

NEW RECORDS OF FISHES FROM THE SEAS AROUND INDIA—PART III

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THE present account forms the third part of the series (Parts I and II appeared in 6(2), 1964 and 7(1), 1965 respectively of the same Journal) giving information on the new records of fishes from the seas around India, and is based on the material collected from the Laccadive Archipelago. For localities of collection reference is invited to Fig. 28 in Part I. In the first two parts 45 species belonging to 18 families were recorded and in this paper 21 species of fishes not hitherto recorded from the Central Indian Ocean belonging to 7 families are briefly described and figured.

Family : MURAENIDAE

1. *Anarchias cantonensis* (Schultz) (Fig. 1)

Uropterygius cantonensis Schultz, 1943, *Bull. U.S. Nat. Mus.*, 180 : 27, Pl. 4, Fig. 3, a.
Anarchias cantonensis Schultz, 1953, *Bull. U.S. Nat. Mus.*, 202 (1) : 146, Pl. 15 and Fig. 29, a.



FIG. 1. *Anarchias cantonensis* (Schultz), 120 mm.

Head 7.3-7.9, depth of body 16.4-20.4, both in total length. Head 2.2-2.6 in trunk. Head and trunk 2.1-2.25 in total length. Eye 1.6-2 in snout which is about 6 in head. Snout to rictus 3-3.3 in head. Nape descends abruptly. Dorsal and anal fins reduced to rudiments and confluent with caudal fin. Anterior nostrils short, tubular, on each side of tip of snout ; 2 posterior nasal openings close together over each eye, opposite hind half of pupil. Teeth in jaws in two rows, the upper inner series 5-6 canine like ; 2 depressible fangs on intermaxillary with 3 slightly smaller teeth on each side ; vomerine teeth uniserial. Ground colour pale, with irregular vertical reticulated brownish bars on sides, clearly visible behind anus ; lower sides of head and abdomen pale ; lips in some specimens barred ; mucus pores on head white ; caudal fin whitish.

Note : According to Schultz *A. cantonensis* has 7 teeth in an inner series in the maxillary. In the specimens examined by us there are 5 or 6 teeth in the inner series and this we consider only as a variation. The specimens from the Laccadives differ from *A. seychellensis* Smith, a closely related species in the Western Indian Ocean in the abrupt profile of nape, and in having a short tail (1.1-1.25 and 1.25-1.4 as long as rest of body in *cantonensis* and *seychellensis* respectively) and

slightly large head (7.3-7.9 and about 9 in total length in *cantonensis* and *seychelensis* respectively).

Material : Kiltan, 2 specimens, 106 and 118 mm.* Minicoy, 3 specimens, 120 to 136 mm.

Distribution : Previously recorded only from the Marshall and Phoenix Islands in the Pacific. This is the first record from the Indian Ocean.

2. *Anarchias fuscus* Smith (Fig. 2)

Anarchias fuscus Smith, 1962, *Ichth. Bull.*, 23 : 428, Pl. 53, G and Fig. 5.



FIG. 2. *Anarchias fuscus* Smith, 133 mm.

Head 7-8, depth of body 15.6-18.8, both in total length. Head 2.4-2.7 in trunk. Head and trunk 2.1-2.2 in total length. Eye 1.8-2.3 in snout which is 6.2-6.6 in head. Snout to rictus 3.2-3.5 in head. Nape descends abruptly. Dorsal and anal fins rudimentary and confluent with caudal fin. Anterior nostrils short, tubular, reaching tip of snout; posterior nostrils of 2 pores over eye. Teeth in 2 series in jaws; the upper inner series of 3-5 teeth canine like; 2 depressible fangs on inter-maxillary with 2-3 slightly smaller teeth on each side; vomerine teeth uniserial. Colour uniform dark brown, mucus pores on head lighter, caudal fin whitish.

Note : *A. allardicei* Jordan and Starks from the Pacific is similar to this species in body proportions and colouration. However, there is only one depressible fang on the intermaxillary in *A. allardicei* and hence *A. fuscus* is considered distinct.

Material : Kalpeni, 4 specimens, 88 to 149 mm. Kavarathi, 1 specimen, 107 mm. Minicoy, 3 specimens, 114 to 133 mm.

Distribution : Known previously only from 6 specimens from Malindi, Delgado and Ibo on the east coast of Africa. This is the first record from outside the above area bordering the Western Indian Ocean.

3. *Echidna leucotaenia* Schultz (Fig. 3)

Echidna leucotaenia Schultz, 1943, *Bull. U.S. Nat. Mus.*, 180 : 22, Pl. 3; Schultz, 1953, *Ibid.*, 202(1) : 105, Fig. 21, e, f and Pl. 12; Smith, 1962, *Ichth. Bull.*, 23 : 423, Pl. 60, A and B; Smith and Smith, 1963, *Fishes of Seychelles* : 57, Pl. 42, A and B.

* Unless otherwise stated, length mentioned is standard except for Muraenidae and Ophichthidae.

Head 7.3-8, depth of body 14-16.2, both in total length. Head 2.4-2.7 in trunk. Eye 8.5-9.6 in head, 1.3-1.6 in snout and 1.1-1.3 in interorbital space. Cleft of mouth 2.3-2.9 in head. Dorsal origin on rear of head, before a level from the gill opening. Anterior nostrils tubular, on each side of tip of snout; posterior nostrils

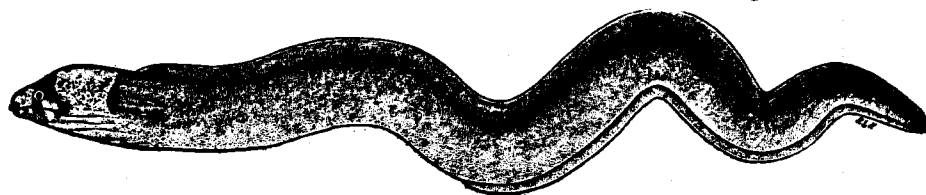


FIG. 3. *Echidna leucotaenia* Schultz, 305 mm.

with slightly raised rims, slightly behind a level from the front border of eye. Teeth granular except those at symphysis of upper jaw which are somewhat conical; uniserial in upper jaw, biserial in lower jaw; 2-3 teeth on intermaxillary and 2-3 series on vomer. Colour plain brownish; a broad area behind eye lighter; edges of dorsal and anal fins white; tip of snout and lower jaw pale to brownish; mucus pores below eye and posterior nostrils white; an oblique elongate dark brownish blotch on upper and lower jaw anterior to corner of mouth.

Material: Kavarathi, 3 specimens, 198 to 283 mm. Minicoy, 1 specimen, 305 mm.

Distribution: So far known only from Aldabra and Pinda in the Western Indian Ocean and from the Marianas, Marshall, Phoenix and Samoan Islands in the Central Pacific. The present record from an intermediate area is of interest.

4. *Gymnothorax javanicus* (Bleeker) (Fig. 4)

Muraena javanica Bleeker, 1859, *Nat. Tijds. Ned.-Ind.*, 19 : 347.

Lycodontis javanicus Smith, 1962, *Ichth. Bull.*, 23 : 436, Pl. 62, A.

Muraena (Gymnothorax) flavimarginata Weber and de Beaufort, 1916, *Fishes Indo-Australian Archipelago*, 3 : 374 (synonymy only, in part).

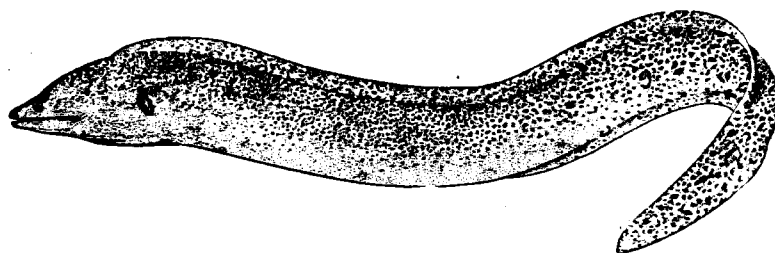


FIG. 4. *Gymnothorax javanicus* (Bleeker), 1225 mm.

Head 8, depth of body 11, both in total length. Head about 2.8 in trunk, head and trunk slightly longer than tail. Eye nearer to tip of snout than to corner of mouth, about 14.5 in head, 2.4 in snout and 2 in interorbital space. Cleft of

mouth 2.3 in head. Anterior nostril in a short tube, posterior nostril with slightly raised rims. Dorsal origin on rear of head about equidistant between rictus and gill opening. Teeth uniserial, 18-19 on side of each jaw, premaxillary with 2 inner median fang like teeth, vomerine band of teeth short and bifurcated anteriorly. Colour brownish, lower side of belly lighter, numerous black spots on head, trunk and tail excepting lower sides of head and belly, spots on head smaller. Gill opening in a black blotch. Corner of mouth dark.

Note : The dentition in the specimen described above is closer to *Gymnothorax javanicus* than to *G. flavimarginatus*. The general colour pattern reported for this species is light brown to bluish brown with black blotches and spots separated by paler brown interspaces ; corner of mouth blackish and gill opening black. The difference in colour of the specimen described above is presumably only on account of its large size.

Material : Agathi, 1 specimen, 1225 mm. This is the largest ever recorded for this species.

Distribution : Recorded previously from the Red Sea, east coast of Africa and some of the neighbouring islands in the Western Indian Ocean and from Indonesia and Marshall Islands. This is the first record from the Central Indian Ocean.

5. *Gymnothorax monostigmus* (Regan) (Fig. 5)

Muraena monostigma Regan, 1909, *Ann. Mag. Nat. Hist.*, (8)4 : 438.

Gymnothorax monostigmus Schultz, 1953, *Bull. U.S. Nat. Mus.*, 202(1) : 126, Fig. 27, c.

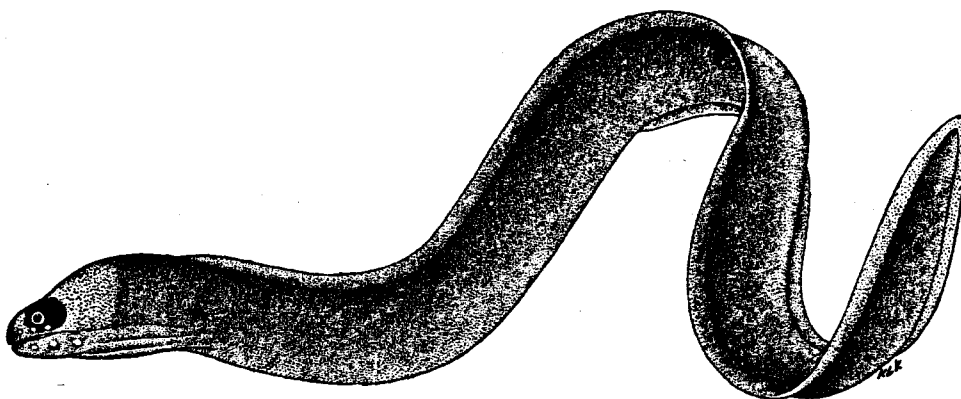


FIG. 5. *Gymnothorax monostigmus* (Regan), 338 mm.

Head 8.1-8.3, depth of body 15.4-16.2, both in total length. Tail about 1/2 length of head shorter than head and trunk. Eye 11-12 in head, about 1.8-1.9 in bluntly rounded snout and 1.6-1.7 in interorbital space. Dorsal origin above gill opening ; anterior nasal tubes short, on each side of tip of snout ; posterior nostrils with raised rims, above anterior border of eye. Teeth in one series in jaws, those near the symphysis of upper jaw canines, two mesial fang like teeth on premaxillary ; maxillary with an inner row of two teeth ; one series of short teeth on

vomer. The skin is very rough. Colour plain brown, slightly lighter below, eye in a rectangular deep black blotch which extends about one eye diameter behind eye; 4 mucus pores on side of lower jaw and 3 on side of upper jaw and posterior nostril situated in white spots; median fin edged broadly whitish posteriorly.

Material: Kavarathi, 1 specimen, 338 mm. Minicoy, 2 specimens, 522 and 573 mm.

Distribution: Previously known only from the Marshall and Society Islands in the Pacific. This appears to be the first record from the Indian Ocean.

6. *Gymnothorax petelli* (Bleeker) (Fig. 6)

Muraena petelli Bleeker, 1856, *Nat. Tijds. Ned.-Ind.*, 11 : 84.

Lycodontis petelli Smith, 1962, *Ichth. Bull.*, 23 : 435, Pl. 58, B.

Muraena (Gymnothorax) petelli Weber and de Beaufort, 1916, *Fishes Indo-Australian Archipelago*, 3 : 372.

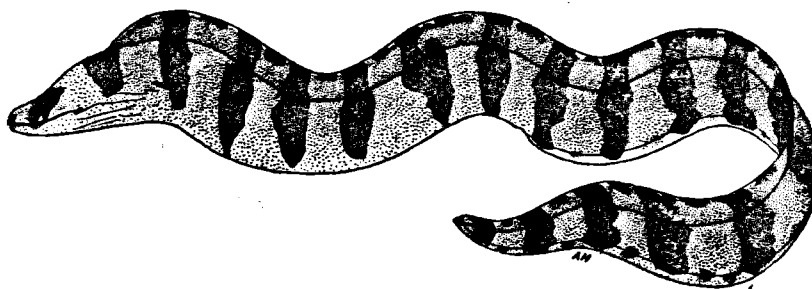


FIG. 6. *Gymnothorax petelli* (Bleeker), 384 mm.

Head 8-9.2, depth of body 14.8-18.7, both in total length. Tail equal to or nearly $\frac{3}{5}$ head longer than head and trunk. Head 2.4-3 in trunk. Eye 8.6-10 in head, 1.5-1.8 in snout and 1-1.2 in interorbital space. Cleft of mouth 2.1-2.5 in head. Dorsal origin before a level from the gill openings. Anterior nostrils tubular, on each side of tip of snout; posterior nostril with slightly raised rims, above anterior edge of eye. Premaxillary with a single series of long teeth and 2-3 large median depressible fangs; maxillary with a series of conical compressed teeth and often with an inner series of 2-3 long teeth anteriorly; mandible with a single series of teeth, those near symphysis longer than others; vomer with a series of 3-4 conical teeth. Ground colour yellowish in juveniles, pale brownish in adults, with 17-21 dark brown cross bands; bands as wide as interspaces in juveniles, broader than interspaces in adults; first band through eye not reaching lower jaw, the second band from origin of dorsal, the third band from dorsal through gill openings or just behind it, some of the bands before anus not meeting ventrally; black rings do not extend to edges of fins posteriorly; pale interspaces on fins often with brownish areas; a dark brown spot at corner of mouth.

Material: Bitra, 13 specimens, 107 to 373 mm. Chetlat, 10 specimens, 105 to 338 mm. Kavarathi, 2 specimens, 118 and 353 mm. Kiltan, 3 specimens, 130 to 143 mm. Minicoy, 7 specimens, 55 to 384 mm.

Distribution: Previously known from the Red Sea, east coast of Africa and neighbouring Islands in the Western Indian Ocean; Indonesia to the Philippines,

Ryukyu, Marshall, Hawaiian and Samoan Islands in the Pacific. This is the first record from the Central Indian Ocean.

Family : OPHICHTHIDAE

7. *Callechelys nebulosus* Smith (Fig. 7)

Callechelys bitaeniatus Smith, 1957, *Ann. Mag. Nat. Hist.*, (12) 10 : 835, Pl. 27, D (nec Peters).

Callechelys nebulosus Smith, 1962, *Ichth. Bull.*, 24 : 452, Pl. 65, D.



FIG. 7. *Callechelys nebulosus* Smith, 236 mm.

Head about 15, depth of body 45, both in total length. Head about 7.6 in trunk. Tail 1.35 in head and trunk. Tip of snout to rictus about 3.5 in head. Eye about 2 in snout and more than 15 in head. Dorsal origin on head slightly behind a level from the angle of mouth. Dorsal and anal low, about 1/3 of body depth and end before tip of tail, caudal absent. Snout projecting beyond tip of lower jaw, dorsal surface of snout strongly convex. Gill openings small oblique slits. Front nostrils short, tubular, near tip of snout; posterior nostrils in upper lip under eye, directed downwards. Several pores on head, of which two on chin behind angle of mouth edged dark. Small conical teeth in a single series in jaws. Pectorals absent. Colour pale, front half of head mostly white, a broad brown band on back from head to tail not touching base of dorsal, the band broken up as brown spots behind head; corner of mouth with brown spot. Dorsal and anal whitish, former with a narrow dusky outer margin.

Material : Chetlat, 1 specimen, 236 mm.

Distribution : Known only from 6 specimens from Pinda and Aldabra in the Western Indian Ocean and the present find from the Laccadives of this species is noteworthy.

8. *Myrichthys maculosus* (Cuvier) (Fig. 8)

Muraena maculosa Cuvier, 1817, *Régne Animal.*, 2 : 232.

Myrichthys maculosus Smith, 1962, *Ichth. Bull.*, 24 : 448, Pl. 63, A.

Myrichthys (Myrichthys) maculosus Weber and de Beaufort, 1916, *Fishes Indo-Australian Archipelago*, 3 : 284, Fig. 129.

Head 13.8-15.8, depth of body 33.5-42.8, both in total length. Head 4.6-5.6 in trunk. Head and trunk 1.3-1.6 in tail. Eye 9.8-12.3 in head, 1.8-2.6 in snout and 1.3-2 in interorbital space. Cleft of mouth 3.1-3.7 in head, extending slightly behind a vertical from the hind border of eye. Snout projecting beyond tip of lower jaw. Dorsal origin on nape, nearer to eye than to gill opening. Dorsal and anal low, ending near tip of tail which projects as a stiff point. Pectoral rather

short, as long as or slightly longer than diameter of eye. Teeth conical or granular, biserial in the jaws and on vomer and a few teeth on premaxillary plate. Anterior

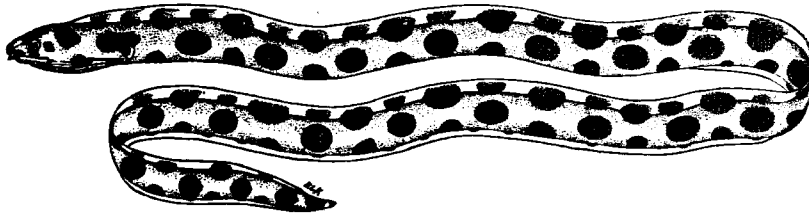


FIG. 8. *Myrichthys maculosus* (Cuvier), 530 mm.

nostrils tubular, on the underside of snout just behind tip of upper jaw ; posterior nostrils in upper lip below front of eye. Ground colour pale yellowish or white with 2 or 3 alternating series of black blotches ; the blotches along middle of side largest and varying from 25 to 31, the upper series partly extending on to dorsal fin leaving the edges white, lower series sometimes slightly extending to base of anal fin ; large adults with smaller spots on lower sides of head and trunk and a dark spot on pectoral which is white.

Material : Agathi, 1 specimen, 497 mm. Chetlat, 10 specimens, 93 to 530 mm. Kavarathi, 1 specimen, 635 mm.

Distribution : Previously known from the Red Sea and east coast of Africa ; Indonesia to the Philippines, Marshall, Phoenix and Hawaiian Islands. This is the first record from the Central Indian Ocean.

Family : MULLIDAE

9. *Parupeneus pleurostigma* (Bennett) (Fig. 9)

Upeneus pleurostigma Bennett, 1831, *Proc. Zool. Soc. London* : 59.

Parupeneus pleurostigma Weber and de Beaufort, 1931, *Fishes Indo-Australian Archipelago*, 6 : 398.

Pseudupeneus brandesii Smith and Smith, 1963, *Fishes of Seychelles* : 22, Pl. 88, D.

Pseudupeneus pleurostigma Smith, 1949, *Fishes of Southern Africa* : 230.

D_1 , VIII ; D_2 , i, 8 ; A.I, 1, 6 ; P. 16. Ll. 30 ; Ltr. $2\frac{1}{2}+1+6\frac{1}{2}$. GR. 5+1+19—21.

Head 3.1-3.2 in standard length, 3.8-4 in total length. Depth of body 3.7-3.8 in standard length, 4.7-4.8 in total length. Eye 4.8-5.2 in head, 2.4-2.7 in snout and 1.3-1.5 in slightly convex interorbital space. Maxillary reaches $\frac{3}{4}$ eye diameter before eye. Barbels nearly reaches a vertical from the hind border of preoperculum. Teeth in a single series in jaws, no teeth on vomer and palatines. First spine of dorsal minute, second shorter than third which is about equal to snout and $\frac{2}{3}$ eye diameter together. Ventral equal to or slightly longer than pectoral. Depth of caudal peduncle about $\frac{1}{2}$ its length. Colour of fresh specimens greyish to dusky above, sides of head and body yellowish to orange red, a black blotch on lateral line below between 7th dorsal spine and origin of soft dorsal, immediately behind it an oblong yellow blotch mostly above the lateral line and an obscure dark

area below and behind base of last dorsal rays. Fins yellowish, base of soft dorsal broadly black with narrow blackish bands above, anal with pale to dusky bands, upper and lower edges of caudal dusky to greyish.

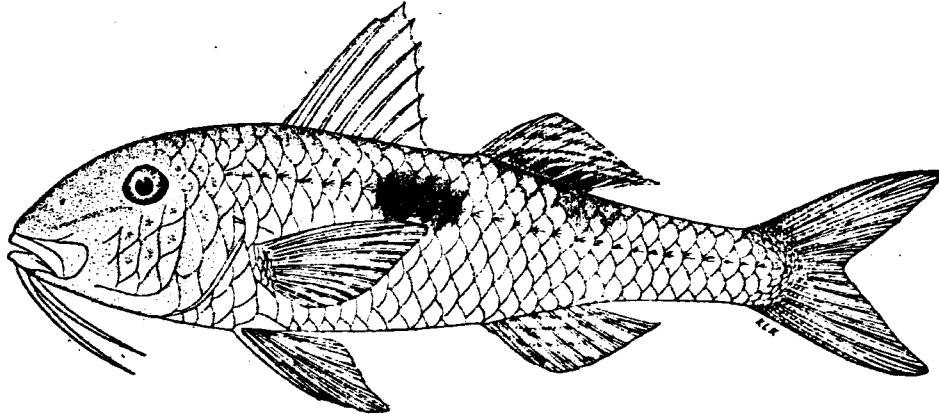


FIG. 9. *Parupeneus pleurostigma* (Bennett), 172 mm.

Material : Bitra, 3 specimens 159 to 172 mm.

Distribution : East coast of Africa and neighbouring Islands upto Seychelles in the Western Indian Ocean, Indonesia to the Philippines, Japan, Marshall, Gilbert and Hawaiian Islands and Tahiti. This is the first record from the Central Indian Ocean.

Family : CHAETODONTIDAE

10. *Heniochus monoceros* Cuvier and Valenciennes (Fig. 10)

Heniochus monoceros Cuvier and Valenciennes, 1831, *Hist. Nat. Poissons*, 7 : 100, Pl. 176 ; Weber and de Beaufort, 1936, *Fishes Indo-Australian Archipelago*, 7 : 41 ; Smith and Smith, 1963, *Fishes of Seychelles* : 24, Pl. 15, I.

D. XII, 26 ; A. III, 18 ; P. ii, 16. Ll. 56 ; Ltr. 10+1+25.

Head 2.8 in standard length, 3.4 in total length. Depth of body 1.4 in standard length, 1.7 in total length. Eye 3.8 in head, 1.3 in snout and 0.9 in interorbital space. A small protuberance above each eye. Dorsal profile of head concave till median protuberance and convex upto origin of dorsal. Fourth dorsal spine produced, longer than head, following spines decreasing in length gradually. First anal spine shorter than 2nd and 3rd which are subequal, anal angulate. Colour pale yellowish white ; a black band from origin of dorsal extending forward to eye, chin and muzzle ; lips and triangular part in front of eyes white ; interorbital space with a black band posteriorly ; a broad black transverse band from 5th to 7th dorsal spine downwards descending to base of pectoral, to belly and extending from origin of ventral to vent ; and a less defined broad blackish band from posterior dorsal spines to posterior rays of anal. Lower margin of anal fin including spines

black, rest of the fin pale yellowish. Base of pectoral black, rest of the fin yellowish. Caudal yellowish. Ventral black.

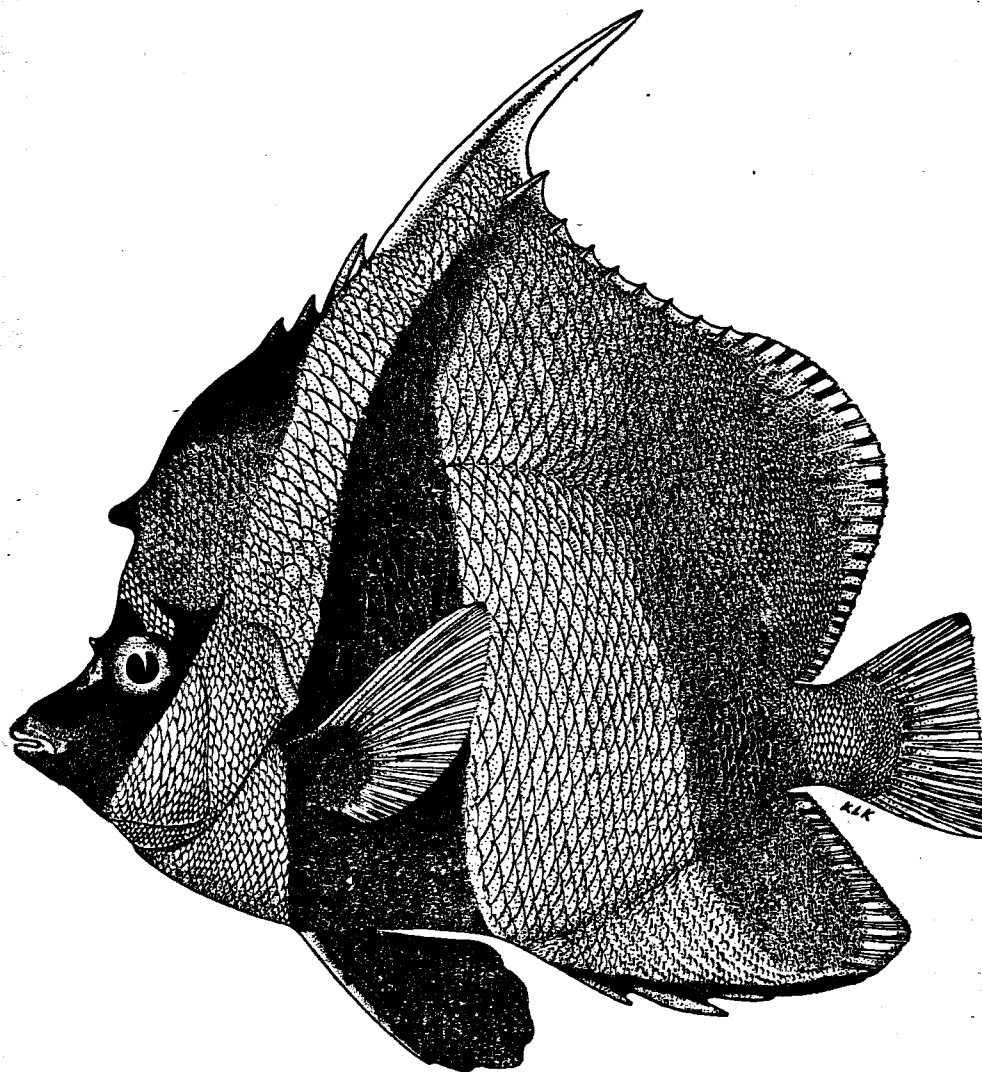


FIG. 10. *Heniochus monoceros* Cuvier and Valenciennes, 182 mm.

Material : Minicoy, 1 specimen, 182 mm.

Distribution : Previously reported from Mauritius and Seychelles in the Western Indian Ocean and from Java, Philippines, Ryukyu Islands, Samoa, Tahiti, Tuamotu and Hawaiian Islands. This is the first record from the Central Indian Ocean.

Family : LABRIDAE

11. *Duymaeria flagellifera* (Cuvier and Valenciennes) (Fig. 11)

Ctenolabrus flagellifer Cuvier and Valenciennes, 1839, *Hist. Nat. Poissons*, 13 : 240.
Duymaeria flagellifera de Beaufort, 1940, *Fishes Indo-Australian Archipelago*, 8 : 140, Fig. 23 ; Smith, 1949, *Fishes of Southern Africa* : 290, Pl. 56, Fig. 796 ; Smith, 1957, *Ichth. Bull.*, 7 : 107 ; Smith and Smith, 1963, *Fishes of Seychelles* : 38, Pl. 28, A.

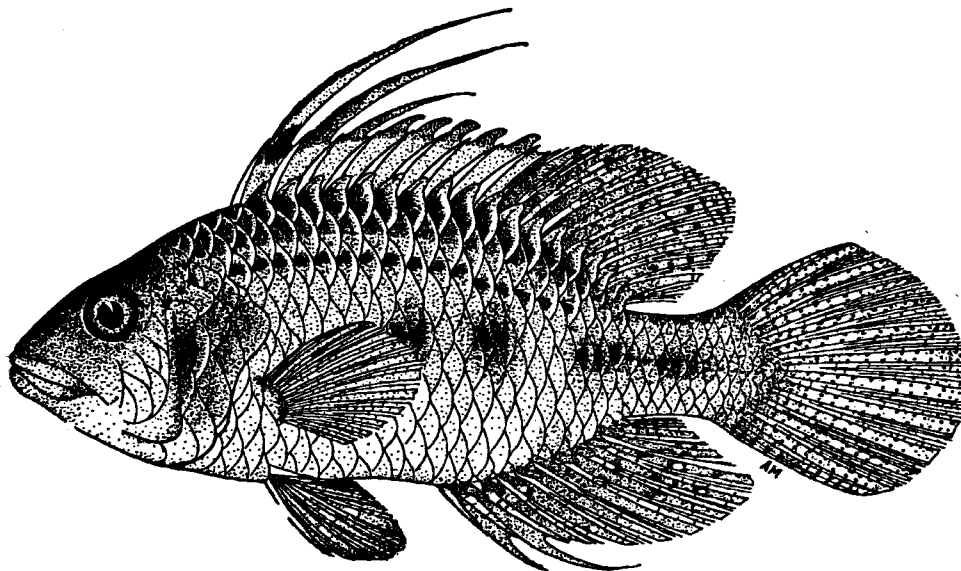


FIG. 11. *Duymaeria flagellifera* (Cuvier and Valenciennes), 87 mm.

D. IX, 11 ; A. III, 9 ; P. ii, 11. Ll. 25 ; Ltr. 2+1+7.

Head 2.7 in standard length, 3.7 in total length. Depth of body 2.5 in standard length, 3.4 in total length. Eye 4.8 in head, 1.5 in snout and 1.2 in slightly convex interorbital space. Mouth somewhat protractile, maxillary reaching behind a level from the front border of eye. Teeth in a single series in jaws except anteriorly where there are 2 irregular rows, 2 pairs of canines in either jaw near the symphysis, the posterior longer and curved slightly backwards. Two rows of scales on cheek, preopercular flange naked. Membranes between dorsal spines deeply incised and produced into long filaments between 1st and 4th spines. Membranes between anal spines incised and produced into filaments. Colour brownish with greenish tinge, becoming slightly lighter below, 4 brown blotches on sides of body, interorbital space darker and a few black spots behind eye. Dorsal pale hyaline with indistinct brownish markings posteriorly and a blackish blotch between first and second dorsal spines. Anal pale hyaline with brownish markings posteriorly. Pectoral hyaline. Caudal pale hyaline with small dark spots on membranes. Ventral greenish basally, pale distally.

Material : Agathi, 1 specimen, 87 mm.

Distribution : East coast of Africa and Seychelles in the Western Indian Ocean and from Indonesia to the Philippines, Ryukyu, China, Japan and New Hebrides. This is the first record from the Central Indian Ocean.

Family : ACANTHURIDAE

12. *Acanthurus elongatus* (Lacépède) (Fig. 12)

Chaetodon elongatus Lacépède, 1802, *Hist. Nat. Poissons*, 4 : 454 and 473, Pl. 6, Fig. 2.

Acanthurus lineolatus Cuvier and Valenciennes, 1835, *Hist. Nat. Poissons*, 10 : 207 ; de Beaufort, 1951, *Fishes Indo-Australian Archipelago*, 9 : 160 ; Smith, 1949, *Fishes of Southern Africa* : 240, Pl. 33, Fig. 609.

Acanthurus nigroris Smith and Smith, 1963, *Fishes of Seychelles* : 24, Pl. 21, G.

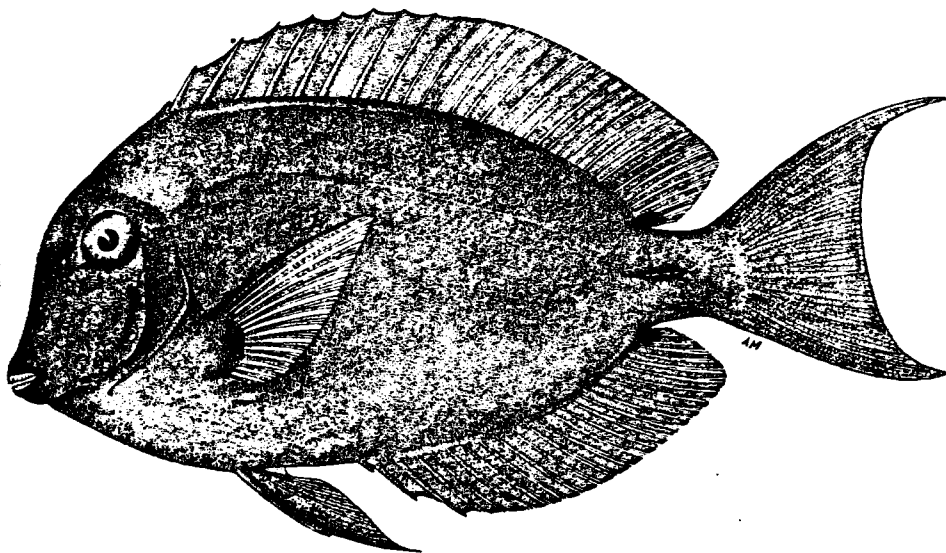


FIG. 12. *Acanthurus elongatus* (Lacépède), 106 mm.

D. IX, 24-25 ; A. III, 23-24 ; P. ii, 14. Ll. 120-138 ; Ltr. 11-13+40-44.

Head 3.3-3.6 in standard length, 4.3-4.7 in total length. Depth of body 1.9-2.1 in standard length, 2.5-2.7 in total length. Eye 3.3-3.6 in head, 1.8-2.2 in snout and 1.2-1.3 in convex interorbital space. Profile of snout rather concave. Teeth strongly lobate, 5-6 on each side of upper jaw and 6-7 on each side of lower jaw. First dorsal spine short, spines increasing in length to the last which is equal to twice eye diameter. Colour variable, uniform chocolate brown to blackish, sometimes with pale greyish longitudinal lines on sides of body and pale spots on cheeks and breast. Dorsal and anal deep chocolate brown, anal generally darker, both fins narrowly edged with blackish. Axils and bases of posterior 2 or 3 dorsal and anal rays black. Caudal spine in black sheath. Caudal dark brown with narrow white distal edge, sometimes lower and upper border posteriorly edged with white.

Pectoral pale hyaline, rays dusky, upper border dark. Ventral dark brownish, bases of soft rays generally lighter.

Material : Agathi, 5 specimens, 59 to 110 mm. Kadamat, 2 specimens, 94 and 103 mm. Minicoy, 1 specimen, 106 mm. Ottathengu Parli (Agathi), 1 specimen, 105 mm. Suheli, 1 specimen, 97 mm.

Distribution : East coast of Africa, Madagascar, Mauritius, Seychelles and from Indonesia to the Philippines, Caroline, Hawaiian, Samoan and Tuamotu Islands. This is the first record from the Central Indian Ocean.

13. *Acanthurus philippinus* Herre (Fig. 13)

Acanthurus philippinus Herre, 1927, *Philippine Jour. Sci.*, 34 : 434, Pl. 5, Fig. 1 ; de Beaufort, 1951, *Fishes Indo-Australian Archipelago*, 9 : 161.

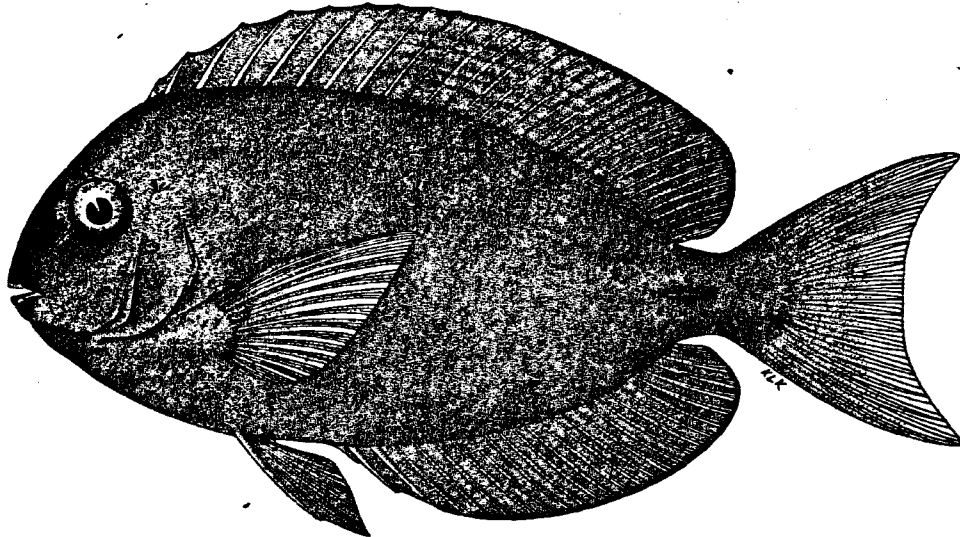


FIG. 13. *Acanthurus philippinus* Herre, 95 mm.

D. IX, 24 ; A. III, 23 ; P. ii, 14. Ll. about 150 ; Ltr. 12+1+52.

Head 3.8 in standard length, 5 in total length. Depth of body 2.1 in standard length, 2.7 in total length. Eye 3.2 in head, 1.2 in snout and about 1.2 in convex interorbital space. Dorsal profile of head convexly rounded. Teeth serrate, 9 on each side of upper jaw and 11 on each side of lower jaw. First dorsal spine short, spines gradually increasing in length to the last which is about twice eye diameter. Third anal spine about 1.5 of eye diameter. Colour dark chocolate brown. Dorsal and anal chocolate brown with narrow blackish edges ; dorsal with 5 indistinct narrow dark lines. Caudal pale yellowish, sharply contrasted with the general body colour. Pectoral dark greyish becoming pale yellowish posteriorly. Ventral dark brown.

Material : Minicoy, 1 specimen, 95 mm.

Distribution : Previously recorded only from Indonesia, Philippines and Rongelap island. This is the first record of this comparatively rare species from the Indian Ocean.

Family : CALLYODONTIDAE

14. *Callyodon capitaneus* (Cuvier and Valenciennes) (Fig. 14)

Scarus capitaneus Cuvier and Valenciennes, 1839, *Hist. Nat. Poissons*, 14 : 228, Pl. 403.

Xanothon capitaneus Smith, 1956, *Ichth. Bull.*, 1 : 5, Pl. 41, F ; Smith, 1959, *Ibid.*, 16 : 268, Pl. 41, F ; Smith and Smith, 1963, *Fishes of Seychelles* : 41, Pl. 75, F.

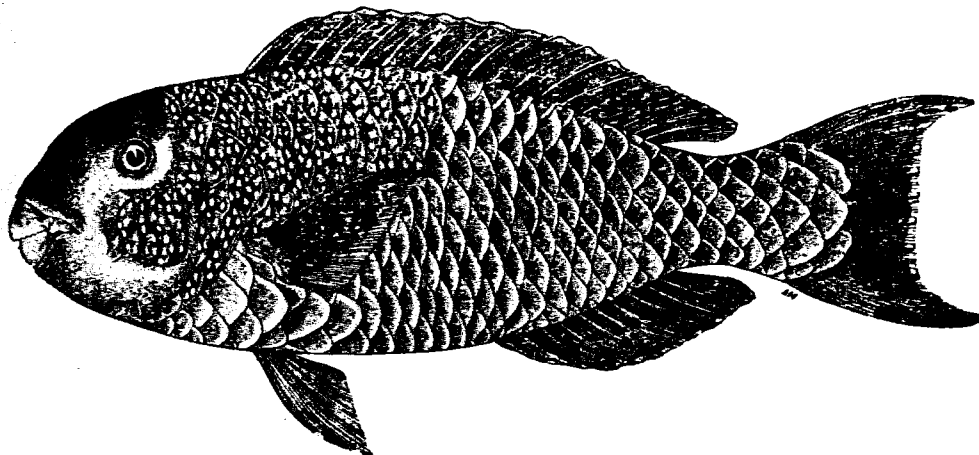


FIG. 14. *Callyodon capitaneus* (Cuvier and Valenciennes), 320 mm.

D. IX, 10 ; A. III, 9 ; P. ii, 13 (14 on one side of a specimen) Ll. 24-25 ; Ltr. 2+1+6.

Head 2.9-3.1 in standard length, 3.6-3.8 in total length. Depth of body 2.7-2.9 in standard length, 3.5-3.7 in total length. Eye 6.2-8.4 in head, 2.7-3.6 in snout and 2.4-3.2 in convex interorbital space. Cheek with 2 rows of scales, preopercle flange naked. 4 scales before dorsal. Teeth green, edges white, lips narrow, covering less than 1/3 of dental plates, one or two canines posteriorly in upper jaw in large specimens. Dorsal profile of snout somewhat rounded in young and more pronounced with age. Anterior nostril with a low rim, posterior nostril much larger and about an eye diameter before eye. Caudal truncate in juveniles, lobes produced in adults. Colour of fresh specimens deep green, snout and dorsal side of eye bluish green, edges of scales slightly lighter, scales of head and upper sides of anterior part of body with several small pale spots. Dorsal and anal blue black with narrow green margin. Caudal and anal blue black with narrow green margin. Caudal blue black, upper, lower and distal edges green. Pectoral green, mid dorsal rays blackish. Ventral green, first ray lighter.

Note : The specimens described above agree in general with the figure of 340 mm. specimen of Smith. The dorsal profile of the snout as seen from the figure of Cuvier and Valenciennes is descending evenly and does not agree with even the

smallest specimen in our collection. In small specimens, the caudal fin is truncate and the profile of snout is convex and is more pronounced with age. According to Smith (1959) the type of *capitaneus* has 2, 12 pectoral rays. Schultz (1958) has synonymised *capitaneus* and *cyanescens* but the latter appears to be a different species altogether. We feel that the differences in the specimens described above justifies specific distinction and if this be so the name *laccadivensis* is provisionally proposed.

Material : Ameni, 1 specimen, 155 mm. Bitra, 1 specimen, 320 mm. Kavarathi, 2 specimens, 275 and 315 mm. Minicoy, 1 specimen, 173 mm. Ottathengu Parli (Agathi), 2 specimens, 154 and 235 mm.

Distribution : Previously known only from Mauritius, Reunion, Zanzibar, Mozambique and Seychelles in the Western Indian Ocean. This is the first record outside the above area.

15. *Callyodon janthochir* (Bleeker) (Fig. 15)

Scarus janthochir Bleeker, 1853, *Nat. Tijds. Ned.-Ind.*, 4 : 139.

Callyodon janthochir de Beaufort, 1940, *Fishes Indo-Australian Archipelago*, 8 : 281 ; Smith, 1956, *Ichth. Bull.*, 1 : 14 ; Smith, 1959, *Ibid.*, 16 : 279.

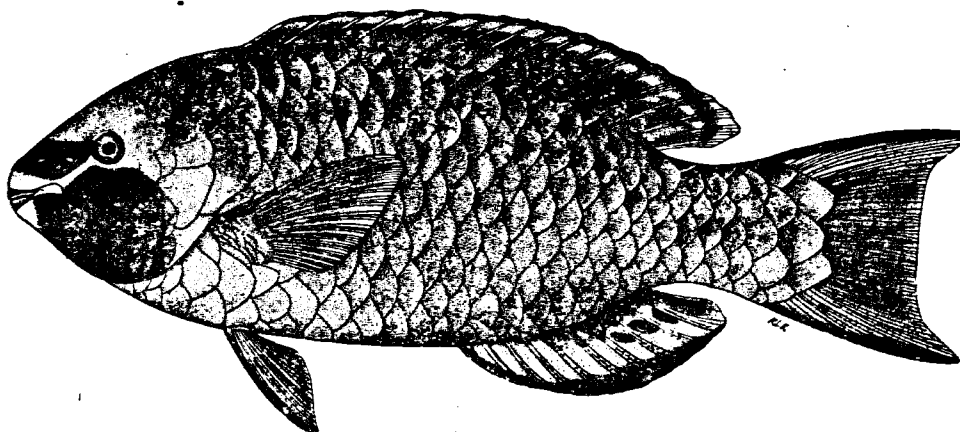


FIG. 15. *Callyodon janthochir* (Bleeker), 262 mm.

D. IX, 10 ; A. III, 9 ; P. ii, 13. Ll. 24 ; Ltr. 2+1+6.

Head 3.2 in standard length, 4 in total length. Depth of body 2.65 in standard length, 3.3 in total length. Eye 7.2 in head, 2.6 in snout and 2.3 in convex interorbital space. Cheek with 2 rows of scales and 3 scales on preopercle flange. Teeth green, edges white, lips covering 1/2 of dental plates, a rudimentary canine on one side. Six scales before dorsal. Nostrils small, close together and less than one eye diameter before eye. Caudal truncate, lobes slightly produced. Colour of body dark bluish green, lighter below, some scales on caudal peduncle with a pale central spot, lower side of head below eye bright green, lips pale creamy continued as a band to eye, a broad bright green band extends forward from eye across

snout, region behind this pale creamy. Edges of dorsal green, green bars along basal $\frac{2}{3}$ of spines, rays green, membrane between rays dark, subterminal part of the fin pale yellowish. Anal broadly edged with green, a green band along base and some greenish streaks on hind part, rest of the fin pale yellowish. Caudal green with a broad yellowish submarginal band along each lobe. Pectoral fin dark blue, outer margin pale. Ventral green with 1st and 2nd ray pale yellowish.

Material : Bitra, 1 specimen, 262 mm.

Distribution : Previously reported from Mauritius, Muscat and Persian Gulf and from Indonesia to the Philippines and Caroline Islands. This is the first record from the Central Indian Ocean.

16. *Callyodon jordani* (Jenkins) (Fig. 16)

Pseudoscarus jordani Jenkins, (1899) 1901, *Bull. U.S. Fish Comm.*, 19 : 63, Fig. 2.
Callyodon africanus Smith, 1955, *Mem. Mus. Dr. Alvaro de Castro*, 3 : 19, Fig. 26 and Pl. 3, Fig. 26.

Callyodon (Margaritodon) africanus Smith, 1959, *Ichth. Bull.*, 16 : 280, Pl. 42, A ;
Smith and Smith, 1963, *Fishes of Seychelles* : 41, Pl. 76, A.

Margaritodon africanus Smith, 1956, *Ichth. Bull.*, 1 : 15, Pl. 42, A.

Scarops jordani Schultz, 1958, *Bull. U.S. Nat. Mus.*, 214 : 21, Pl. 6, B.

Scarus africanus Schultz, 1958, *Ibid.*, 75, Pl. 18, E and Pl. 19, E.

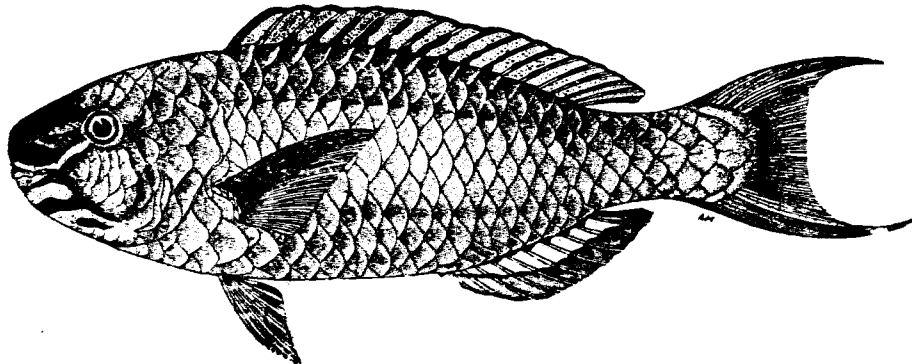


FIG. 16. *Callyodon jordani* (Jenkins), 305 mm.

D. IX, 10 ; A. III, 9 ; P. ii, 13. Ll. 25 ; Ltr. 2+1+6.

Head 3.2 in standard length, 4.3 in total length. Depth of body 2.8 in standard length, 3.8 in total length. Eye 6.4 in head, 2.5 in snout and 2.3 in convex interorbital space. Nostrils small, adjacent, about $\frac{3}{4}$ eye diameter before eye. Lips broad, upper lip covers more than half, lower lip about $\frac{2}{5}$ of dental plates which are green ; posteriorly in upper jaw one canine on one side and two canines on the other side. Two rows of scales on cheek and two scales on preopercle flange. Six predorsal scales. Caudal with outer rays much produced. Snout swollen before eye and almost vertical above mouth. Colour of fresh specimen greenish with reddish brown tinge above, yellowish green below. Upper lip light orange,

bordered above with green band and above this a pale band on snout upto eye and a broad dark green area above. Lower lip green, an orange band below and then a curved green band. Dorsal orange coloured with green outer margin, bases of spines with green streaks and a few bluish green spots on soft part of the fin. Basal half of anal orange with greenish streaks basally, outer half green. Caudal bluish green with lighter hind margin and narrow pale bands along lobes. Pectoral with greenish dorsal edge, upper rays purple, lower 2/3 of the fin hyaline. Ventral yellowish with greenish outer border.

Note : Smith, 1955 considered *africanus* distinct from *jordani* Jenkins, 1901, (type locality Honolulu) because of the remoteness of the type locality of *jordani* from Africa, by the absence of any intermediate record and in having more than one canine in the upper jaw and in the more pronounced snout. Our specimen has one canine posteriorly on one side of the upper jaw and two on the other side and the snout is rather humped anteriorly. The snout is swollen anteriorly in *jordani* even though not so prominent and the colour pattern described by Jenkins corresponds almost exactly with that given by Smith for *africanus* and also with the specimen from the Laccadives and hence we have united the two.

Material : Bitra, 1 specimen, 305 mm.

Distribution : Previously recorded from the east coast of Africa and Aldabra to Seychelles in the Western Indian Ocean and from Hawaiian Islands, Samoa, Cocos Island, Roqueto Island and Socorro Island in the Pacific. This is the first record from the Central Indian Ocean.

17. *Callyodon niger* (Forskål) (Fig. 17)

Scarus niger Forskål, 1775, *Descript. Animal.*, 28.

Callyodon niger Smith, 1956, *Ichth. Bull.*, 1 : 13, Pl. 43, C and G ; Smith, 1959, *Ibid.*, 16 : 279, Pl. 43, C and G.

Callyodon nuchipunctatus de Beaufort, 1940, *Fishes Indo-Australian Archipelago*, 8 : 283.

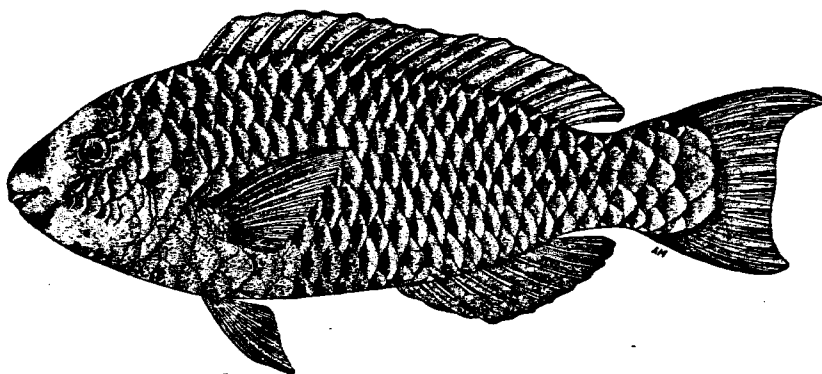


FIG. 17. *Callyodon niger* (Forskål), 235 mm.

D. IX, 10 ; A. III, 9 ; P. ii, 13. Ll. 25 ; Ltr. 2+1+6.

Head 3 in standard length, 3.8 in total length. Depth of body 2.6 in standard length, 3.3 in total length. Eye 6.6 in head, 2.5 in snout and 2.4 in convex inter-orbital space. Cheek with 2 series of scales and 2 scales on preopercle flange. Six scales before dorsal. Teeth green, lips covering about 2/3 of dental plates, a rudimentary canine posteriorly in upper jaw. Nostrils small, the hind one about 3/4 eye diameter before eye. Caudal truncate, the lobes slightly produced. Colour dark brown; both lips pale greenish, cheeks lighter, a dark bar from below lower lip to behind rictus continued as a pale band below eye, pale streaks extending forward and backward from eye. Dorsal and anal dark brown and narrowly edged with greenish. Caudal dark brown, hind border slightly lighter. Pectoral brown, posterior edge lighter. Ventral brown, spine and extremity of rays slightly greenish.

Material : Bitra, 1 specimen, 235 mm.

Distribution : Red Sea and east coast of Africa and neighbouring Islands upto Seychelles; Indonesia to the Philippines, Ryukyu Islands, China, Japan; Gilbert, Fiji, Society and Tuamotu Islands. This is the first record from the Central Indian Ocean.

18. *Callyodon pectoralis* (Cuvier and Valenciennes) (Fig. 18)

Scarus pectoralis Cuvier and Valenciennes, 1839, *Hist. Nat. Poissons*, 14 : 269.

Callyodon cyanognathus Smith, 1959, *Ichth. Bull.*, 16 : 271, Pl. 42, K.

Callyodon lazulinus Smith, 1956, *Ibid.*, 1 : 13, Pl. 42, K.

Callyodon pectoralis de Beaufort, 1940, *Fishes Indo-Australian Archipelago*, 8 : 286.

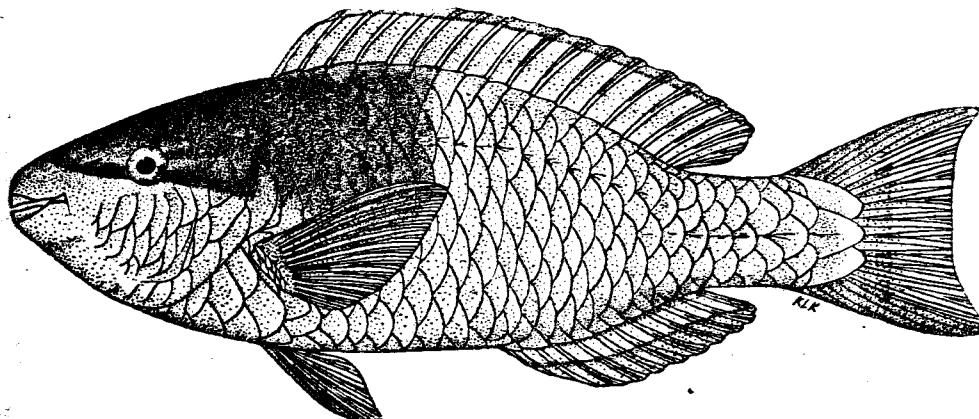


FIG. 18. *Callyodon pectoralis* (Cuvier and Valenciennes), 158 mm.

D. IX, 10, A. III, 9; P. ii, 13. Ll. 24; Ltr. 2+1+6.

Head 2.9 in standard length, 3.7 in total length. Depth of body 2.7 in standard length, 3.5 in total length. Eye 6.3 in head, 2.6 in snout and 2 in convex inter-orbital space. Cheek with 2 series of scales and 3 scales on preopercle flange. Teeth greenish, lips broad, covering about 2/3 of dental plates, no canines. Nostrils small, the posterior about 3/4 eye diameter before eye. Caudal lobes slightly extended. Colour of preserved specimen pale yellowish, a dark area dorso-anteriorly above level of lower edge of eye from top of snout extending on body to below.

7th dorsal spine. Lips yellowish. Dorsal fin pale yellowish, bluish distally, the two colours defined by a submarginal dusky line. Anal fin pale yellowish basally, broadly bluish distally with a median dusky line. Caudal yellowish, upper and lower edges of the fin darker. Pectoral pale hyaline, median rays slightly darker. Ventral pale yellowish.

Material : Agathi, 1 specimen, 158 mm.

Distribution : Red Sea and east coast of Africa and neighbouring islands upto Seychelles ; Indonesia to the Philippines and east-ward to Solomon, New Hebrides, Samoan and Society Islands.

19. *Callyodon scaber* (Cuvier and Valenciennes) (Fig. 19)

Scarus scaber Cuvier and Valenciennes, 1839, *Hist. Nat. Poissons.*, 14 : 239.

Callyodon scaber Smith, 1956, *Ichth. Bull.*, 1 : 10, Pl. 41, G ; Smith, 1959, *Ibid.*, 16 : 279, Pl. 41, G.

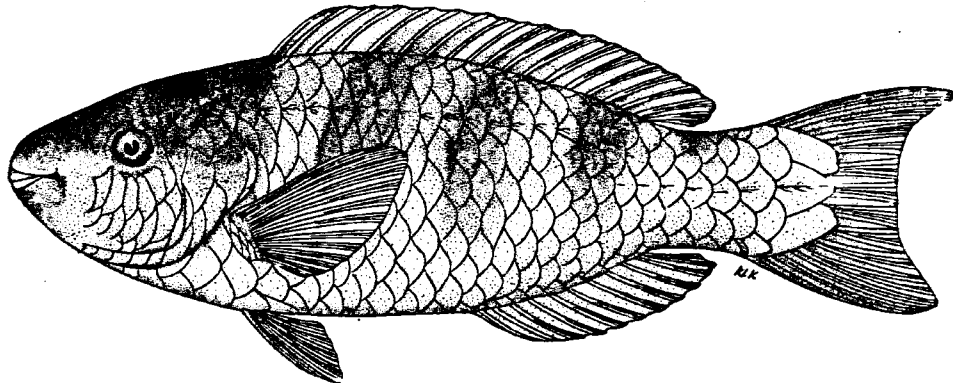


FIG. 19. *Callyodon scaber* (Cuvier and Valenciennes), 180 mm.

D. IX, 10 ; A. III, 9 ; P. ii, 12 (13). Ll. 24-25 ; Ltr. 2+1+6.

Head 2.9-3.2 in standard length, 3.6-3.9 in total length. Depth of body 2.5-2.8 in standard length, 3.2-3.5 in total length. Eye 5.8-6.4 in head, 2.2-2.6 in snout and 2-2.4 in slightly convex interorbital space. Teeth white, lips broad, covering most of the plates, no canines. Two rows of scales on cheek, 2 or 3 scales on preopercle flange. Six or seven scales before dorsal. Nostrils minute, adjacent, the posterior about $\frac{3}{5}$ eye diameter before eye. Caudal truncate, the lobes slightly extended in adults. Colour light brownish grey above, becoming creamy white below, upper side of the snout darker. Five dark cross bars on back slightly slanting forward and merge with the creamy colour on sides. The first bar below origin of dorsal, the second about below 4th to 7th dorsal spines, the third about below 1st to 4th dorsal rays, the fourth below 6th to 10th dorsal rays and the fifth on caudal peduncle which is sometimes obscure. Dorsal, anal and caudal pale yellowish, dorsal with slightly dusky outer edge, upper and lower edges of caudal sometimes slightly dusky. Pectoral and ventral yellowish.

Material : Agathi, 2 specimens, 158 and 180 mm. Kadamat, 2 specimens, 160 and 172 mm. Minicoy, 1 specimen, 168 mm.

Distribution : East coast of Africa, Mauritius, Reunion and Seychelles in the Western Indian Ocean and Philippines to Samoa and Hawaiian Islands in the Pacific. This is the first record from the Central Indian Ocean.

20. *Callyodon sexvittatus* (Rüppell) (Fig. 20)

Scarus sexvittatus Rüppell, 1835, *Neue Wirbelt. Fische Rothen Meeres* : 26.

Callyodon rubroviolaceus de Beaufort, 1940, *Fishes Indo-Australian Archipelago*, 8 : 296 ; Smith, 1956, *Ichth. Bull.*, 1 : 11, Pl. 43, J.

Callyodon sexvittatus Smith, 1959, *Ibid.*, 16 : 270, Fig. 2 and Pl. 41, H and I.

Callyodon upolensis Smith, 1956, *Ibid.*, 1 : 11, Pl. 41, H and I.

Callyodon (Scarops) rubroviolaceus Smith, 1959, *Ibid.*, 16 : 278, Pl. 43, J.

Scarus rubroviolaceus Bleeker, 1849, *Verh. Bat. Gen. 22, Gladschub. Labroid* : 52.

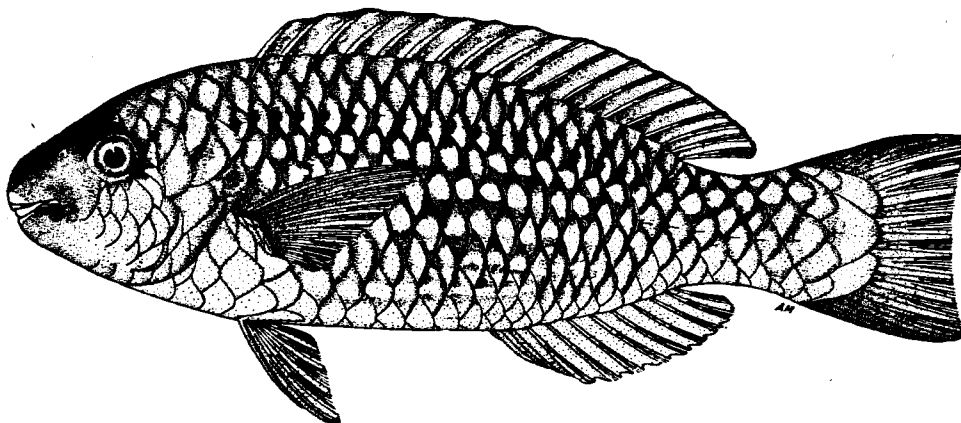


FIG. 20. *Callyodon sexvittatus* (Rüppell), 230 mm.

D. IX, 10 ; A. III, 9 ; P. ii, 13. Ll. 25-26 ; Ltr. 2+1+6.

Head 3-3.2 in standard length, 3.6-4 in total length. Depth of body 2.9-3 in standard length, 3.6-3.8 in total length. Eye 5.5-6.7 in head, 2-2.6 in snout and 2-2.5 in convex interorbital space. Lips broad, covering more than half of dental plates, teeth whitish. Often 1-2 short posterior canines in upper jaw in large specimens, always absent in juveniles. Nostrils small, adjacent, the anterior one with a low rim. Two rows of scales on cheek and 2 scales on flange. Six or seven scales before dorsal. Caudal rounded to truncate in juveniles, lobes slightly elongate in large adults. Dorsal profile of snout almost straight in young, bluntly rounded and swollen with age. Colour brownish to reddish brown, scales on back and sides with dark hind border, some dark spots and streaks on sides forming horizontal bands. Dorsal pale yellowish to brownish, often with dusky outer edge. Anal yellowish. Pectoral hyaline, upper rays brownish. Caudal yellowish, dorsal and ventral sides darker. Ventral yellowish.

Note : In the specimens examined by us, the snout is relatively longer, the dorsal profile of snout is almost straight in small specimens and becomes blunt and

somewhat swollen anteriorly with age. Very often 1 or 2 short canines are present posteriorly in the upper jaw in large specimens, but are always absent in juveniles. Hence we consider *Scarus rubroviolaceus* Bleeker as a synonym of *sexvittatus* Rüppell.

Material: Agathi, 1 specimen, 230 mm. Ameni, 3 specimens, 170 to 200 mm. Bitra, 4 specimens, 225 to 305 mm. Minicoy, 7 specimens, 155 to 220 mm.

Distribution: Previously recorded from the Red Sea, east coast of Africa and from Indonesia to the Philippines, Hawaiian, Gilbert, Samoan, Society and Tuamotu Islands. This is the first record from the Central Indian Ocean.

21. *Callyodon taeniurus* (Cuvier and Valenciennes) (Fig. 21)

Scarus taeniurus Cuvier and Valenciennes, 1839, *Hist. Nat. Poissons*, 14: 257; Schultz, 1958, *Bull. U.S. Nat. Mus.*, 214: 61, Fig. 8.

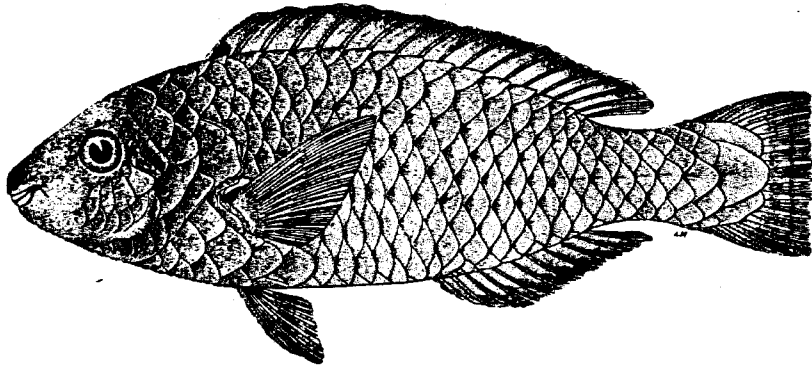


FIG. 21. *Callyodon taeniurus* (Cuvier and Valenciennes), 135 mm.

D. IX, 10; A. III, 9; P. ii, 12 (13). Ll. 23-24; Ltr. 2+1+6.

Head 2.8-3.1 in standard length, 3.4-3.7 in total length. Depth of body 2.8-3 in standard length, 3.4-3.6 in total length. Eye 5.3-6.4 in head, 1.6-1.8 in snout and 1.5-1.7 in convex interorbital space. Two rows of scales on cheek, preopercle flange naked. 4 scales before dorsal. Teeth whitish, lips broad, nearly covering the dental plates in small specimens and about 1/4 of dental plates uncovered in adults, a canine in upper jaw, none in lower. Colour greyish brown, some specimens with greenish tinge, centre of scales on sides of body sometimes darker, edges of lips often greyish green. Dorsal brownish with pale outer margin and a small dark spot on membrane between 1 and 2 spines. Anal brownish with pale outer margin. Caudal brownish with narrow white hind edge and sometimes 2 or 3 indistinct dark cross bands. Pectoral pale hyaline, a dark spot at base of upper pectoral rays. Anterior margin of ventral brownish, rest of the fin pale.

Material: Agathi, 6 specimens, 58 to 130 mm. Kadamat, 4 specimens, 110 to 135 mm. Kalpeni, 18 specimens, 35 to 132 mm. Minicoy, 24 specimens, 48 to 140 mm.

Distribution: Red Sea and Mauritius and from Indonesia to Marianas, Marshall, Phoenix, New Hebrides, Society and Hawaiian Islands. This is the first record from the Central Indian Ocean.