



of the dorsal fin and a grey spot at the base of each spine and ray; anal spines grey, the membrane and rays black, except the last two rays, which are white.

*Hab.* Seas of India; growing to at least  $14\frac{1}{2}$  inches in length.

785. (4.) *Chrysophrys aries*.

*Chrysophrys aries*, Temm. & Schleg. *Faun. Japon.*, Poiss. p. 67, pl. 31; Day, *Fish. India*, Suppl. p. 788.

*Chrysophrys haffara*, Cuv. & Val. H. N. Poiss. vi, p. 108; Day, *Fish. India*, p. 142, pl. xxxv, fig. 1 (see synon.), not *Sparus haffara*, Forsk.

D. 11/13. P. 15. A. 3/11. L. 1. 60. L. tr. 6-7/14. Cæc. pyl. 3.

Length of head  $4\frac{1}{4}$  to  $4\frac{1}{2}$ , height of body  $2\frac{3}{4}$  in the total length. *Eyes*—diameter  $3\frac{1}{4}$  to  $4\frac{1}{4}$  in length of head,  $1\frac{1}{2}$  to 2 diam. from end of snout, and 1 apart. Dorsal profile much more convex than abdominal; a prominence over fore part of orbit; posterior nostril very elongated. Preopercle entire; opercle with a spine. *Teeth*—six conical and compressed incisors in front of either jaw, sometimes only four in lower; remaining teeth with rounded crowns, the largest in the inner row, three rows in lower, four in upper jaw. *Fins*—dorsal spines rather weak, the fourth the highest. Pectoral longer than head; anal spines comparatively weak, the second a little the strongest and slightly the longest; caudal lobed. *Scales*—five rows between the eye and the angle of the preopercle, a very long one at base of ventral fin. *Colour*—silvery, with golden bands along each row of scales as in *C. sarba*; usually no black mark on the shoulder; fins grey, ventral and anal almost black.

*Hab.* Red Sea and Sind to China; the largest specimen I obtained in Sind measured 12 inches in length.

786. (5.) *Chrysophrys bifasciata*.

*Chaetodon bifasciatus*, Forsk. *Descr. Anim.* p. 64.

*Chrysophrys bifasciata*, Day, *Fish. India*, p. 141, pl. xxxiv, fig. 5 (see synon.).

D. 11/12-15. A. 3/10-11. C. 19. L. 1. 48-50. L. tr. 7/15. C. pyl. 2.

Length of head  $3\frac{1}{2}$ , height of body  $2\frac{1}{2}$  in the total length. *Eyes*—diameter  $4\frac{1}{2}$  in length of head,  $1\frac{1}{2}$  to 2 diam. from end of snout, and  $1\frac{1}{3}$  apart. Dorsal profile more convex than abdominal; a slight elevation above the anterior angle of the eye. *Teeth*—six large compressed incisors in front of upper and four in lower jaw; five rows of rounded molars along sides of upper and four in lower jaw. *Fins*—dorsal spines strong, increasing in length to fifth, rays scarcely higher than spines; pectoral a little longer than the head; second anal spine much the strongest and equal in length to third; caudal forked. *Colour*—silvery, with dark lines along each row of scales on the body, and two vertical black cross bands, the first through eye, the second over hind edge of opercle; a yellow band



before the eyes; snout black; dorsal, caudal, and pectoral yellow; dorsal spines black, and a narrow black edge along soft dorsal; ventral and anal black except the last anal ray, which is yellow.

*Hab.* Red Sea, east coast of Africa and seas of India; attaining at least 15 inches in length.

787. (6.) *Chrysophrys sarba*.

*Sparus sarba*, *Forsk. Descr. Anim.* p. 31, no. 22.

*Chrysophrys sarba*, *Day, Fish. India*, p. 142, pl. xxxiv, fig. 6 (see *synon.*).

*Tin-til*, Baluch.; *Chitchillee*, Tel.; *Vella-mattawa*, Tam.; *Suffadamuddawa*, Hind.

D. 11/13-14. P. 15. A. 3/11. C. 17. L. 1. 55-60. L. tr. 6-7/14.

Length of head 4 to  $4\frac{1}{4}$ , height of body  $2\frac{1}{2}$  to  $2\frac{3}{4}$  in the total length. *Eyes*—diameter 3 to  $3\frac{1}{2}$  in the length of head,  $1\frac{1}{2}$  diam. from end of snout, and  $1\frac{1}{4}$  apart. Dorsal profile slightly more convex than abdominal. Vertical limb of preopercle entire, angle and lower edge crenulated; opercle with a badly marked spine. *Teeth*—from 4 to 6 broad and compressed incisors in front of upper jaw and 6 to 8 in lower, the remainder of teeth with rounded crowns, the largest in the inner row; about three rows in lower and four in upper jaw. *Fins*—dorsal spines alternately broader on each side, the fourth the highest. Pectoral longer than head; second anal spine strongest, equal to the third or a little shorter and equal to the sixth dorsal; caudal emarginate or slightly lobed. *Scales*—five rows between the eye and the angle of the preopercle; some small ones over the caudal fin. *Colour*—silvery, with golden bands along each row of scales, parallel to the back above the lateral line and horizontal below it; fins yellowish, with a tinge of grey along upper portion of dorsal and end of caudal; a dark band along middle of former fin. *Eyes* golden.

*Hab.* Red Sea and seas of India; attaining at least 16 inches in length. This species abounds in Madras about April, when the young ascend the rivers and backwaters. As food it is inferior to *C. berda*.

Fourth group. PIMELEPTERINA.

7. Genus *PIMELEPTERUS* (Lacép.), Cuv.

*Syn. Kyphosus* (Lacép.), Cuv.

Branchiostegals seven; pseudobranchiæ. Preopercle as a rule serrated. Villiform teeth in the jaws, with an outer cutting row; fine teeth on the vomer, palatines, and tongue. A single dorsal with 11 spines, anal with 3. Small scales on soft portions of vertical fins. Air-bladder divided behind into two long processes, and sometimes notched anteriorly. Pyloric appendages few or very numerous.

*Geographical Distribution.* Tropical seas.

*Synopsis of Indian Species.*

Longest dorsal spines higher than the rays . . . 1. *P. vaigiensis*, p. 48.  
Dorsal spines not so high as the rays . . . . . 2. *P. cinerascens*, p. 48.

788. (1.) *Pimelepterus vaigiensis*.

*Pimelepterus vaigiensis*, Quoy & Gaim. *Voy. Uranie et Phys.*, Zool. p. 386, pl. lxii, fig. 4.

*Pimelepterus fuscus*, Day, *Fish. India*, p. 143, *Suppl.* p. 788 (see *synon.*), not *Xyster fuscus*, Lacép.

D. 10-11/13-15. A. 3/12. L. 1. 60. L. tr. 10/23. C. pyl. numerous.

Length of head 5, height of body 3 in the total length. *Eyes*—diameter 4 in length of head, rather above 1 diam. from end of snout, and  $1\frac{1}{2}$  apart. Body oblong, compressed, and with a swelling opposite the front of the orbit. *Fins*—dorsal spines increasing in length to 5th, 6th, and 7th, which are  $\frac{1}{3}$  to  $\frac{1}{2}$  higher than the longest ray; pectoral slightly longer than the ventral; anal spines moderate, the third much the longest and half the length of first ray; caudal emarginate. *Colour*—grey, darkest along back and at edges of scales. A silvery band under eyes.

*Hab.* Red Sea, throughout the seas of India to the Malay Archipelago and beyond; attaining upwards of 2 feet in length.

789. (2.) *Pimelepterus cinerascens*. (Fig. 18.)

*Sciæna cinerascens*, Forsk. *Descr. Anim.* p. 53, no. 66.

*Pimelepterus cinerascens*, Day, *Fish. India*, p. 143, pl. xxxv, fig. 3 (see *synon.*).

*Thendala*, Tam.; *Ma oung na*, Arracan.

D. 11/12. P. 18. A. 3/11. C. 17. L. 1. 60. L. tr. 10/21.

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

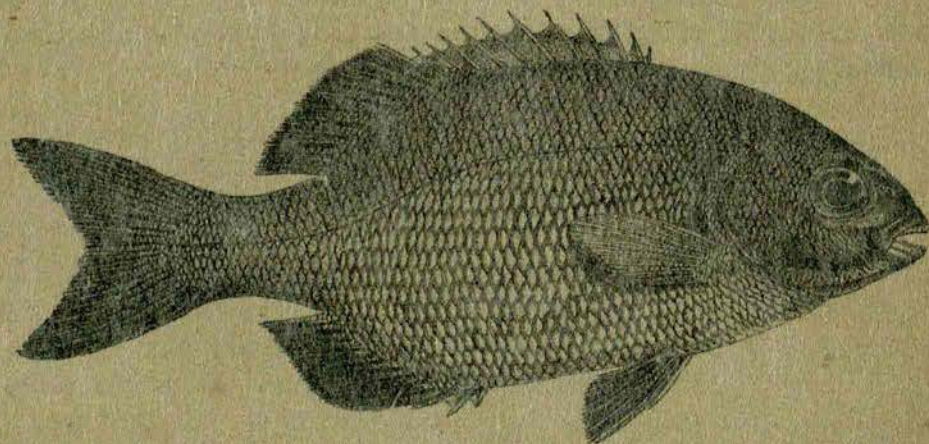


Fig. 18.—*Pimelepterus cinerascens*.

$1\frac{1}{3}$  apart. Body oblong, compressed, with a slight swelling opposite the front of the orbit. *Fins*—dorsal spines increasing in



length to the 4th and 5th, which are nearly as high as the middle rays, the highest in the fin, the whole enveloped in scales; pectoral of the same length as the ventral; anal spines moderate, the third slightly the longest, but only half or two fifths the height of anterior portion of soft anal, which is scaled, as is also the soft dorsal; caudal emarginate. *Colour*—silvery grey, with a dark band between each row of scales; a silvery band under the eye; fins nearly black.

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

## Family V. CIRRHITIDÆ.

*Percoidei*, pt., et *Scienoidei*, pt., Cuv.; *Theraponidæ*, pt., et *Polynemidæ*, pt., Richardson.

Branchiostegals three, five, or six; pseudobranchiæ. Body oblong and compressed. Teeth in the jaws villiform or pointed; sometimes canines as well. A single dorsal fin composed of spines and rays of nearly equal extent; anal with three spines. Lower pectoral rays simple, and generally thickened; ventrals 1/5. Scales cycloid; lateral line continuous. Air-bladder absent, or with many appendages. Pyloric appendages few.

*Geographical Distribution.* Tropical seas, temperate parts of South Pacific.

### *Synopsis of Indian Genera.*

Opercle unarmed. No teeth on palatines ..... 1. *CIRRHITES*.  
Opercle with spines. Teeth on palatines ..... 2. *CIRRHITICHTHYS*.

#### 1. Genus *CIRRHITES* (Comm.), Cuv.

*Syn.* *Amblycirrhitus*, Gill; *Paracirrhitæ*, Bleeker.

Branchiostegals six. Preopercle denticulated; opercle unarmed. Villiform teeth in both jaws; canines generally present; teeth on the vomer, none on the palatines. A single dorsal fin with ten spines; the lower five to seven pectoral rays are unbranched. Scales of moderate size. Air-bladder absent. Pyloric appendages few.

*Geographical Distribution.* Indian Ocean and tropical Pacific.

#### 790. (1.) *Cirrhitæ forsteri*. (Fig. 19.)

*Grammistes forsteri*, Bl. Schn. *Syst. Ich.* p. 191.

*Cirrhitæ forsteri*, Day, *Fish. India*, p. 144, pl. xxxv, fig. 4 (see synon.).

D.10/11. P.7+vii. A.3/6. L.1.50. L.tr.5/13. C.pyl.4. Vert.10/16.

Length of head  $3\frac{1}{2}$  to 4, height of body  $3\frac{1}{4}$  to  $3\frac{1}{2}$  in total length



*Eyes*—diameter  $4\frac{1}{2}$  to  $5\frac{1}{2}$  in length of head,  $1\frac{1}{2}$  diam. from end of snout, and 1 apart. Anterior nostril rather valvular and fringed. *Teeth*—strong canines on either side of symphysis of upper jaw, two large and some small lateral conical canine-like teeth in the mandible; the villiform teeth on the vomer in a triangular patch, with its base behind. *Fins*—dorsal spines increasing in length to third and fourth, then slightly decreasing in length to the last but one; interspinous membrane with a fine prolongation behind each

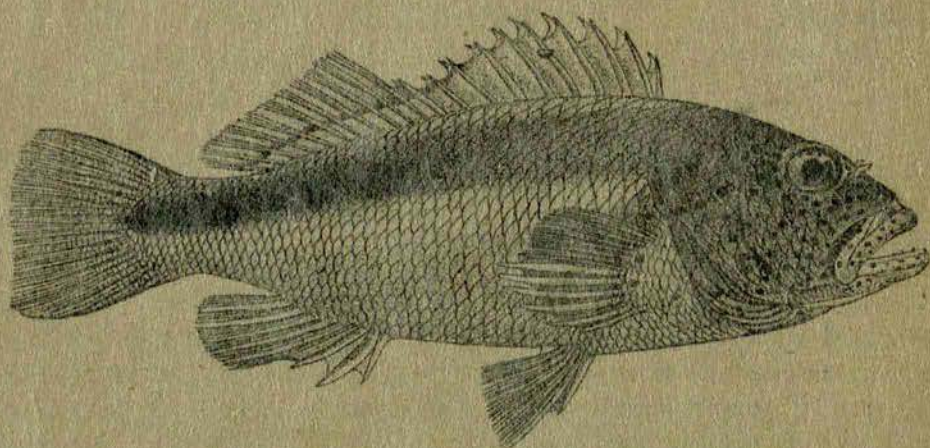


Fig. 19.—*Cirrhites forsteri*.

spine, highest rays of dorsal as long as those of anal; lower free rays of pectoral longer than branched rays; second anal spine the strongest and as long as the third; caudal cut square or slightly emarginate. *Colour*—reddish; head, chest, and base of pectoral fin with black spots; a broad dark band along the middle of the body to the upper half of the caudal, becoming brown with black blotches in its last third. A wide yellow band from above pectoral to lower half of caudal. Upper edge of last half of spinous dorsal black, continued as a black band along base of soft dorsal; front edge of anal and outer edge of soft caudal with narrow black margins.

*Hab.* Red Sea, east coast of Africa, seas of India to the Malay Archipelago and beyond. Bennett observes, "The *Tik kossah* of the Cingalese inhabits rocky situations, seldom exceeds eighteen inches in length, and is a firm-fleshed and wholesome fish."

## 2. Genus **CIRRHITICHTHYS**, Bleeker.

Syn. *Cirrhilopsis*, Gill.

Branchiostegals six. Preopercle denticulated; opercle spinate. Villiform teeth and canines in the jaws; teeth also in the vomer and palatines. A single dorsal fin with 10 spines; anal with 3; 5 to 7 of the lower pectoral rays unbranched. Scales of moderate size. Air-bladder absent. Pyloric appendages few.

*Synopsis of Indian Species.*

- P. 9/v-vi. No elongate dorsal ray. Vertical bands of colour ..... 1. *C. fasciatus*, p. 51.  
 P. 7/vi-vii. First dorsal ray prolonged ..... 2. *C. aureus*, p. 51.  
 P. 7/vii. No elongate dorsal ray. Body spotted ..... 3. *C. marmoratus*, p. 52.

791. (1.) *Cirrhitichthys fasciatus*.

*Cirrhitichthys fasciatus*, Cuv. & Val. *H. N. Poiss.* iii, p. 76, pl. 47; Day, *Fish. India*, p. 145, *Suppl.* p. 788.

D. 10/12. P. 9+v-vi. V. 1/5. A. 3/6. C. 15. L. 1. 41. L. tr.  $3\frac{1}{2}/10$ .

Length of head  $3\frac{1}{4}$  to  $3\frac{1}{2}$ , height of body  $2\frac{1}{2}$  to  $3\frac{1}{2}$  in the total length. *Eyes*—diameter 3 to  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout, and  $\frac{1}{3}$  apart. *Teeth*—some enlarged in front of upper jaw and three moderately sized canines in middle of side of lower; villiform on vomer and palatines. *Fins*—dorsal interspinous membrane emarginate; fourth dorsal spine highest; from it they decrease to the last but one, which is not so high as the last; soft portion of fin as high as spinous; second anal spine longest, rather exceeding the highest dorsal. *Scales*—cycloid, those on the head large. *Colour*—greyish, becoming white below, vertically banded darker; some white spots on the snout and nape. Two small specimens received from Madras were grey with a pinkish tinge; a narrow dark band from the eye along the snout, a second passing round the chin, and a third in a similar direction from behind the eye. Some large black spots on the opercles and upper surface of the head. A large dark blotch on the nape of the neck, and six still larger along the base of the dorsal fin; on which they are likewise continued in the form of spots. Body with three or four large blotches below each of those mentioned, being the remains of vertical bands; caudal fin with some very indistinct markings.

*Hab.* Madras, whence two specimens were procured, the larger 1.6 inches in length.

792. (2.) *Cirrhitichthys aureus*. (Fig. 20.)

*Cirrhitichthys aureus*, Temm. & Schleg. *Faun. Japon.*, Poiss. p. 15, t. vii, fig. 2.

*Cirrhitichthys aureus*, Day, *Fish. India*, p. 145, pl. xxxv, fig. 5 (see *synon.*).

*Shun-gun*, Tam.

D. 10/12-13. P. 7+vi-vii. A. 3/6-7. C. 15. L. 1. 43. L. tr. 4/12.

Length of head 4, height of body  $3\frac{1}{2}$  in the total length. *Eyes*—diameter  $3\frac{1}{4}$  in length of head,  $1\frac{1}{4}$  diam. from end of snout, and  $\frac{1}{2}$  apart. *Teeth*—villiform, with an outer rather enlarged row in the upper jaw, and two or more rather curved and conical lateral row in the mandible; villiform bands on vomer and palate. *Fins*—



dorsal spines increasing in length to the fifth and sixth; first ray elongate, otherwise soft portion of fin only as high as spinous; the two upper, free, pectoral rays the longest and reaching to above the anal spines; second anal spine strongest and much the longest; caudal slightly emarginate. *Colour*—rosy, with lightish longitudinal lines and a large ill-defined blotch below the soft dorsal extending halfway down the side, in some specimens two more descend

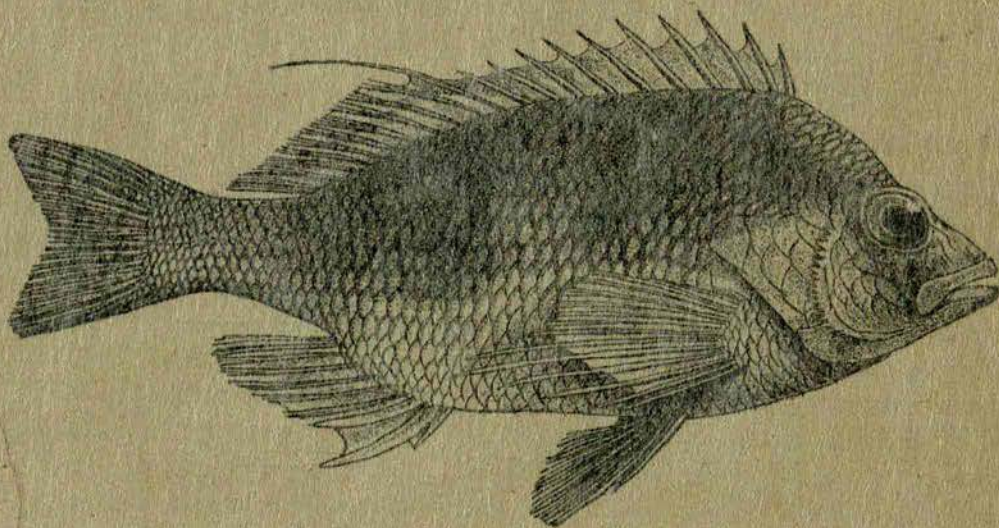


Fig. 20.—*Cirrhitichthys aureus*.

from the spinous dorsal; a small dark blotch behind upper edge of the preopercle. Dorsal and caudal fins more or less banded, soft dorsal darker than spinous portion, and having a light outer edge; caudal with red spots.

*Hab.* Seas of India to the Malay Archipelago and Japan. Rather common at Madras; attaining to about 4 inches in length.

### 793. (3.) *Cirrhitichthys marmoratus*.

*Labrus marmoratus*, Lacép. *H. N. Poiss.* iii, p. 493, pl. v, fig. 3.

*Cirrhitichthys marmoratus*, Day, *Fish. India*, p. 146 (see synonym.).

D. 9-10/11-12. P. 7+vii. A. 3/6. L. 1. 40. L. tr. 4/10. Vert. 10/16.

Length of head  $3\frac{1}{2}$ , height of body  $3\frac{1}{2}$  in the total length. *Eyes* diameter 4 in length of head,  $1\frac{1}{3}$  diam. from end of snout, and  $\frac{3}{4}$  apart. A broad fringed valve to the posterior nostril. *Mouth*—villiform in the jaws, vomer, and anterior portion of the palatines. *Fins*—dorsal spines increase in length to the 5th and 6th, which are as long as the rays, no prolonged dorsal ray; second anal spine strongest, longest, and equalling the highest in the dorsal fin. *Colour*—body and vertical fins with brown spots, and a row of dark spots along base of dorsal.

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



## Family VI. SCORPÆNIDÆ.

*Sclerogenidæ*, pt., Owen.

Branchiostegals five to seven; pseudobranchiæ. Body oblong, compressed or subcylindrical. Some of the bones of the head armed; suborbital ring articulated with the preopercle by a bony process. Teeth in villiform bands. A single dorsal fin; the anal usually similar to the soft dorsal; ventrals thoracic. Air-bladder generally present. Pyloric appendages, when present, few or in moderate numbers.

*Geographical Distribution.* Some of these fishes are found in most seas.

*Synopsis of Indian Genera.*

## A. Body with distinct scales.

- |   |                   |
|---|-------------------|
| a. No occipital groove. No barbel or free pectoral ray. Fins not elongate. Interorbital space convex, scaly. No long spines on preopercle or preorbital. .... | 1. SEBASTICHTHYS. |
| b. An occipital groove; interorbital space concave.   |                   |
| Teeth in jaws, vomer, and palatines. ....   | 2. SCORPÆNA.      |
| No palatine teeth. ....   | 3. SCORPÆNOPSIS.  |
| c. No occipital groove.   |                   |
| Interorbital space concave; some spines and rays greatly elongate and free ....   | 4. PTEROIS.       |
| A mandibular barbel and a free pectoral ray   | 5. APISTUS.       |
| Interorbital space concave. Sharp and long preorbital and preopercular spines ....  | 6. CENTROPOGON.   |

## B. Scales rudimentary or wanting.

- |  |                     |
|--|---------------------|
| a. Articulated fin-rays branched; no free pectoral rays; upper profile of head not in a straight line with the back. |                     |
| a'. Dorsal fin high, ventrals well developed. Three anterior dorsal spines distinct from others. ....                | 7. GYMNAPISTUS.     |
| No division in dorsal spines. ....   | 8. AMBLYAPISTUS.    |
| b'. Dorsal fin low, ventrals rudimentary ..  | 9. MICROPUS.        |
| b. Articulated fin-rays unbranched.  |                     |
| One free pectoral ray. ....  | 10. MINOUS.         |
| No free pectoral ray. ....   | 11. COCOTROPUS.     |
| c. Articulated fin-rays mostly branched.   |                     |
| a'. Two free pectoral rays. ....   | 12. PELOR.          |
| b'. Three free pectoral rays. ....   | 13. CHORIDACTYLUS.  |
| c'. No free pectoral rays; upper profile of head in almost a straight line with back.                                |                     |
| a". Head large, $\frac{1}{3}$ of total length or more.   |                     |
| Teeth in jaws and vomer, not on palate   | 14. SYNANCIDIUM.    |
| Teeth in jaws, not on vomer or palate  | 15. SYNANCEIA.      |
| b". Head less than $\frac{1}{4}$ total length.   |                     |
| Three anal spines. ....  | 16. LEPTOSYNANCEIA. |
| No anal spines. ....   | 17. POLYCAULIS.     |

1. Genus **SEBASTICHTHYS**, Gill.

Branchiostegals six; pseudobranchiæ. Head and body somewhat compressed. No groove on the occiput, usually a few small spines; preopercle armed. Villiform teeth on the jaws and vomer, but none on the palatines. Fins not elongate; a single dorsal, the spinous portion more or less separated from the soft by a notch, spines 12 to 14; anal not elongate, with 3 spines; no free rays to the pectoral fin. Articulated fin-rays branched. Scales present, and of moderate or small size, extending as far forwards as the orbit or even beyond; no skin appendages. Air-bladder, as a rule, present. Pyloric appendages few or in moderate numbers.

794. (1.) *Sebastichthys strongia*.

*Scorpæna strongiæ*, Cuv. & Val. *H. N. Poiss.* iv, p. 323.

*Sebastichthys strongia*, Day, *Fish. India*, p. 148 (see synon.).

D. 11-12 | 1/9. P. 19. A. 3/5. C. 15. L. 1. 45. L. tr. 5/16.

Length of head 3, height of body more than 3 in the total length. *Eyes*—diameter a little less than 3 in length of head,  $\frac{3}{4}$  diam. from end of snout,  $\frac{1}{2}$  apart. Supraorbital ridge spinose; two spinose lines given off from the orbit, one towards the occiput, the other towards the lateral line. A sharp spine on nostril. Ridge below orbit to angle of preopercle also spiny, and two more strong spines on lower margin of preopercle. Three strong spines on preorbital and a very strong one at shoulder. Two tentacles above the orbit and several more about the head. *Fins*—the lower 8 rays of the pectoral with free extremities. Dorsal spines strong, increasing in length to the 9th; second dorsal rather lower than first; second anal spine longest and strongest; caudal rounded. *Lateral line*—in single tubes, with here and there tentacles. *Colour*—brownish, banded darker, the first band passing downwards through the eye; a large brown spot on opercle; fins irregularly banded in dotted lines.

*Hab.* Ceylon, Andamans, Malay Archipelago.

2. Genus **SCORPÆNA**, Artedi.

Syn. *Neosebastes*, Guichenot; *Pseudomonopterus*, Bleeker.

Branchiostegals seven; pseudobranchiæ. Head large, with a scaleless groove on the occiput, armed with spines and usually with skinny flaps. Villiform teeth on the jaws, vomer, and palatines. A single dorsal fin deeply notched, with 12 spines; anal with 3 spines, not elongate; pectoral large, without free rays. Air-bladder absent. Pyloric appendages few.

*Geographical Distribution.* Tropical seas; also in the Mediterranean and on the Atlantic coasts of America.

*Synopsis of Indian Species.*

- L. tr. 6/22. An orbital tentacle ..... 1. *S. bleekeri*, p. 55.  
L. tr. 9/19. No orbital tentacle ..... 2. *S. armata*, p. 55.

795. (1.) *Scorpæna bleekeri*. (Fig. 21.)

*Scorpæna haplodactylus*, Day, *Fish. India*, p. 149, pl. xxxvi, fig. 2 (not *Bleeker*).

*Scorpæna bleekeri*, Day, *Fish. India*, p. 747.

D. 11 | 1/9. P. 5+xii. A. 3/5. C. 15. L. 1. 26. L. r. 44/42. L. tr. 6/22.

Length of head 3, height of body  $3\frac{1}{2}$  in the total length. *Eyes*—diameter 4 in length of head,  $1\frac{1}{2}$  diam. from end of snout, and  $\frac{1}{2}$  apart. Interorbital space deeply concave, no groove below eyes. Two spines on the posterior upper edge of the orbit, the hinder furnished with a tentacle. Occipital, temporal, and suborbital ridges armed with spines; a strong turbinal spine: three strong spines on vertical limb of operopercle and two blunt ones along its horizontal border; two strong opercular spines. Several fleshy tentacles about the head. A strong spine above the base of the pectoral fin on the

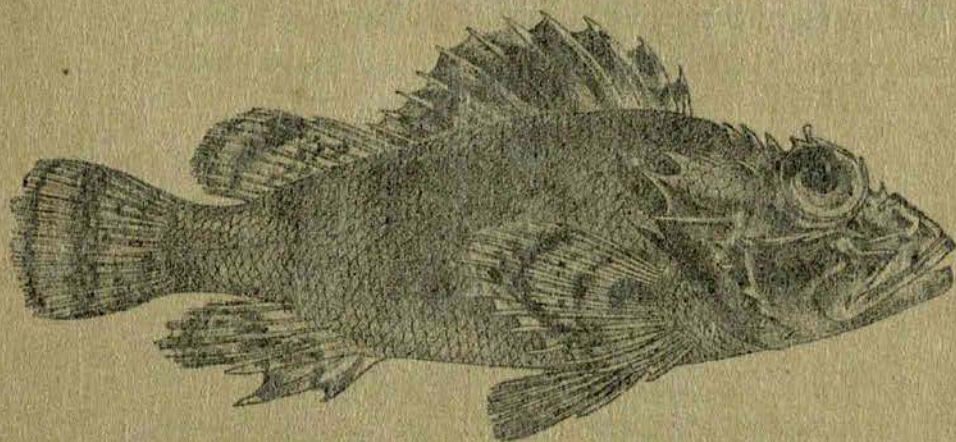


Fig. 21.—*Scorpæna bleekeri*.

shoulder-girdle. *Fins*—dorsal spines increase in length to 4th, from it they decrease in length to 11th; 12th spine twice as high as 11th; soft dorsal slightly higher than the spinous; second anal spine the strongest and longest; caudal rounded. A few fleshy tentacles along the lateral line. *Colour*—brownish black, banded and marbled with darker; anal having a broad band along its basal half; one vertical band at base of caudal, another along its middle, and a dark margin edged with white; dorsal with brown marks.

*Hab.* Andamans.

796. (2.) *Scorpæna armata*.

*Scorpæna armata*, Sauvage, *Nouv. Arch. du Museum*, ix, 1873, *Bull.* p. 49, pl. 6, fig. 1; Day, *Fish. India*, p. 149.

D. 11 | 1/9. P. 6+xii. A. 3/5. C. 13. L. 1. 35. L. tr. 9/19.

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



apart. The maxilla reaches to nearly below hind edge of orbit. Interorbital space very concave, with a quadrangular fossa, along which are two low ridges that terminate posteriorly in two spines; a deep groove below the eyes. Two or three spines along the upper margin of the orbit; a turbinal spine; spines on preorbital and preopercle. Opercle with two spines. Occipital and temporal ridges spiny. *Fins*—fifth dorsal spine rather above half the height of the body; pectorals and ventrals of the same length, extending slightly beyond the anus; third anal spine the longest, exceeding the highest in the dorsal fin; caudal slightly rounded. *Colour*—roseate brown, with darker blotches and a few yellowish-white spots; head spotted with black. Fins yellowish brown, spotted with darker, sometimes forming lines.

*Hab.* Two specimens, obtained in the East Indies, were presented to the Paris Museum by M. Bonaré.

### 3. Genus **SCORPÆNOPSIS**, Heckel.

Syn. *Scorpanichthys* and *Parascorpena*, Bleeker.

Differs from *Scorpena* in having no palatine teeth.

*Geographical Distribution.* Same as the last genus.

#### *Synopsis of Indian Species.*

- |   |                                 |
|---|---------------------------------|
| D. 12   1/9. No orbital tentacle. Scales over cheeks and opercles .....                                 | 1. <i>S. guamensis</i> , p. 56. |
| D. 11   1/10. Orbital tentacle, if present, small. Head scaleless .....                                 | 2. <i>S. cirrhosa</i> , p. 57.  |
| D. 11   1/10. Orbital tentacle well developed. Scales on upper portions of opercle and preopercle ..... | 3. <i>S. leonina</i> , p. 57.   |
| D. 11   1/10. An orbital tentacle. Scales on upper portion of opercles .....                            | 4. <i>S. rosea</i> , p. 58.     |
| D. 11   1/9. Apparently no orbital tentacle. Head scaleless .....                                       | 5. <i>S. venosa</i> , p. 59.    |

#### 797. (1.) **Scorpanopsis guamensis**.

*Scorpena guamensis*, Quoy & Gaim. *Voy. Uranie et Phys.*, Zool. p. 326.

*Scorpanopsis guamensis*, Day, *Fish. India*, p. 150, *Suppl.* p. 788 (see *synon.*)

D. 12 | 1/9. P. 9+x. V. 1/5. A. 3/5. C. 13. L. r. 43.

Length of head 3, height of body  $3\frac{1}{2}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout, and  $\frac{3}{4}$  apart. Interorbital space concave. No groove beneath the eyes. Supra-orbital edge spiny. No orbital tentacle. The maxilla reaches to below the middle of the eye. Spines on head acute. *Fins*—highest dorsal spines equal half of the height of the body. *Scales*—present on cheeks and opercles. *Colour*—brown marbled with darker.

*Hab.* Malay Archipelago, and said to have been brought from the East Indies.

798. (2.) *Scorpenopsis cirrhosa*.

*Perca cirrhosa*, Thunb. *Nya Handl. Stockh.* xiv, 1793, p. 199, pl. 7, fig. 2.

*Scorpenopsis cirrhosa*, Day, *Fish. India*, p. 150 (see *synon.*).

D. 11 | 1/10. P. 6 + xii. V. 1/5. A. 3/5. C. 13. L. r. 56.

Length of head 3, height of body  $3\frac{1}{2}$  in the total length. *Eyes*—diameter 5 in length of head,  $1\frac{1}{2}$  diam. from end of snout, and  $\frac{2}{3}$  apart. Interorbital space deeply concave, with two low ridges along its whole extent which do not end in spines; a deep groove below the anterior edge of the orbit; a shallow groove over occiput; occipital and temporal ridges strongly spinose. Two strong spines along the upper edge of the orbit. Sometimes an orbital tentacle of small size, which is, however, mostly absent. A spinous ridge from the preorbital across the cheeks; preopercle spiny; opercle with two spines. *Tentacles*—besides the orbital one, there are many more about the head and a very large one above the angle of the mouth; there are also some on the body. *Fins*—dorsal spines increase in length to the 4th, which is half as high as the body, and usually shorter than second anal; ventral reaches the anus; caudal cut nearly square. *Scales*—none on the head. *Colour*—pinkish brown marbled with darker; fins spotted and blotched.

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

799. (3.) *Scorpenopsis leonina*.

*Scorpena leonina*, Richard. *Ich. China*, p. 216.

*Scorpenopsis oxycephala*, Day, *Fish. India*, p. 150, pl. xxxvi, fig. 3, *Suppl.* p. 788 (see *synon.*).

D. 11 | 1/10. P. 6 + xii. V. 1/5. A. 3/5. C. 13. L. r. 52/46. L. tr. 7/22.

Length of head  $3\frac{1}{2}$ , height of body  $4\frac{1}{2}$  in the total length. *Eyes*—diameter 5 in length of head,  $1\frac{1}{2}$  diam. from end of snout, and 1 apart. Interorbital space deeply concave, with two low ridges, not ending in spines, along its whole extent, between them anteriorly is a third; a deep groove below front third of orbit, continued as a shallow one below eye. Three strong spines along upper edge of orbit, with a tentacle between the last two. A strong turbinal spine. A tentacle to front nostril. Preorbital with ridges in a star-shape, about seven in number, and ending in spines; a spiny ridge across the cheeks to a strong spine in centre of vertical border of preopercle; opercle with two spines. A spine on shoulder-girdle just above base of pectoral. *Tentacles*—besides those enumerated, a large one above angle of mouth, some small ones along margin of preopercle, a few also on lateral line and on some of the body-scales. *Fins*—third dorsal spine very slightly longer than fourth, and about as long as the rays; second anal spine much the strongest; caudal cut square. *Scales*—present on upper portions of opercle and preopercle. *Colour*—reddish, clouded with



brown, and having a few blackish spots; a dark band traverses the spinose dorsal obliquely and descends between the 6th and 7th spines on to the back; many blotches on fins; a dark band over last half of caudal; three narrow dark horizontal bands across lower half of anal; undivided pectoral rays spotted; ventral with brown spots.

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

800. (4.) *Scorpenopsis rosea*. (Fig. 22.)

*Scorpena rosea*, Day, *P. Z. S.* 1867, p. 703; *Fish. India*, p. 151, pl. xxxvi, fig. 4.

D. 11 | 1/9-10. P. 6+xii. A. 3/5. C. 15. L. l. 43. L. tr. 7/18.

Length of head 5, height of body 3 in the total length. *Eyes*—somewhat elevated, with a deep groove below, and anterior and posterior depressions; interorbital space deeply concave, with an elevated smooth ridge on either side; diameter of eyes 4 in length of head,  $1\frac{3}{4}$  from end of snout, and  $\frac{3}{4}$  apart. Snout rather elevated; a broad fleshy fringed tentacle to the anterior nostril. Above the angle of the preopercle is a ridge with five more backwardly directed spines. Along the angle and lower edge of the preopercle are three denticulations, the superior strong and sharp, the others

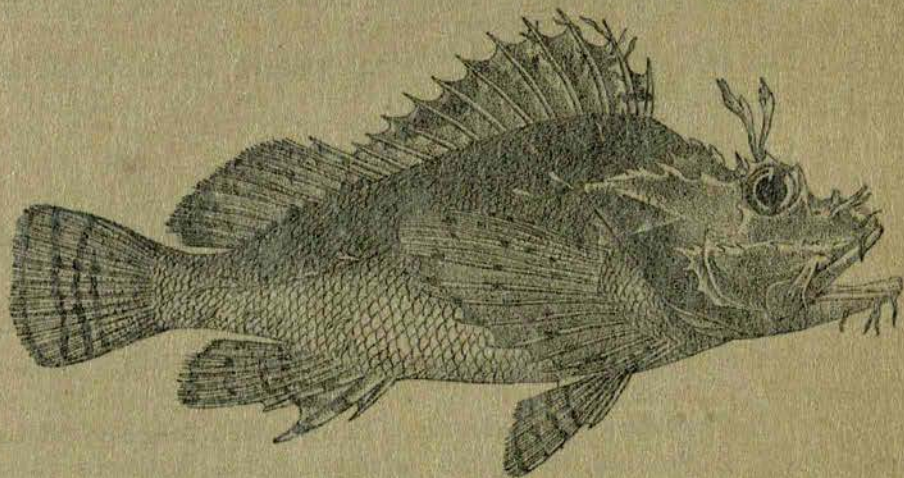


Fig. 22.—*Scorpenopsis rosea*.

blunted; also three fleshy tentacles along its border and one on its surface. Interopercle with a blunt spine and tentacle. Opercle with a central bony ridge ending in two spines. Temporal and occipital ridges spiny. Orbit with a strong spine at its posterior upper, and another at its superior, edge, the last with a long wide tentacle at its base. Several fleshy tentacles on the snout, a large one at the angle of the mouth, and two on the end of the upper jaw; also three rather large ones on the lower jaw. *Fins*—dorsal spines moderately strong, the third the longest, interspinous membrane rather deeply cleft and extended beyond each spine. Pectoral with its lowest twelve rays unbranched and minute fleshy appendages attached to them. Second and third anal



spines of equal length, the former much the stronger. Caudal cut nearly square. *Scales*—present, some on the upper part of the opercle; head otherwise scaleless. *Colour*—rosy, marbled with greyish; one or two irregular vertical grey bands on the caudal fin; dorsal, anal, and ventral also banded; pectoral with numerous dark spots.

*Hab.* Madras.

801. (5.) *Scorpænopsis venosa*.

*Scorpæna venosa*, Cuv. & Val. *H. N. Poiss.* iv, p. 317.

*Scorpænopsis venosa*, Day, *Fish. India*, p. 151.

D. 11 | 1/10. P. 9 + x. V. 1/5. A. 3/5. C. 16. L. r. 55/45. L. tr. 9/25.

Length of head  $3\frac{1}{2}$ , height of body  $3\frac{1}{3}$  in the total length. *Eyes*—diameter 5 to  $5\frac{1}{2}$  in length of head,  $1\frac{1}{4}$  diam. from end of snout, and about 1 apart. Interorbital space very concave, with two longitudinal ridges that end posteriorly in spines; a groove before the eyes; a quadrangular space on the vertex bordered by spines; turbinal and preorbital spines, a spiny ridge across the cheeks; vertical margin of opercle, occipital and temporal ridges spiny. *Tentacles*—none apparent over orbit (?); very distinct on lower jaw and different parts of head. Valenciennes observes that the most remarkable character is that all the skin of the head between the spines is as if it were veined with small scooped-out lines which join on all sides, and thus form a network which has the appearance of scales. *Fins*—4th dorsal spine longest and equal to second anal, which is  $\frac{2}{3}$  length of head. *Scales*—none on head. *Colour*—“head and body dark, with a mixture of dull red; the throat and belly are of a pink colour. The fins irregularly streaked black and red; the ventral at its root is pink like the belly.” (*Russell*).

*Hab.* Coromandel coast of India.

4. Genus *PTEROIS*, Cuv.

Syn. *Pseudomonopterus*, Klein; *Macrochyrus*, *Pteroleptus*, *Pteropterus*, and *Brachyrus*, Swainson.

Branchiostegals seven; pseudobranchiæ. Head rather large, armed with spines and having skinny flaps; no occipital groove. Villiform teeth in jaws and on vomer, none on the palate. A single deeply notched dorsal fin, having from twelve to thirteen spines; anal with two or three spines and few rays; rays, and sometimes spines, elongate; no pectoral appendages. Air-bladder large. Pyloric appendages few.

*Geographical Distribution.* Indian and Pacific Oceans within the tropics.

No great value can be attached to the comparative length of the dorsal spines or pectoral rays in this genus of fishes, as the spines and rays are subject to considerable variation in specimens of the same species. It has yet to be ascertained whether the orbital tentacle is equally developed in both sexes.

*Synopsis of Indian Species.*

## A. Dorsal spines 12.

## a. Interorbital space scaly.

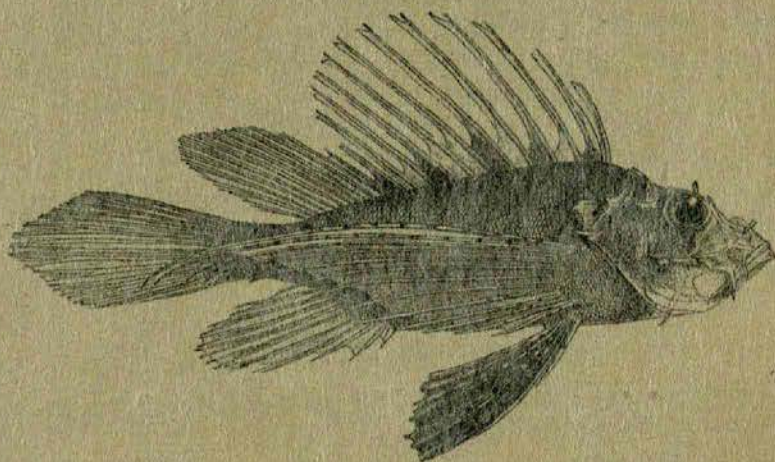
Caudal unspotted ..... 1. *P. russellii*, p. 60.Caudal spotted ..... 2. *P. miles*, p. 61.

## b. Interorbital space without scales.

Caudal banded ..... 3. *P. zebra*, p. 61.Caudal spotted ..... 4. *P. volitans*, p. 62.B. Dorsal spines 11 ..... 5. *P. radiata*, p. 63.802. (1.) *Pterois russellii*. (Fig. 23.)*Pterois russellii* (*Van Hass.*), *Bennett*, *P. Z. S.* 1831, p. 128; *Day*, *Fish. India*, p. 152, pl. xxxvi, fig. 5 (see synon.).*Tambi* or *Sin toubi*, Tamil.

D. 12 | 1/11-12. P. 13. A. 3/7-8. C. 14. L. r. 71/66. L. tr. 11/33.

Length of head 4, height of body 4 in the total length. *Eyes*—diameter  $4\frac{1}{2}$  to 5 in length of head,  $1\frac{3}{4}$  diam. from end of snout, and  $\frac{3}{4}$  apart. A spiny ridge traverses the preorbital and continues over the cheek to upper preopercular spine, below which there are two or three more on the vertical, and two along the horizontal edge.

Fig. 23.—*Pterois russellii*.

A spine at posterior upper angle of orbit and a short supraorbital tentacle. Interorbital space deeply concave, it and occiput scaled. Occipital and temporal ridges spiny; a small turbinal spine. A rather long fleshy tentacle at angle of preorbital, one at anterior nostril, and several more about the head. *Fins*—dorsal spines increase in length to 5th, which equals height of body and is longer than rays; the pectoral, with its membrane, especially between its four upper rays, deeply cleft, reaches a little beyond base of caudal or even further; ventral extends to anal rays; third anal spine longest; caudal pointed. *Colour*—reddish, with 11 or 12 broad dark vertical bands, with intermediate narrow ones. A black spot on shoulder behind opercle, no white spot in axilla.



Pectoral grey, its upper two rays with black spots, its lowest five pinkish, in the adult all are spotted; ventrals grey, with obscurely marked white spots; dorsal spines grey, or white annulated with grey. Soft dorsal, caudal, and anal flesh-coloured without spots, but having in adults a narrow black edge.

*Hab.* Seas of India, Mauritius to the Malay Archipelago. Very common in Madras, especially about June; attaining at least to  $11\frac{1}{2}$  inches.

### 803. (2.) *Pterois miles*.

*Scorpena miles*, Bennett, *Fish. Ceylon*, p. 9, pl. 9.

*Pterois miles*, Day, *Fish. India*, p. 153, pl. xxxvii, fig. 2 (see synon.).

*Kurru toombi*, Tam., "Flying Dragon;" *Ratoo gini maha*, Cing.

D. 12 | 1/10-11. P. 14. A. 3/6-7. L. r. 92. L. tr. 12/— . Vert. 10/14.

Length of head  $4\frac{1}{2}$ , height of body  $3\frac{1}{2}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  to 4 in the length of the head,  $1\frac{1}{2}$  diam. from end of snout, and 1 apart. Lower third of preorbital covered with spiny elevations, which are continued across cheeks to angle of preopercle, where they end in spines; two strong turbinal spines; interorbital space convex but not very deeply so; upper edge of orbit, temporal and occipital ridges spiny. A short orbital tentacle, one at the anterior nostril, a long preorbital one over angle of mouth, and other short ones about the head. *Fins*—dorsal spines highest from 6th to 12th, which equal height of body and are longer than rays; pectoral with interradiat membrane most deeply cleft between first three rays, and reaching to below end of base of dorsal or further; ventral reaches anal, the third spine of which is longest; caudal wedge-shaped. *Scales*—present in the interorbital space and on the nape. *Colour*—red, with many dark vertical bands much wider than the ground-colour, which in the first two thirds of the body appears like narrow light bands; in the last third the dark bands are wider apart. Head with bands mostly radiating from eye, two of an S-shape on chest. A white spot surrounded by black in axilla. Dorsal spines with five or six dark rings. Soft dorsal, caudal, and anal covered with small black spots; pectoral with large black blotches on a lighter ground; ventral nearly black, with white and light brown spots.

*Hab.* Red Sea, seas of India, the Malay Archipelago and beyond. The largest specimen captured at Madras measured 14 inches. In a specimen 9 inches long the pectoral reaches the root of the caudal.

### 804. (3.) *Pterois zebra*.

*Pterois zebra*, Cuv. & Val. *H. N. Poiss.* iv, p. 367; Day, *Fish. India*, p. 153 (see synon.).

D. 12 | 1/11. P. 17. A. 3/6-7. C. 14. L. r. 55-50. L. tr. 9/— .

Length of head  $3\frac{1}{2}$ , height of body  $3\frac{1}{2}$  in the total length. *Eyes*



3

CSL

—diameter  $3\frac{1}{2}$  in length of head (in a specimen  $3\frac{1}{2}$  inches long), 1 diam. from end of snout, and  $\frac{2}{3}$  apart. Interorbital space scaleless, deeply concave, traversed by two low ridges ending behind in a strong spine. Preopercle with three spines on its vertical border; turbinal spines present. Two or three spines along the upper edge of the orbit, its hind margin likewise serrated. Ridges in a stellate form on the preorbital, one is continued backwards across the suborbitals and cheeks to the superior preopercular spine; spines on occipital and temporal ridge. A long orbital tentacle more than half length of head; fleshy tentacles along lower edge of preorbital, the hind one over angle of mouth very large. *Fins*—dorsal spines increase in length to the seventh, remaining about equal to the tenth, or as long as the height of the body and higher than the rays; the upper four pectoral rays with filamentous prolongations, and reaching base of caudal; ventrals reach anal spines, the third of which is slightly the longest; caudal wedge-shaped. *Colour*—body vertically banded; a black blotch with a white central spot in the axilla; dorsal spines annulated with black; soft dorsal and anal with black spots in irregular lines; four or five sinuous vertical bands on the caudal; pectoral and ventral with black transverse bands and lines as wide as the ground-colour or wider.

*Hab.* Seas of India to the Malay Archipelago and beyond. I have this species from the Andamans.

#### 805. (4.) *Pterois volitans*.

*Gasterosteus volitans*, *Linn. Syst. Nat.* i, p. 491.

*Pterois volitans*, *Day, Fish. India*, p. 154, pl. xxxvii, fig. 1 (see *synon.*).

*Kombada*, Maráthi; *Purrooah*, Mal.; *Cheeb-ta-ta-dah*, Andam.

D. 12 | 1/10–11. P. 14. A. 2–3/7–6. L. r. 90. L. tr. 13. Cæc. pyl. 3.

Length of head  $3\frac{2}{3}$  to  $4\frac{1}{2}$ , height of body 3 to  $3\frac{1}{2}$  in the total length. *Eyes*—diameter 4 to  $4\frac{1}{2}$  in length of head,  $1\frac{1}{2}$  to  $1\frac{3}{4}$  diam. from end of snout, and 1 apart. Interorbital space deeply concave, it and the nape scaleless, or with some very rudimentary scales; it is traversed by two low ridges which do not terminate posteriorly in spines. Preopercle with spines on its vertical border and lower limb; turbinal spines present; upper edge of orbit, occipital ridge, temporal ridge, and lower margin of preorbital spiny, and a raised line, sometimes almost spiny, runs across the cheeks from preorbital to upper preopercular spine. Opercular spine but slightly developed. A long tentacle from upper edge of the orbit about half the length of the head; also fleshy tentacles along the lower edge of the preorbital, the hindmost largest. *Fins*—the first ten dorsal spines are high, and equal to the height of the body, or one half more, the interspinous membrane deeply emarginate; soft portion of fin not so high as spinous; pectoral reaching to the root of caudal or beyond, membrane between upper four rays deeply



cleft; ventrals reach anal rays; third anal spine longest, three fourths as high as the first dorsal spine; caudal rather rounded or wedge-shaped. *Colour*—reddish, with vertical brown bands and narrow pale lines intervening; three or four broad stripes radiate from the eye; one passes over the nape. A black mark in the axilla, having a pure white spot in its centre. Dorsal spines annulated with black; soft dorsal, caudal, and anal spotted; pectoral greyish with light coloured spots; ventral slate-coloured with white spots.

*Hab.* Red Sea, east coast of Africa, through the seas of India to Australia.

806. (5.) *Pterois radiata*.

*Pterois radiata* (Park.), Cuv. & Val. H. N. Poiss. iv, p. 369.

*Pterois cincta*, Rüppell, N. W., Fische, p. 103, t. 26, fig. 3; Day, Fish. India, p. 154, pl. xxxvii, fig. 3, Suppl. p. 788 (see synon.).

D. 11 | 1/11–12. P. 16. A. 3/6. C. 15. L. 1. 25. L. r. 45. L. tr. 7/25.

Length of head  $3\frac{2}{3}$ , height of body  $3\frac{2}{3}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout, and  $\frac{2}{3}$  apart. Interorbital space very concave. Tentacle above the orbit long, and reaching as far as the end of the snout. Margin of orbit serrated; occipital and temporal ridges spiny; other bones about the head comparatively feebly armed; several fleshy tentacles on the head; long ones on the snout. *Fins*—eighth to ninth dorsal spines the highest; pectoral reaches end of caudal. *Scales*—on nape. *Colour*—snout uncoloured; a deep brown band edged with white extends from the eye to the angle of the interopercle; the second encircles the neck, and there are six more on the body, which looks as if it were traversed vertically by narrow milk-white bands. A dark band at the base of the pectoral, which is also stained in its outer half; a blackish mark in the axilla without any white spot. Ventral greyish, its spine white; caudal spotted.

*Hab.* Red Sea, Andamans to the Malay Archipelago and beyond.

5. Genus *APISTUS*, Cuv.

Syn. *Pterichthys*, Swainson; *Polemius*, Kaup.

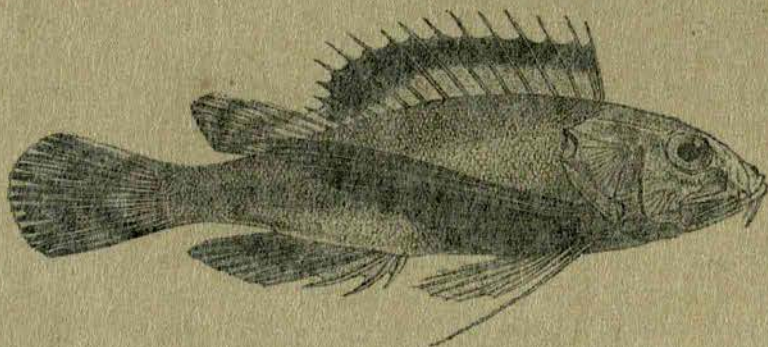
Branchiostegals six. Head and body rather compressed. No groove across occiput. Strong and sharp preorbital and preopercular spines; opercles armed. A mandibular barbel. Villiform teeth in jaws, vomer, and palate. A single dorsal fin with more spines than rays; three anal spines; pectoral elongate and having a free ray at its base. Articulated fin-rays branched. Scales present. Air-bladder with a constriction. A cleft behind the fourth gill.

*Geographical Distribution.* From the Red Sea through the seas of India.

807. (1.) *Apistus carinatus*. (Fig. 24.)*Scorpaena carinata*, Bl. *Schn. Syst. Ich.* p. 193.*Apistus carinatus*, Day, *Fish. India*, p. 155, pl. xxxvii, fig. 4 (see synon.).

D. 14-16/9. P. 12+i. V. 1/5. A. 3/7. C. 12. L. r. 70.

Length of head from  $3\frac{1}{2}$  to  $3\frac{2}{3}$ , height of body 4 to  $4\frac{1}{2}$  in the total length. *Eyes*—directed slightly upwards and outwards, diameter  $3\frac{1}{2}$  to 4 in length of head, rather above 1 diam. from end of snout, and  $\frac{1}{3}$  apart. Upper surface of the head rugose, with two divergent lines passing from snout between eyes to occiput, where they terminate in small spines a little in front of either side of base of dorsal fin. *Barbels*—a long slender one, equalling diameter of eye, below mandibular symphysis, and another a short distance behind it. *Fins*—dorsal spines increase to 6th, then decrease to 14th; membrane deeply notched; pectoral reaching to base of last dorsal ray, its single appendage to first of anal; third

Fig. 24.—*Apistus carinatus*.

anal spine longest; caudal cut square. *Scales*—small, somewhat trefoil in shape. *Colour*—body greyish along the back, becoming rosy on the abdomen; pectorals deep black; appendage milk-white; dorsal diaphanous, tinged with grey and edged with black; a deep black blotch from 8th to 14th spine; three oblique brownish streaks on the soft dorsal, which also has a brown edging; upper pectoral ray white; caudal with four vertical black bands; anal greyish, with a yellow horizontal band.

*Hab.* Red Sea, seas of India to the Malay Archipelago and beyond; attaining 5 inches in length.

6. Genus **CENTROPOGON**, Günther.*Syn. Gymnapistes*, sp., Swainson.

Branchiostegals six or seven. Head and body rather strongly compressed; no groove on occiput. Preorbital with a strong spine, preopercle likewise spiniferous; opercle armed. Villiform teeth in the jaws, vomer, and palatine bones. A single dorsal fin with more spines than rays (D. 14-15/7-9); anal with three spines;



pectoral without any free rays at its base; articulated fin-rays branched. Scales present. (A narrow cleft behind the fourth gill.)

*Geographical Distribution.* Seas of India to the Malay Archipelago and beyond.

808. (1.) *Centropogon indicus*. (Fig. 25.)

*Centropogon indicus*, Day, *Fish. India*, p. 155, pl. xxxviii, fig. 2.

B. vii. D. 14/8. P. 10. V. 1/4. A. 3/5. C. 14. L. r. 80.

Length of head  $3\frac{1}{3}$ , height of body 4 in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head,  $\frac{3}{4}$  diam. from end of snout, and  $\frac{2}{3}$  apart. Interorbital space slightly concave, traversed by two ridges which posteriorly have rather spiny terminations. Preorbital with a strong spine extending to below hind edge of eye. A strong preopercular spine equal to two thirds of the diameter of the orbit in length. *Fins*—second and third dorsal spines the longest,

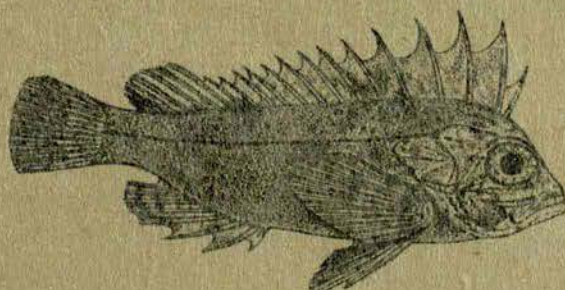


Fig. 25.—*Centropogon indicus*.

longer also than the rays; third anal spine considerably the longest and equal in length to the highest in the dorsal fin; caudal slightly rounded. *Colour*—pinkish with irregular markings over the head, the cheeks barred with pinkish and brown vertical bands; three or four badly defined vertical bars on the body, the last being over base of caudal; a vertical brown band over last third of caudal, and posterior third of anal banded; ventral nearly black in its last half.

*Hab.* Madras; growing at least to  $2\frac{1}{2}$  inches in length.

7. Genus *GYMNAPISTUS*, Swains.

Syn. *Apistus*, sp., Cuv. & Val.; *Trichosomus*, sp., Swainson; *Proso-podasys*, Günther.

Branchiostegals six. Head and body somewhat compressed; no groove across the occiput. Preorbital and preopercle with strong, sharp spines; opercle armed. Villiform teeth in jaws, vomer, and palate. Dorsal fin formed of two portions, the first of three spines which are connected by membrane with the second, the spines in greater number than the rays; three anal spines;



pectoral without any free rays at its base; articulated fin-rays branched. Scales rudimentary or absent.

*Geographical Distribution.* Indian Ocean.

*Synopsis of Indian Species.*

- |  |                               |
|--|-------------------------------|
| Nearly black .....   | 1. <i>G. niger</i> , p. 66.   |
| Greyish brown, with a black blotch on the dorsal fin ..... | 2. <i>G. dracæna</i> , p. 67. |

809. (1.) *Gymnapistus niger*. (Fig. 26.)

*Apistus niger*, Cuv. & Val. *H. N. Poiss.* iv, p. 415.

*Gymnapistus niger*, Day, *Fish. India*, p. 156, pl. xxxvii, fig. 5 (see synon.).

*Pom-tho-cho-roque-dah*, Andam.

B. vi. D. 3 | 9-10/8. P. 10. V. 1/5. A. 3/7. C. 9.

Length of head  $3\frac{1}{3}$ , height of body 3 in the total length. *Eyes*—diameter 4 in length of head, 1 diam. from end of snout, and  $\frac{3}{4}$  apart. Interorbital space slightly concave. *Fins*—first dorsal commences over hind third of orbit, interspinous membrane of the two fins continuous, the second spine is two thirds as high as the body; there is a short interspace between the two fins; the rayed portion is of equal height with the second part of the spinous; a membranous prolongation goes from the end of the fin nearly to the

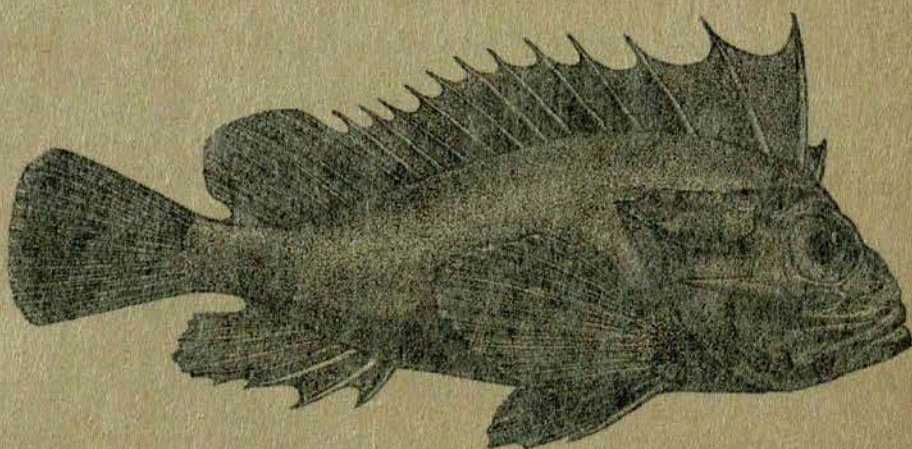


Fig. 26.—*Gymnapistus niger*.

base of the caudal; third anal spine longer but weaker than the second; caudal cut square. *Scales*—absent except in the form of roughnesses here and there in the skin. *Colour*—brownish black; caudal yellowish white, striated with brown and having a dark band in its last fourth and a white external edge.

*Hab.* Seas of India to the Malay Archipelago; very numerous at the Andamans. The natives assert that wounds from the spines are exceedingly venomous.

810. (2.) *Gymnapistus dracæna*.*Apistus dracæna*, Cuv. & Val. *H. N. Poiss.* iv, p. 403.*Gymnapistus dracæna*, Day, *Fish. India*, p. 156, pl. xxxviii, fig. 1 (see synonym.).

B. vi. D. 3 | 8-9/7-8. P. 13. V. 1/5. A. 3/5-6. C. 13.

Length of head  $3\frac{1}{2}$ , height of body 3 in the total length. *Eyes*—diameter 4 in length of head,  $\frac{3}{4}$  diam. from end of snout, and  $\frac{2}{3}$  apart. Lower jaw the longer and having a tubercle at the symphysis. *Fins*—dorsal spines sharp but slender; the first arises over middle of eye, the second or third spine the longest, equalling half the height of body, all three longer than spines of second dorsal; membrane deeply notched between the two dorsals. Pectoral reaching to above middle rays of anal; ventral reaches the anal spines, the third of which is the longest; caudal cut almost square. *Scales*—rudimentary. *Colour*—greyish brown, a black blotch on dorsal fin between the 3rd or 4th and 7th or 9th spines; soft dorsal nearly black in last three-fourths; pectoral blackish, as is also outer half of ventral and anal; caudal yellowish white, with some small brown spots.

*Hab.* Common in the seas of Western India and Ceylon, especially off Canara, where it attains 3 inches in length.

8. Genus **AMBLYAPISTUS**, Bleeker.Syn. *Apistus*, sp., Cuv. & Val.; *Platypterus*, Swainson.

Branchiostegals five or six. Head and body strongly compressed; no groove across occiput. Strong and sharp preorbital and preopercular spines; opercle armed. Villiform teeth in jaws, vomer, and palate. A single dorsal fin with more spines than rays, generally elevated anteriorly; three anal spines; pectoral without any free ray at its base. Articulated fin-rays branched. Scales, if present, rudimentary. Air-bladder present. Pyloric appendages few.

*Synopsis of Indian Species.*

A. Dorsal fin begins above the eyes; caudal rounded or square.

Dorsal fin slightly connected with caudal 1. *A. tænianotus*, p. 67.Dorsal fin quite distinct from caudal ... 2. *A. longispinis*, p. 63.

B. Dorsal fin begins in front of eyes; caudal pointed .....

3. *A. macracanthus*, p. 68.811. (1.) *Amblyapistus tænianotus*.*Apistus tænianotus*, Cuv. & Val. *H. N. Poiss.* iv, p. 404.*Amblyapistus tænianotus*, Day, *Fish. India*, p. 157, pl. xxxviii, fig. 5 (see synonym.).

B. v. D. 17-16/8-7. P. 12. V. 1/5. A. 3/5-7. C. 12.



Length of head  $4\frac{1}{3}$ , height of body  $3\frac{1}{2}$  in the total length. *Eyes*—diameter  $3\frac{1}{3}$  in length of head, nearly 1 diam. from end of snout and  $\frac{3}{4}$  apart. The profile from snout to commencement of dorsal fin almost vertical. *Fins*—dorsal commencing between the eyes, high anteriorly, its first spine short, its second as high as the body, its third a little shorter; from about the fourth spine to the end of the rays all are of about the same height; a slight membranous continuation between the end of the dorsal and base of the caudal fins; third anal spine longest; caudal slightly rounded. *Lateral line*—first sixteen tubules distinct, subsequently they coalesce into one tube. *Colour*—reddish, with irregular brownish spots, a brown mark between the 5th and 6th or 7th dorsal spines.

*Hab.* Andaman Islands, Malay Archipelago and beyond; attaining a few inches in length.

812. (2.) *Amblyapistus longispinis*.

*Apistus longispinis*, Cuv. & Val. *H. N. Poiss.* iv, p. 408.

*Amblyapistus longispinis*, Day, *Fish. India*, p. 157, pl. xxxviii, fig. 4 (see synon.).

B. vi. D. 13-15/6-8. V.  $1\frac{1}{4}$ . A.  $3\frac{1}{4}$ -5. C. 12.

Length of head  $3\frac{3}{4}$ , height of body  $3\frac{2}{3}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout, and nearly 1 apart. A rise from the snout to the base of the dorsal fin at about  $45^\circ$ . The maxilla reaches to below the middle of the orbit; lower jaw slightly the longer. *Fins*—dorsal spines commencing over eye, interspinous membrane deeply emarginate; first spine as long as snout from middle of eye, second and third equal, and as long as head excluding snout, last eight spines of about the same height as the rays; third anal spine longest; caudal cut square. *Scales*—rudimentary, but distinct. *Lateral line*—with 20 tubes. *Colour*—pinkish, a brown spot on lateral line below the seventh dorsal spine, and a white one above and behind it; fins with brown spots, end of caudal blackish.

*Hab.* Seas of India to China; attaining a few inches in length.

813. (3.) *Amblyapistus macracanthus*. (Fig. 27.)

*Apistus macracanthus*, Bleeker, *Batav. Nat. Tijdsch.* iii, p. 267.

*Amblyapistus macracanthus*, Day, *Fish. India*, p. 158, pl. xxxviii, fig. 3 (see synon.).

B. vi. D. 15-16/9-10. P. 12. V.  $1\frac{1}{5}$ . A.  $3\frac{3}{8}$ . C. 12.

Length of head  $4\frac{1}{2}$ , height of body  $3\frac{1}{2}$  in the total length. *Eyes*—diameter  $3\frac{2}{3}$  in length of head, 1 diam. from end of snout, and  $\frac{3}{4}$  apart. Body strongly compressed. *Fins*—dorsal fin commences before the eyes, is high anteriorly; the first three spines at some distance from the others, second spine the highest, being nearly as high as the body, the last spine as high as the rays; a slight membranous connection between the dorsal and caudal;



third anal spine longest; caudal pointed, its lower border truncated. Scales—a few small ones imbedded in the skin on the body. Colour—brownish black; pectoral with a white border.

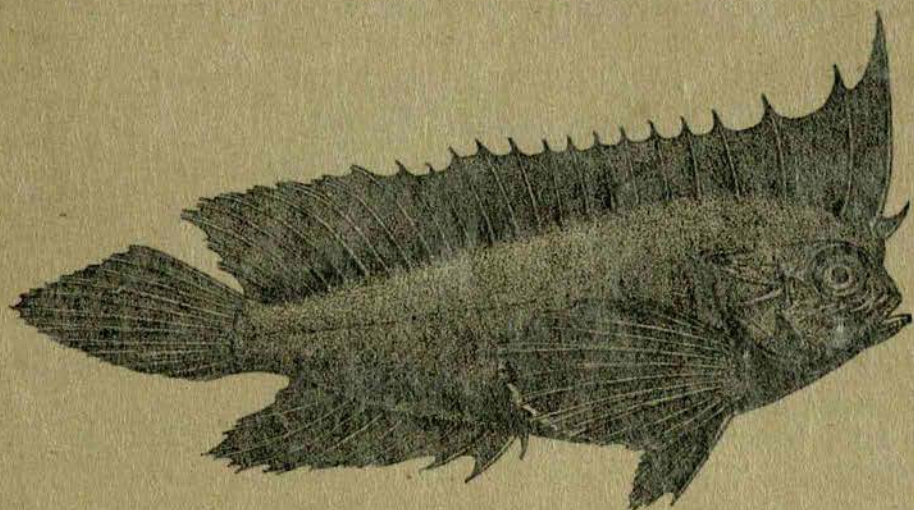


Fig. 27.—*Amblyapistus macracanthus*.

*Hab.* Andamans and Malay Archipelago; attaining to at least  $3\frac{1}{2}$  inches in length.

#### 9. Genus **MICROPUS**, Gray.

Syn. *Caracanthus*, Kröyer; *Amphiprionichthys*, Bleeker; *Centropus*, Kner; *Crossoderma*, Guichenot.

Branchiostegals four to six. Body strongly compressed, short and deep. Preorbital, pre-, sub-, and interopercles armed. Villiform teeth in the jaws only. One or two dorsal fins, the first with seven or eight spines, the anal with two; no free pectoral rays; ventrals rudimentary; some of the articulated fin-rays branched. Body scaleless, but covered with small tubercles. (No cleft behind the fourth gill.)

*Geographical Distribution.* Small fishes distributed through the seas of India to the Malay Archipelago and Pacific.

#### 814. (1.) **Micropus zeylonicus**. (Fig. 28.)

*Amphiprionichthys zeylonensis*, Day, P. Z. S. 1869, p. 515.

*Micropus zeylonicus*, Day, *Fish. India*, p. 158, pl. xxxviii, fig. 6 (see synonym.).

B. vi. D.  $7/14$ . P. 13. V.  $1/3?$ . A.  $2/11$ . C. 15.

Length of head nearly 3, height of body 2 to  $2\frac{1}{4}$  in the total length. Eyes—high up,  $1\frac{1}{2}$  diameters from end of snout and 1 apart. Preopercle with five blunt spines. A serrated ridge passes from the back of the orbit towards the occiput. Fins—dorsal fin has a notch between its two portions, the third and



fourth spines the highest; rays not so high as spines; anal spines with a deep notch in the membrane separating them from the rays. *Colour*—bluish along upper half of body, becoming dirty brown on the abdomen; several irregular rows of yellowish blotches along

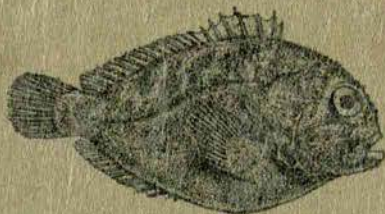


Fig. 28.—*Micropus zeylonicus*.

the back and sides, separated by a darker reticulation; fins light-coloured, caudal marked like sides of body.

*Hab.* Malabar and Ceylon; the largest obtained was  $2\frac{1}{2}$  inches in length.

#### 10. Genus **MINOUS**, Cuv. & Val.

*Syn.* *Corythobatus*, sp., Cantor.

Branchiostegals seven. Head large, body rather compressed; a groove across occiput. Preorbital with a strong spine, preopercle likewise spinate; opercle armed. Villiform teeth on jaws and vomer, palatines edentulous. A single dorsal fin with about the same number of spines as rays; anal spines, if present, badly developed; pectoral with a free ray at its base. Articulated fin-rays single, unbranched. Scales absent. Cæcal appendages few. (A cleft behind the fourth gill.)

##### 815. (1.) **Minous monodactylus**. (Fig. 29.)

*Scorpaena monodactyla*, *Bl. Schn. Syst. Ich.* p. 194.

*Minous monodactylus*, *Day, Fish. India*, p. 159, pl. xxxviii, fig. 7 (see *synon.*).

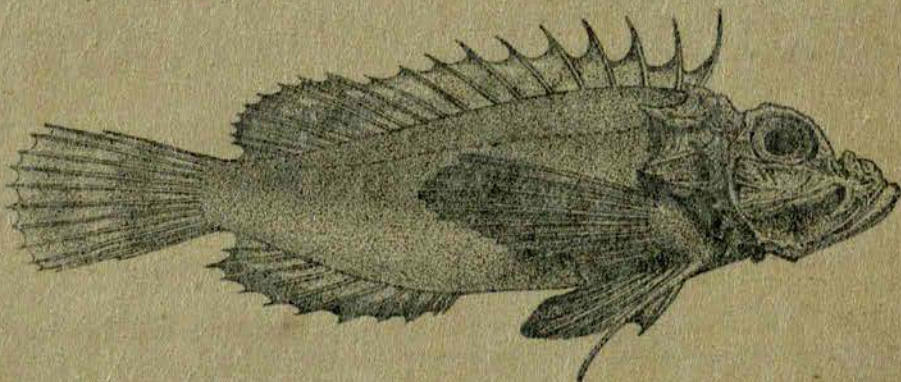


Fig. 29.—*Minous monodactylus*.

*Dhoma*, Maráthi; *Cul-plaachee*, Tam.



D. 9-11/12-9. P. 10+i. V. 1/5. A. 9-11. C. 10. Cæc. pyl. 4.

Length of head  $3\frac{1}{2}$ , height of body 4 to  $4\frac{1}{4}$  in the total length. Eyes—diameter  $3\frac{1}{2}$  to 4 in length of head,  $1\frac{1}{2}$  diam. from end of snout and also apart. Fins—dorsal spines moderately strong, the first distinct from the remainder, the membrane deeply cleft. Colour—head greyish brown above, sides and abdomen lighter or flesh-coloured, with dark blotches and marks; dorsal fin light brown margined with black; pectoral black, its appendages white; caudal buff, with three vertical brown bars.

Hab. Seas of India to China; attaining 4 or 5 inches in length.

### 11. Genus **COCOTROPUS**, Kaup.

Syn. *Corythobatus*, sp., Cantor; *Tetraroge*, pt., Günther.

Branchiostegals six. Head and body strongly compressed; no groove across the occiput. Preorbital with a strong blunt spine; preopercle with a similar one; opercle armed. Villiform teeth in jaws and vomer, palatines edentulous. A single dorsal fin with more spines than rays; two weak anal spines; pectoral without any free ray at its base. Articulated fin-rays single, unbranched. Scales absent.

#### *Synopsis of Indian Species.*

D. 13/11, P. 11; first dorsal spine longest . . . . . 1. *C. echinatus*, p. 71.  
D. 14-15/9-10, P. 14; second dorsal spine longest. 2. *C. roseus*, p. 71.

#### 816. (1.) **Cocotropus echinatus**.

*Corythobatus echinatus*, Cantor, *J. A. S. B.* xviii, p. 1027; *Catal.*

*Mal. Fish.* p. 45, pl. 13.

*Cocotropus echinatus*, Day, *Fish. India*, p. 159 (see synon.).

D. 13/11. P. 11. V. 1/3. A. 2/8. C. 12.

Length of head  $3\frac{2}{3}$ , height of body  $3\frac{1}{2}$  in the total length. Eyes—near the dorsal profile, diameter  $4\frac{1}{2}$  in length of head,  $1\frac{1}{3}$  diam. from end of snout, and  $\frac{3}{4}$  apart. The anterior profile from dorsal fin to snout almost vertical. Fins—dorsal commences over orbit, first spine rather curved and longest, the last spines as high as the rays; from end of dorsal a membranous continuation extends to base of caudal. Caudal rounded. Body and head studded with small obtuse prickles. Lateral line—indistinct. Colour—buff, with five brown lines radiating from the eye; dorsal fin reddish with its upper edge purple; fins generally reddish or yellow, the pectoral with three light vertical bands on its basal half; some large brownish blotches in the upper half of the body.

Hab. Andamans and Pinang; attaining a few inches in length.

#### 817. (2.) **Cocotropus roseus**. (Fig. 30.)

*Cocotropus roseus*, Day, *Fish. India*, p. 160, pl. xxxviii, fig. 8 (see synon.).



D. 14-15/9-10. P. 14. V. 1/3. A. 2/7-8. C. 12.

Length of head  $3\frac{1}{2}$ , height of body  $3\frac{1}{2}$  in the total length. *Eyes*—placed high up, diameter 4 in length of head,  $1\frac{3}{4}$  diam. from end of snout, and  $\frac{3}{4}$  apart. Profile from dorsal fin to snout oblique. A rough ridge passes across the suborbitals to a little above the angle of the preopercle; an elevated occipital ridge, and also a temporal one having three blunt spines. *Fins*—dorsal fin commences over the middle of the eye; spines strong, the second slightly the longest, they subsequently slightly decrease to the last, which is as high as the first ray; a membranous extension from end of dorsal nearly reaches base of caudal. Caudal rounded.

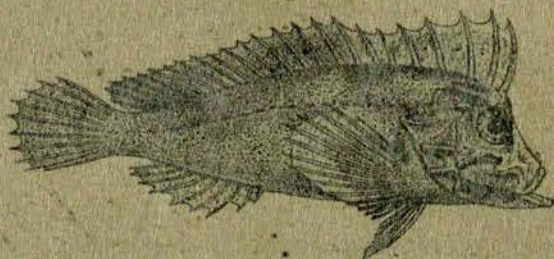


Fig. 30.—*Cocotropus roseus*.

Skin with many widely spread rough elevations, becoming somewhat spiny in large specimens; tubes of lateral line 10 or 11 in number, occupying its whole length. *Colour*—fleshy, the fins more pinkish. Dorsal fin edged with white, having a dull grey band along its centre, and most distinct in its last half; caudal edged with white, and numerous grey spots at the base; pectoral and anal reddish, the former with many black spots; ventrals white.

These fish are very common in Madras in October and through the cold months, but rarely exceed  $2\frac{1}{2}$  or 3 inches in length.

*Hab.* Cōromandel coast of India.

## 12. Genus **PELOR**, Cuv. & Val.

Branchiostegals seven. Head irregularly shaped. Villiform teeth in the jaws and vomer. The first three dorsal spines connected by membrane and at a little distance from the others (12-14), which are somewhat isolated, the interspinous membrane being deeply cleft; two free rays at the base of the pectoral fin, having a connecting membrane; ventrals thoracic. Articulated fin-rays branched. Scales absent. Head, body, and fins with skinny appendages. Air-bladder small. Pyloric appendages few.

### 818. (1.) *Pelor didactylum*. (Fig. 31.)

*Scorpeena didactyla*, Pallas, *Spic. Zool.* fasc. vii, p. 26, t. 4.

*Pelor didactylum*, Günther, *Catal.* ii, p. 150; Day, *Fish. India* p. 160, pl. xxxix, fig. 1 (see synonym.).



D. 3 | 13-15/8-9. P. 10+ii. V. 1/5. A. 11-12. C. 12.

Length of head  $3\frac{1}{2}$  to 4, height of body  $3\frac{1}{2}$  in the total length. *Eyes*—diameter  $5\frac{1}{2}$  in the adult to 3 in the young in length of head,  $2\frac{1}{2}$  diam. from end of snout, and from 1 to  $1\frac{1}{4}$  apart. Lower jaw considerably the longer. Interorbital space deeply concave with a transverse ridge between the two eyes; a deep saddle-shaped depression across the occiput; a groove below the eyes. Upper edge of orbit with blunt spines; spiny occipital and temporal ridges; preopercle with spines on its vertical border; a suborbital spiny ridge; a turbinal spine; opercle mostly with two spines.

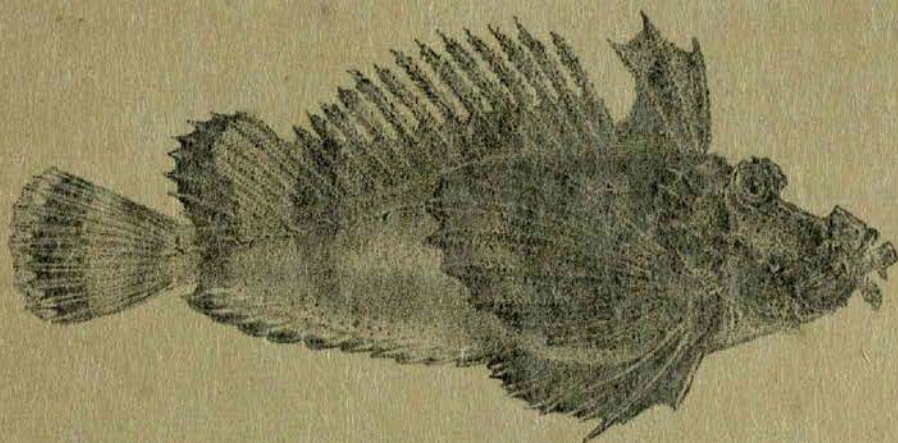


Fig. 31.—*Pelor didactylum*.

Rather long fleshy tentacles on the lower jaw. *Fins*—second dorsal spine somewhat longest of first three, as high as longest in rest of fin; interspinous membrane deeply cleft and covered with skinny appendages. Caudal cut almost square. *Colour*—brownish grey, becoming dirty white beneath, with fine spots over the body and head. Dorsal coloured like the body, a dark band passes down last few spines on to body, and another over last few rays takes the same course; caudal yellow, with a dark vertical band across its base, and another in its last third; outer edge of anal dark coloured.

*Hab.* Andaman Islands, to the Malay Archipelago and beyond.

### 13. Genus **CHORIDACTYLUS**, Richardson.

Branchiostegals six. Head and body compressed. Bones of head with osseous ridges; the preorbital, preopercle, and opercle with spines; a groove on the occiput. Villiform teeth on the jaws; palate edentulous. A single dorsal fin with more spines (13) than rays (9); anal with two spines; pectoral fin with three free rays. V. 1/5. Articulated fin-rays branched. Scales absent; some skinny appendages on the body. Air-bladder absent. Pyloric appendages few.

*Geographical Distribution.* Coromandel coast of India and seas of China.

819. (1.) *Choridactylus multibarbis*. (Fig. 32.)

*Choridactylus multibarbis*, Richardson, *Voy. Samarang, Fishes*, p. 8, pl. 2, figs. 1-3; Day, *Fish. India*, p. 161, pl. xxxix, fig. 2 (see synon.).

D. 13/9. P. 9+iii. V. 1/5. A. 2/8. C. 15.

Length of head 4, height of body  $3\frac{1}{2}$  in the total length. Eyes—high up, with prominent orbits, diameter  $3\frac{1}{2}$  in length of head, 1 diam. from end of snout, and rather more apart. Interorbital space concave, with two longitudinal ridges, connected behind by a transverse one. A fleshy tentacle over the centre of the eye, and some tentacles on the mandible. Fins—dorsal commencing just behind the eyes, the first three spines somewhat removed from the rest, the fourth likewise at some distance from those before or behind it, the third and fourth spines the longest; interspinous membrane deeply emarginate; rays a little higher than the longest spine; ventral large, nearly the whole of its inner edge attached by

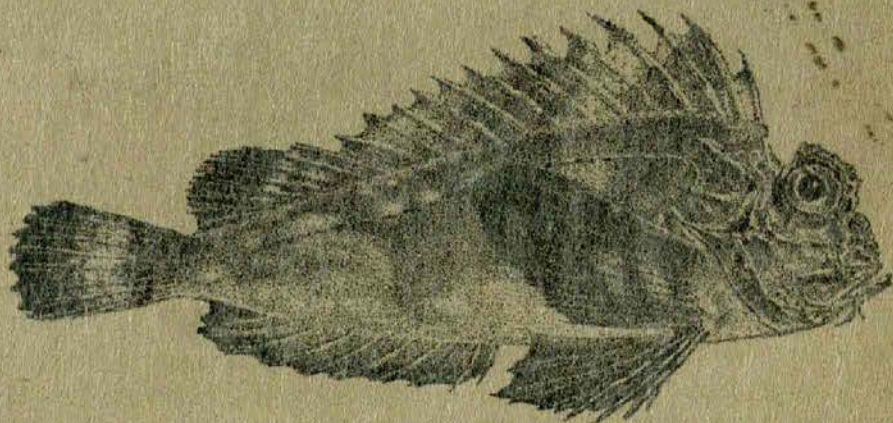


Fig. 32.—*Choridactylus multibarbis*.

a skinny flap to the abdomen; anal spines small, the second one-third the longest; caudal rounded. Colour—brownish, with a yellow shoulder-mark, and two or three vertical orange bands; base of ventral and anal with fine white spots. Fins blackish brown, with a light band between the fourth and sixth dorsal spines; margins of pectoral orange; caudal with a black band at its base, and another in its last third having a light edge; outer two thirds of anal blackish; free rays black, with white in their middle.

*Hab.* Coromandel coast of India, and China. This fish is very common at Madras, attaining about 4 inches in length.

14. Genus **SYNANCIDIUM**, Müll.

*Syn. Buffichthys*, Swains.

Branchiostegals seven. Head monstrous and irregularly shaped, but without sharp spines. Villiform teeth on the jaws and vomer,



but not on the palatines. The soft dorsal continuous with the spinous, fewer rays than spines; anal  $3/5$ ; no pectoral appendages. Scales absent; body and sometimes the head with skinny flaps. Air-bladder small. Pyloric appendages few.

820. (1.) *Synancidium horridum*. (Fig. 33.)

*Scorpena horrida*, Linn. *Syst. Nat.* i, p. 453.

*Synancidium horridum*, Day, *Fish. India*, p. 162, pl. xxxix, fig. 3.

D. 12-13/6-7. P. 16. V.  $1/5$ . C. 12. Cæc. pyl. 3. Vert. 10/14.

Length of head 3, height of body 3 in the total length. Eyes—diameter 8 in length of head, 3 diam. from end of snout. Crown of head irregularly saddle-shaped; a deep groove on the cheeks, orbit raised. Fins—dorsal spines stiff, the first three the highest and somewhat separated from the others; vertical fins more or

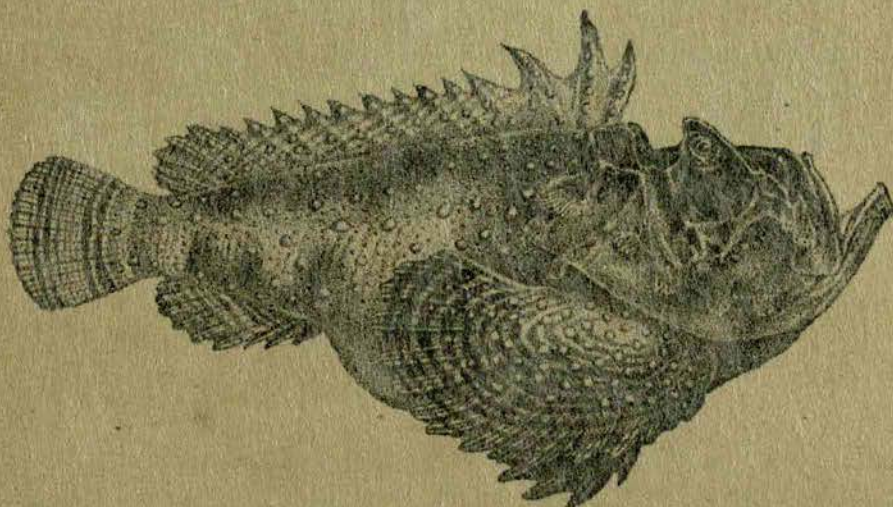


Fig. 33.—*Synancidium horridum*.

less enclosed in skin. Articulated fin-rays branched. Skin with numerous large and small tubercles even on the fins; some large fringed tubercles along lower edge of preopercle and preorbital. Colour—brownish fawn above, lighter below; irregular blotches on the body, and smaller ones on the fins.

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

15. Genus *SYNANCEIA*, Bl. Schn.

Syn. *Synanceichthys*, Bleeker.

Branchiostegals seven. Head monstrous, irregularly shaped but spineless; no saddle-shaped fossa across the occiput; no transverse elevation between the orbits, nor deep groove below the eyes. Villiform teeth on the jaws; vomer and palatine bones edentulous. The soft dorsal continuous with the spinous, fewer rays than spines; anal  $3/5$ , no pectoral appendages. Air-bladder present. Scales absent. Pyloric appendages few.

821. (1.) *Synanceia verrucosa*. (Fig. 34.)

*Synanceia verrucosa*, Bl. Schn. Syst. Ich. p. 195, t. 45; Day, Fish. India, p. 162, pl. xxxix, fig. 4 (see synonym.).

D. 13/6-8. P. 1/8. V. 6. C. 10-12. Cæc. pyl. 0(4). Vert. 10/14.

Length of head  $2\frac{1}{2}$ , height of body  $2\frac{2}{3}$  in the total length. Eyes—diameter 6 to 7 in length of head and 2 diam. from end of snout. Interorbital space very concave; orbits but little elevated. A slight groove on the cheek. The anterior extremity of the lower jaw is on the dorsal profile. Body with cutaneous excrescences,

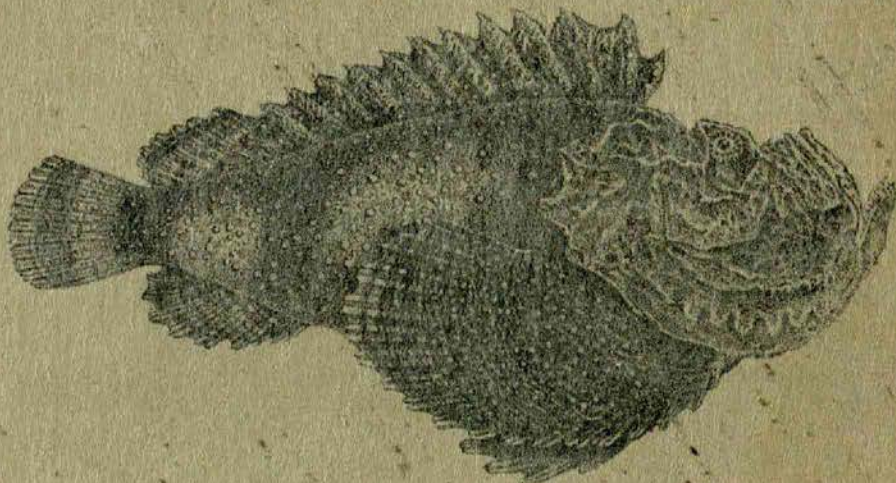


Fig. 34.—*Synanceia verrucosa*.

and many filaments about the head. Colour—brownish, caudal with a vertical dark band down its centre and white margins; pectoral and ventral with dark edges and light borders; anal banded.

*Hab.* Red Sea, east coast of Africa, seas of India to the Malay Archipelago and beyond; attaining at least 13 inches in length.

This species is well known at the Mauritius and dreaded on account of the wounds inflicted by its dorsal spines, each of which is grooved and has a small poison-bag attached. Men are said to have died as a result of the wounds.

16. Genus **LEPTOSYNANCEIA**, Bleeker.

Syn. *Pseudosynanceia*, Day.

Branchiostegals seven. Body elongate, anteriorly subcylindrical, posteriorly compressed; head broad, depressed. Eyes on the upper surface of the head, directed upwards. Preopercle and pre-orbital armed. Gill-opening with a superior as well as posterior orifice, the two being continuous. Villiform teeth in the jaws and on the vomer, none on the palate or tongue. A single dorsal fin



with 18 strong spines and 5 unbranched rays; anal with 3 spines and 7 rays. No pectoral appendage. Articulated fin-rays unbranched. Scales absent. Skin smooth.

*Geographical Distribution.* From Sind to the Malay Archipelago.

822. (1.) *Leptosynanceia melanostigma*. (Fig. 35.)

*Pseudosynanceia melanostigma*, Day, *Fish. India*, p. 163, pl. iv, fig. 6, *Suppl.* p. 788.

D. 16/5. P. 14. V. 1/3. A. 3/7. C. 11.

Length of head  $4\frac{1}{3}$ , height of body 6 in the total length. *Eyes*—diameter 7 in length of head,  $1\frac{1}{2}$  diameters from end of snout, and 3 apart. Upper surface of the head with sinuous, but not spiny, ridges. Opercle with a spine. Lower jaw the longer, its symphysis forming a portion of the dorsal profile. *Fins*—dorsal spines strong, commencing over the centre of the opercle, the posterior ones being somewhat the longest but not so high as the rays; interspinous membrane deeply cleft. Anal spines short but

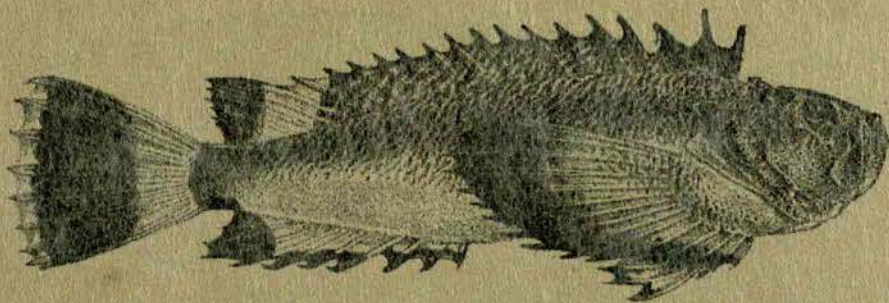


Fig. 35.—*Leptosynanceia melanostigma*.

pungent. No skinny tentacles on head, body, or fins. *Colour*—grey mottled with black on top of head and along back, becoming yellow on abdomen. Spinous dorsal also mottled, a vertical yellow band across front half of soft dorsal, its last half black. Pectoral yellow, with some grey spots at its base and a wide black edge. Ventral and anal yellow, edged with black. Caudal yellow, with a black band down the last half, externally edged with yellow.

*Hab.* Kurrachee, in Sind; growing to at least 7 inches in length. This fish lives in the mud and is difficult to obtain.

17. Genus **POLYCAULIS**, Günther.

Syn. *Synanceia*, sp., Bloch; *Trachicephalus*, Swainson.

Branchiostegals seven. Body anteriorly subcylindrical, posteriorly compressed; head broad, rather depressed. Eyes directed upwards. Preopercle armed. Gill-opening with a superior as well as posterior orifice, the two being continuous. Villiform teeth in the jaws, none on the vomer. A single dorsal fin with flexible



spines and rays; anal somewhat elongate; no pectoral appendages; ventral thoracic, united to the abdomen along its inner edge. Articulated fin-rays unbranched. Scales absent. Vertical fins more or less enveloped in skin.

*Geographical Distribution.* Seas of India to the Malay Archipelago and beyond.

823. (1.) *Polycaulis uranoscopus*. (Fig. 36.)

*Synanceia uranoscopa*, Bl. Schn. *Syst. Ich.* p. 195.

*Polycaulis uranoscopus*, Day, *Fish. India*, p. 164, pl. xxxix, fig. 6 (see synonym.).

D. 9-12/11-14. P. 13. V. 1/5. A. 11-15. C. 11.

Length of head from  $4\frac{1}{2}$  to 5, height of body  $4\frac{1}{2}$  to 5 in the total length. *Eyes*—diameter  $4\frac{1}{2}$  to 5 in length of head,  $1\frac{1}{2}$  diam. from end of snout, and 2 apart. Head covered with bony ridges having numerous blunt points. Lower jaw the longer. *Fins*—the low dorsal commences between or rather in advance of the



Fig. 36.—*Polycaulis uranoscopus*.

superior openings of the gills. Ventral attached along its entire inner edge to the abdomen. *Colour*—brownish, with or without white dots; fins stained dark at their edges, sometimes spotted, the caudal with a white edge.

*Hab.* Seas and estuaries of India, to the Malay Archipelago and beyond; attaining at least 5 inches in length.

## Family VII. NANDIDÆ.

*Pseudochromides*, pt., et *Manoidei*, pt., Müll. & Trosch.

Branchiostegals five or six; pseudobranchiae present in marine genera, but sometimes concealed or absent in freshwater forms. Body oblong and compressed. Teeth feeble, but dentition more or less complete. Dorsal fin single; the base of the spinous portion longer than that of the soft or equal to it; anal with 3 spines, its soft portion similar to that of the dorsal; ventrals thoracic,  $1/4$  or  $1/5$ . Scales etenoid, covering the body. Lateral line interrupted or absent. No superbranchial organ. Air-bladder present. Pyloric appendages few or absent.



*Geographical Distribution.* Of the Asiatic genera of *Nandidæ*, some are marine, others freshwater; their range extends from the Red Sea and east coast of Africa to India, the Malay Archipelago and beyond.

*Synopsis of Indian Genera.*

First group. PLESIOPINA.

Pseudobranchiæ present; ventral with four rays.

The first one or two ventral rays elongate and bifid .. 1. PLESIOPS.

Second group. NANDINA.

Pseudobranchiæ absent; ventral with five rays.

Preopercle not serrated. Villiform teeth in jaws and palate, but not on tongue..... 2. BADIS.

Preopercle serrated. Villiform teeth in jaws, palate, root of tongue, and cavity of mouth ..... 3. NANDUS.

Preopercles serrated. Villiform teeth in jaws and palate, with globular crowns at root of tongue and roof of cavity of mouth ..... 4. PRISTOLEPIS.

First group. PLESIOPINA.

1. Genus PLESIOPS, Cuv.

Syn. *Pharopteryx*, Rüpp.

Branchiostegals six; pseudobranchiæ. Body oblong and compressed. Mouth moderately protractile. None of the bones of the head serrated. Villiform teeth on the jaws, vomer, and palatines, none on the tongue. Eleven or twelve spines in the dorsal fin, three in the anal; ventral with one spine and four rays, the outer rays elongate and bifid. Lateral line interrupted. Air-bladder present. Pyloric appendages absent.

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

824. (1.) *Plesiops nigricans*. (Fig. 37.)

*Pharopteryx nigricans*, Rüpp. *Atl.* p. 15, t. iv, fig. 2.

*Plesiops nigricans*, Day, *Fish. India*, p. 128, pl. xxxi, fig. 5 (see synon.).

D. 12/7-8. P. 21. A. 3/8. C. 16. L. 1. 23-28. L. tr. 2½/10.

Length of head from 3¼ to 4, height of body 4½ in the total length. *Eyes*—diameter 4 to 5 in length of head, ¾ to 1 diam. from end of snout, and 1 apart. *Teeth*—outer row in upper jaw usually slightly enlarged. *Fins*—dorsal spines much shorter than rays; interspinous membrane (which extends beyond tip of each spine) deeply emarginate; soft portion of fin and also of anal pointed; two outer ventral rays elongate; third anal spine longest; caudal pointed. *Scales*—finely ctenoid in last half of body. *Colour*



—brownish, each scale on the body with a blue centre, some of those on the shoulder and head with several blue spots. Opercle with a large black, blue-edged ocellus. A blue band along the dorsal and anal fins; dorsal, caudal, and anal with a white margin; soft

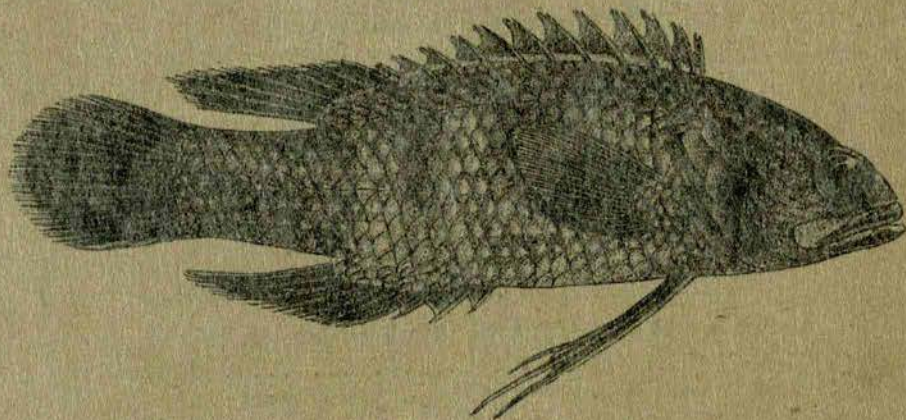


Fig. 37.—*Plesiops nigricans*.

dorsal and anal with blue streaks in the direction of the rays; streaks are also present on the caudal but in the form of transverse blotches.

*Hab.* From the Red Sea, through the seas of India to the Malay Archipelago and beyond. This fish is very common at the Andaman Islands, attaining at least 6 inches in length.

## Second group. NANDINA.

### 2. Genus **BADIS**, Bleeker.

Branchiostegals six; pseudobranchiae apparently absent. Mouth protractile. Opercle with one sharp spine; other bones of the head armed. Villiform teeth on the jaws, vomer, and palatines, absent from the tongue. A single dorsal fin, the spinous portion of much greater extent than the soft; anal with 3 spines, its rayed portion similar to that of the dorsal; ventral  $1\frac{1}{5}$ . Scales ctenoid, of moderate size. Lateral line interrupted or absent. Air-bladder large and simple. Pyloric appendages absent.

*Geographical Distribution.* Fresh waters of the hills and plains of India and Burma.

### *Synopsis of Indian Species.*

Lateral line interrupted. Purplish, banded or spotted .....	1. <i>B. buchanani</i> , p. 80.
Lateral line absent. Stone-colour with vertical bands .....	2. <i>B. dario</i> , p. 82.

### 825. (1.) *Badis buchanani*. (Fig. 38.)

*Labrus badis*, Ham. *Buch. Fish. Ganges*, pp. 70, 368, pl. 25, fig. 23.  
*Badis buchanani*, Bleeker, *Batav. Genootsch. Verhand.* xxv, *Beng. Hind.* p. 106; Day, *Fish. India*, p. 128, pl. xxxi, fig. 6 (see synon.).



*Kala-poo-ti-ah* and *Chiri*, Punj.; *Kundala* and *Ka-sundara*, Tel.; *Kahlee-poe* and *Bundei*, Ooriah; *Nabat* and *Ran-doh-nee*, Assam.; *Pin-lay-nga-ba-mah* and *Nga-mee-loung*, Burm.

D. 16-18/7-10. P. 12. A. 3/6-8. C. 16. L. 1. 26-33. L. tr.  $2\frac{1}{2}/8$ .

Length of head  $4\frac{1}{2}$  to 5, height of body  $2\frac{3}{4}$  to  $4\frac{1}{2}$ , in the variety figured, in the total length. *Eyes*—diameter  $2\frac{2}{3}$  in length of head,  $\frac{2}{3}$  from end of snout, and 1 apart. Form of body an elongated oval, sides compressed. *Teeth*—villiform in jaws, vomer, and palatines, also on pre-sphenoid and epi-hyal. *Fins*—dorsal spines somewhat slender, the soft portion of the fin rather elevated and pointed; anal spines short, caudal pointed. The number of spines

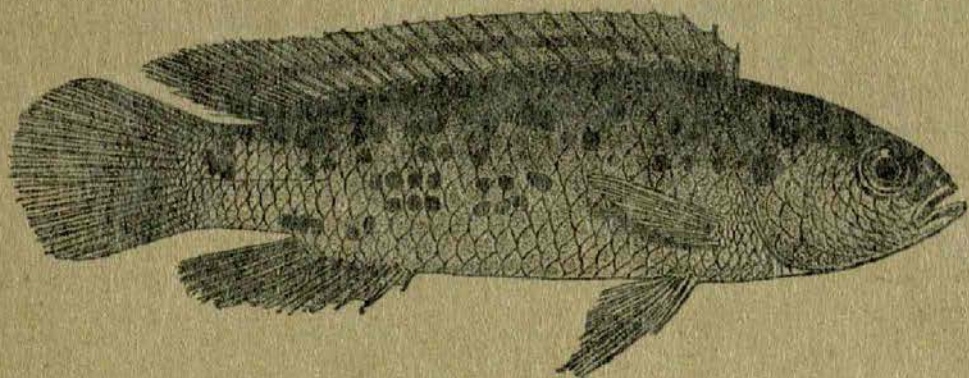


Fig. 38.—*Badis buchanaui*.

and rays varies: in Bengal and Madras the formula is generally D. 16-17/3-7, A. 3/6-7, L. 1. 26-28; but in Assam and Burma it is mostly D. 17-18/9-10, A. 3/8, L. 1. 28-33. *Scales*—ctenoid, extending over the body and head, there are two or three small rows along the bases of the dorsal and anal fins, and some minute ones often present on the rays of the vertical fins, one entire row intervenes between highest portion of lateral line and the small scales along base of dorsal fin. *Lateral line*—interrupted below posterior extremity of dorsal. *Colour*—subject to great variation. In India proper, including the Punjab and Sind, the body is variegated with alternate belts of black and green; but in old fishes, especially if captured in dirty water, these bands are black and dirty red. On each shoulder there is usually a bluish-black spot, another is often present on the opercle, and a third at base of caudal. In Assam these fishes are dull red, blotched or spotted with black; but in Burma the spots take the form of six vertical bands, each formed by four transverse blotches one above the other; a large one is situated on the shoulder, and another on the side of the free portion of the tail; all the vertical fins have a narrow white edge.

*Hab.* Fresh waters of India and Burma, attaining at least  $3\frac{1}{2}$  inches in length. I obtained several at Mandalay in Upper Burma from a canal which was being baled out.

826. (2.) *Badis dario*.*Labrus dario*, Ham. Buch. Fish. Ganges, pp. 72, 368.*Badis dario*, Günther, Catal. iii, p. 367; Day, Fish. India, p. 129 (see synonym.).*Kunkakie*, Oorlah; *Ka-sondara*, Tel.

D. 14/8. P. 9. A. 3/7. C. 15. L. 1. 26-30. L. tr. 11.

Length of head 4, height of body 4 in the total length. *Eyes*—diameter 3 in length of head,  $\frac{1}{2}$  diam. from end of snout and also apart. *Teeth*—minute as in the last species. *Fins*—dorsal spines slender, the soft portion as well as that of the anal pointed; caudal wedge-shaped. *Scales*—rather large. *Lateral line*—absent. *Colour*—stone-colour, with several black vertical bands, mostly in the posterior half of the body; in dirty water the black colour extends all over.

*Hab.* Ponds, rivers, and ditches in the northern parts of Bengal, Behar, and along the Western Ghats; attaining 3 inches in length.

3. Genus **NANDUS**, Cuv. & Val.Syn. *Bedula*, Gray.

Branchiostegals six; pseudobranchiae absent. Body oblong, compressed. Mouth very protractile, its cleft deep. Opercle with one spine; preopercle serrated, or more or less entire, as are also the preorbital, sub- and interopercles. Teeth villiform on the jaws, vomer, palatines, and tongue. Ventrals 1/5. Spinous portion of dorsal fin longer than rayed part; anal with 3 spines. Scales of moderate size, ctenoid. Lateral line interrupted. Air-bladder large and simple. Pyloric appendages absent.

*Geographical Distribution.* Fresh waters of India, Burma, and Siam.

827. (1.) *Nandus marmoratus*. (Fig. 39.)*Coius nandus*, Ham. Buch. Fish. Ganges, pp. 96, 370, pl. 30, fig. 32.*Nandus marmoratus*, Cuv. & Val. vii, p. 482, pl. 207; Day, Fish. India, p. 129, pl. xxxii, fig. 1 (see synonym.).

*Mootahree*, Mal.; *Bodosi* and *Gossiporah*, Oorlah; *Vaadhut*, Hind.; *Septi*, Tel.; *Latha* and *Gudtha*, Beng.; *Mussoassah*, Punj.; *Gad-gud-di* and *Bad-vaud-hi*, Assam.

D. 12-14/11-13. A. 3/7-9. L. 1. 46-57. L. tr.  $5\frac{1}{2}$ -6/17-20. Vert. 24.

Length of head 3, height of body 3 to  $3\frac{1}{2}$  in the total length. *Eyes*—diameter 5 to 6 in length of head, rather above 1 diam. from end of snout, and 1 apart. Premaxillaries very protrusible, reaching to one diameter behind the posterior border of the orbit. The posterior extremity of the maxilla reaches to some distance behind the eye. *Teeth*—in villiform bands in the jaws, in an elongate band, widest at either extremity, on the tongue; in a narrow row on the palatines and in a  $\Lambda$ -shaped band on the vomer, in



some cases "intermixed with these in each jaw are several sharp teeth of a larger size" (Ham. Buch. *l. c.*). *Fins*—dorsal spines rather strong, their base receivable into a groove, interspinous membrane deeply emarginate, soft portion of fin similar to that of anal and almost square; anal spines of moderate strength, the second longest and equal to two thirds length of rays; caudal cut nearly square. *Scales*—rather smaller on nape than on body, some extend over bases of dorsal and anal rays, an enlarged one at angle of ventral fin and another between the two ventrals. *Lateral line*—interrupted at about the 36th scale. *Colour*—greenish brown

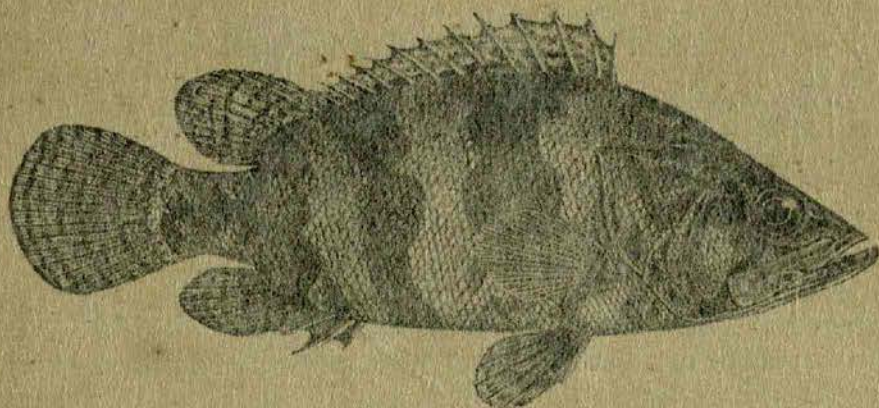


Fig. 39.—*Nandus marmoratus*.

with brassy reflections, vertically marbled with three broad patchy bands; a fourth crosses the free portion of the tail, or occasionally there exists a black blotch there; some narrow dark bands radiate from the eye. Narrow bands of spots across the soft portions of the dorsal, anal, and caudal fins.

In Assam and to the east of Bengal the bones of the head are more strongly serrated than is usually seen in the other parts of India.

*Hab.* Fresh and brackish waters of India and Burma, attaining at least 7 inches in length. This species is common in ditches and inundated fields, where it preys on small *Cyprinidæ*. It is exceedingly tenacious of life.

#### 4. Genus **PRISTOLEPIS**, Jerdon (1848).

Syn. *Catopra*, Bleeker (1851); *Paranandus*, Day.

Branchiostegals six; pseudobranchiæ absent. Mouth moderately protractile. Opercle with two flat (generally bifid) spines; preopercle and preorbital mostly serrated. Teeth villiform on the jaws and palate, villiform or globular on the vomer, obtusely globular on the base of the tongue, on the roof of the cavity of the mouth (presphenoid), and sometimes on the vomer. Anal fin with 3 or 4 spines; ventrals 1/5. Scales ctenoid, large, extended on to



the interbrachial membrane. Lateral line interrupted. Pyloric appendages two.

*Geographical Distribution.* Fresh waters of the plains and hills of Malabar, Burma, Siam, and the Malay Archipelago.

*Synopsis of Indian Species.*

- A. Teeth on vomer villiform (*Paranandus*).  
 a. Anal spines 4 ..... 1. *P. marginata*, p. 84.  
 b. Anal spines 3 ..... 2. *P. malabarica*, p. 84.  
 B. Teeth on vomer globular (*Catopra*); A. 3/8. 3. *P. fasciata*, p. 85.

828. (1.) *Pristolepis marginata*.

*Pristolepis marginatus*, Jerdon, *Mad. Journ. L. S.* xv, 1848, p. 141;  
*Day, Fish. India*, p. 130 (see *synon.*).

D. 15-16/11-12. P. 14. A. 4/8. L. r. 30/27. L. tr. 3½-11.

Length of head 3½ to 3¾, height of body 3¾ in the total length. *Eyes*—diameter 3½ to 3¾ in length of head, 1 diam. from end of snout, and ¾ apart. Lower jaw very slightly the longer. Preopercle serrated at its angle and also for a short distance along its vertical border; sub- and interopercles likewise serrated; opercle with two flat spines, the lower of which may be bifid; preorbital sometimes rather strongly serrated. *Teeth*—an outer row rather widely placed and curved in each jaw. *Fins*—dorsal spines rather strong, increasing in length to the 5th; 3 last anal spines about the same length; caudal rounded. *Scales*—13 rows between the base of the ventral and that of the dorsal fin. *Lateral line*—interrupted opposite the last third of the soft dorsal on the twenty-first scale. *Colour*—as in the next species.

*Hab.* This form, originally described by Jerdon, was obtained from the Manantoddy river flowing into the Cauvery; in the Cotiaddy river in North Malabar, and in the stream that runs near Canote in the same district. I obtained one specimen in Malabar 3¾ inches in length, with *P. malabarica*. This fish is said to attain a considerably greater length than 4 inches.

829. (2.) *Pristolepis malabarica*.

*Catopra malabarica*, Günther, *A. M. N. H.* ser. 3, xiv, 1864, p. 375.  
*Pristolepis malabaricus*, Day, *Fish. India*, p. 131, pl. xxxii, fig. 2 (see *synon.*).

*Chudichi*, Mal.

D. 14/12-14. C. 16. L. r. 27-29/25-27. L. tr. 3½/11. Vert. 13/11.

Length of head 4 to 4½, height of body 2¼ to 2½ in the total length. *Eyes*—diameter 3½ in length of head, 1 diam. from end of snout and also apart. Body compressed; jaws equal in front. Preopercle with its vertical limb roughened, in some cases serrated,



most strongly so at its angle; sub- and interopercles with some fine serrations at their approximating portions. Opercle with two sharp flat spines generally bifid; preorbital entire. *Teeth*—outer row in jaws somewhat enlarged, some specimens have merely two or four teeth enlarged in the lower jaw, and standing rather in front of the remainder; the presphenoid has small teeth, all but the outer row of which have rounded crowns, and there are some of the same description at the root of the tongue on the epi- and cerato-hyals; villiform teeth on both superior and inferior pharyngeals. *Fins*—dorsal spines rather stout, shorter than the rays, increasing in length to the 3rd and having a groove for their reception along their base, interspinous membrane somewhat deeply emarginate; second anal spine thickest but not quite so long as the third, a groove along their base; caudal rounded. *Lateral line*—interrupted, ceasing opposite the fourth ray on the twenty-first scale, commencing again in the centre of the side below the last ray, 13 rows between ventral and base of dorsal. *Colour*—rifle-green with purplish reflections, fins with lighter edges; caudal with a white outer margin. In some specimens the fish is vertically banded.

*Hab.* Ghats of Western India, where this fish seems to prefer clear and rapid streams, and to attain at least to 6 inches in length.

830. (3.) *Pristolepis fasciata*. (Fig. 40.)

*Catopra fasciata*, Bleeker, *Batavia Nat. Tijdsch.* ii, p. 65.

*Pristolepis fasciatus*, Day, *Fish. India*, p. 131, pl. xxxii, fig. 3 (see *synon.*).

D. 12-13/14-16. A. 3/8. C. 14. L. r. 30/28. L. tr.  $4\frac{1}{2}/12$ . Cæc. pyl. 2.

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

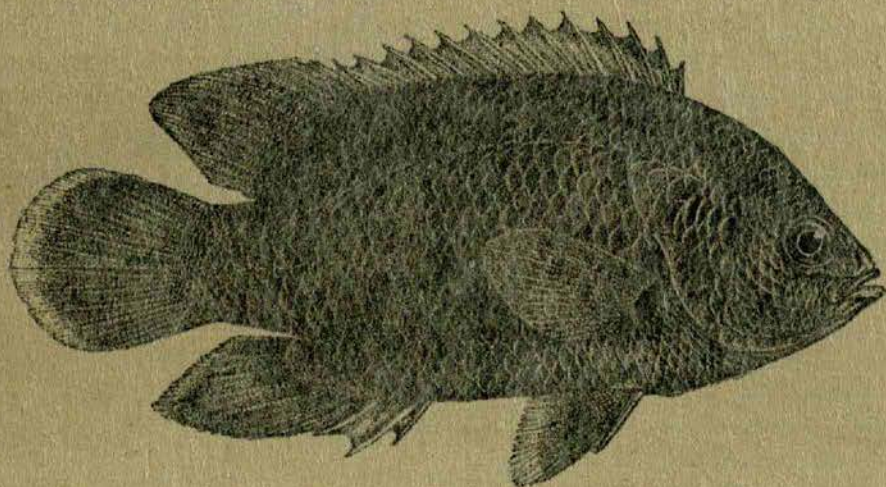


Fig. 40.—*Pristolepis fasciata*.

from end of snout, and  $1\frac{1}{2}$  apart. Body oblong, compressed. Pre-orbital and preopercle rather strongly serrated; fine serrations,



which may be absent, on the contiguous portions of the sub- and interopercles; two sharp flat spines on the opercle, mostly bifid and the lower the larger. *Teeth*—globular on vomer, base of tongue, and roof of the cavity of the mouth, at the base of the tongue they extend forward nearly to its anterior extremity. In the young (*C. siamensis*), the vomerine teeth are not quite so blunted as they become in the adult. *Fins*—dorsal spines strong, interspinous membrane deeply emarginate, rays in the middle the longest; second anal spine strongest but not so long as third; caudal rounded. *Lateral line*—interrupted opposite posterior end of dorsal fin, being continued on the third row of scales below it. *Air-bladder*—large. *Scales*—16 or 17 rows between bases of the ventral and dorsal. *Colour*—dull greenish, a deep black spot in the axilla and over upper part of base of pectoral, which is yellow; the other fins slate-coloured.

*Hab.* Fresh waters of Burma, Siam, and the Malay Archipelago. Four specimens were procured in Burma varying from  $4\frac{3}{16}$  to 8 inches in length.

## Family VIII. MALACANTHIDÆ.

Branchiostegals from five to six; pseudobranchiæ present. Gill-openings wide, the membranes united beneath the throat; gills four, with a slit behind the fourth. Body elongate and compressed; lips thick. A posterior canine tooth in the premaxillary. Dorsal and anal fins with many rays, the first few of the former not being articulated. Ventrals thoracic, with one spine and five rays. Scales small and finely ctenoid. Air-bladder simple. Pyloric appendages absent.

### 1. Genus **MALACANTHUS**, Cuv.

Cleft of mouth horizontal, the jaws equal anteriorly. Opercle with a spine, preopercle entire. Eyes lateral. Villiform teeth in the jaws, having an outer band of stronger ones; palate toothless. A long and continuous dorsal fin, with the first four to six rays unarticulated.

*Geographical Distribution.* Tropical seas.

#### 831. (1.) **Malacanthus lativittatus**. (Fig. 41.)

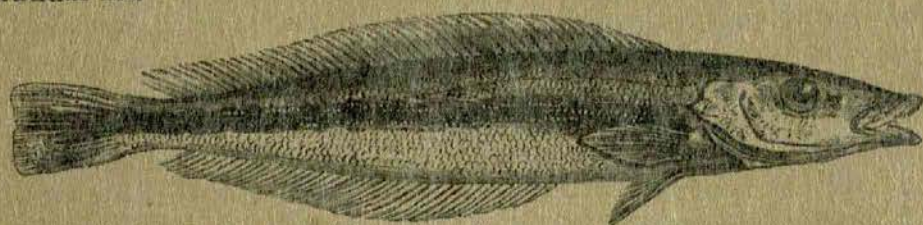
*Labrus lato-vittatus*, Lacép. *H. N. Poiss.* iii, p. 526, pl. xxviii, fig. 2.  
*Malacanthus lato-vittatus*, Day, *Fish. India, Suppl.* 1888, p. 787 (see synon.).

B. iv-v. D. 4/43-46. P. 17. A. 1/38-40. C. 17. L. 1. 125.

Length of head 4, of caudal fin 9, height of body 6 to 7 in the total length. *Eyes*—high up, and situated nearly midway between the end of the snout and the posterior extremity of the opercle;



diameter 7 in length of head. Cleft of mouth does not extend to below front edge of orbit. *Fins*—dorsal commences above axial of pectoral, but does not extend on to the caudal. *Colour*—brownish with a broad black band along the side from the pectoral to the caudal fin.



1. —*Malacanthus lativittatus*.

*Hab.* New Guinea, Mauritius, Ceylon (*Haly*).

## Family IX. TEUTHIDIDÆ.

*Teuthyes*, pt., Cuv.

Branchiostegals five; pseudobranchiæ well developed. Body oval and strongly compressed. Eyes of moderate size, lateral. Mouth slightly cleft, and but little protractile. A single row of cutting incisors in either jaw; palate edentulous. One dorsal fin with the spinous portion more developed than the soft; anal with seven spines. Ventrals thoracic, each with two spines and three intermediate soft rays. Scales minute. Lateral line complete.

### 1. Genus **TEUTHIS**, Linn.

Syn. *Siganus*, Forsk.; *Centrogaster*, Houtt.; *Amphacanthus*, Bl. Schn.; *Buro* (Comm.) Lacép.

*Worah*, Tam.; *Nga-pron-ka*, Mugh.

Teeth small. A single dorsal fin with thirteen spines and a horizontal one in front. Scales cycloid. Air-bladder large, forked both anteriorly and posteriorly. Pyloric appendages when present few (4-6)\*.

*Geographical Distribution.* Red Sea, Indian and Pacific Oceans.

### *Synopsis of Indian Species.*

- |   |                                   |
|---|-----------------------------------|
| Pale round spots on back, becoming elongate and passing into bands on abdomen ..              | 1. <i>T. java</i> , p. 88.        |
| Sinuous vermiculate blue lines on body throughout; height $2\frac{1}{2}$ in total .....       | 2. <i>T. vermiculata</i> , p. 88. |
| Sinuous blue lines on back, becoming longitudinal below; height $3\frac{1}{2}$ in total ..... | 3. <i>T. marmorata</i> , p. 89.   |
| Blue spots on back, 2 oblique brown bands on head and shoulder .....                          | 4. <i>T. virgata</i> , p. 89.     |

\* Rüppell states that in *T. sigana* they are absent.



- Blue bands on head, orange spots on body. 5. *T. concatenata*, p. 90.  
 Small subdistant blue spots; no bands.  
 Height of body  $3\frac{1}{2}$  in total ..... 6. *T. margaritifera*, p. 90.  
 Height  $2\frac{3}{4}$  in total ..... 7. *T. sutor*, p. 90.  
 Indistinct white spots on body, caudal  
 barred ..... 8. *T. oramin*, p. 91.  
 Greyish with purplish angular spots ..... 9. *T. stellata*, p. 92.

832. (1.) *Teuthis java*.

*Teuthis java*, Linn. Syst. Nat. i, p. 507; Day, Fish. India, p. 165,  
 pl. xxxix, fig. 5 (see synonym.).

Ottah, Tam.; Thar-our-dah, Andam.; Worahwah, Tel.; Nga-ryn-sha,  
 Arracan.

D. 13/10. P. 18. V.  $1\frac{1}{3}/1$ . A.  $7/9$ . C. 19.

Length of head  $5\frac{1}{4}$ , height of body  $2\frac{2}{3}$  to  $2\frac{3}{4}$  in the total length.  
*Eyes*—diameter 3 to  $3\frac{1}{2}$  in length of head,  $1\frac{1}{4}$  diam. from end of  
 snout and also apart. Interorbital space rather elevated, with a  
 central shallow groove which narrows anteriorly; anterior upper  
 edge of orbit serrated. *Fins*—dorsal spines strong, increasing in  
 length to the 4th, which is slightly higher than the rays, from it  
 they decrease to the last; soft portion of fin (and of anal) obliquely  
 rounded; anal spines strong, increasing in length to 3rd, which  
 equals longest in dorsal fin, then decreasing to 6th, but the 7th is  
 longer and equal to 3rd; caudal emarginate. *Colour*—head, back,  
 and sides dark brownish neutral tint, abdomen lighter. On the  
 head and back many pale grey rounded spots, becoming more  
 elongate on sides and abdomen. Diameter of upper spots less  
 than their distance apart. No streaks on the head as a rule, but  
 in some instances the cheeks are reticulated; fins immaculate.

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

833. (2.) *Teuthis vermiculata*.

*Amphacanthus vermiculatus* (Kuhl & v. Hass.), Cuv. & Val. H. N.  
 Poiss. x. p. 126.

*Teuthis vermiculata*, Günther, Catal. iii, p. 317; Day, Fish. India,  
 p. 166, pl. xl, fig. 1 (see synonym.).

Kut-e-rah, Mal.; Chow-lud-dah, Andam.

D. 13/9-10. P. 16. V.  $1\frac{1}{3}/1$ . A.  $7/8-9$ . C. 17.

Length of head about 5, height of body  $2\frac{1}{3}$  to  $2\frac{1}{2}$  in the total  
 length. *Eyes*—diameter  $3\frac{1}{3}$  in length of head, upwards of  $1\frac{1}{2}$  diam.  
 from end of snout, and  $1\frac{1}{3}$  apart. *Fins*—dorsal spines strong, from  
 the fourth they are about equal, but not so high as first few rays;  
 rayed portion of fin angular; anal of same form as dorsal, but  
 spines stronger and of about the same height from the third;  
 caudal slightly emarginate. *Scales*—distinct over the body and  
 cheeks. *Colour*—light brown, run into bluish green on back,  
 and nearly white on abdomen. The whole of the body, head, and



lips are vermiculated with very sinuous bluish lines of about one fourth the width of the interspaces, being broadest near the abdomen; caudal fin with brown lines.

*Hab.* Seas of India, Malay Archipelago and beyond, attaining at least 11 inches in length.

834. (3.) *Teuthis marmorata*.

*Amphacanthus marmoratus*, Quoy & Gaim. *Voy. Uranie et Phys.* Zool. p. 367, pl. 62, figs. 1, 2.

*Teuthis marmorata*, Günther, *Catal.* iii, p. 322; Day, *Fish. India*, p. 166, pl. xl, fig. 2 (see synonym.).

B. v. D. 13/10. P. 18. V. 1/3/1. A. 7/9. C. 17.

Length of head 5 to  $5\frac{1}{2}$ , height of body  $3\frac{1}{3}$  to  $3\frac{1}{2}$  in the total length. *Eyes*—diameter 3 in length of head, 1 to  $1\frac{1}{4}$  diam. from end of snout, and 1 apart. Interorbital space nearly flat, edge of orbit entire. *Fins*—dorsal spines increasing to the fourth and subsequently decreasing from the seventh, the highest spines half as long again as the soft portion of the fin, which is rounded; anal spines increase in length to the third, from which they decrease to the last; caudal lobed, upper lobe the longer. *Colour*—brownish, covered all over the back with blue vermiculated lines, which become sinuously-longitudinal along the sides; head covered with similar lines. Dorsal, anal, and caudal with sinuous brown lines; pectorals yellow.

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

835. (4.) *Teuthis virgata*.

*Amphacanthus virgatus*, Cuv. & Val. II. N. Poiss. x, p. 133.

*Teuthis virgata*, Day, *Fish. India*, p. 166, pl. xl, fig. 3 (see synonym.).

*Tah-meer-dah*, Andam.

D. 13/10. P. 17. V. 1/3/1. A. 7/9. C. 17. Cæc. pyl. 4.

Length of head  $4\frac{1}{2}$ , height of body  $2\frac{1}{2}$  to  $3\frac{1}{2}$  in the total length. *Eyes*—diameter 3 in length of head,  $1\frac{1}{3}$  diam. from end of snout, and  $1\frac{1}{4}$  apart. A slight protuberance over the eyes; no serrations to orbit. *Fins*—dorsal spines increasing in length to 5th and remaining about same height to 7th, after which they decrease; the longest spines equal head excluding snout, and are of same height as longest rays, soft portion rather angular; anal spines increase in length to 4th, from which they continue of about the same length, or equal to the longest in the dorsal fin; caudal emarginate. *Colour*—some oblique blue lines and spots on the snout. Upper two thirds of body coppery yellow, covered with round blue spots; blue lines on the head. A brown band, as wide as orbit, from before the dorsal fin through the eye to below the jaws; a second from the sixth and seventh dorsal spines to the base of the pectoral; both these bands with undulating blue edges. Fins yellowish.

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

836. (5.) *Teuthis concatenata*.

*Amphacanthus concatenatus*, *Cuv. & Val. H. N. Poiss.* x, p. 127.

*Teuthis concatenata*, *Cantor, J. A. S. B.* xviii, p. 1190; *Day, Fish. India*, p. 167, pl. xl, fig. 4 (see *synon.*).

*Thar-our-dah*, Andam.

D. 13/10. P. 18. V. 1/3/1. A. 7/9. C. 18. Cæc. pyl. 5-6. Vert. 10/13.

Length of head  $4\frac{3}{4}$ , height of body  $2\frac{1}{2}$  to  $2\frac{3}{4}$  in the total length. *Eyes*—diameter 3 in length of head,  $1\frac{1}{4}$  diam. from end of snout, and  $1\frac{1}{4}$  apart. Interorbital space with a broad shallow groove along its whole extent, bounded on either side by a low ridge; anterior upper angle of orbit freely serrated. *Fins*—dorsal spines increase in length to 5th, and then slightly decrease to 12th, but the last is a little longer; soft portion of dorsal and anal fins angular and rather higher than longest spine; ventral reaches anal; anal spines increase in length to 3rd, which equals highest dorsal, last spine a little longer; caudal emarginate. *Scales*—larger than in most of the known species. *Colour*—dark greyish brown, covered all over with light orange spots, which along the back are larger than the interspaces, but decrease in size towards the abdomen. A broad blue band extends from below the orbit to the angle of the mouth, and another passes along the preopercle; brown spots on the caudal fin.

*Hab.* Andaman Islands and Malay Archipelago.

837. (6.) *Teuthis margaritifera*.

*Amphacanthus margaritiferus*, *Cuv. & Val. H. N. Poiss.* x, p. 145.

*Teuthis margaritifera*, *Günther, Catal.* iii, p. 317; *Day, Fish. India*, p. 167, pl. xl, fig. 5 (see *synon.*).

D. 13/10. P. 17. V. 1/3/1. A. 7/9. C. 17. Vert. 10/13.

Length of head  $5\frac{1}{4}$ , height of body  $3\frac{1}{2}$  to  $3\frac{3}{4}$  in the total length. *Eyes*—diameter 3 in length of head,  $1\frac{1}{4}$  diam. from end of snout and also apart. Dorsal and abdominal profiles equally convex. Interorbital space nearly flat; no serrations along the edge of orbit. *Fins*—dorsal spines rather weak, increasing in length to 5th, which is one third longer than the rays, subsequently decreasing to last; pectoral rather pointed; ventral does not reach anal; 3rd and 4th anal spines slightly longer than 2nd and equal to 3rd dorsal, from 4th the spines decrease to the last; caudal lobed, the upper lobe longer, central. *Colour*—brownish olive, with small scattered blue spots much smaller than the interspaces on the back and sides; a dark oval shoulder-mark; some dark lines on the spinous dorsal; soft dorsal and anal with brown spots.

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

838. (7.) *Teuthis sutor*.

*Amphacanthus sutor*, *Cuv. & Val. H. N. Poiss.* x, p. 148.

*Teuthis sutor*, *Günther, Catal.* iii, p. 317; *Day, Fish. India*, p. 167 (see *synon.*).



D. 13(14)/10. P. 16. V. 1/3/1. A. 7/9 (10). C. 17.

Length of head  $5\frac{1}{2}$ , height of body  $2\frac{3}{4}$  in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head,  $1\frac{1}{2}$  diam. from end of snout, and  $1\frac{1}{4}$  apart. Anterior upper edge of orbit indistinctly serrated. *Fins*—fifth dorsal spine the longest, from it they decrease to the last, which equals  $1\frac{1}{4}$  diameters of the orbit in length; third anal spine the longest, equal to 5th dorsal, from it they decrease to the last, which is only two fifths of the same; caudal emarginate, the central rays  $\frac{1}{3}$  of length of outer. *Colour*—light brown, with pale blue spots, those in the middle of the side being the largest and having brown centres; a dark blotch on the shoulder.

*Hab.* Seychelles and coast of Malabar.

839. (8.) *Teuthis oramin.* (Fig. 42.)

*Amphacanthus guttatus*, var. *oramin*, *Bl. Schn. Syst. Ich.* p. 207, t. 48.  
*Teuthis oramin*, *Günther, Catal. iii*, p. 318; *Day, Fish. India*, p. 168, pl. xl, fig. 6 (see synonym.).

*Dhagavir*, Marát.; *Tafeza*, Arabi.

D. 13/10. P. 16. V. 1/3/1. A. 7/9. C. 17.

Length of head from  $4\frac{3}{4}$  to  $5\frac{1}{4}$ , height of body 3 to  $3\frac{1}{4}$  in the total length. *Eyes*—diameter  $2\frac{3}{4}$  in the length of head, 1 to  $1\frac{1}{4}$  diam. from end of snout, and 1 apart. Interorbital space flat, anterior upper edge of orbit very finely serrated. *Fins*—dorsal spines rather weak, increasing in length to 4th, which is nearly twice as long as the rays, subsequently they decrease to the last;

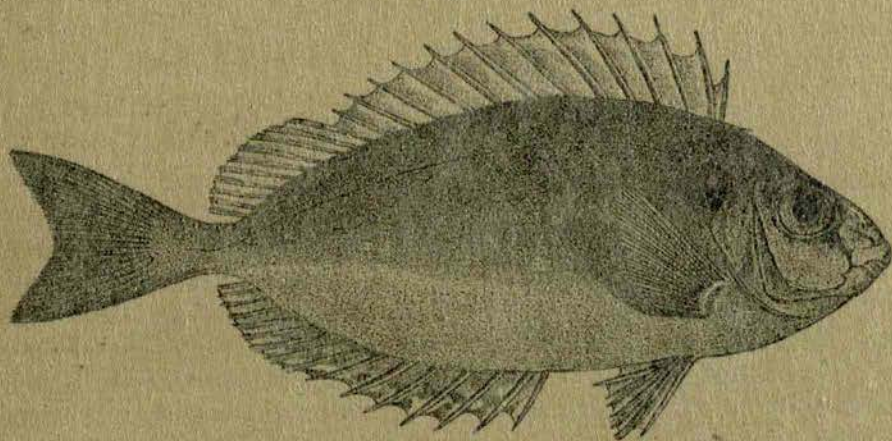


Fig. 42.—*Teuthis oramin.*

anal spines increase to the 3rd and 4th, which equal highest dorsal, they subsequently decrease to the last; caudal with pointed lobes, central rays two thirds length of outer. *Colour*—olivaceous, with indistinct longitudinal stripes in upper half of body, below silvery white. A round black shoulder-spot, and a



black spot at top of eye; numerous pearl-white spots on upper half of body. Dorsal fin spotted with brown; caudal with four or five vertical bars and a black outer edge. Spinous portion of anal with large black spots, the soft irregularly lineated; pectorals orange. In specimens over 7 or 8 inches in length the markings on the fins generally become obsolete, the white spots on the body decrease in number and have a blue tinge. The shoulder-spot becomes dark, but the spot on the upper edge of the eye remains.

*Hab.* Common along the coasts of India, attaining at least 9 inches in length.

#### 840. (9.) *Teuthis stellata*.

*Scarus stellatus*, *Forsk. Descr. Anim.* p. 26, no. 10.

*Teuthis stellata*, *Günther, Catal.* iii, p. 320; *Day, Fish. India*, p. 168 (see synonym.).

D. 13/10. P. 16. V. 1/3/1. A. 7/9. C. 19.

Length of head nearly 4, height of body about 3 in total length. *Eyes*—diameter 3 in length of head,  $1\frac{1}{2}$  diam. from end of snout, and  $1\frac{1}{4}$  apart. *Fins*—fourth dorsal spine the highest, soft dorsal and anal rather pointed; last anal spine the longest; caudal deeply lobed, the upper the longer. *Colour*—greyish, covered all over with small angular spots of a purplish-brown colour; a greenish-yellow spot in front of dorsal fin; a dark shoulder-spot sometimes present; dorsal and anal fins spotted with brown, border of soft rays and of caudal yellowish.

*Hab.* Red Sea, through those of India.

### Family X. BERYCIDÆ.

*Holocentrinæ*, pt., Swainson.

Branchiostegals from four to eight; pseudobranchiæ present. Form of body oblong, or rather elevated and compressed. Opercles more or less armed. Head with large muciferous cavities. Eyes large, lateral. Cleft of mouth more or less oblique, extending to the sides of the muzzle. Teeth more or less villiform in both jaws, and usually so on the palate. Ventrals thoracic; each with either more or less than five soft rays. Scales ctenoid, seldom bony or absent; none on the head.

*Geographical Distribution.* Wide, many of the forms living at great depths.

#### *Synopsis of Indian Genera.*

No large spine at angle of preopercle ..... 1. MYRIPRISTIS.  
A long, strong spine at angle of preopercle ..... 2. HOLOCENTRUM.

1. Genus **MYRIPRISTIS**, Cuv.

Branchiostegals usually 8, more rarely 7; pseudobranchia well developed. Muzzle short, lower jaw prominent. Cleft of mouth oblique, in one species horizontal. Opercular pieces serrated; opercle generally with one spine, none on the preopercle. Teeth villiform on jaws, vomer, and palatines; there may be an outer widely separated row of small, obtusely conical ones in the jaws. Two dorsal fins, scarcely united; ventral with one spine and 7 rays; anal with four spines; caudal forked. Scales large, ctenoid. Air-bladder transversely contracted near its middle. Pyloric appendages in moderate numbers.

*Geographical Distribution.* Tropical seas.

*Synopsis of Indian Species.*

Scarlet, vertical fins with black tips; eyes  $\frac{3}{4}$  diam. apart

1. *M. botche*, p. 93.

Roseate, vertical fins with white edges; eyes  $\frac{1}{2}$  diam. apart

2. *M. mardjan*, p. 94.

841. (1.) **Myripristis botche**. (Fig. 43.)

Botche, *Russell, Fish. Vizag.* ii, p. 4, pl. cv.

*Myripristis botche*, Cuv. & Val. *H. N. Poiss.* iii, p. 181; *Day, Fish.*

*India*, p. 169, pl. xli, fig. 1, *Suppl.* p. 788 (see *synon.*).

*Moonda kun kakasi*, Tam.

B. viii. D. 10 | 1/14-16. A. 4/12-13. L. 1. 28-30. L. tr.  $3/7\frac{1}{2}$ .

Length of head  $3\frac{3}{4}$ , height of body more than 3 in the total length. Eyes—diameter  $2\frac{1}{2}$  to  $2\frac{3}{4}$  in length of head,  $\frac{1}{2}$  diam. from end of snout, and  $\frac{3}{4}$  apart. Under surface of lower jaw roughly and

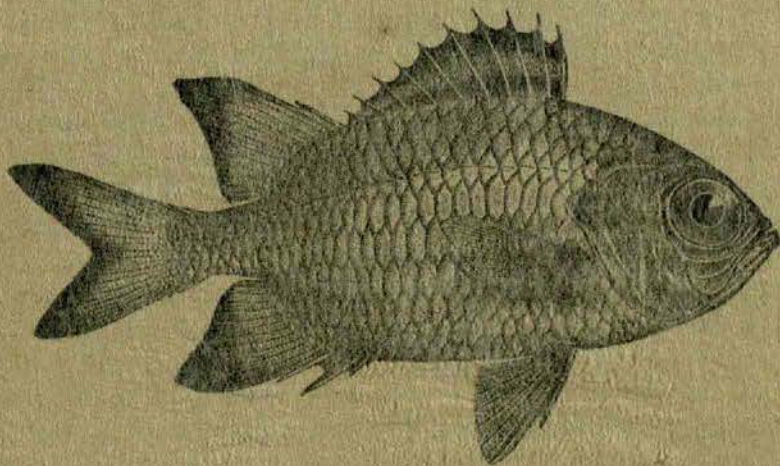


Fig. 43.—*Myripristis botche*.

irregularly furrowed; pre- and suborbitals serrated, also both limbs of preopercle; a moderately strong opercular spine with two or three others above and below it; the lower half of the opercle,



the sub- and the interopercles serrated. *Fins*—dorsal spines weak; second dorsal higher than the first; fourth anal spine the longest, but not so strong as the third. *Colour*—scarlet, edges of scales violet, more especially above lateral line; longitudinal bands, alternately lighter and darker along each row of scales. First dorsal black, or black with a light longitudinal band, or simply rose-coloured; the other fins pinkish, with the outer third of the soft dorsal, anal, and caudal lobes black, the black area sometimes reduced to a mere spot. A deep black spot behind the gill-opening, a dark mark in the axilla. In some rare instances a dark spot may exist on the upper edge of the eye.

*Hab.* East coast of Africa, seas of India, to the Malay Archipelago and beyond. Not nearly so common as *M. murdjan*.

842. (2.) *Myripristis murdjan*.

*Sciaena murdjan*, *Forsk. Descr. Anim.* p. 48, no. 52.

*Myripristis murdjan*, *Day, Fish. India*, p. 170, pl. xli, fig. 2.

B. viii. D. 10 | 1/14–15. A. 4/12–13. L. 1, 28–30. L. tr.  $3\frac{1}{2}/7\frac{1}{2}$ .

Length of head  $3\frac{1}{4}$  to  $3\frac{1}{2}$ , height of body from 3 to  $3\frac{1}{4}$  in the total length. *Eyes*—diameter  $2\frac{1}{4}$  to  $2\frac{1}{2}$  in length of head,  $\frac{1}{3}$  diam. from end of snout, and about  $\frac{1}{2}$  apart. Lower jaw slightly the longer, having a rough, nipple-like projection on either side of the symphysis. Under surface of lower jaw furrowed by ten or twelve grooves; the maxilla, pre-, sub-, and interopercles also grooved. Preopercle serrated in its whole extent. Interopercle finely denticulated; opercle with a moderately strong spine, having a few denticulations above it, and the whole of its outer margin below it serrated. Subopercle and shoulder-scale serrated. Upper surface of the head roughened by three or four raised lines, which, passing backwards, divide and subdivide, each terminating in a small spine. *Teeth*—villiform in the jaws, with an external row, widely separated, larger and conically rounded, 3 on either side slightly the largest, and rounded at their extremities, none on the tongue. *Fins*—dorsal spines increasing in length to third, which is about equal to three next, interspinous membrane rather deeply emarginate, front portion of second dorsal higher than first. Third anal spine the strongest, but the fourth the longest. *Colour*—roseate, gill-openings deep brownish black, or else like coagulated blood, a dark mark in the axilla. A dark vertical band through the eye, sometimes confined to above the pupil. Dorsal, caudal, and anal fins with milk-white outer edges; a dark mark, often deep black, may be present or absent at the highest points of the soft dorsal and anal fins, also at the tips of the caudal. Rarely there is a dark mark along the first dorsal. Outer edge of ventral white.

*Hab.* Red Sea, east coast of Africa, seas of India to the Malay Archipelago and beyond. My longest specimen measures  $11\frac{1}{4}$  inches. Very common at Madras, especially about February.

2. Genus **HOLOCENTRUM**, Artedi.

Syn. *Rhynchichthys*, Cuv. & Val. (young); *Corniger*, Agassiz.

Branchiostegals eight. Eyes large, lateral. Opercles and sub-orbitals serrated; opercle with two spines; generally a large spine at the angle of the preopercle. Villiform teeth on the jaws, vomer, and palatines. Two dorsal fins scarcely united; ventral with one spine and 7 rays; anal with 4 spines, the third being long and strong; caudal forked. Scales ctenoid, of moderate size. Air-bladder oval and simple. Pyloric appendages numerous.

*Synopsis of Indian Species.*

- |                  |   |                                      |
|------------------|---|--------------------------------------|
| D. 11   1/13.    | No rostral spine .....                      | 1. <i>H. diadema</i> , p. 95.        |
| D. 11   15.      | A bifid rostral spine .....                 | 2. <i>H. andamanense</i> , p. 95.    |
| D. 11   13-14.   | Both intranasal and rostral<br>spines ..... | 3. <i>H. caudimaculatum</i> , p. 96. |
| D. 11   12-13.   | Two rostral, no intranasal<br>spines .....  | 4. <i>H. rubrum</i> , p. 96.         |
| D. 10   1/11-12. | No rostral spine? ....                      | 5. <i>H. sammara</i> , p. 97.        |

843. (1.) **Holocentrum diadema**.

*Holocentrum diadema*, Lacép. *H. N. Poiss.* iv, pp. 372, 374, pl. 32, fig. 3; Day, *Fish. India*, p. 171 (see synonym.).

*Kyook byoo*, Arracan.

D. 11 | 1/13. P. 13. A. 4/9. C. 19. L. 1. 47-48. L. tr. 3/7. Vert. 11/16.

Length of head  $3\frac{1}{2}$ , height of body  $3\frac{1}{2}$  to  $3\frac{2}{3}$  in the total length. *Eyes*—diameter 2 to  $2\frac{1}{2}$  in length of head,  $\frac{1}{2}$  diam. from end of snout, and from  $\frac{1}{2}$  to  $\frac{2}{3}$  apart, width of interorbital space being about  $\frac{1}{4}$  of length of head. Lower edge of preorbital serrated and having a strong blunt spiny projection, directed downwards and forwards. Upper opercular spine the longest and strongest, but not equalling that on the preopercle. No spines at nostrils nor end of snout. *Fins*—the fourth to the sixth dorsal spines the longest, interspinous membrane deeply cleft; the two dorsal fins of about the same height. Ventral reaches the vent. *Colour*—red, with from 8 to 11 longitudinal silvery bands; spinous dorsal brownish black, having a white longitudinal band, the other fins rosy.

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

844. (2.) **Holocentrum andamanense**.

*Holocentrum andamanense*, Day, *P. Z. S.* 1870, p. 686; and *Fish. India*, p. 172, pl. xli, fig. 3.

D. 11 | 15. P. 17. V. 1/7. A. 4/9. C. 22. L. 1. 42. L. tr.  $3\frac{1}{2}/7\frac{1}{2}$ .

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



end of snout, and  $\frac{3}{4}$  apart, width of interorbital space not quite  $\frac{1}{2}$  of length of head. Vertical and horizontal margins of preopercle rather finely denticulated, and with an entire but fluted spine at the angle as long as the orbit or  $\frac{1}{2}$  longer. Opercle with two or three flat spines, the upper or central one the longest, the margin of the opercle below it spiny; preorbital with two or three triangular tooth-like processes directed downwards along its lower border, and the interspace serrated. Shoulder-bone rather strongly serrated. A bifid spine on either side at end of snout. Fins—third to fifth dorsal spines the highest, the last spine much the shortest, interspinous membrane very slightly notched. Scales—seven or eight rows along the preopercle. Colour—uniform rosy scarlet.

*Hab.* Andamans, whence two specimens were procured, the longest measuring 9 inches.

#### 845. (3.) *Holocentrum caudimaculatum*.

*Holocentrus caudimaculatus*, *Rupp. Atlas*, pl. 23, fig. 1, *N. W., Fische*, p. 97.

*Holocentrum caudimaculatum*, *Day, Fish. India*, p. 172 (see synon.).

D. 11 | 13–14. P. 14. A. 4/9. C. 19. L. 1. 40–43. L. tr.  $3\frac{1}{2}/7\frac{1}{2}$ .

Length of head  $3\frac{1}{3}$ , height of body 3 to  $3\frac{1}{4}$  in the total length. Eyes—diameter  $2\frac{1}{2}$  to 3 in length of head, from  $\frac{1}{2}$  to  $\frac{2}{3}$  diam. apart and also from end of snout, width of interorbital space about  $\frac{1}{2}$  length of head. Preorbital serrated and anteriorly with a rather large blunt spine pointing downwards. Opercular bones serrated, the upper opercular spine the longer; the preopercular spine as long as or longer than the orbit. Shoulder-bone serrated. Two intranasal spines. Fins—fourth dorsal spine the longest, but not so high as the soft dorsal; dorsal interspinous membrane rather deeply emarginate. Third anal spine longest and strongest. Colour—red, more or less longitudinally banded with violet, and having a white spot over the free portion of the tail behind the end of the dorsal fin.

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

#### 846. (4.) *Holocentrum rubrum*. (Fig. 44.)

*Sciæna rubra*, *Forsk. Descr. Anim.* p. 48, no. 51.

*Holocentrum rubrum*, *Günther, Catal.* i, p. 35; *Day, Fish. India*, p. 172, pl. xli, fig. 4 (see synon.).

*Chirya*, Marathi; *Cul-kah-catchee*, Tam.; *Kyouch-nga-nee*, Arracan.

D. 11 | 12–13. A. 4/9. L. 1. 35–39. L. tr.  $3/6\frac{1}{2}$ . C. x. pyl. 20. Vert. 11/16.

Length of head  $3\frac{1}{2}$  to  $3\frac{3}{4}$ , height of body  $3\frac{1}{4}$  to  $3\frac{1}{2}$  in the total length. Eyes—diameter  $2\frac{3}{4}$  to  $3\frac{1}{2}$  in length of head,  $\frac{2}{3}$  diam. from end of snout,  $\frac{3}{4}$  apart, width of interorbital space from  $\frac{2}{7}$  to  $\frac{1}{4}$  length of head. Upper surface of the head roughened, with sinuous



lines which posteriorly end in spiny points. Suborbital ring of bones narrow, fluted and serrated in their whole extent. Preopercle likewise fluted along its vertical limb, having a strong spine as long as the orbit at its angle and serrated along both margins. Opercle evenly fluted, armed with two spines (the lower the shorter) and its outer edge strongly serrated; sub- and interopercles fluted and denticulated; shoulder-bones denticulated. Snout with two

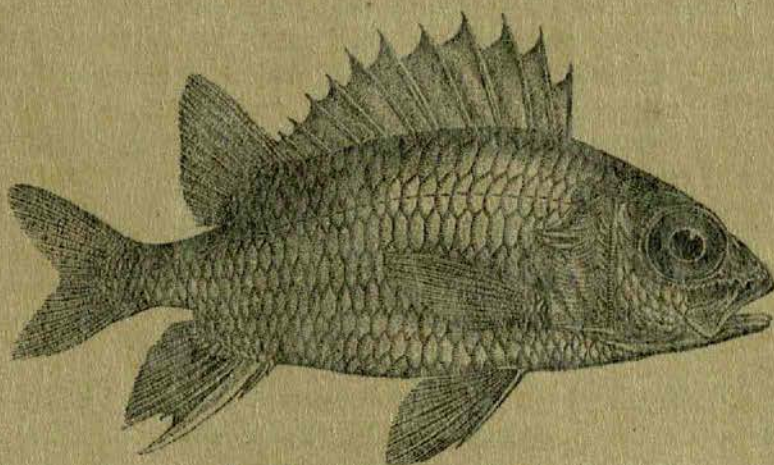


Fig. 44.—*Holocentrum rubrum*.

sharp nipple-shaped spines on the preorbital and intermediate serrations; no spines at nostrils. Fins—dorsal spines strong, 3rd to 5th longest, but not so high as soft portion of fin; third anal spine very strong. Colour—in the *young* silvery white, with longitudinal dull rosy bands from the opercles, the second and third coalescing. In the *adult* red, with seven or eight silvery bands. Head more or less rosy, as are also the fins. Occasionally there is a little dark colour about the latter.

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

847. (5.) *Holocentrum sammara*.

*Sciæna sammara*, *Forsk. Descr. Anim.* p. 48, no. 53.

*Holocentrum sammara*, *Cuv. & Val. II. N. Poiss.* iii, p. 216; *Day Fish. India*, p. 173, *Suppl.* p. 788 (see *synon.*).

D.10 | 1/11–12. P.14. A.4/7–8. L.1.39–40. L.tr.3/7. Vert.11/16.

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  $2\frac{2}{3}$  to 3 in length of head,  $\frac{2}{3}$  diam. from end of snout and also apart; the interorbital space  $\frac{3}{10}$  to  $\frac{1}{4}$  of length of head. The lower jaw the longer. Both limbs of preopercle serrated in their entire extent; length of preopercular spine about  $\frac{1}{2}$  of diameter of orbit. The external edges of all the opercles more or less serrated; two spines on the opercle, the upper of which is as large as the preopercular one, the lower rather smaller. Preorbital denticulations strong; suborbital likewise



serrated. No spine at nostrils nor at end of the snout. Shoulder-bone striated and serrated. *Fins*—2nd, 3rd, and 4th dorsal spines about same height, subsequently the spines decrease to the 10th, which is one fourth as high; interspinous membrane deeply emarginate; second dorsal fin highest anteriorly and rather higher than the highest dorsal spine. Ventral reaches halfway to the anal. *Colour*—body with or without longitudinal violet bands, which may be composed of spots. A black spot may be present on either cheek. Usually a black spot on each space between the first four dorsal spines, and sometimes a light mark between the bases of each spine. Anterior edge of soft dorsal and anal, also usually upper and lower edge of caudal, violet.

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

## Family XI. KURTIDÆ.

Branchiostegals seven; pseudobranchiæ absent. Body oblong and compressed. Eyes large. Cleft of mouth oblique; lower jaw prominent. A single dorsal fin, the spinous portion of less extent than the soft; anal elongate, with two or three spines; ventrals thoracic, with one spine and five rays. Scales of moderate or small size. Air-bladder present. Pyloric appendages few.

### *Synopsis of Indian Genera.*

Dorsal spines rudimentary, three anal ones. A horizontally directed spine between the ventral fins. . . . 1. KURTUS.  
Six dorsal and three anal spines. Scales over the anal fin . . . . . 2. PEMPHERIS.

### 1. Genus KURTUS, Bloch.

Body strongly compressed; back elevated. Preopercle denticulated. Villiform teeth in the jaws, vomer, and palatines. A single dorsal fin, much shorter than the anal, dorsal spines rudimentary; between the ventrals is a horizontal backwardly directed spine. Scales very small. Air-bladder present, enclosed in a conical cavity made by the ribs, which are dilated and convex, and form rings in contact with each other.

#### 848. (1.) *Kurtus indicus*. (Fig. 45.)

*Kurtus indicus*, Bloch, *Ich.* t. 169; Day, *Fish. India*, p. 174, pl. xlii, fig. 1 (see synon.).

*Kakasi* and *Somdrum-kara-mooddee*, Tel.; *Ocrdah* and *Vallianul-cut-chul*, Tam.

D. 6-7/13-14. P. 21. A. 2/31-33. C. 17. Vert. 8/15.

Length of head 4 to  $4\frac{1}{2}$ , height of body 3 to  $3\frac{1}{2}$  in the total length.



*Eyes*—in anterior half of the head, 1 diameter from end of snout, and  $1\frac{1}{4}$  apart. Males with a cartilaginous arched process directed forwards, and situated a short distance in front of the dorsal fin. Lower jaw having a tuberosity at the symphysis: when the mouth is closed the extremity of the mandible forms a portion of the dorsal profile. A strong, short spine directed downwards at angle of preopercle, and two or three more along its lower edge; the occipital ridge rough. *Fins*—dorsal fin having five spines in front of the soft portion, preceded by a recumbent spine directed anteriorly; in

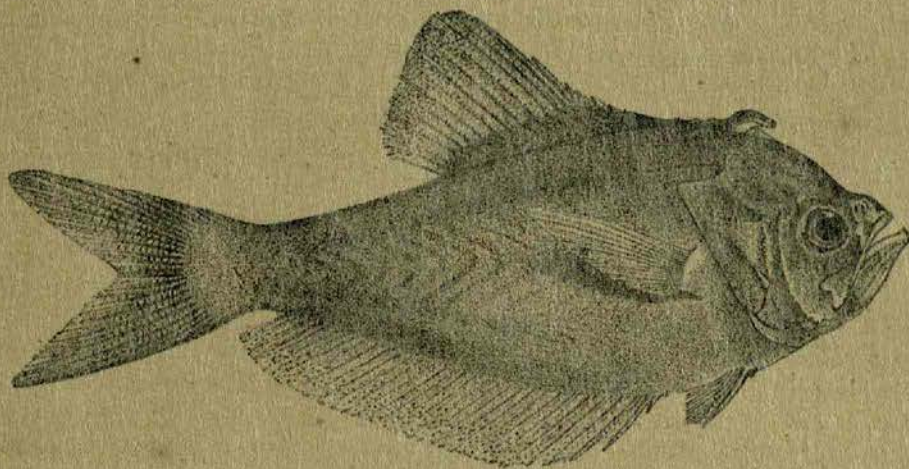


Fig. 45.—*Kurtus indicus* (male).

front of this spine are some points appearing above the skin, most distinct in the fry, and similar to the rudimentary fins of *Stromateidæ*, &c.; soft portion of the dorsal fin highest anteriorly; ventral reaches as far as the anal, it has a short backwardly directed spine in front of the base of the outer ray of either fin, and also a similar horizontal but larger one between the two fins; second anal spine two thirds as high as the rays; caudal deeply lobed. *Scales*—fine and irregular on the body. *Lateral line*—ceases opposite end of soft dorsal. *Colour*—silvery shot with steel-blue or lilac; back with fine black dots which behind the occiput form a rounded black spot.

*Hab.* Seas of India to the Malay Archipelago and beyond. This fish attains at least  $4\frac{1}{2}$  inches in length, and is most numerous on the Coromandel coast during the cold months.

## 2. Genus **PEMPHERIS**, Cuv. & Val.

Head obtuse. Opercle with a small spine. Villiform teeth on the jaws, vomer, and palatine bones. A single short dorsal fin with 6 spines and 9 rays; anal with 3 spines and many rays. Scales small, extended over the anal fin. Air-bladder divided into an anterior and posterior portion. Pyloric appendages few.

*Geographical Distribution.* Indian and Pacific Oceans within the tropics.

*Synopsis of Indian Species.*

- Eyes about  $\frac{2}{3}$  length of head; height of body  $\frac{3}{5}$  of total length ..... 1. *P. malabarica*, p. 100.  
 Eyes large,  $\frac{1}{2}$  length of head; height of body  $\frac{2}{3}$  of total ..... 2. *P. russellii*, p. 100.

849. (1.) *Pempheris malabarica*.

*Pempheris malabarica*, *Cuv. & Val. H. N. Poiss.* vii, p. 303; *Day, Fish. India, Suppl.* p. 788 (see synonym.).

*Pempheris mangula*, *Day, Fish. India*, p. 175, pl. xlii, fig. 3 (not *Cuv. & Val.*).

*Moonda-kun-karawa*, Tamil.

D. 6/9. P. 17. V. 15. A. 3/42-46. C. 17. L. 1. 60-64.

Length of head 5, height of body  $3\frac{1}{3}$  in the total length. *Eyes*—diameter  $2\frac{1}{4}$  to  $2\frac{1}{2}$  in length of head. Interorbital space slightly concave. Preopercle having rather a strong denticulation on intramarginal edge near angle. *Fins*—soft dorsal highest anteriorly, rapidly decreasing in height to the last ray. Pectoral a little longer than head. Ventral reaches anal. Anterior portion of anal highest and equal to two fifths of the body; caudal emarginate. *Colour*—violet-brown above, becoming silvery below. Fins roseate with fine dots; axilla and base of pectoral light coloured.

*Hab.* Seas of India; obtained at Kyoukhyoo by Colonel Tickell.

850. (2.) *Pempheris russellii*. (Fig. 46.)

*Mangula-kutti*, *Russell, Fish. Vizag.* ii, p. 10, pl. 114.

*Pempheris molucca*, *Day, Fish. India*, p. 175, pl. xlii, fig. 2 (not *Cuv. & Val.*).

*Pempheris russellii*, *Day, Fish. India, Suppl.* p. 788 (see synonym.).

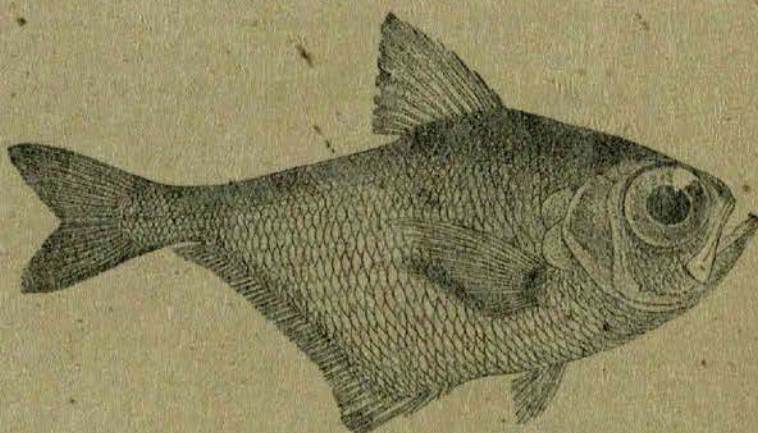


Fig. 46.—*Pempheris russellii*.

D. 6/9. P. 18. A. 3/40-42. C. 17. L. 1. 56. Cæc. pyl. 6-7. Vest. 10/14.

Length of head  $3\frac{2}{3}$ , height of body  $2\frac{1}{2}$  in the total length.



*Eyes*—diameter about 2 in length of head,  $\frac{3}{4}$  diam. apart. Preopercle entire, but having three denticulations along its intra-marginal border. *Fins*—dorsal spines weak, increasing in length to the last, which is scarcely so high as the first rays, the soft portion decreases posteriorly in height. Pectoral as long as head. Ventral short; anal highest in front; caudal forked. *Scales*—the rows along the lateral line larger than the others. *Colour*—silvery grey, upper third of dorsal rays black; pectorals orange, and usually having a dark base; anal rather dark anteriorly and inferiorly; caudal with its posterior margin stained grey.

*Hab.* Coast of Sind and of Indian Peninsula.

This species is identical with Russell's fish, but not with *P. mangula*, C. V., a form figured in Günther's 'Fische d. Südsee,' t. lix. f. B. Klunzinger's *P. mangula*, again, differs from both the others.

## Family XII. POLYNEMIDÆ.

Branchiostegals seven; pseudobranchiæ. Body oblong, somewhat compressed. Eyes large, lateral, more or less covered by an adipose membrane; mouth on the lower side of a prominent snout, and having a lateral cleft. Muciferous system on the head well developed. Villiform teeth on the jaws and palatines; present or absent on the vomer. Two dorsal fins; several free articulated appendages below the pectoral fin; ventrals thoracic. Lateral line continuous, continued on to the caudal fin. Air-bladder, when present, varying in form and structure. Pyloric appendages of varying numbers.

*Geographical Distribution.* Tropical seas (not found in the Red Sea).

*Uses.* These fish are all excellent as food, and rough isinglass (fish-sounds) is obtained from some, and exported in large quantities.

### 1. Genus **POLYNEMUS**, Linn.

Syn. *Trichidion*, Klein; *Polistonemus*, Gill; *Eleutheronema*, Bleeker.

*Kala*, Tam.; *Nut-tiah*, Mugh.

Preopercle serrated. First dorsal fin with seven or eight weak spines; soft dorsal and anal of nearly equal extent; pectoral rays simple or branched, and having a varying number of free rays (3-7) at the base of the fin. Scales ctenoid, rather small, extended on to the vertical fins. Air-bladder, when present, varying in form, size, and structure. Pyloric appendages varying in number.

### *Synopsis of Indian Species.*

A. Seven free pectoral rays.

D. 7 | 1/15-16. Upper free pectoral rays

twice the length of fish ..... 1. *P. paradiseus*, p. 102.



- D. 8 | 1/12-13. Free pectoral rays not extending beyond anal ..... 2. *P. heptadactylus*, p. 103.  
 B. Six free pectoral rays.  
   *a.* Silvery, no air-bladder ..... 3. *P. xanthonemus*, p. 103.  
   *b.* Golden, an air-bladder.  
     Free rays do not extend beyond ventrals. 4. *P. sextarius*, p. 104.  
     Free rays extend beyond ventrals ..... 5. *P. seafilis*, p. 105.  
 C. Five free pectoral rays.  
   L. 1. 70-75. Second dorsal as high as anal ..... 6. *P. indicus*, p. 105.  
   L. 1. 60-65. Second dorsal higher than anal ..... 7. *P. plebeius*, p. 106.  
 D. Four free pectoral rays ..... 8. *P. tetradactylus*, p. 106.

### 851. (1.) *Polynemus paradiseus*.

*Polynemus paradiseus*, *Linn. Syst. Nat.* p. 522; *Day, Fish. India*, p. 176, pl. xlii, fig. 4 (see synon.).

*Tupsee muchee*, Beng.; *Nga-poongna*, Burm., *Mangoe fish*.

D. 7 | 1/15-16. P. 15 + vii. A. 2/12. L. 1. 70. L. tr. 5/14. C. pyl. 5 (10).

Length of head 6 to  $6\frac{1}{2}$ , height of body 6 to  $6\frac{1}{2}$  in the total length. *Eyes*—minute in the young, in the adult diameter 8 in length of head, 2 diam. from end of snout, and 3 apart. The maxilla extends upwards of two diameters behind posterior edge of orbit. Preopercle serrated and having a soft, produced, and rounded angle; the other opercles entire. A small spine on the shoulder. *Fins*—spines of first dorsal weak, the second slightly the longest; first ray of second dorsal equals in length the base of the fin, which is highest anteriorly, its upper edge concave. Pectoral rays undivided; the fin has seven free rays below its base, the three superior being the longest, strongest, and about twice the length of the fish. Anal commencing under second dorsal and of the same height, its lower edge emarginate. Caudal deeply forked, upper lobe the longer. *Lateral line*—forms a gradual curve, and becomes lost at the centre of the base of the caudal fin. *Air-bladder*—absent. *Colour*—generally golden, with a shade of grey along the back; dorsal fins also stained greyish with a slight tinge of the same shade, so are also the caudal, the pectoral, and upper pectoral appendages.

Buchanan observed: "Those who officiate in the temple of *Sib* are called *Tapasi* in the vulgar dialect, and *Tapasivi* in Sangskritta, that is to say penitents. They ought not to shave, on which account a fish called *Mangoe fish* by the English of Calcutta, which has long fibres proceeding from near its head, is called by the same name."

*Hab.* Indian seas, Bay of Bengal at least as low as Caconada, also along the coasts of Burma to the Malay Archipelago, entering rivers for spawning-purposes, and generally during the S.W. monsoon and the cold months. This species is considered a great



luxury for the table, and commences to be taken in numbers about June. It attains 9 inches in length.

Col. Tickell observed that along the coasts of Burma this fish is inferior as food to those in Bengal; that it remains in estuaries throughout the year except in the depth of the rains, and is always of the same value as food, whereas in Bengal it ascends rivers in May and June, and is then in its prime condition.

852. (2.) *Polynemus heptadactylus*.

*Polynemus heptadactylus*, Cuv. & Val. H. N. Poiss. iii, p. 390; Day, *Fish. India*, p. 177, pl. xlii, fig. 5 (see synon.).

D. 8 | 1/12-13. P. 15+vi. A. 3/11-12. L. 1.50-52. L. tr. 5/11. C. p. 4.

Length of head 5, height of body 4 in the total length. *Eyes*—diameter  $3\frac{1}{2}$  in length of head,  $\frac{1}{2}$  diam. from end of snout, and 1 apart. The maxilla reaches to half a diameter behind the posterior edge of the eye; interorbital space nearly flat. Preopercle strongly serrated, having a well-developed spine just above its angle, which is rounded and produced. A spine on shoulder at the commencement of the lateral line. *Fins*—first dorsal spine short, the third the longest, the last scarcely one third of its height; second dorsal highest anteriorly, upper edge of the fin concave. Pectoral rays unbranched, the free appendages reach to base of anal, the upper being the longest. Anal highest anteriorly, where it equals the first dorsal, its lower edge straight. Caudal deeply lobed. *Air-bladder*—absent. *Colour*—golden, pectoral nearly black; edge of first dorsal, upper edge of second dorsal, margins of caudal, lower half of anal, and tip of ventral also black.

*Hab.* Seas of India to the Malay Archipelago; attaining at least 6 inches in length.

853. (3.) *Polynemus xanthonemus*.

*Polynemus xanthonemus*, Cuv. & Val. H. N. Poiss. vii, p. 517; Day, *Fish. India*, p. 177 (see synon.).

D. 8 | 1/11. P. 15+vi. A. 3/11-12. Cæc. pyl. 12.

This fish is said to resemble *P. sextarius* more than *P. sexfilis*. *Fins*—six free pectoral rays extend beyond end of ventral. Although the caudal lobes are not more elongated than in *P. sextarius* (one fifth of the total length), the fin is more deeply cleft. *Air-bladder*—absent. *Colour*—back greenish, sides and abdomen silvery; the fins yellow with a black border, the free rays are the same colour as the fins.

*Hab.* Seas of India to China; attaining at least 6 inches in length. I have not recognized this species in India.

854. (4.) *Polynemus sextarius*. (Fig. 47.)

*Polynemus sextarius*, Bloch, *Schn. Syst. Ich.* p. 18, t. iv; Day, *Fish. India*, p. 177, pl. xlii, fig. 6 (see synonym.).

*Ravás*, Maráthi; *Nga knyín ho*, Arracan.

D.8 | 1/12-13. P.14+vi. A.3/12-13. C.17. L.L.48-50. L.tr.5/10.

Length of head 4 to  $4\frac{1}{4}$ , height of body 4 to  $4\frac{1}{2}$  in the total length. *Eyes*—diameter 3 to  $3\frac{3}{4}$  in length of head,  $\frac{2}{5}$  to  $\frac{3}{4}$  diam. from end of snout, and about 1 apart. The maxilla reaches to behind the posterior edge of the orbit. Vertical margin of preopercle denticulated, with a rather strong tooth just above its angle, which is rounded, produced, and entire. *Teeth*—villiform;

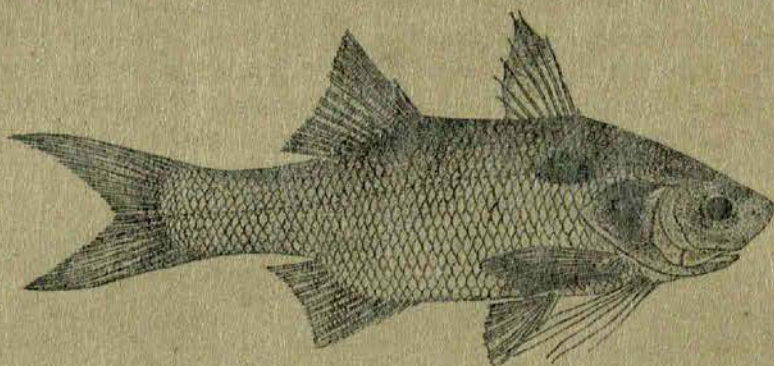


Fig. 47.—*Polynemus sextarius*.

those on the vomer in a transverse band, whilst the palatine band is semi-interrupted. *Fins*—dorsal spines with rather filamentous terminations, the third highest and as long as highest ray in second dorsal; the height of second dorsal and anal are nearly the same, but the former has the longer base; upper edge of second dorsal fin scarcely, if at all, emarginate. Pectoral rays branched; the free rays at the base of the fin reach to the middle of the ventral fin, occasionally to its end; caudal rather deeply forked. A spine on the shoulder at the commencement of the lateral line. *Air-bladder*—small and simple. *Cecal appendages*—long and rather numerous. *Colour*—golden, the upper half of the first dorsal black-spotted; pectoral and ventral with numerous black spots, the former sometimes almost black; other fins more or less dotted with black and often black-edged. A large black spot on the shoulder on the lateral line from the second to the eighth scales.

*Hab.* East coast of Africa, seas of India to the Malay Archipelago. Common on the Indian coasts, and growing to  $7\frac{1}{2}$  inches in length.

855. (5.) *Polynemus sexfilis*.

*Polynemus sexfilis*, Cuv. & Val. H. N. Poiss. vii, p. 515; Day, Fish. India, p. 178, pl. xliii, fig. 1 (see synonym.).

D. 8 | 1/12-13. P. 15+vi. A. 3/11-12. L. 1. 46. L. tr. 5/10.

Length of head  $4\frac{1}{4}$ , height of body  $4\frac{1}{2}$  in the total length. Eyes—diameter  $4\frac{1}{2}$  in length of head,  $\frac{1}{2}$  diam. from end of snout, and 1 apart. The maxilla reaches half a diameter behind the orbit. Vertical margin of preopercle strongly denticulated, with a rather strong tooth above its rounded, produced, but entire angle. Teeth—villiform in jaws, in a semilunar band on the vomer, and in an interrupted one on the palatines. Fins—third dorsal spine highest; second dorsal one fourth higher anteriorly than the anal, its upper edge rather concave. The pectoral rays unbranched, the free ones reach to rather beyond the end of the ventral; base of anal slightly longer than that of second dorsal; caudal deeply forked. A spine on the shoulder at the commencement of the lateral line. Cecal appendages—long and rather numerous. Air-bladder—large. Colour—golden; pectoral deep black; a lower black edge to the anal; ventral dark in the middle.

Hab. Seas of India and Mauritius.

856. (6.) *Polynemus indicus*.

*Polynemus indicus*, Shaw, Zool. v, p. 155; Day, Fish. India, p. 179 (see synonym.).

*Maga-booshee*, Tel.; *Tahlun-kala*, Tam.; *Yeta*, Mal.; *Dara*, Bombay; *Bhāt*, Mahr.; *Lukicah*, Arrac.; *Ku-ku-yan* or *Katha* (young), Burm.; *Kway-yeng*, Tavoy.

D. 8 | 1/13-14. P. 15+v. A. 2-3/11-12. L. 1. 70-75. L. tr. 7/13.

Length of head  $4\frac{1}{4}$  to  $4\frac{1}{2}$ , height of body 6 in the total length (excluding the filamentous prolongation of the tail). Eyes—diameter 7 in length of head, 1 to  $1\frac{1}{4}$  diam. from end of snout, and 2 apart. The maxilla reaches to far behind the orbit. Preopercle with a rounded and produced angle, its posterior margin moderately serrated, and having a strong tooth above its angle. Inter-orbital space rather flat. Teeth—in a somewhat semilunar band on the vomer, and in a wide cuneiform band, broadest anteriorly, on the palatines, the last emarginate internally about its middle. Fins—spines of first dorsal weak, the third having a rather filamentous prolongation, the fin one third higher than long; second dorsal highest in front, where it equals the anal and is one third higher than its base is long; upper edge of the fin concave. Pectoral with its rays branched, having five articulated free rays, the upper of which is the longest, reaching nearly to the anal; the latter fin extends posteriorly some distance behind the vertical from the end of the second dorsal, and is concave below. Caudal deeply lunate, with pointed lobes, which usually have filamentous terminations, the lower mostly the longer. Air-bladder—oval and thick, occupying the entire length of the abdomen and posteriorly