caudal deep yellow or brownish yellow, with a broad white edge which has a narrow black base; dorsal and anal yellow, with a white edge having a black base; ventral yellow, the extremity black. In some specimens the posterior white band on body is continued along either side of caudal fin.

*Hab.* Seas of India, Malay Archipelago and beyond; the Andamans.



1220. (4.) *Amphiprion bifasciatus*.*Anthias bifasciatus*, Bloch, *Ich.* t. 316, fig. 2.*Amphiprion bifasciatus*, Day, *Fish. India*, p. 379, *Suppl.* p. 800 (see synon.).

D. 11/13-15. P. 15. A. 2/12-13. C. 17. L. 1. 50-55. L. tr. 6/19.

Length of head 4 to  $4\frac{1}{2}$ , height of body  $2\frac{1}{2}$  to  $2\frac{3}{4}$  in the total length. *Eyes*—diameter 4 in length of head, 1 diam. from end of snout,  $1\frac{1}{3}$  apart. *Lateral line*—tubes cease opposite middle of soft dorsal. *Colour*—brownish black, with two milk-white cross bands; anterior from nape over opercles; second from last three spines and first few dorsal rays down to middle of body, and backward to summit of all dorsal rays; caudal black, upper and lower edge white.

*Hab.* Andamans to the Malay Archipelago and beyond.1221. (5.) *Amphiprion akallopistus*.*Amphiprion akallopistus*, Bleeker, *Batavia Nat. Tijdsch.* iv, p. 281.*Amphiprion akallopistus*, Day, *Fish. India*, p. 380 (see synon.).

D. 9-10/20-18. P. 19. A. 2/13-14. C. 15. L. 1. 60. L. tr. 6/24.

Length of head  $3\frac{1}{2}$  to  $4\frac{1}{4}$ , height of body  $2\frac{3}{4}$  to 3 in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout and also apart. *Fins*—dorsal spines short, increasing in length to fourth, a notch between spinous and soft portions. Caudal rounded. *Colour*—orange, brightest on head, chest, and base of caudal fin; a blue band from between orbits to dorsal fin, there dividing into two, half going along either side of base of fin. Scales on body with a light spot.

*Hab.* Andamans to Malay Archipelago.2. Genus *PREMNAS*, Cuv.

Branchiostegals five or six. All the opercles serrated; a long strong spine at posterior edge of preorbital. Teeth in a single row, conical and small. Dorsal with 9 or 10, anal with 2 spines. Scales of moderate size. The lateral line ceases below the end of the dorsal fin. An air-bladder. Pyloric appendages three.

*Geographical Distribution.* Indian Ocean.1222. (1.) *Premnas biaculeatus*. (Fig. 126.)*Chaetodon biaculeatus*, Bloch, *Ich.* t. 219, fig. 2.*Premnas biaculeatus*, Day, *Fish. India*, p. 380, pl. lxxx, fig. 5 (see synon.).

B.v. D. 9-10/16-20. A. 2/13-15. L. 1. 60-70. L. tr. 14/35. Vert. 12/14.

Length of head 4, height of body  $2\frac{2}{3}$  in the total length. *Eyes*—diameter a little above  $3\frac{1}{2}$  to 4 in length of head, 1 to  $1\frac{1}{4}$  diam. from end of snout, and 1 apart. Preorbital with two strong spines. *Fins*—fourth dorsal spine and second anal longest.





*Colour*.—black or chestnut-brown, fins black-edged. A broad white band margined with black passes over occiput and on to opercles; a second from last three dorsal spines to in front of base of anal; a third over free portion of caudal.

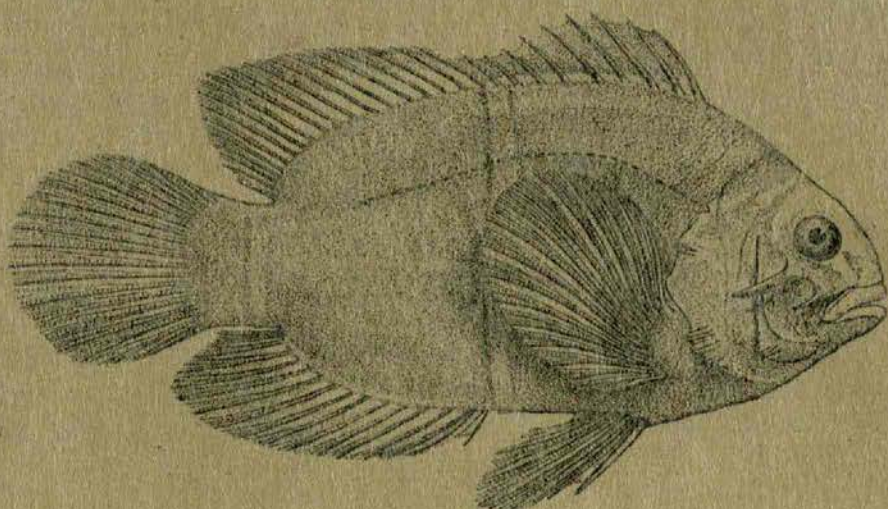


Fig. 126.—*Premnas biaculeatus*.

This fish sometimes uses *Actinia* as a hiding-place (De Cresp. P. Z. S. 1869, p. 248).

*Hab.* Seas of India to the Malay Archipelago and beyond.

### 3. Genus **TETRADRACHMUM**, Cantor.

Syn. *Dascyllus*, Cuv. (Preoccupied by Latreille (1796), *Coleoptera*.)

Branchiostegals five. Preopercle, and occasionally the preorbital, serrated. Teeth villiform in a narrow band, the outer row somewhat larger. Dorsal with 12 or 13, anal with 2 spines. Scales large or of moderate size. Lateral line ceases in a tubular form below the soft dorsal, but is continued along the middle row of scales as a circular hole in each. Air-bladder large. Pyloric appendages two or three.

*Geographical Distribution.* Indo-Pacific Ocean.

#### *Synopsis of Indian Species.*

Brown, vertical fins dark ..... 1. *T. trimaculatum*, p. 379.  
Bluish, many scales with a bright blue spot. 2. *T. marginatum*, p. 380.  
Pearl-white, with 3 vertical black bands .. 3. *T. aruanum*, p. 380.

#### 1223. (1.) **Tetradrachmum trimaculatum**.

*Pomacentrus trimaculatus*, Rüpp. *Atl. Fische*, p. 39, pl. viii, fig. 3.

*Tetradrachmum trimaculatum*, Day, *Fish. India, Suppl.* 1888, p. 801 (see synon.).

D. 12/13-15. A. 2/13-14. L. 1.27. L. tr. 3/11. C. p. 3. Vert. 11/14.





Length of head 4 to  $4\frac{1}{2}$ , height of body a little over 2 in the total length. *Eyes*—diameter  $2\frac{1}{2}$  in length of head,  $\frac{1}{2}$  diam. from end of snout. *Colour*—deep brown; vertical fins dark, becoming black at their edges. A white spot at nape, sometimes wanting, a second above lateral line below middle of dorsal fin.

*Hab.* Red Sea, east coast of Africa, Ceylon, to Polynesia. Common at Colombo.

1224. (2.) *Tetradrachmum marginatum*. (Fig. 127.)

*Pomacentrus marginatus*, Rüpp. *Atl. Fische*, p. 38, t. viii, fig. 2.

*Tetradrachmum marginatum*, Day, *Fish. India*, p. 381, pl. lxxix, fig. 7, *Suppl.* p. 800 (see synon.).

D. 12/14–16. P. 17. A. 2/12–13. C. 17. L. 1. 25–26. L. tr. 3/12.

Length of head  $3\frac{1}{2}$  to 4, height of body  $1\frac{3}{4}$  in the total length. *Eyes*—diameter  $2\frac{1}{4}$  in length of head,  $\frac{3}{4}$  to  $\frac{3}{2}$  diam. from end of snout, and 1 apart. Body strongly compressed; the profile, omitting the tail, is nearly orbicular. Preorbital narrow. *Fins*—dorsal spines from the second to the last of about equal length; caudal

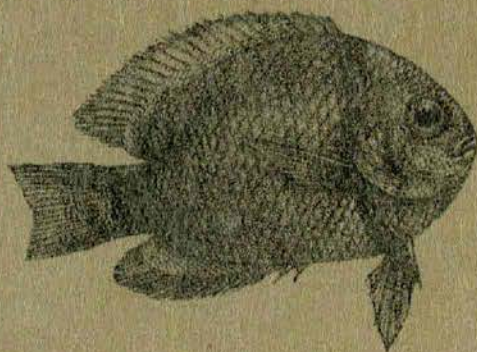


Fig. 127.—*Tetradrachmum marginatum*.

slightly emarginate. *Colour*—bluish. A dark band passes from first two dorsal spines, through base of pectoral to ventral. Snout dark. Every scale on head, chest, and lower two thirds of body, and a few on upper third with a bright blue black-edged spot. Soft dorsal and caudal yellow; spinous dorsal, ventral, and anal black.

*Hab.* Red Sea, east coast of Africa, Andamans, Malay Archipelago, China, and beyond.

1225. (3.) *Tetradrachmum aruanum*.

*Chaetodon aruanus*, Linn. *Syst. Nat.* i, p. 464.

*Tetradrachmum aruanum*, Day, *Fish. India*, p. 381, pl. lxxx, fig. 6 (see synon.).

D. 12–13/12–11. A. 2/11–12. L. 1. 25–27. L. tr. 3/10–11. C. pyl. 3.

Length of head 4, height of body  $2\frac{1}{4}$  in the total length. *Eyes*—diameter  $2\frac{1}{2}$  in length of head,  $\frac{1}{2}$  diam. from end of snout, and





1 apart. *Fins*—third dorsal spine and second anal longest. *Colour*—pearl-white, with three vertical black bands, the anterior from first three dorsal spines through eye to under surface of lower jaw; the second from sixth to ninth dorsal spines to the ventral fins, which are black; the third from base of soft dorsal to anal; caudal dark, light posteriorly.

*Hab.* Red Sea, eastern coast of Africa, seas of India to Polynesia, &c.; numerous at the Andamans, Nicobars, and Burmah, but much rarer in Western than in Eastern India.

#### 4. Genus **POMACENTRUS** (Lacépède), Cuvier.

*Syn.* *Pristotis*, Rüpp.; *Lepidozygus*, Günther; *Pseudopomacentrus*, Bleeker.

Branchiostegals 4 or 5. Preopercle and usually infraorbital ring serrated. Teeth small, compressed; the crowns smooth or emarginated. Dorsal with 12 or 13, anal with two spines. Scales rather large. Lateral line ceases below the soft dorsal fin. Air-bladder present. Pyloric appendages few.

*Geographical Distribution.* Tropical seas of both hemispheres.

#### *Synopsis of Indian Species.*

##### A. L. tr. 3-4/9-10½.

###### a. Lips moderate.

- |   |                                      |
|---|--------------------------------------|
| Olivaceous; scales with blue spots, 3 to 5 blue lines on forehead, caudal yellow .....                          | 1. <i>P. trilineatus</i> , p. 381.   |
| Greenish yellow; head-scales with blue spots, 3 black blotches on back descending to sides .....                | 2. <i>P. trimaculatus</i> , p. 382.  |
| Yellowish, two black bands on upper part of each side. Fins yellow....  | 3. <i>P. bifasciatus</i> , p. 383.   |
| Deep violet, ends of soft dorsal and caudal yellow .....  | 4. <i>P. sindensis</i> , p. 383.     |
| Brownish, blue lines on forehead, scales with blue dots, a black ocellus at base of soft dorsal .....           | 5. <i>P. littoralis</i> , p. 384.    |
| Olive, bluish spots on scales, 3 black spots on each side .....   | 6. <i>P. bankanensis</i> , p. 384.   |
| Olive, a broad vertical yellowish band under last dorsal spines .....   | 7. <i>P. prosopotaenia</i> , p. 384. |
| Greyish brown, bluish-white spots on scales, black ocellus at base of soft dorsal, no blue lines on forehead .. | 8. <i>P. lividus</i> , p. 385.       |

###### b. Lips thick, covered with papillæ and reflected .....

- |  |                                 |
|--|---------------------------------|
| B. L. tr. 5/11. Caudal lobes produced, pointed ..... | 9. <i>P. labiatus</i> , p. 385. |
|  | 10. <i>P. jerdoni</i> , p. 385. |

#### 1226. (1.) **Pomacentrus trilineatus.**

*Pomacentrus trilineatus* (Ehr.), Cuv. & Val. *H. N. Poiss.* v, p. 428; Day, *Fish. India*, p. 382, *Suppl.* p. 801 (see synonym.).





B. v. D. 13/15. P. 17. A. 2/16. C. 17. L. 1. 28. L. tr. 3/9.

Length of head from 4 to  $4\frac{1}{4}$ , height of body  $2\frac{3}{4}$  in the total length. *Eyes*—diameter  $2\frac{3}{4}$  in length of head,  $\frac{3}{4}$  diam. from end of snout, and 1 apart. Greatest depth of preorbital equals half diameter of eye. Suborbital ring of bones serrated, two strong denticulations on first bone. Two opercular spines. *Colour*—olivaceous; caudal yellow; each scale with one or two blue spots; three to five blue lines on forehead, the outer of which are continued on to the nape, and sometimes along base of dorsal. A dark round spot on the opercle; a blue-edged black spot across free portion of tail. The immature have a similar spot on anterior third of soft dorsal.

*Hab.* Red Sea, east coast of Africa, Andamans, Nicobars, Malay Archipelago, and beyond.

1227. (2.) *Pomacentrus trimaculatus*. (Fig. 128.)

*Dascyllus trimaculatus*, Cuv. & Val. H. N. Poiss. v. p. 441.

*Pomacentrus trimaculatus*, Day, Fish. India, p. 382, pl. lxxx, fig. 10 (see synon.).

B. v. D. 13/14-15. V. 1/5. A. 2/13-15. C. 17. L. 1. 27-28. L. tr. 4/9.

Length of head  $4\frac{1}{2}$  to  $4\frac{2}{3}$ , height of body 3 to  $3\frac{1}{4}$  in the total length. *Eyes*—diameter 3 to  $3\frac{1}{4}$  in length of head, 1 diam. from end of snout and also apart. Preorbital entire, suborbital bones serrated. Greatest depth of preorbital rather above  $\frac{1}{2}$  diameter of eye. *Fins*—posterior dorsal spines slightly longer than middle ones; caudal emarginate. *Scales*—a row of small ones along bases of dorsal and anal fins. *Colour*—greenish yellow, with three black

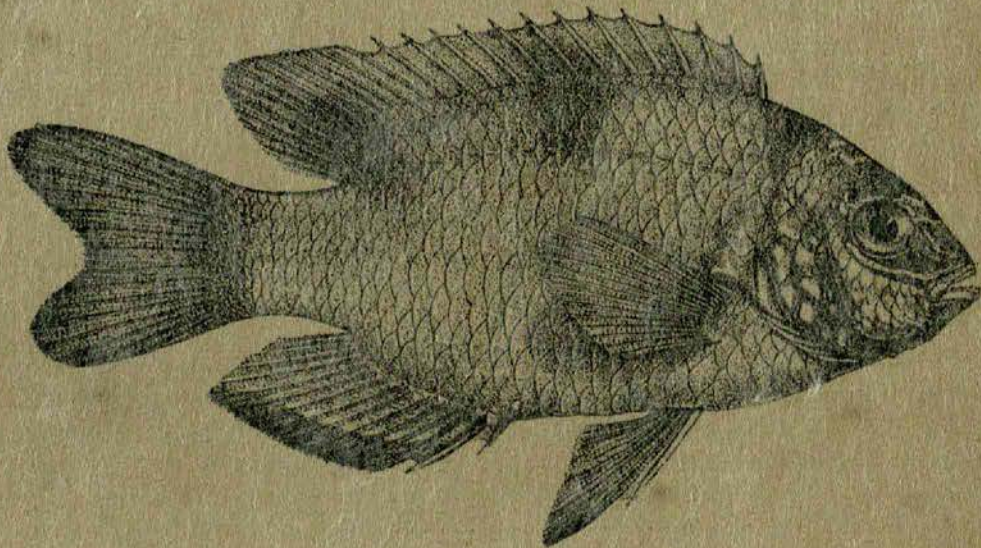


Fig. 128.—*Pomacentrus trimaculatus*.

dorsal blotches, the first extending from origin of dorsal fin to snout, second between 7th and 10th dorsal spines, third from





middle of soft dorsal, both the latter descending to below the lateral line. A light band over nape, and two narrow blue bands from one orbit to the other. A light blue line along suborbital ring of bones, spots on scales covering cheeks, and at bases of dorsal and anal. Dorsal and caudal with a narrow dark edge, anal with a broad dark outer margin, having one or two narrow blue lines along its base.

*Hab.* Andamans to the Malay Archipelago and beyond. At the Andamans the species is not uncommon.

1228. (3.) *Pomacentrus bifasciatus*.

*Pomacentrus bifasciatus*, Bleeker, *Batavia Nat. Tijdsch.* vi, p. 330; *Day, Fish. India*, p. 383 (see synon.).

D. 13/14. P. 17. A. 2/13-14. C. 17. L. 1. (25) 28. L. tr. 3/9.

Length of head 4, height of body  $2\frac{2}{3}$  in the total length. *Eyes*—diameter  $2\frac{2}{3}$  in length of head,  $\frac{2}{3}$  diam. from end of snout, and 1 apart. Preorbital and suborbital bones entire. Greatest depth of preorbital not equal to  $\frac{1}{2}$  diameter of eye. *Colour*—yellow, a curved blue line on preorbital; a black band from nape over opercles, and a second from last dorsal spines to below lateral line. Fins yellow.

*Hab.* Andamans and Malay Archipelago.

1229. (4.) *Pomacentrus sindensis*.

*Glyphidodon sindensis*, Day, *Sea-fishes of India and Burma*, 1873, p. cclxiii; *Fish. India*, p. 388, pl. lxxxii, fig. 2.

*Pomacentrus sindensis*, Day, *Fish. India*, p. 748.

D. 13/11-12. P. 19. A. 2/11-13. C. 15. L. 1. 26. L. tr.  $3\frac{1}{2}/10$ .

Length of head  $3\frac{3}{4}$  to 4, height of body  $2\frac{2}{3}$  to 3 in the total length. *Eyes*—diameter 3 in length of head,  $\frac{1}{2}$  diam. from end of snout, and 1 apart. Preorbital where widest not  $\frac{1}{2}$  diameter of eye in depth, suborbital ring of bones narrow. *Teeth*—in a narrow row, about 50 in upper jaw, their summits notched. *Fins*—dorsal spines increasing to fourth, all behind that about equal; soft dorsal rather produced in centre; caudal forked, upper lobe the longer, and occasionally produced, more especially in the young; soft dorsal and anal scaled. *Colour*—deep violet, extending on to dorsal and anal fins; pectoral hyaline, with a dark mark at its base; ventral nearly black; posterior extremities of dorsal and caudal canary-yellow; all scales on upper part of body and free portion of tail with light blue central spots. Some blue lines about the head in the young, which has also free portion of tail yellow and chest light-coloured.

*Hab.* Numerous in the harbour at Karachi in Sind.



1230. (5.) *Pomacentrus littoralis*.

*Pomacentrus littoralis* (Kuhl & v. Hass.), Cuv. & Val. *H. N. Poiss.* v, p. 425; *Day, Fish. India*, p. 383 (see synonym.).

D. 13-14. P. 16. A. 2/14-15. C. 17. L. 1. 26-28. L. tr. 3/9.

Length of head  $3\frac{1}{2}$ , height of body  $2\frac{1}{2}$  to  $2\frac{3}{4}$  in the total length. *Eyes*—diameter  $2\frac{3}{4}$  in length of head,  $\frac{1}{2}$  to  $\frac{3}{4}$  diam. from end of snout, and  $\frac{2}{3}$  to 1 apart. Preorbital narrow, entire; suborbital bones serrated in the adult, entire in the immature. *Fins*—dorsal spines increase in length behind; caudal slightly emarginate. *Colour*—brownish, two narrow blue lines from back along forehead converging on snout; two more through eye to maxilla. A dark blue mark on opercle; and a line of blue spots along cheeks; each scale with a blue spot; a black white-edged ocellus at base of soft dorsal, and sometimes another across back of tail behind base of dorsal fin. Ventral nearly black.

*Hab.* Andamans and Nicobars to the Malay Archipelago and beyond.

1231. (6.) *Pomacentrus bankanensis*.

*Pomacentrus bankanensis*, Bleeker, *Batavia Nat. Tijdsch.* v, p. 513  
*Day, Fish. India*, p. 383.

D. 13/14. P. 18. A. 2/14. C. 15. L. 1. 27. L. tr.  $3\frac{1}{2}/9$ .

Length of head  $4\frac{1}{4}$ , height of body  $2\frac{3}{4}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout and also apart. Greatest depth of preorbital equals  $\frac{1}{2}$  diam. of eye. Suborbital bones serrated, anterior denticulation the strongest. *Fins*—dorsal spines increase in length posteriorly; caudal with rounded lobes. *Colour*—olive, with vertical or round bluish spots on scales. A black spot at commencement of lateral line, another at base of pectoral, and a third over free portion of tail.

*Hab.* Andamans to the Malay Archipelago and Australia.

1232. (7.) *Pomacentrus prosopotaenia*.

*Pomacentrus prosopotaenia*, Bleeker, *Batavia Nat. Tijdsch.* iii, p. 67;  
*Day, Fish. India, Suppl.* p. 801 (see synonym.).

*Pomacentrus albofasciatus*, *Day, Fish. India*, p. 384, pl. lxxx, fig. 9  
(not Schlegel).

D. 12-13/15. P. 17. A. 2/13-14. C. 17. L. 1. 26. L. tr. 3/9.

Length of head  $4\frac{1}{2}$ , height of body  $3\frac{1}{4}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout, and  $1\frac{1}{3}$  apart. Preorbital entire, suborbital bones serrated. Greatest depth of preorbital nearly equals diameter of eye. *Colour*—dark olive, with bluish spots on cheeks; a curved blue line below eye, and a broad vertical yellowish band underneath last dorsal





spines; sometimes a black spot on base of last few dorsal rays, and a round white-edged one at base of pectoral.

*Hab.* Andamans to the Malay Archipelago.

### 1233. (8.) *Pomacentrus lividus*.

*Chaetodon lividus*, Forster, *Descr. An. ed. Licht.* p. 227.

*Pomacentrus punctatus*, Quoy et Gaim. *Voy. Uranie et Phys.*, Zool. p. 395, pl. 64, fig. 1; Day, *Fish. India*, p. 384, pl. lxxx, fig. 8.

*Pomacentrus lividus*, Day, *Fish. India, Suppl.* p. 801 (see synonym.).

D. 12-13/15-14. A. 2/13-14. L. 1. 27. L. tr.  $3\frac{1}{2}$ /10. Cæc. pyl. 3.

Length of head  $3\frac{1}{4}$  to  $3\frac{2}{3}$ , height of body  $2\frac{2}{3}$  in the total length. *Eyes*—diameter from 3 to  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout and also apart. Preorbital in adults nearly as deep as long, and equal to diameter of eye; in the immature its depth is not nearly so great. Hind edge of preorbital and suborbital ring serrated. *Fins*—dorsal spines subequal in height but lower than soft dorsal, which is pointed. Caudal emarginate. *Colour*—greyish brown, head with irregular bluish-white dots and one on each scale of the body. A black spot, margined before and behind with white, at base of last six dorsal rays, and usually continued on to back of free portion of tail. Occasionally a dark spot in axil of pectoral.

*Hab.* Red Sea, Mauritius, Andamans, Nicobars, and Malay Archipelago.

### (9.) *Pomacentrus labiatus*.

*P. labiatus*, Day, *Fish. India*, p. 384, pl. lxxxi, fig. 2.

D. 17. A. 2/13-14. C. 17. L. 1. 28. L. tr.  $3\frac{1}{2}$ /10 $\frac{1}{2}$ .

Length of head  $3\frac{1}{4}$ , height of body  $2\frac{1}{2}$  in the total length. *Eyes*—diameter from 3 to  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout and also apart. Suborbital ring of bones rough, scarcely serrated. Preorbital scaleless, its greatest depth half diameter of eye. Lips very large, thick, covered with papillæ, and reflected all round the mouth. *Fins*—dorsal spines subequal, shorter than soft dorsal, which is pointed. Ventral reaches anal. Upper lobe of caudal usually slightly the longer. *Colour*—brown, lightest on chest and lower surface of head; fins black. Blue spots on some scales of head, and usually one on centre of each scale in row above lateral line.

*Hab.* Andamans and Nicobars, growing to  $3\frac{1}{2}$  inches in length.

### 1235. (10.) *Pomacentrus jerdoni*.

*Pomacentrus jerdoni*, Day, *Fish. India*, p. 383, pl. lxxx, fig. 7.

B. iv. D. 13/13. P. 17. A. 2/14. C. 17. L. 1. 34. L. tr. 5/11.

Length of head 5, height of body  $3\frac{1}{4}$  in the total length. *Eyes*—diameter 3 in length of head,  $\frac{3}{4}$  diam. from end of snout, and 1





apart. Preorbital entire, much longer than deep. Opercle with two spines; angle of opercle slightly serrated as well as contiguous portions of subopercle; infraorbital ring narrow, entire, and scaleless. *Fins*—dorsal spines increase in length posteriorly; soft dorsal and anal pointed; caudal lobes, especially the upper, produced; second anal spine longest and strongest; ventral reaches anal. *Colour*—olive, becoming light below; seven rows of light blue spots across gill-cover, one row along suborbitals, and one over snout. A row of light lines along middle of scales on sides. A black spot at base of pectoral. Fins dark-coloured. Base of caudal and the anal barred with light lines.

*Hab.* Madras, growing to 5 inches in length.

### 5. Genus **GLYPHIDODON** (Lacépède), Cuvier.

*Syn.* *Glyphisodon*, Cuv. & Val.; *Euschistodus*, *Dischistodus*, *Hypsipops*, *Pomatoprión*, *Microspathodon*, Gill.

Branchiostegals five or six. Body short, compressed. Cleft of mouth small. Opercles entire. Teeth compressed and in a single row. Anal with two spines. Scales of moderate size. The tubular portion of the lateral line ceases below the end of the dorsal fin, but is continued in the form of minute circular orifices. Air-bladder present. Pyloric appendages few.

*Geographical Distribution.* Tropical seas of both hemispheres.

#### *Synopsis of Indian Species*

##### A. Transverse (vertical) bands on sides.

L. tr. 4/12. Dull dark bands, broader than interspaces. Black spots on nape .....

1. *G. sordidus*, p. 387.

L. tr. 4/14 .....

2. *G. leucopleura*, p. 388.

L. tr.  $4\frac{1}{2}$ /12. Narrow white vertical bands .....

4. *G. notatus*, p. 387.

L. tr. 3/11 .....

6. *G. septemfasciatus*, p. 388.

L. tr.  $4\frac{1}{3}$ /12. Dark bands narrower than interspaces .....

7. *G. coelestinus*, p. 389.

L. tr. 4/11 .....

8. *G. bengalensis*, p. 389.

##### B. No transverse bands.

a. Caudal lobes, soft dorsal, and anal produced into long points .....

3. *G. cochinchensis*, p. 387.

b. Vertical fins not produced.

L. tr. 3/10 .....

5. *G. melas*, p. 388.

L. tr.  $2\frac{1}{2}$ /9 .....

9. *G. antjerius*, p. 390.

L. tr. 3/12 .....

10. *G. leucogaster*, p. 390.

L. tr.  $2\frac{1}{2}$ /8 .....

11. *G. modestus*, p. 391.

### 1236. (1.) **Glyphidodon sordidus**.

*Chaetodon sordidus*, Forsk. *Descr. Anim.* p. 62, no. 87.

*Glyphidodon sordidus*, Day, *Fish. India*, p. 385, pl. lxxxiii, fig. 1 (see synon.).

*Chak-mud-dah*, Andam.; *Calamoia pota*, Tel.





D. 13/14-16. A. 2/12-15. L. 1. 29. L. tr. 4/12. C. p. 3. Vert. 12/14.

Length of head 4 to  $4\frac{1}{4}$ , height of body  $2\frac{1}{4}$  in the total length. *Eyes*—diameter 4 in length of head,  $1\frac{1}{4}$  diam. from end of snout, and  $1\frac{1}{3}$  apart. Greatest width of preorbital nearly equals diameter of eye, suborbitals about half as wide. *Teeth*—about 36 in upper jaw, their crowns notched. *Fins*—fifth to seventh dorsal spines longest; soft dorsal higher than long; caudal forked. *Colour*—yellowish olive, the fins darker. Five dull bands, broader than interspaces, from dorsal fin down sides, and a sixth, nearly black, over free portion of tail. A black spot at base of pectoral. A row of black spots across nape.

*Hab.* Red Sea, east coast of Africa, seas of India to China.

1237. (2.) *Glyphidodon leucopleura*.

*Glyphidodon leucopleura*, Day, *Fish. India*, p. 385, pl. lxxxiii, fig. 4.

B. v. D. 13/15. P. 17. A. 2/14. C. 15. L. 1. 28. L. tr. 4/14.

Length of head  $3\frac{1}{2}$ , of caudal fin  $4\frac{1}{3}$ , height of body  $2\frac{2}{3}$  in the total length. *Eyes*—diameter  $2\frac{1}{2}$  in length of head,  $\frac{1}{2}$  diam. from end of snout, and  $\frac{3}{4}$  apart. Greatest depth of preorbital equals  $\frac{1}{3}$  diameter of orbit; suborbital ring very narrow. *Teeth*—with notched summits. *Fins*—third to sixth dorsal spines considerably longer than the last; soft dorsal angular. Caudal slightly lobed, lobes pointed. *Colour*—brownish, with a dark, almost black, band from first half of dorsal fin to ventral; several narrow white vertical bands from back to abdomen. A white-edged black spot on free portion of the tail extending to bases of last three dorsal rays. Ventral and anal black. Caudal yellowish, with dark outer edges.

*Hab.* Two specimens, about  $1\frac{3}{4}$  inches long, from the Andamans.

1238. (3.) *Glyphidodon cochinensis*.

*Glyphidodon cochinensis*, Day, *P. Z. S.* 1865, p. 38, and *Fish. India*, p. 386, pl. lxxxi, fig. 1 (see synonym.).

B. v. D. 13/12-15. P. 15. A. 2/10-11. C. 15. L. 1. 28. L. tr. 3/8.

Length of head from  $5\frac{1}{2}$  to 6, of caudal fin  $2\frac{1}{2}$  to 3, height of body  $3\frac{2}{3}$  in the total length. *Eyes*—diameter 3 to  $3\frac{1}{4}$  in length of head,  $\frac{3}{4}$  diam. from end of snout, and 1 apart. Preorbital narrow, about  $\frac{1}{3}$  width of orbit. *Teeth*—about 40 in upper jaw, their summits notched. *Fins*—soft portions of dorsal, anal, and caudal lobes much elongate. *Colour*—purplish black, rather lighter on abdomen, edges of scales sometimes with a lighter tinge; pectoral not so dark as other fins.

*Hab.* Cochin and the Andamans.

1239. (4.) *Glyphidodon notatus*.

*Glyphidodon notatus*, Day, *P. Z. S.* 1869, p. 521; and *Fish. India*, p. 386, pl. lxxxiii, fig. 5 (see synonym.).





B. v. D. 13/13-14. P. 19. A. 2/13-14. C. 17. L. 1. 28-30. L. tr.  $4\frac{1}{2}/12$ .

Length of head 4 to  $4\frac{1}{4}$ , of caudal fin 4 to  $4\frac{1}{4}$ , height of body  $2\frac{1}{2}$  in the total length. *Eyes*—diameter 3 in length of head,  $\frac{3}{2}$  diam. from end of snout, and 1 apart. Greatest depth of preorbital equals  $\frac{1}{2}$  diameter of eye; suborbital ring decreases rapidly in width posteriorly. *Fins*—dorsal rays much longer than spines; caudal deeply forked. *Colour*—olive-brown, lighter below; five narrow white bands from back down sides, the first from first dorsal spine to base of pectoral, the second from third spine to middle of ventral, third from seventh spine, fourth from tenth, and fifth over free portion of tail. A black spot at base of pectoral; caudal yellowish.

*Hab.* Andamans, growing to  $3\frac{1}{2}$  inches in length.

1240. (5.) *Glyphidodon melas*.

*Glyphisodon melas* (Kuhl & v. Hass.), *Cuv. & Val. H. N. Poiss.* v, p. 472.

*Glyphidodon melas*, *Day, Fish. India, Suppl.* 1888, p. 801 (see *synon.*).

*Nga yanga aphyoo*, Arracan.

B. v. D. 13/13-14. A. 2/10-13. C. 17. L. 1. 28. L. tr. 3/10.

Length of head 4, height of body  $2\frac{1}{4}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout. *Fins*—dorsal spines rather short, increasing in length posteriorly; soft portion of dorsal and anal somewhat rounded, caudal slightly emarginate. *Colour*—neutral sepia or dusky, with a greenish tinge beneath; fins black or a little diluted at their bases. Scales edged darker.

*Hab.* Red Sea, east coast of Africa, Burma to the Malay Archipelago.

1241. (6.) *Glyphidodon septemfasciatus*.

*Glyphisodon septemfasciatus*, *Cuv. & Val. H. N. Poiss.* v, p. 463.

*Glyphidodon septemfasciatus*, *Day, Fish. India*, p. 386, pl. lxxxi, fig. 7 (see *synon.*).

B. v. D. 13/13. P. 17. A. 2/12. C. 17. L. 1. 29. L. tr. 3/11.

Length of head  $4\frac{1}{4}$ , height of body  $2\frac{2}{3}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head,  $1\frac{1}{4}$  diam. from end of snout, and  $1\frac{2}{3}$  apart. Greatest depth of preorbital equals  $\frac{3}{4}$  diameter of eye. *Fins*—fourth to sixth dorsal spines the longest. Soft dorsal angular, the fifth ray longest; caudal lobes broad, not very emarginate. *Colour*—greenish olive, with seven dark cross bands wider than interspaces: the first, which is indistinct, from summit of head to preopercle; the second from in front of dorsal fin to base of pectoral; the third, fourth, and fifth from the spinous dorsal; the sixth from below soft dorsal; and the seventh over free portion of tail. Spinous dorsal with a black edge and a yellowish band below it. A black spot at base of pectoral.

*Hab.* Seas of India to China.



1242. (7.) *Glyphidodon celestinus*. (Fig. 129.)

*Glyphisodon celestinus* (Solander), *Cuv. & Val. H. N. Poiss.* v, p. 464, pl. 135, and ix, p. 508.

*Glyphidodon celestinus*, *Day, Fish. India*, p. 386, pl. lxxxiii, fig. 2 (see synonym.).

*Rahti potah*, Tel.; *Nga koongya*, Arracan.

B. v. D. 13/13. P. 17. A. 2/12-13. C. 17. L. 1. 29. L. tr.  $4\frac{1}{2}/12$ .

Length of head  $4\frac{1}{2}$ , height of body  $2\frac{2}{3}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  to  $3\frac{3}{4}$  in length of head,  $\frac{3}{4}$  diam. from end of snout, and 1 apart. Greatest depth of preorbital equals  $\frac{2}{3}$  diameter of eye; sub-orbital ring very narrow. *Teeth*—about 40 in upper jaw, narrow and notched. *Fins*—dorsal spines increase in length posteriorly;

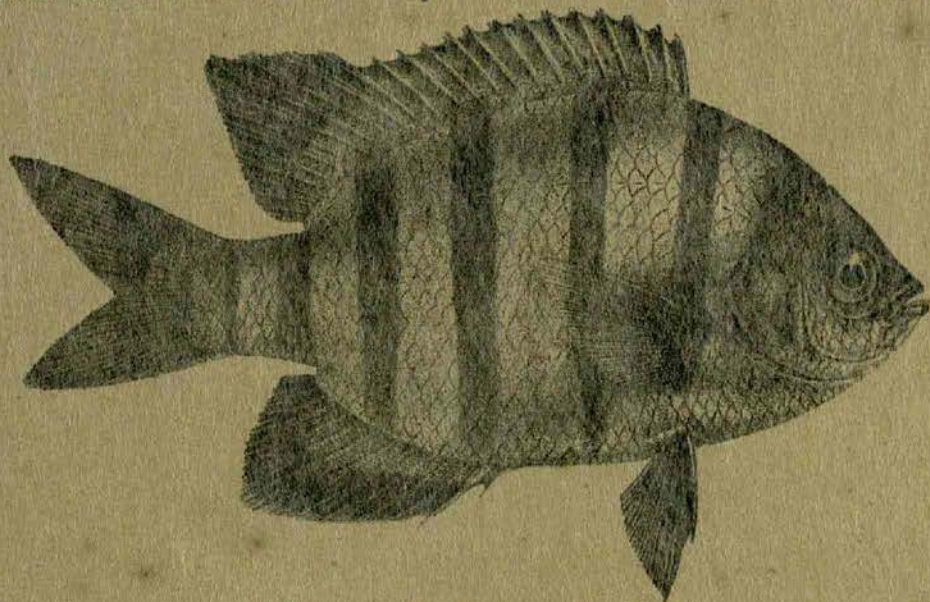


Fig. 129. —*Glyphidodon celestinus*.

soft dorsal pointed, its fourth and fifth rays longest. Caudal deeply forked. *Colour*—olive-brown, with five vertical dark cross bands narrower than interspaces. A dark spot at base of pectoral. Outer edge of caudal usually black.

*Hab.* Red Sea, east coast of Africa, seas of India, Malay Archipelago, and Polynesia.

1243. (8.) *Glyphidodon bengalensis*.

*Glyphisodon bengalensis*, *Cuv. & Val. H. N. Poiss.* v, p. 458.

*Glyphidodon bengalensis*, *Day, Fish. India*, p. 387, pl. lxxxiii, fig. 3 (see synonym.).

*Chāk-mud-dah*, Andamanese.

B. v. D. 13/12-13. A. 2/11-12. C. 15. L. 1. 29-30. L. tr.  $4/11$ .

Length of head  $4\frac{1}{4}$ , height of body  $2\frac{1}{2}$  in the total length. *Eyes*—diameter  $3\frac{1}{8}$  in length of head, 1 diam. from end of snout, and  $1\frac{1}{4}$  apart. Greatest depth of preorbital equals diameter of eye. *Teeth*—crowns notched. *Fins*—soft dorsal angular, the





fourth and fifth rays longest. Caudal forked, lobes pointed. *Colour*—dull greenish olive, with seven vertical dark bands extending downwards from the back, the first across the head, the second across the neck, four below the dorsal fin, and one across free portion of tail. A dark edge to spinous dorsal, a dark spot at base of pectoral, and two bands along anal fin.

*Hab.* Seas of India from Karáchi to the Malay Archipelago and beyond.

1244. (9.) *Glyphidodon antjerius*.

*Glyphisodon antjerius* (Kuhl & v. Hass.), *Cuv. & Val. H. N. Poiss.* v, p. 481.

*Glyphidodon antjerius*, *Day, Fish. India*, p. 387, pl. lxxxi, figs. 4 and 5, *Suppl.* p. 801 (see *synon.*).

B. v. D. 13/12-13. A. 2/12-13. C. 17. L. l. 26-28. L. tr.  $2\frac{1}{2}/9$ .

Length of head  $4\frac{1}{4}$  to  $4\frac{1}{2}$ , height of body  $2\frac{3}{4}$  to 3 in the total length. *Eyes*—diameter 3 to  $3\frac{1}{2}$  in length of head,  $\frac{3}{4}$  to 1 diam. from end of snout, and 1 apart. Preorbital rather broad, its greatest depth about  $\frac{1}{2}$  diameter of eye; suborbital ring narrow. *Teeth*—narrow and in two rows. *Fins*—soft dorsal and anal angular. Caudal slightly forked. *Colour*—exceedingly various, the markings being partially or entirely absent in some specimens, and that not merely from age. Carulean blue above the lateral line, this colour extending on to some scales along the base of the dorsal, and usually terminating at end of soft dorsal by surrounding a black blotch which is sometimes divided into two and sometimes absent altogether. A blue supraorbital line, joining another from opposite side across snout, and several other blue lines around eyes and on cheeks. In some specimens there is a spot of blue on several scales of the body.

*Hab.* Red Sea, seas of India, Malay Archipelago and beyond.

1245. (10.) *Glyphidodon leucogaster*.

*Glyphidodon leucogaster*, *Bleeker, Batav. Genootsch. Verhand.* xxi, *Labr. Cten.* p. 26; *Day, Fish. India*, p. 388, pl. lxxxi, fig. 3 (see *synon.*).

B. v. D. 13/12-13. A. 2/12-13. C. 17. L. l. 26-28. L. tr. 3/12.

Length of head  $4\frac{1}{2}$ , height of body  $2\frac{3}{4}$  in the total length. *Eyes*—diameter  $2\frac{3}{4}$  in length of head,  $\frac{2}{3}$  diam. from end of snout, and  $1\frac{1}{4}$  apart. Preorbital with a shallow notch, its greatest width equals nearly 1 diameter of eye; suborbital ring narrow. *Teeth*—about 46 in upper jaw. *Fins*—dorsal spines, after second, subequal in length; soft portion of dorsal rather pointed; anal rounded. Caudal forked, with pointed lobes. *Scales*—cover preorbital and suborbitals. *Colour*—olive-brown, lighter on sides and yellowish on abdomen. Upper edge of dorsal and outer two thirds of anal black, rest of fin and ventral yellow; outer margin of caudal dark. A black spot at base of pectoral.

*Hab.* Red Sea, east coast of Africa, Nicobars, and Malay Archipelago.



1246. (11.) *Glyphidodon modestus*.

*Glyphidodon modestus*, Schleg. *Overz. Amphipr. &c. in Verh. Nat. Gesch. Ned. Overz. Bezitt.* p. 23, t. vi, fig. 2; Day, *Fish. India*, p. 388, pl. lxxxi, fig. 6 (see synonym.).

B. v. D. 13/12. P. 18. A. 2/12. C. 15. L. 1. 23-24. L. tr.  $2\frac{1}{2}/8$ .

Length of head  $4\frac{1}{2}$ , height of body  $3\frac{1}{2}$  in the total length. *Eyes*—diameter  $2\frac{3}{4}$  to 3 in length of head,  $\frac{2}{3}$  to  $\frac{3}{4}$  diam. from end of snout, and 1 apart. Greatest depth of preorbital a little more than half diameter of eye; posteriorly the suborbital ring of bones rapidly narrows. *Teeth*—notched at their extremities; about 36 in the upper jaw. *Fins*—dorsal spines gradually increase in length to last, soft dorsal and anal somewhat rounded; caudal slightly cleft and having rounded lobes. *Scales*—none on preorbital or suborbital ring of bones. *Colour*—yellowish olive, lighter on sides and beneath; outer third of dorsal and anal fins greyish; a brownish dot superiorly at base of pectoral.

*Hab.* Andamans; seas of India and China.

6. Genus *HELIASTES*, Cuv. & Val.

Syn. *Furcaria*, Poey; *Chromis* (sp. Cuv.), Bleeker, 1877.

Branchiostegals five. All the opercles entire. Teeth in the jaws conical, in a narrow and irregular row. Dorsal fin with 12 to 14 spines; anal with two. Lateral line in a tubular form not continued beyond the end of the base of the dorsal fin. Air-bladder present. Pyloric appendages two.

1247. (1.) *Heliastes lepidurus*. (Fig. 130.)

*Heliastes lepidurus*, Cuv. & Val. *H. N. Poiss.* v, p. 498.

*Heliastes lepidurus*, Günther, *Catal.* iv, p. 63; Day, *Fish. India*, p. 389, pl. lxxxii, fig. 1 (see synonym.).

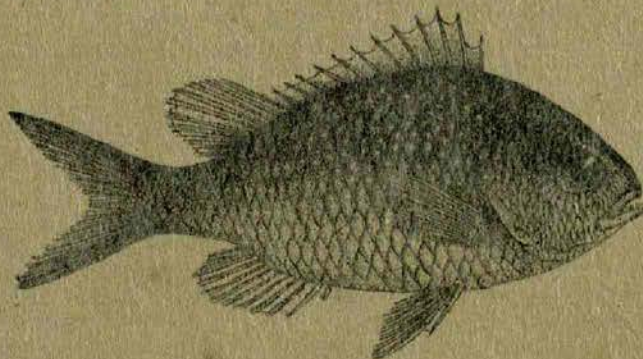


Fig. 130.—*Heliastes lepidurus*.

D. 11-12/10-11. P. 15. A. 2/10. C. 17. L. 1. 26-27. L. tr.  $2\frac{1}{2}/9$ .

Length of head 4 to  $4\frac{1}{4}$ , height of body  $2\frac{3}{4}$  to 3 in the total length. *Eyes*—diameter 3 in length of head,  $\frac{3}{4}$  to  $\frac{1}{2}$  diam. from end of





snout, and 1 apart. *Scales*—on preorbital and suborbitals. *Colour*—olive, each scale with a blue dot; a blue line from eye across preorbital, a blue spot at commencement of lateral line; dorsal dotted with blue, and having a dark edge; anal dotted with yellow, also with a dark margin; caudal with a brownish longitudinal band along either lobe. A dark axillary spot on pectoral; ventrals green.

This fish is very abundant about the coral reefs of the Andaman Islands. It retires for safety to the branching coral, and allows pieces to be removed from the water without leaving them.

*Hab.* East coast of Africa, Andamans, Malay Archipelago and beyond.

### Family XLIII. LABRIDÆ.

*Labroides cycloidei*, Müll.; *Scaroides*, Cantor; *Cyclolabridæ*, Owen.

Pseudobranchiæ present. Gills three and a half. Body oblong or elongate. Teeth in the jaws, palate edentulous; lower pharyngeal bones ankylosed along the median line without any median suture. A single dorsal fin with usually as many spines as rays or more; the anal rays usually similar to those of the dorsal; ventrals thoracic, 1/5. Scales cycloid. Air-bladder present. No caecal sac to the stomach. Pyloric appendages absent.

*Geographical Distribution.* Marine members of this family are mostly confined to the seas of tropical and temperate regions, and are generally abundant in the neighbourhood of rocks and coral reefs. The British species are known as Wrasses. Some are provided with strong teeth to enable them to crush the shells of mollusks, and a few have an additional pointed tooth at each angle of the mouth for pressing a shell against the crushing front and lateral teeth.

#### *Synopsis of Indian Genera.*

- A. Anterior teeth free and (except in *Anampses*) conical.
  - a. Lateral teeth more or less confluent into a ridge.
    - No scales along bases of fins ..... 1. *XIPHOCHILUS*.
    - Vertical fins with scaly bases..... 2. *CHÆROPS*.
  - b. Lateral teeth not confluent.
    - a'. Cheeks and opercles scaly.
      - a". Dorsal spines 12 (rarely 13)..... 3. *COSSYPHUS*.
      - b". Dorsal spines 9 or 10.
        - a. Lateral line continuous ..... 4. *LABROIDES*.
        - β. Lateral line interrupted.
          - Jaws not produced behind ..... 5. *CHILINUS*.
          - Lower jaw produced to behind orbit.... 6. *EPIBULUS*.
    - β'. Head almost or quite scaleless. L. l. 25-30.
      - a". Dorsal spines 9. Lateral line continuous.
        - a. Two prominent compressed cutting anterior teeth in each jaw ..... 7. *ANAMPSES*.





- β. Cheeks with a row of a few small scales.  
     Lips very thick ..... 8. HEMIGYMNUS.  
 γ. Anterior teeth not compressed. Cheeks  
     scaleless.  
     Scales on chest at least as large as on  
     sides ..... 9. STETHOJULIS.  
     Scales on chest smaller than on sides . 10. PLATYGLOSSUS.  
 δ'. Dorsal spines 9, the two first semidetached.  
     L. 1. interrupted ..... 11. NOVACULA.  
 ε'. Dorsal spines 8.  
     Snout moderate ..... 12. JULIS.  
     Snout greatly produced ..... 13. GOMPHOSUS.  
 ζ'. Head naked. L. 1. 45-80. Dorsal spines 9.  
 α''. Body elongate, nearly cylindrical ..... 14. CHILIO.  
 δ''. Body oblong compressed.  
     Lateral line continuous ..... 15. CORIS.  
     Lateral line interrupted ..... 16. CYMOLUTES.  
 B. Anterior teeth broad and with cutting lateral  
     edges ..... 17. PSEUDODAX.  
 C. Anterior teeth soldered into a cutting-edge .... 18. SCARICHTHYS.  
 D. Anterior teeth imbricate ..... 19. CALLYODON.  
 E. Anterior teeth soldered together in quincuncial  
     order..... 20. PSEUDOSCARUS.

### 1. Genus **XIPHOCHILUS**, Bleeker.

Branchiostegals six. Body oblong; head scaled; snout obtuse; upper lip thin and capable of being almost hidden under the pre-orbital. Both limbs of the preopercle destitute of scales. Four canine teeth anteriorly in both jaws, lateral teeth soldered into an osseous ridge; a posterior canine tooth present. Scales large. No scales along the bases of the fins. Lateral line continuous.

*Geographical Distribution.* Indian Ocean.

#### 1248. (1.) **Xiphochilus robustus**.

*Xiphochilus robustus*, Günther, *Catal.* iv, p. 98; *Day, Fish. India*, *Suppl.* p. 802 (see *synon.*).

D. 11-12/9-8. A. 3/10. L. 1. 29. L. tr. 3/9.

The following is from Dr. Günther's description:—Height of body nearly  $3\frac{2}{5}$ , length of head  $3\frac{2}{5}$  in the total length. Head nearly as high as long. Preorbital higher than orbit, preopercle not serrated. *Teeth*—outer canines of mandibles turned outwards, an obtuse osseous ridge round the edge of the jaws in which teeth are scarcely distinct. *Fins*—dorsal spines strong, the last longest and one third length of head; soft dorsal and anal reach root of caudal, which is rounded. *Colour*—yellowish red, a yellow band along basal half of anal, and another along middle of dorsal fin.

*Hab.* One specimen 12 inches long, obtained in Ceylon by Mr. Haly; also Red Sea and Mauritius.



2. Genus **CHÆROPS**, Rüppell.

Syn. *Cossyphus*, sp., Cuv. & Val.; *Chairodon* and *Cossyphodes*, Bleeker; *Hypsigenys*, Günther.

Branchiostegals five or six. Body oblong, compressed. Snout obtuse. The four anterior teeth conical and free, the lateral ones more or less confluent in an osseous ridge; a posterior canine tooth, occasionally two, may be present. Dorsal fin with more spines than rays; anal with more rays than the soft dorsal. Scales large; cheeks high, covered with small scales, which usually are not imbricate; opercles scaled. Vertical fins with scaly bases; no enlarged row at base of caudal. Lateral line continuous.

*Geographical Distribution.* Red Sea, east coast of Africa, seas of India, Malay Archipelago, and Australia.

1249. (1.) **Chærops anchorago**. (Fig. 131.)

*Sparus anchorago*, Bloch, *Ich.* v, p. 108, t. 276.

*Chærops anchorago*, Day, *Fish. India*, p. 391, pl. lxxxii, fig. 5 (see synonym.).

B. vi. D. 13/7. P. 15. A. 3/9. C. 14. L. 1. 29–30. L. tr.  $3\frac{1}{2}/9$ .

Length of head  $3\frac{1}{3}$  to  $3\frac{2}{3}$ , height of body  $3\frac{1}{4}$  to  $3\frac{1}{2}$  in the total length. *Eyes*—high up, diameter  $4\frac{1}{2}$  to 5 in length of head, 2 diam. from end of snout, and  $1\frac{1}{4}$  apart. Preopercle finely serrated. *Teeth*—a posterior canine in adults. *Colour*—cheeks brownish, shot with yellow, and covered with scarlet spots. Back

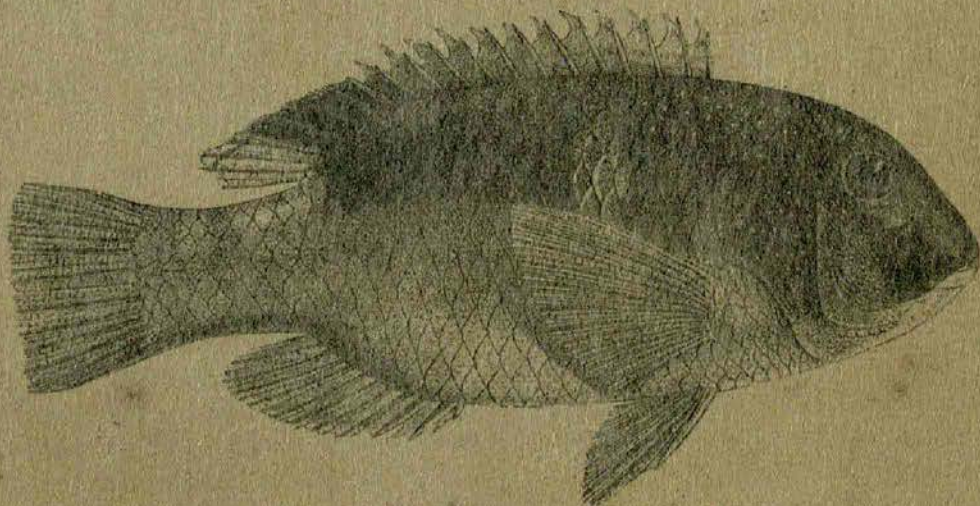


Fig. 131.—*Chærops anchorago*.

brownish, a white vertical band from bases of about fourth to sixth dorsal spines to below last third of pectoral; a light band over free portion of tail. In some specimens there are two to four wide dark cross bands. Dorsal fin with two dark bands and another descending down the first four rays to the back; posteriorly





the fin is yellow and edged with orange; other fins yellowish, a band along ventral and sometimes a brown base to pectoral.

*Hab.* Andamans to the Malay Archipelago; attaining a large size.

### 3. Genus **COSSYPHUS**, Cuv. & Val.

*Syn.* *Harpe*, *Lepidoplois*, and *Pimelometopon*, Gill.

Branchiostegals six. Body oblong, compressed. Snout more or less pointed. The four anterior teeth conical and free; the lateral teeth in a single row; a posterior canine is as a rule present. Dorsal fin with more spines than rays; the anal with more rays than the soft dorsal. Scales of moderate size, those on the cheeks and opercles imbricate; bases of vertical fins scaled. No enlarged row of scales at base of caudal. Lateral line continuous.

*Geographical Distribution.* Nearly all intertropical and adjacent seas.

#### *Synopsis of Indian Species.*

- Orange-red, darkest superiorly ..... 1. *C. axillaris*, p. 395.  
 Reddish, three white spots between the lateral  
 line and base of dorsal fin ..... 2. *C. diana*, p. 396.  
 A black blotch below hind edge of dorsal fin,  
 another between first three dorsal rays ... 3. *C. bilunulatus*, p. 396.

#### 1250. (1.) *Cossyphus axillaris*. (Fig. 132.)

*Labrus axillaris*, Bennett, *P. Z. S.* 1831, p. 166.

*Cossyphus axillaris*, Day, *Fish. India*, p. 392, pl. lxxxii, fig. 3 (variety)  
 (see *synon.*).

*Moonjilli*, Tamil.

D. 12/10. P. 16. A. 3/12. C. 14. L. 1. 34. L. tr. 5/12.

Length of head 4, height of body  $3\frac{1}{2}$  to 4 in the total length.  
*Eyes*.—diameter 4 to  $4\frac{1}{2}$  in length of head,  $1\frac{1}{3}$  to  $1\frac{2}{3}$  diam. from

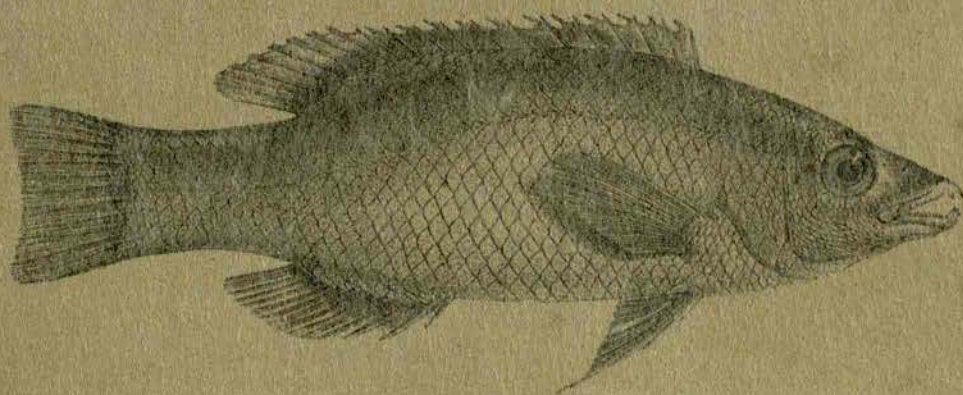


Fig. 132.—*Cossyphus axillaris*, var.

end of snout, and  $1\frac{1}{4}$  apart. Upper lip thick and with a broad anterior fold. Preopercle finely serrated. *Teeth*—a posterior





canine present. *Fins*—caudal truncated or slightly emarginate. *Colour*—head and upper two thirds of back orange-red. Fins yellow, a black base to pectoral, and a black blotch on upper two thirds of first few dorsal and anal rays.

*Hab.* Madagascar, Mauritius, seas of India to New Hebrides.

1251. (2.) *Cossyphus diana*.

*Labrus diana*, Lacép. *H. N. Poiss.* iii, pp. 451, 522, pl. xxxii, fig. 1.

*Cossyphus diana*, Day, *Fish. India*, p. 392, pl. lxxxvii, fig. 3 (see synon.).

*Cul monjilli*, Tamil.

D. 12/10. P. 16. A. 3/10-12. C. 14. L. 1. 32-33. L. tr. 4/12.

Length of head  $3\frac{1}{3}$  to  $3\frac{1}{2}$ , height of body  $3\frac{1}{2}$  in the total length. *Eyes*—diameter 5 in length of head, 2 diam. from end of snout, and  $1\frac{1}{4}$  apart. Snout produced, rather pointed; lips thick and broad; preopercle finely serrated. *Teeth*—a posterior canine in either jaw. *Fins*—no elongate ventral ray; caudal truncated. *Colour*—reddish, three large white spots between lateral line and base of dorsal fin, two below spines and one beneath rays. Dark spots on scales from commencement of soft dorsal to caudal above lateral line; a black spot at posterior end of lateral line; fins diaphanous. *Varieties*—some specimens have a white spot before commencement of lateral line. Others show a large black spot upon each ventral, and two more on the anal fin.

*Hab.* Seas of India; a specimen  $5\frac{1}{2}$  inches long in the Calcutta Museum.

1252. (3.) *Cossyphus bilunulatus*.

*Labrus bilunulatus*, Lacép. *H. N. Poiss.* iii, pp. 454, 526, pl. xxxi, fig. 2.

*Cossyphus bilunulatus*, Day, *Fish. India*, *Suppl.* p. 802 (see synon.).

D. 12/10. P. 16. A. 3/12. C. 14. L. 1. 34.

Length of head  $3\frac{2}{3}$ , height of body  $3\frac{1}{4}$  in the total length. *Eyes*—diameter  $5\frac{1}{2}$  in length of head, 2 diam. from end of snout. Preopercle finely serrated. *Fins*—caudal emarginate, the outer rays produced. *Colour*—reddish, with light or yellow stripes and a large black blotch below hind edge of soft dorsal and over commencement of free portion of tail. Two black lines on head, one from snout through eye, the second from angle of mouth to subopercle. A black blotch between first three dorsal spines.

*Hab.* Isle de France, Ceylon (*Haly*) to the Malay Archipelago.

4. Genus **LABROIDES**, Bleeker.

*Diproctacanthus*, Bleeker; *Fissilabrus*, Kner.

Branchiostegals five. Body oblong, compressed. Gill-membranes attached to the isthmus. Snout pointed; lips prominent, one of them having a notch anteriorly. Preopercle entire. A band





of small teeth in the jaws, with a pair of curved canines in either jaw, the upper pair being received between the lower ones; a posterior canine tooth. Dorsal fin with usually fewer spines than rays; anal with rays nearly similar to those of the dorsal. Scales extended over the opercles, cheeks, and base of the vertical fins; no enlarged row at base of caudal fin. Lateral line continuous.

*Geographical Distribution.* Red Sea, seas of India to the Malay Archipelago.

1253. (1.) *Labroides dimidiatus*. (Fig. 133.)

*Cossyphus dimidiatus*, Cuv. & Val. *H. N. Poiss.* xiii, p. 136.

*Labroides dimidiatus*, Day, *Fish. India*, p. 393, pl. lxxxvii, fig. 1 (see synonym.).

D. 9/10-12. P. 13. A. 3/10. C. 14. L. 1. 46-50. L. tr. 4/15.

Length of head  $3\frac{1}{2}$  to  $3\frac{3}{4}$ , height of body  $3\frac{1}{2}$  to 4 in the total length. *Eyes*—diameter 4 in length of head, 1 diam. from end of snout, and  $1\frac{1}{2}$  apart. Lips emarginate anteriorly. *Fins*—caudal



Fig. 133.—*Labroides dimidiatus*.

cut square. *Lateral line*—curves opposite posterior end of dorsal. *Colour*—nearly white, with a black band through eye to caudal fin; a black band along anal, passing to the caudal and joining the upper band at the end of that fin; a dark band along dorsal.

*Hab.* Red Sea, Coromandel coast of India, Andamans to the Malay Archipelago.

5. Genus **CHILINUS** (Lacép.), Cuvier.

*Oxycheilinus* et *Crassilabrus*, Gill.

Branchiostegals five. Body oblong, compressed. Preopercle entire. Lower jaw not produced backwards. Teeth in one row, two canines in either jaw, not directed outwards; no posterior canine. Dorsal spines about equal in number to the rays. Anal with three spines, the third longest, the rays rather fewer than those of the dorsal. Scales large, two rows on the cheeks, the last three scales at the base of the caudal fin enlarged. Lateral line interrupted.

*Geographical Distribution.* Indo-Pacific.



*Synopsis of Indian Species.*

- |   |                                   |
|---|-----------------------------------|
| A. D. 10/9. Ventral extending to anal rays.                       | 1. <i>C. chlorurus</i> , p. 398.  |
| B. D. 8-9/10. Ventral not extending to anal.                      |                                   |
| Greyish brown, red spots and stripes on head                      | 2. <i>C. trilobatus</i> , p. 398. |
| Yellowish with dark transverse bands                              | 3. <i>C. fasciatus</i> , p. 399.  |
| Bluish green above, reddish below, narrow bands on head and chest | 4. <i>C. undulatus</i> , p. 399.  |

1254. (1.) *Chilinus chlorurus*. (Fig. 134.)

*Sparus chlorurus*, Bloch, *Ich.* v, p. 24, t. 260.

*Cheilinus chlorurus*, Day, *Fish. India*, p. 393, pl. lxxxii, fig. 6 (see synonym.).

D. 10/9. P. 11. A. 3/8. C. 12. L. 1. 22. L. tr. 2/8.

Length of head  $3\frac{3}{4}$ , of caudal fin  $4\frac{1}{2}$ , height of body 3 in the total length. *Eyes*—diameter  $4\frac{1}{2}$  in length of head,  $1\frac{1}{2}$  diam. from end of snout and also apart. *Fins*—ventral reaches anal rays; outer caudal rays produced, causing the fin to appear three-lobed; it is sometimes rounded in the young. *Lateral line*—tubes much

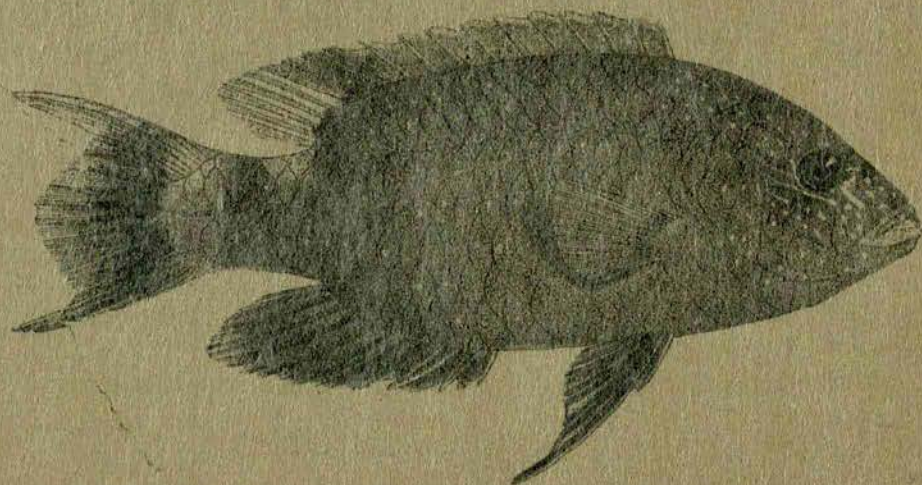


Fig. 134.—*Chilinus chlorurus*.

branched. *Colour*—olive-brown, with round yellow spots on cheeks and a yellow streak from eye to angle of mouth; body sparingly dotted with yellow, a yellow mark covers last few dorsal rays and is continued on to the back of free portion of tail; spinous dorsal olive, with red edges, and spines with brown dots; soft dorsal reddish; anal, ventral, and caudal with small yellow dots.

*Hab.* Bay of Bengal to Malay Archipelago and beyond.

1255. (2.) *Chilinus trilobatus*.

*Cheilinus trilobatus*, Lacép. *H. N. Poiss.* iii, pp. 529, 537, t. 31, fig. 3; *Day, Fish. India*, p. 394, pl. lxxxii, fig. 4 (see synonym.).

D. 9/10. P. 12. A. 3/8. C. 13. L. 1. 20. L. tr.  $2\frac{1}{2}$ /7.





Length of head  $3\frac{2}{3}$ , of caudal fin 7, height of body  $3\frac{1}{4}$  in the total length. *Eyes*—diameter  $5\frac{1}{2}$  in length of head,  $1\frac{1}{2}$  diam. from end of snout and also apart. Profile over snout rather concave. *Fins*—ventral does not reach anal, caudal rounded except in large specimens, when it is usually trilobed. *Lateral line*—tubules branched. *Colour*—greyish brown, with red spots and narrow stripes on head, the stripes mostly before and below the eyes; some of the body-scales with red spots. Vertical fins green, dorsal and anal having red margins; a dark spot at base of middle dorsal rays, sometimes extending to the posterior ones.

*Hab.* Red Sea, east coast of Africa, Adamans, Malay Archipelago and beyond; growing to at least 3 feet in length.

1256. (3.) *Chilinus fasciatus*.

*Sparus fasciatus*, Bloch, *Ich.* v, p. 18, t. 257.

*Cheilinus fasciatus*, Day, *Fish. India*, p. 394, pl. lxxxiv, fig. 1 (see synon.).

D. 9/10. A. 3/8. C. 13. L. 1.  $2\frac{1}{2}$ –23. L. tr. 2/7. Vert. 10/13.

Length of head  $3\frac{1}{2}$ , of caudal fin  $4\frac{2}{3}$ , height of body 3 to  $3\frac{1}{2}$  in the total length. *Eyes*—diameter 5 in length of head, 2 diam. from end of snout and also apart. Outer end of maxilla curved forwards in a hook-like process to receive outer extremity of premaxillary. *Fins*—ventral rounded, not reaching anal; caudal truncated, having its upper and lower rays produced. *Lateral line*—tubules unbranched. *Colour*—yellowish, with six or seven dark or black transverse bands; black spots on nape, opercles, and pectoral region, also some scattered over the body. Caudal with a crescentic vertical black band, and a black posterior edge, a few narrow dark bands between the two. Dorsal with a light edge having a dark base, some body bands extended on to this fin. A large black blotch on ventral.

*Hab.* Red Sea, seas of India, Malay Archipelago and beyond.

1257. (4.) *Chilinus undulatus*.

*Chilinus undulatus*, Rüpp. v. W., *Fische*, p. 20, t. vi, fig. 2; Day, *Fish. India*, *Suppl.* p. 802 (see synon.).

D. 8–9/10. A.  $2\frac{1}{8}$ . C. 11. L. 1. 22–23. Vert. 9/14.

Length of head  $3\frac{1}{3}$ , of caudal fin  $5\frac{1}{2}$ , height of body about 3 in the total length. *Eyes*—diameter 6 in length of head and situated about middle of its length. Head having a hump in some old specimens; lips thick. *Fins*—ventrals not quite so long as pectorals; caudal rounded. *Lateral line*—tubules not branched. *Colour*—bluish green, anterior half of body below lateral line reddish, also the cheeks. Two narrow dark bands from eye to snout, between them is a yellow one; two similar bands pass backwards from eye. Many narrow red and yellow lines on head and chest, and dark undulating bands on fins; outer edge of caudal yellow.

*Hab.* Red Sea, Zanzibar, Ceylon, Malay Archipelago.



6. Genus **EPIBULUS**, Cuvier.

Branchiostegals five. Body oblong, compressed. Preopercle entire. Mouth very protractile, the ascending processes of the premaxillaries, also the mandibles and tympanics, elongate. Teeth in one row, two canines in either jaw, but no posterior canine. Dorsal fin with fewer spines than rays; anal rays less numerous than dorsal. Scales large, two rows on cheeks, three enlarged scales at base of caudal fin. Lateral line interrupted.

*Geographical Distribution.* Seas of India to Malay Archipelago.

1258. (1.) **Epibulus striatus**. (Fig. 135.)

*Epibulus striatus*, Day, *D. Z. S.* 1870, p. 697; *Fish. India*, p. 395, pl. lxxxvii, fig. 2 (see syn.).

D. 9/10. P. 11. V. 1/5. A. 3/8. C. 13. L. 1. 19. L. tr. 2/7.

Length of head above  $2\frac{1}{2}$ , height of body  $2\frac{1}{2}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout and apart. *Fins*—interspinous membrane prolonged beyond both dorsal and anal spines. *Colour*—a white line between orbits; a second from eye to snout; a third descending from each orbit meets one from

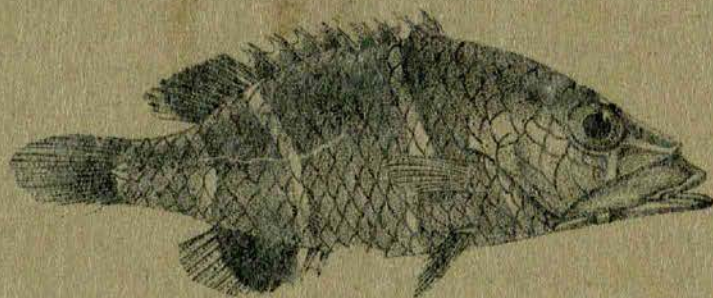


Fig. 135.—*Epibulus striatus*.

opposite side. Body greenish brown, with five narrow milk-white vertical bands, the first from opercles to before ventrals, the next from second dorsal spine to end of ventral, the third from dorsal to anal, the fourth from end of dorsal to end of anal, the fifth round free portion of tail. Soft dorsal and termination of anal white, remainder of fins dark-coloured.

*Hab.* Andamans, where a single specimen  $1\frac{1}{2}$  inches in length was captured.

7. Genus **ANAMPSJES**, Cuvier.

Branchiostegals six; body oblong, compressed. Preopercle entire. Teeth in jaws in one row, the two front teeth in each prominent, directed forwards, and compressed, with cutting-edges; no posterior canine. Dorsal spines fewer than the rays; anal with the same number of rays as the dorsal. No scales on the head, no enlarged row at base of caudal fin. Lateral line continuous.

*Geographical Distribution.* Indo-Pacific.



1259. (1.) *Anampses cæruleopunctatus*. (Fig. 136.)

*Anampses cæruleopunctatus*, *Rupp. Atl. Fische*, p. 42, t. x, fig. 1;  
*Day, Fish. India*, p. 395, pl. lxxxvii, fig. 4 (see synonym.).

D. 9/12. A. 3/12. C. 13. L. 1. 27-28. L. tr. 4/18. Vert. 11/15.

Length of head  $3\frac{1}{2}$ , height of body 3 in the total length. *Eyes*—diameter 5 in length of head,  $1\frac{1}{2}$  diam. from end of snout, and 2 apart. *Colour*—reddish brown, several bluish lines radiate from orbit; each scale on body with a blue spot surrounded by a

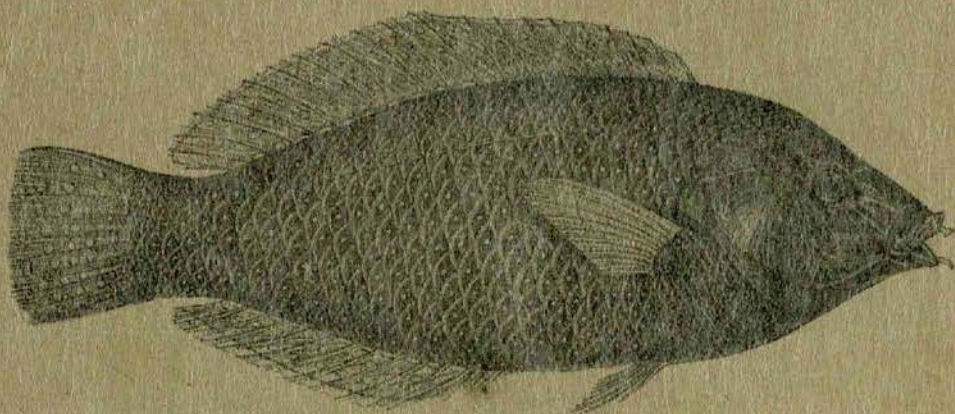


Fig. 136.—*Anampses cæruleopunctatus*.

dark ring; fins reddish, dorsal with three rows of blue spots, anal with two or three caudal likewise blue-spotted, all these fins with light edges. The spots on the middle part of body are sometimes apt to assume the appearance of vertical lines.

*Hab.* Red Sea, east coast of Africa, Mauritius, seas of India, Malay Archipelago and beyond.

8. Genus **HEMIGYMNUS**, Günther.

*Syn.* *Halichares*, sp., Rüppell; *Tautoga*, sp., Cuv. & Val.; *Erychthys* and *Hemudis*, Swainson.

Branchiostegals six; body oblong, compressed. Preopercle entire; lips very fleshy. Teeth in a single row, two canines anteriorly in either jaw, the lower ones received between the upper pair; generally a posterior canine. Dorsal fin with fewer spines than rays; anal with the same number of rays as the soft dorsal. Scales large, none on the opercles, but a strip of very small ones on the cheek. Lateral line continuous.

*Geographical Distribution.* Indo-Pacific.

*Synopsis of Indian Species.*

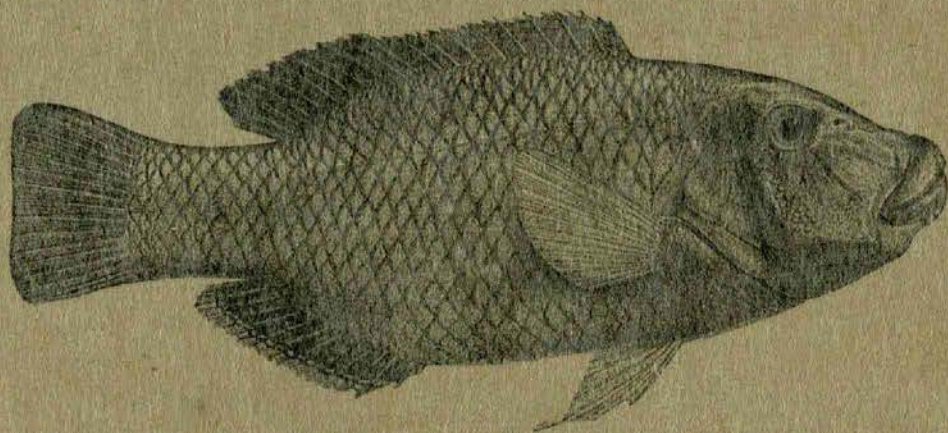
- L. tr. 5/14. Scales dotted with blue . . . . . 1. *H. melanopterus*, p. 402.  
 L. tr. 5/11. Bluish, with wide vertical bands. 2. *H. fasciatus*, p. 402.



1260. (1.) *Hemigymnus melanopterus*. (Fig. 137.)*Labrus melapterus*, Bloch, *Ich.* t. 285.*Hemigymnus melanopterus*, Günther, *Catal.* iv, p. 139; Day, *Fish. India*, p. 396, pl. lxxxiv, fig. 2 (see synon.).

D. 9/11. P. 13. A. 3/10. C. 15. L. l. 27-29. L. tr. 5/14.

Length of head  $3\frac{1}{4}$  to  $3\frac{1}{2}$ , height of body  $2\frac{3}{4}$  to  $3\frac{1}{2}$  in the total length. *Eyes*—diameter 4 in the young, to 6 or  $6\frac{1}{2}$  in length of head in adults, 2 to 3 diam. from end of snout, and  $1\frac{1}{2}$  to 2 apart. Lips very thick, the lower notched in middle, each lateral portion pendent like a wattle. *Colour*—bluish, brown above, yellowish beneath; a dark mark behind orbit; scales dotted with blue; dorsal and anal light at their external third, followed by a bluish band, edged

fig. 137.—*Hemigymnus melanopterus*.

darker: caudal dark. In the *young*, the body behind a line from commencement of dorsal to base of anal dark violet, some of the lower scales blue-spotted; anterior to this nearly white beneath, but darker along top of head; most of the scales with more or less dark spots.

*Hab.* Zanzibar, Andamans, Malay Archipelago, and Australia.

1261. (2.) *Hemigymnus fasciatus*.*Mullus fasciatus*, Thunb. *Reise nach Japan*, iv, p. 351, t. 314.*Hemigymnus fasciatus*, Günther, *A. M. N. H.* 1861, ser. 3, viii, p. 386; Day, *Fish. India*, p. 396 (see synon.).*Panoo-girawah*, "Worm parrot," Singhalese.

D. 9/11. P. 14. A. 3/11. C. 14. L. l. 28-29. L. tr. 5/11.

Length of head  $3\frac{2}{3}$  to 4, height of body  $3\frac{1}{3}$  to  $3\frac{1}{2}$  in the total length. *Eyes*—diameter 5 to 6 in length of head, nearly 3 diam. from end of snout. Lips very thick, folded; lower notched in middle and pendent like a wattle. *Fins*—caudal truncated. *Colour*—bluish, with broad rivuluted red bands on head, and a brown spot behind the eye; these marks appear to be sometimes absent. Five vertical brownish cross bands, wider than ground-colour, descend from back to the abdomen. Dorsal and anal brownish, the former with blue





spots and a blue edge, having a red band below it; anal with two blue longitudinal bands. Caudal brownish, with a blue vertical band. Pectoral yellowish. Outer two thirds of ventral dark.

*Hab.* Red Sea, east coast of Africa, seas of India and Malay Archipelago.

### 9. Genus **STETHOJULIS**, Günther.

Syn. *Julis*, sp., Cuv. & Val.

Branchiostegals six; body oblong and compressed. Preopercle entire; no anterior canine teeth; a posterior canine; dorsal fin with fewer spines than rays; anal with the same number of rays as the soft dorsal. Scales of moderate size, of equal dimensions on chest and sides; none on the head. Lateral line continuous.

*Geographical Distribution.* East coast of Africa to Western Pacific.

#### 1262. (1.) *Stethojulis strigiventer*. (Fig. 138.)

*Julis strigiventer*, Bennett, P. Z. S. 1832, p. 184.

*Stethojulis strigiventer*, Günther, A. M. N. H. 1861, ser. 3, viii, p. 386; Day, Fish. India, p. 397, pl. lxxxiv, fig. 7 (see synon.).

D. 9/11. P. 15. A. 2/11. C. 14. L. 1. 26-27. L. tr. 2/9.

Length of head  $3\frac{1}{2}$  to  $3\frac{3}{4}$ , height of body 4 to  $4\frac{1}{4}$  in the total length. Eyes—diameter 4 to  $4\frac{1}{2}$  in length of head,  $1\frac{1}{4}$  to 2 diam. from end of snout, and  $1\frac{1}{4}$  apart. Colour—light brown, yellowish on abdomen; a brown band having a white lower edge from

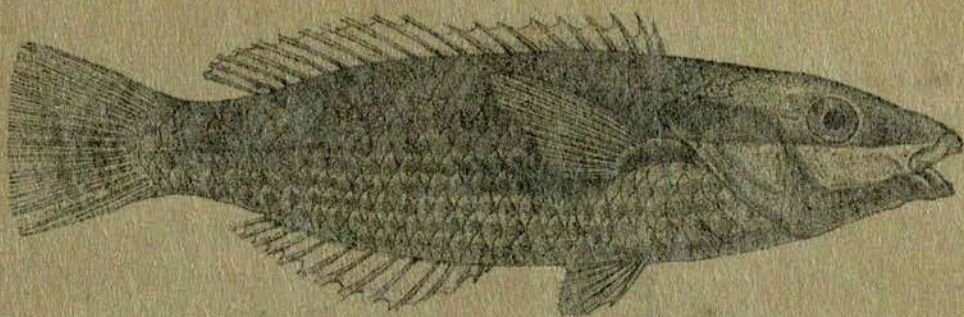


Fig. 138.—*Stethojulis strigiventer*.

snout below eye to opercle; several longitudinal yellow lines and some black dots along sides, especially in lower half of body; a black spot on last dorsal ray, another at base of caudal fin, the last sometimes absent.

*Hab.* East Africa, seas of India, Malay Archipelago, and China; very abundant at the Nicobars and Andamans.

### 10. Genus **PLATYGLOSSUS** (Klein), Günther.

Syn. *Halichares*, sp., Rüppell; *Julis*, sp., Cuv. & Val.; *Macropharyngodon*, Güntheria, and *Hemitartoga*, Bleeker; *Chærojulis*, Gill.

Branchiostegals six. Body oblong, compressed. Anterior teeth conical; a posterior canine. Dorsal fin with fewer spines than





rays; anal with about the same number of rays as the soft dorsal. Scales rather large; those on the thorax smaller than on the remainder of the body; none on the head (except a few rudimentary ones behind the eye in two or more species). Lateral line continuous.

*Geographical Distribution.* Tropical and adjacent seas.

*Synopsis of Indian Species.*

- |   |                                     |
|---|-------------------------------------|
| L. tr. 3/11. Purplish brown, red longitudinal bands; 2 black spots on dorsal .....                          | 1. <i>P. notopsis</i> , p. 404.     |
| L. tr. 2/12. A brownish-black band along back, another along lateral line .....                             | 2. <i>P. hyrtlui</i> , p. 405.      |
| L. tr. 3½/10. Blackish green. Undulating blue-edged grass-green streaks on head and fore part of body ..... | 3. <i>P. marginatus</i> , p. 405.   |
| L. tr. 3/10. Bluish green, violet bands on head, a dark ocellus on spinous dorsal ..                        | 4. <i>P. dussumieri</i> , p. 405.   |
| L. tr. 3½/8. Longitudinal silvery bands on sides; 2 black spots on dorsal .....                             | 5. <i>P. leparensis</i> , p. 406.   |
| L. tr. 2½/9. Broad bluish streaks on head, fore part of back with blue spots .....                          | 6. <i>P. hortulanus</i> , p. 406.   |
| Head with blue lines and spots, each scale below 1. l. with rosy centre .....                               | 7. <i>P. kawarin</i> , p. 407.      |
| L. tr. 3/12. Body with light and dark blotches and spots; 2 dark spots on dorsal .....                      | 8. <i>P. nebulosus</i> , p. 407.    |
| Blue spot behind orbit, oblique red streaks on head .....   | 9. <i>P. javanicus</i> , p. 408.    |
| L. tr. 2½/10. A broad red, blue-edged band along side .....   | 10. <i>P. scapularis</i> , p. 408.  |
| L. tr. 4/9. Violet bands round eye. An angular, black, white-edged spot in middle of side .....             | 11. <i>P. bimaculatus</i> , p. 409. |
| Rosy, a large black spot behind middle of eye.  | 12. <i>P. roseus</i> , p. 409.      |
| Olive, about 13 longitudinal dark lines on side.  | 13. <i>P. metager</i> , p. 409.     |

1263. (1.) *PlatyGLOSSUS notopsis*.

Julis (*Halicheres*) *notopsis*, *Bleeker, Batavia Nat. Tijdsch.* iv, p. 290.  
*PlatyGLOSSUS notopsis*, *Day, Fish. India*, p. 398, pl. lxxxiv, fig. 4  
 (see *synon.*).

D. 9/13. P. 13. A. 3/12. C. 14. L. l. 27-29. L. tr. 3/11.

Length of head 4 to 4½, height of body 3½ to 3¾ in the total length. *Eyes*—diameter 3½ in length of head, about 1 diam. from end of snout and also apart. *Fins*—dorsal spines two thirds height of rays; cauda rounded. *Colour*—purplish brown, with four or five red longitudinal bands. Two black ocelli on dorsal fin; the smaller between 1st and 2nd spines, the larger between 3rd and 6th rays; one or two rows of round light spots on fin posterior to large black spot. Caudal with a yellow band at its base, and yellow edges. Young much darker than adults, having light longitudinal narrow lines and three white spots on back.

*Hab.* Andamans to the Malay Archipelago.



1264. *PlatyGLOSSUS hyrtlII*.

*Julis* (*Halichoeres*) *hyrtlII*, *Bleeker, Act. Soc. Sc. Ind. Ned. i, Menado*, p. 60.

*PlatyGLOSSUS hyrtlII*, *Day, Fish. India*, p. 398, pl. lxxxviii, fig. 1 (see *synon.*).

D. 9/12-13. P. 14. A. 3/12. C. 14. L. 1. 27-28. L. tr. 2/12.

Length of head  $4\frac{1}{3}$  to  $4\frac{1}{2}$ , height of body  $4\frac{1}{4}$  to 5 in the total length. *Eyes*—diameter 5 in length of head, nearly 2 diam. from end of snout, and  $1\frac{1}{4}$  apart. *Fins*—caudal rounded. *Colour*—back olive, abdomen white; two brownish-black longitudinal bands—the upper along each side of base of dorsal fin; the lower from snout through eye to middle of base of caudal fin, where it ends in a black spot, in its course it is interrupted on the opercle by a bright red spot. Dorsal fin anteriorly with two, posteriorly with three rows of spots, the reticulations forming which are very distinct between the first and third spines. Caudal similarly reticulated. Pectoral with a dark spot superiorly at its base.

*Hab.* Andamans to the Malay Archipelago.

1265. (3.) *PlatyGLOSSUS marginatus*.

*Halichoeres marginatus*, *Rüpp. N. W., Fische*, p. 16.

*PlatyGLOSSUS marginatus*, *Day, Fish. India*, p. 398, pl. lxxxiv, figs. 5 and 6 (*variety*) (see *synon.*).

D. 9/12-13. P. 13. A. 3/11. C. 15. L. 1. 27. L. tr.  $3\frac{1}{2}$ /10.

Length of head  $4\frac{1}{3}$  to  $4\frac{2}{3}$ , height of body  $3\frac{1}{2}$  to  $3\frac{2}{3}$  in the total length. *Eyes*—diameter  $4\frac{1}{2}$  to 5 in length of head,  $1\frac{2}{3}$  to 2 diam. from end of snout, and  $1\frac{1}{3}$  apart. Dorsal profile somewhat concave above orbits. *Fins*—caudal slightly rounded. *Colour*—blackish green; head and anterior part of body with undulating grass-green streaks edged with blue. Numerous red blue-edged streaks and spots on vertical fins, which have blue margins; a large vertical green crescent-shaped mark covered with light spots on middle of caudal fin, basal half of pectoral black. *Variety*—a specimen captured at the Andamans has the marks on the head and body deep brown, the crescentic band on caudal envelops the whole of it except its outer angles, and instead of being covered with light spots has brown undulating vertical bands. The black base to the pectoral is absent.

*Hab.* Red Sea, seas of India, and Malay Archipelago.

1266. (4.) *PlatyGLOSSUS dussumieri*.

*Julis dussumieri*, *Cuv. & Val. H. N. Poiss.* xiii, p. 478, pl. 387.

*PlatyGLOSSUS dussumieri*, *Day, Fish. India*, p. 399, pl. lxxxv, fig. 1 (see *synon.*).

*Kullaray meen*, Mal.; *Chikoti*, Maráthi.