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FISHES OF THE FAMILY

APOGONIDAE

of the Western Indian Ocean and the Red Sea

by

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# FISHES OF THE FAMILY APOGONIDAE

of the

## Western Indian Ocean and the Red Sea

(With Plates 46-52)

by J. L. B. SMITH

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Body shape varies from almost orbicular and compressed, to elongate and fusiform, mostly covered with scales, usually strong and ctenoid on body, cycloid on head, where few, sometimes all cycloid, or, more rarely, scales feeble or entirely absent. Lateral line usually complete to caudal base, sometimes incomplete, rarely absent.

Mouth usually large, oblique, the lower jaw often projects. Dentition variable; usually villiform teeth present in bands in jaws and variably on palate, in some genera canines are present, sometimes strong. Two separate dorsal fins, the first of 6-9 spines, sometimes feeble, the second of a spine and 8-11 soft rays. Anal of 2 spines and 8-17 soft rays, 1st spine small. Pectorals of 2 simple rays above, the uppermost minute, the 2nd long, and 8 or more branched rays, also usually 1-2 small simple rays below. Caudal forked, emarginate, truncate or rounded. Vent usually close before anal fin but sometimes nearer pelvics.

Mostly rather small fishes, many exquisitely coloured, found chiefly in shallow tropical seas of both hemispheres, some penetrate to sub-tropical zones, a few to deeper waters. Most are marine, free swimming in clear water about coral reefs, but some live chiefly in sand, hidden by day, others are found in weedy areas and turbid water. Some penetrate to brackish water while others live entirely in fresh water.

A curious and striking feature of most species, possibly all, is that the males undertake buccal incubation of the eggs, which are sometimes as brightly coloured, in yellows or reds, as the fish itself. Considerable numbers of eggs are shed, which cling together. These blobs of eggs are taken into the mouth by the male. They distend his chin and throat, and usually project outside as well. In this way gills and gillrakers may be distorted, and preserved males are often found with them in this condition. Males with eggs in pools have been observed to desposit the eggs at times, but to rush back and scoop them up when they feel that danger threatens. The Apogonidae are clearly carnivorous fishes feeding mainly on small crustacea, worms and larval fishes. Most are brightly, some brilliantly coloured, and attractive, some are indeed the most gorgeous feature of the underwater tropical scene. As some may be caught easily, are small and easily preserved, they often came to the hands of earlier travellers and collectors and hence to European museums, to the later sorrow of more recent systematists, for the early descriptions of the dead fishes are generally too brief to satisfy the more exacting taxonomic standards of this time. Some of these fishes actually present a formidable task to the systematist. While characteristic markings render some species easily identifiable by the collector when fresh, these usually fade rapidly and leave the systematist with few clues, for the species vary little in meristic characters, e.g. fin formulae and scale counts. Even when it is possible to define a species concisely it is sometimes difficult to decide which early name it should bear, and when types have vanished, from lack of proper definition names can only be discarded or ignored. Important characters are the presence or absence of serrations on the preopercle ridge and margin, the shape of the caudal, fin counts, and the presence or absence of canines and of palatine teeth. The number of spines in the first dorsal, usually 6 or 7, appears to be constant in any one species. This, while generally not used as a basis for generic cleavage, is used here, as it provides a broad basis for grouping of species. The gillraker count is of considerable value in diagnosis as this varies relatively little within one species, and the identity of faded specimens can sometimes be settled by this count.

Small and relatively feeble as most of these fishes are many cover an astonishing range. Some are found over truly vast areas of the Indo-Pacific, ranging from Southern Africa to the mid-Pacific. As a result, workers on even mid-Pacific **Apogonidae** need to give heed to the fauna of the Red Sea and of the Western Indian Ocean, from where, as in the case of the Parrot fishes, many early types were described. Failure to do this has caused species from the Pacific described as new, later to be proved identical with those long known from the Red Sea or the Indian Ocean. Comparatively few systematists have ventured to undertake regional revisions of these troublesome



fishes. Of comprehensive works, that of Weber and de Beaufort 1929, covering most of Bleeker's species, is of great value, though gillraker counts would have added to this. In recent times Lachner 1953 has published a detailed, careful and well illustrated descriptive revision of the Apogonidae of the Marshall Island area of the central Pacific, which, while it covers a relatively limited fauna, gives wider information of great value in modern analysis and comparison. Every worker on this family in the Indo-Pacific will need to study Lachner's monograph. It has helped me repeatedly with the Indian Ocean fauna. The Red Sea fauna has been known chiefly from early works such as those of Ruppell and Klunzinger. In recent times the careful analytical work of Klausewitz has added greatly to our knowledge of the Apogonidae of that region.

Although mostly quite small, the species that attain more than about 3 inches in length are valued as food by natives in East Africa, for the flesh is delicate and tasty. The Apogonids are recognised as a type, and in some parts the natives have a general name for them, e.g. SANGALALA or SALAUAMBA (Pinda). MASENDA (N.Moz.). DAGAA GEGEE (Tanganyika). CHIRDUMBOADITSO (Comores). MADAMUS (Somaliland). In some cases the species are so well known as in some parts to have individual names. These are recorded under the species.

**SPECIAL NOTE:** Counts and dimensions are taken and recorded in normal fashion, thus P 2,10,2 indicates a pectoral fin of 2 upper simple rays, 10 median divided and 2 lower simple, total 14.

Gillrakers are recorded thus, e.g. (3)2+1+8(4-5) indicates 3 rudiments and 2 formed rakers on upper limb, one (formed) in the angle, 8 formed rakers and 4-5 rudiments in front on lower limb. Rudiments often grade into formed rakers and vice versa. A raker is counted as formed when its apex is freely movable, or when its length is at least twice its base.

Unless otherwise stated TYPES are in this Department.

In this revision, the Apogonidae proper are limited as those with two anal spines. 60 species in 24 genera are described from the Western Indian Ocean and the Red Sea. Of these, 7 are defined as new, while **Apogon kiensis** Jordan & Snyder, 1901, **Apogon leptacanthus** Bleeker, 1856, **Ostorhynchus nubilus** (Garman), 1903, **O. angustatus** (Smith & Radcliffe), 1911, **O. savayensis** (Günther), 1871, **O. cyanosoma** (Bleeker), 1853, **O. apogonides** (Bleeker), 1856, and **Archamia fucata** (Cantor), 1850, all Pacific species, are described for the first time from the Indian Ocean. Three new genera, viz. **Asperapogon**, **Jaydia** and **Coranthus** are defined. All species are illustrated (except **Foa madagascariensis** Petit, 1931, known only from the type, which cannot be found) in 69 illustrations, 32 in colour. In the photographs in the monochrome plates the fins, which would otherwise have been hardly visible, have been carefully touched up, always with reference to the original of the photograph.

Some long standing names, e.g. **Cheilodipterus lineatus** Linn, 1758 and **Apogon warreni** Regan, 1908 have been shown to be invalid or unusable.

The Apogonidae as here defined appear to fall naturally into five well defined groups, each given subfamily rank, these diagnosed as follows:

#### Key to subfamilies

- A. Teeth feeble, no canines.  
Depth of body usually more than  $\frac{1}{4}$  of its length. Scales usually ctenoid.
  - I. No silvery tubular gland each side from tongue to abdomen, passing vent and anal fin ..... 1. **Apogoninae**
  - II. A tubular silvery gland from below tongue each side to abdomen, passing vent and anal fin ..... 2. **Siphamiinae**
- B. Distinct canine teeth present. Depth of body usually not or little more than  $\frac{1}{4}$  of its length.
  - I. Usually 6 (by exception 7) spines in first dorsal, if 7 spines then caudal rounded. Shallow or deep water.
    - a. Body robust, fusiform, with strong ctenoid scales. Subocular shelf present. Active predacious free swimming types ..... 3. **Cheilodipterinae**
    - b. Body feeble and flabby, naked, or with feeble cycloid scales. No subocular shelf. Tiny fishes living in shelter ..... 4. **Pseudamiinae**
  - II. 7-9 spines in 1st dorsal. Caudal always forked, never rounded. Scales weak, easily shed, mostly cycloid. Deep water ..... 5. **Synagropinae**



# 1. Subfamily Apogoninae

Mostly small fishes, chiefly found in shallow tropical seas, a few in deeper cooler waters. Body well compressed, oblong, ovate, to almost orbicular, rarely elongate, with ctenoid scales, rarely more than 40 series, lateral line present, complete or incomplete. Caudal rounded, truncate, emarginate, or forked. Villiform teeth in bands on most of each jaw, sometimes absent, outer series rarely enlarged. Never any canines. Fine teeth on vomer, sometimes absent from palatines. Gillrakers feeble to well developed, not more than 30 on first arch. Numerous species in all tropical seas. Remarks about systematic problems in these fishes made in the introduction under Apogonidae apply with special emphasis to this subfamily in which there are groups of closely related species that are shown to be different only by the closest and most detailed study of many specimens. In addition there has been wide divergence of opinion about cleavage of these fishes at generic level. During the past 100 years numerous genera have been proposed, but the recognition accorded by different workers ranges widely from the dumping of almost all species into the single genus **Apogon**, Lacepede, as favoured by Schultz 1940, and followed by Lachner 1953, to the varied choice of Whitley & Munro for the Australian fauna. When numerous species in a family show considerable diversity of form, and fall naturally into groups on that basis, as in this case, to lump them all together in one genus is out of keeping with the standards adopted in most other families.

More than a hundred species in this subfamily have been recorded from the Western Indian Ocean. In this revision 45 are recognised. These appear to fall naturally and conveniently into 15 reasonably clear-cut genera as defined below.

## Apogoninae Key to Genera

- |  |                              |
|--|------------------------------|
| A. Scales all cycloid, easily shed .....   | B                            |
| AA. Scales mostly ctenoid, strong .....  | C                            |
| B. Less than 30 series of scales. Shallow water .....  | 1. <b>Rhabdamia</b>          |
| BB. More than 30 series of scales. Deep water .....  | 2. <b>Epigonus</b>           |
| C. More than 12 rays in anal fin .....   | 3. <b>Archamia</b>           |
| CC. Less than 12 rays in anal fin .....  | D                            |
| D. Lateral line complete .....   | E                            |
| DD. Lateral line incomplete .....  | G                            |
| E. More than 30 scales in L.1. ....  | 4. <b>Lepidamia</b>          |
| EE. Less than 30 scales in L.1. ....   | F                            |
| F. 6 spines in 1st dorsal .....  | H                            |
| FF. 7 spines in 1st dorsal .....   | J                            |
| FFF. 8 spines in 1st dorsal .....  | 5. <b>Neamia</b>             |
| G. No palatine teeth .....   | 6. <b>Fowleria</b>           |
| GG. Palatine teeth present .....   | 7. <b>Foa</b>                |
| H. Caudal distinctly rounded and preopercle ridge spinose .....  | 8. <b>Asperapogon nov.</b>   |
| HH. Caudal not distinctly rounded and preopercle ridge entire .....  | I                            |
| I. Depth of body more than half length. Procurrent spiny rays in caudal. More than 20 formed rakers. ....                                  | 9. <b>Sphaeramia</b>         |
| II. Depth of body less than half length. No procurrent spiny rays in caudal. Rarely more than 20 formed rakers .....                       | 10. <b>Apogon</b>            |
| J. Whole preopercle ridge as well as suborbital strongly spinate .....   | 11. <b>Pristiapogon</b>      |
| JJ. Preopercle ridge smooth, or if any spines only at angle, and few points .....  | K                            |
| K. Caudal distinctly rounded .....   | L                            |
| KK. Caudal not distinctly rounded .....  | M                            |
| L. No palatine teeth. Not more than 6 formed rakers. Angle of preopercle ridge smooth. Tiny fishes, shallow water .....                    | 12. <b>Apogonichthys</b>     |
| LL. Palatine teeth present. More than 10 formed rakers. Angle of preopercle ridge spinose or escalloped. Larger fishes, deeper water ..... | 13. <b>Jaydia nov.</b>       |
| M. Caudal subtruncate to feebly emarginate .....   | 14. <b>Apogonichthyoides</b> |
| MM. Caudal distinctly emarginate or forked .....   | 15. <b>Ostorhynchus</b>      |



1. **RHABDAMIA** Weber, 1909  
(*loamia* Fowler & Bean, 1930)

Type **Rhabdamia clupeiiformis** Weber, 1909 = **R. gracilis** Bleeker, 1856. Compressed rather elongate translucent body covered with fewer than 30 series of thin cycloid scales. Preopercle ridge and margin smooth. Lateral line complete. Mouth moderate, oblique, no canines, fine teeth in narrow bands in jaws, teeth on vomer, palatines edentate or with few teeth. First dorsal of 6 spines, 2nd of 9-10 rays. Anal with 9-13 soft rays. Pectoral of 13 rays. Gillrakers well developed, slender, total 13-27. Caudal well forked. This genus is well defined and worthy of retention. Tiny translucent fishes, Indo-Australian area, 2 species now found over much of the W. Indian Ocean, easily distinguished, possibly merit subgeneric distinction.

- A. 9 anal rays. 11 lower gillrakers ..... **cypselurus**  
B. 12-13 anal rays. 21 lower gillrakers ..... **gracilis**

**RHABDAMIA CYPSELURUS** Weber, 1909. (PI 46, C) Weber 1909, 167 (E. Indies); and 1913, 242, fig. 60 (E. Indies). Weber and de Beaufort 1929, 358, fig. 86 (E. Indies). Smith 1955, 690 (Aldabra). D VI+I 9. A II 9. P 2,9,4. L.1. 25. Tr 2/6. Predorsal 5. 2 cheek scales. Gillrakers 2-3+1+10, slender. Depth about 3.6, head about 2.6 in body. Eye 3.1 in head, 1.2 times snout, 1.6 times interorbital. Preopercle ridge and margin smooth, no opercles serrate. Mouth moderate, maxilla end expanded, reaches below mid-eye. In upper jaw narrow band of villiform teeth, in lower on side a single series of sharp recurved teeth, 2-3 series of smaller teeth in front. Angular row of irregular small teeth on vomer, none on palatine. Tongue spatulate. Dorsal fins well apart, spines of 1st fin slender, 1st spine about equals eye, 2nd longest, 3rd shorter 1.2 times eye, front soft rays highest, edge of fin concave. 2nd anal spine 3 times 1st and is little less than eye, soft rays highest, edge of fin concave. Mid-pectoral rays longest, 1.5 in head, reach beyond anal origin. Pelvic 2.5 in head, to anus. Caudal well forked. Scales cycloid, thin, lateral line tubes slender, distinct, each with fine expansion above and below at base. In life translucent with faint colours as in PI 46, C. Preserved more or less uniform yellowish with traces of dark line from snout to eye and beyond. 10 specimens, 45-56mm length, from Pinda (14°S) northwards along E. Africa and adjacent islands to 4°S, also Aldabra and Seychelles, nowhere more than a rarity. Previously known only from E. Indies and Phillipines, my specimens clearly agree with descriptions and illustrations of specimens from there.

**RHABDAMIA GRACILIS** (Bleeker), 1856. **Apogonichthys gracilis** Bleeker, 1856, 371; and 1877, pl. 63, fig. 2 (E. Indies). **Apogonichthys nudus** Regan 1905, 321, Pl. 3, fig. 6 (India). **Rhabdamia gracilis** Weber & de Beaufort 1929, 357, fig. 85 (Singapore, E. Indies). Smith 1955, 690 (Aldabra). D VI+I 9. A II 12-13. P 2,9,2. L.1. 25. Tr 1½/7. Predorsal 4. Cheek scales biserial. 6+1+20 slender gillrakers.

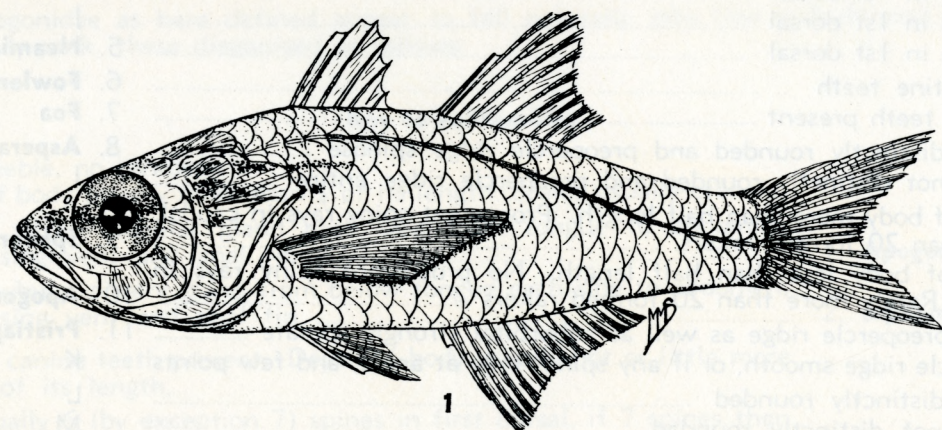


Fig. 1. **Rhabdamia gracilis** (Blkr). 60mm (Pinda).

Depth 3.4, head 2.6 in body. Eye 3 in head, 1.3 times snout and interorbital. Preopercle ridge and margin smooth, no opercles serrate. Mouth moderate, lower jaw projects, maxilla end expanded, reaches below front of pupil. Fine teeth in single series on sides of jaws, irregularly biserial in front. Feeble small teeth on vomer, a few on head of palatine. Dorsal fins well apart, spines of 1st fin slender, the 1st equals 4th, almost equal eye, 2nd and 3rd subequal, longest, little



exceed eye. 1st anal spine  $\frac{1}{4}$  of 2nd, which is little less than eye. Pectoral with 2 upper and 2 lower rays simple, 1.1 in head, the 2nd upper simple ray longest, to above mid-anal. Pelvic 2 in head not to anal. Caudal well forked. Scales cycloid, thin. Lateral line tubes prominent, with large flaps above and below. Predorsal scales reach halfway to eye. In life translucent pink, preserved, uniform yellowish, some adults with a line of fine black dots from top of operculum along side to beyond pectoral apex. 12 specimens, 35-60mm length, from among coral debris and in tide pools, Bazaruto (21°S) northwards, at several localities in E. Africa to 4°S, Zanzibar and Aldabra. Previously known from tropical Western and Mid-Pacific and India, nowhere more than a rarity. Bleeker's original 1877 figure is inaccurate in many respects.

## 2. *Epigonus* Rafinesque, 1810

(*Hynnodus* Gilbert, 1903. *Parahynnodus* Barnard, 1927).

Type *Pomatomus telescopus* Risso, 1810 (Atlantic). Elongate body with 45 or more series of cycloid scales. No front ridge on preopercle. Eye large. Mouth large, with fine teeth in bands on jaws and palate, or sometimes entirely absent. First dorsal of 7 spines. Moderate sized fishes of deep water of all major oceans. *Epigonus telescopus* Risso, 1810 was recorded from E. Arabia by Steindachner 1902 (07), 162 without quoting authority. *telescopus* is otherwise known only from deep water of the Atlantic. This group is in need of critical revision. Fowler describes as *telescopus* Risso, a 382mm specimen from Natal, shallow water, giving D VIII+I 12. A II 12. L.I. 50. Gillrakers (5)4+11(6). Teeth on vomer and palatine. *E. telescopus* has D VII+I 9. A II 9. and no palatal teeth. Barnard 1927, described, as *telescopus* Risso, a 500mm specimen from 500 fathoms off Saldanha Bay, giving D VII+I 10. A II 9. 15 lower gillrakers. Palatines toothed. *E. macrops* Gilchrist and von Bonde, 1924 from 500 fathoms off S.W. Africa has D VII+I 9. A II 9. Gillrakers 9+1+20 and no palatal teeth. Closely related is *E. occidentalis* Goode & Bean, 1895 which has D VII 9. A II 9. 16 lower gillrakers, no palatal teeth.

The genus is however known from the Pacific, Matsubara (Journ. Imp. Fish. Inst. 1936, vol 31, 122, fig. 1, B) describes *robustus* Barnard, 1927 from Japan. It may therefore be accepted that the genus occurs in the intermediate Indian Ocean as well, the type of *robustus* having been taken in deep water off Cape Point, S.Africa. As shown below, *Parahynnodus robustus* Barnard, 1927 proves to be identical with *Epigonus macrops* Gilchrist and von Bonde, 1924 from 500-600 fathoms off St. Helena Bay (S.A.). 2 species are known from the Western Indian Ocean.

A. Spine in 2nd dorsal, 2nd anal spine and pelvic spine all as long as eye **macrops**

B. These spines all half eye diameter ..... **atherinoides**

**EPIGONUS MACROPS** Gilchrist & von Bonde, 1924. *Epigonus macrops* Gilchrist & von Bonde 1924, 14, Pl 1, fig. 3 (W. Cape 600 fms) Barnard 1927, 523 (Rec). *Parahynnodus robustus* Barnard 1927, 525 (W. Cape 460fms). *Hynnodus robustus* Smith 1949, 210, fig. 495 (Cape Point). *Epigonus robustus* Matsubara 1936, 122, fig. 1 B (Japan).

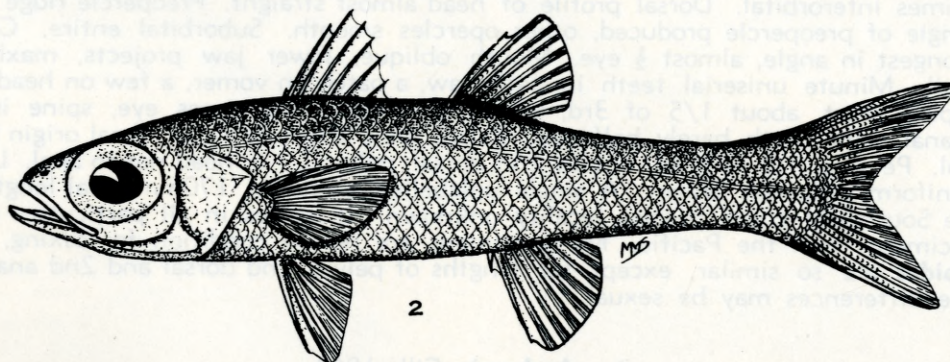


Fig. 2. *Epigonus macrops* Gilchrist & von Bonde, 190mm

D VII+I 9. A II 9. P 1,14,2. L.I. about 50. Tr 3-4/10. Predorsal about 15, end over mid-eye. Gillrakers 9+1+20. 6 pyloric caeca. Depth about 5, head 3.2 in body. Eye 2.4 in head, exceeds snout, 1.3 times interorbital. Preopercle ridge with flat spine at angle, the margin entire. One sharp opercular spine. Gillrakers well developed, longest in angle, about half eye. Lower jaw projects slightly, maxilla extends to below front of pupil. No teeth in jaws or on palate, or at



most faint asperities. 1st dorsal origin behind pectoral base, 1st spine short, about  $\frac{1}{4}$  of 2nd, which is  $\frac{2}{3}$  of 3rd, this subequal with 4th, longest, 1.2 times eye, last spine  $\frac{1}{2}$  of 3rd. Spine of 2nd dorsal equals eye, soft rays higher,  $1\frac{1}{2}$  times in front. Hind edge of anal base about 2.5 times eye from caudal origin. Anal origin below middle of 2nd dorsal, 2nd spine about equals eye. Pectoral about 1.7 in head, tip not below 2nd dorsal. Pelvic 2.2 in head, not to anus. Caudal broken, but clearly forked. Least depth of peduncle about equals eye. Scales mostly lost, pockets visible. L.1. little curved, tubules large. As preserved, uniform yellow-brown. A single specimen, 162mm standard length, about 190mm total, one of a number of unlabelled deep sea fishes from the remnants of the S.A. Fisheries Survey collection. From the nature of the other specimens and from its close agreement with the original description I conclude that this was Gilchrist & von Bonde's type of **macrops** from 600 fathoms off S. Helena Bay. I have compared Barnard's type of **Parahynnodus robustus** S.A. Museum No. 13080, from 460 fathoms off Cape Point, kindly lent by Dr. F. Talbot of the S.A. Museum. This type is in shocking condition, but I can find nothing to distinguish it from **macrops** Gilchrist & von Bonde. Another specimen 22846 from the S.A. Museum, 180mm total length taken in experimental deep trawling off the Cape in 1959 is in better condition. It agrees with the above in every particular, shows a forked caudal, has 10+1+21 gillrakers, and asperities on the vomer. **Epigonus lenimen** Whitley, 1935 from Australia does not appear to be different.

**EPIGONUS ATHERINOIDES** (Gilbert), 1903. **Hynnodus atherinoides** Gilbert 1903, 618, Pl 79 (Hawaii). Smith 1949, 210 fig. 459a. Fourmanoir 1957, 86, (Comores). **Hynnodus megalops** Smith & Radcliffe 1912, 445, Pl 38, fig. 3 (Philippines). **Sceptarias fragilis** Jordan & Jordan 1922, 45, Pl 2 (Hawaii). **Epigonus atherinoides** Matsubara 1936, 120 fig. 1A (Japan).

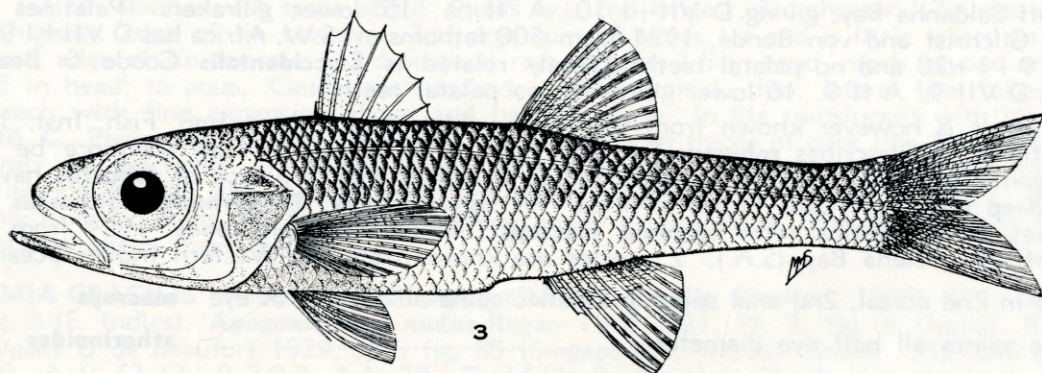


Fig. 3. **Epigonus atherinoides** (Gilbert) 170mm

D VII+I 10. A II 8. P 3,15,2. L.1. about 50. Tr 3/9. 11 predorsal to mid-eye. Gillrakers 9+1+20. About 10 pyloric caeca. Depth about 5, head about 3.5 in body. Eye 2.8 in head, twice snout, 1.2 times interorbital. Dorsal profile of head almost straight. Preopercle ridge smooth, hind margin of angle of preopercle produced, other opercles smooth. Suborbital entire. Gillrakers well developed, longest in angle, almost  $\frac{1}{2}$  eye. Mouth oblique, lower jaw projects, maxilla to below front of pupil. Minute uniserial teeth in each jaw, a patch on vomer, a few on head of palatines. 1st dorsal spine short, about  $\frac{1}{5}$  of 3rd, which is longest, 1.2 times eye, spine in 2nd dorsal equals 2nd anal spine, both barely half eye. Pelvic spine about  $\frac{2}{3}$  eye. Anal origin below middle of 2nd dorsal. Pectoral 1.8 in head, not to 2nd dorsal, pelvic 2.1 in head not to anal. L.1. complete. Preserved, uniform yellowish brown. A single unlabelled specimen, 170mm total length, from deep water of the Southwest coast, precise locality unknown. It agrees in all particulars with descriptions of specimens from the Pacific. My specimens are not in condition for sexing, but **macrops** and **atherinoides** are so similar, except for lengths of pelvic, 2nd dorsal and 2nd anal spines, that I suspect the differences may be sexual.

### 3. **Archamia** Gill, 1864.

Type **Apogon bleekeri** Gunther, 1859 = **lineolatus** C & V, 1828. Compressed body with large ctenoid scales, some in front cycloid, the head mostly naked. Inner preopercle ridge smooth, hind margin serrate. Mouth large, oblique, no canines. Small sharp recurved teeth in front of jaws, continue laterally in lower, replaced by lateral villiform band in upper jaw, uniserial teeth on vomer and palatines. Total gillrakers 19-24, the upper few knoblike. Lateral line complete. First dorsal of 6 spines. Anal with (12)13-18 soft rays. Caudal emarginate. Small fishes of delicate





# PLATE 46

A. *Archamia mozambiquensis* n. sp. Type 84 mm. (Is. Mozambique). B. *Archamia fucata* (Cantor), 80 mm. (Pinda). C. *Rhabdamia cypselurus* Weber., 50 mm. (Pinda). D. *Ostorhynchus fleurieu* Lacep., 120 mm. (Pinda). E. *Apogon nigripes* Plyfr., 60 mm. (Inhambane). F. *Neamia octospina* Smith & Rdcife., 48 mm. (Zanz.). G. *Apogon leptacanthus* Blkr., 45 mm. (Pinda). H. *Apogon fragilis* n. sp. Type 47 mm. (Pinda). I. *Ostorhynchus endekataenia* (Blkr.), 80 mm. (Inhaca). J. *Ostorhynchus angustatus* (Smith & Rdcife.), 93 mm. (Inhaca).



colours of shallow waters of the tropical Indian and Western Pacific Oceans. Basically the species are much alike, falling into 2 groups distinguished either by anal fin and gillraker counts or by markings. A number of species have been described, but few early types survive and there has been considerable confusion. Probably not more than 5 or 6 widely distributed species occur, 3 in our area, distinguished as below. The following records from the W. Indian Ocean are not certainly identifiable

1. **Apogon lineolatus** Angot 1950, 459 (Madag).
2. **Apogon macropteroides** Playfair 1866, 20 (Zanz). Sauvage 1891, 513 (Zanz).
3. **Apogon macropterus** Sauvage 1875-91, 141 (Madag). Steindachner 1902, 162 (Arabia). Pellegri 1907, 204 (Madag).
4. **Apogon zeylonicus** Peters 1855, 234 (Mozamb).
5. **Archamia lineolata** Fourmanoir 1957, 85, fig. 61 (Comores).

### KEY TO W. INDIAN OCEAN SPECIES

- A. 13-15 anal rays, mostly 14. Gillrakers total average more than 21.  
10 divided pectoral rays.
  - I. Gillrakers total average 22. About 13 narrow red bars across body.  
Dark spot at caudal base 2-2.5 in depth of peduncle ..... **lineolata**
  - II. Gillrakers total average 23. Orange stripes or spots along body,  
none or few red cross-bars. Dark spot at caudal base small, 3-4  
in peduncle depth ..... **mozambiquensis nov.**
- B. 16-17 anal rays. Gillrakers total average 20. 20 or more narrow  
curved red bars across body. Dark spot at caudal base variable,  
1.5-2.5 in depth of peduncle. 9 divided pectoral rays, upper simple  
ray longest ..... **fucata**

**Apogon argenteus** Valenciennes 1832, 60, from Vanicolo, described as having D VI+I 9, A II 14, with a black spot at caudal base but no vertical bars, was placed by Lachner 1951, 591 in the synonymy of **Archamia lineolata** (C & V). By kindness of Dr. J. Guibe I have been able to examine Valenciennes, 1832 type of **argenteus**; Paris No. 8755, 60mm total length. It is fragile but in good condition. I find D VI+I 9; A II 14; P 2,10,2. (2)3+1+16 gillrakers. Depth 3.0, head 2.8 in body. Eye 3.8 in head. The preopercle ridge has a blunt process at the angle, while the whole extent of the margin is serrated, more coarsely at angle. The black spot at caudal base has largely faded, but on one side its extent still shows fairly clearly, indicating it as about half peduncle depth. In its gillraker, pectoral fin, and anal fin counts this fish falls in the first division of the above key with **lineolata** C & V, and **mozambiquensis n.sp.** but in its notably less deep body, smaller eye and upper limb of preopercle margin serrate it differs clearly from both and almost certainly merits acceptance as a distinct species. Dr. W. Klausewitz has sent me 2 small specimens from Maldives, each about 35mm in length, labelled **Archamia argentea** Val. These have D VI+I 9, A II 15-16, (2?)3+1+14 gillrakers. Depth equals head, 2.5 in body, no cross-bars, a caudal spot about half depth of peduncle. These differ from any described here, and possibly represent a new species.

**ARCHAMIA LINEOLATA** (C & V), 1828, (PI 50, H). **Apogon lineolatus** C & V 1828, 160 (Red Sea). Ruppell 1828, 47 PI 12, fig. 1 (Red Sea). Ruppell 1835, 85 (Red Sea). Klunzinger 1870, 710 (Red Sea). **Apogon macropterus** C & V, 1828, 160 (Java). **Apogon zeylonicus** C & V 1829, 491 (Ceylon). By kindness of Dr. W. Klausewitz I have been able to examine one of Ruppell's specimens 52mm standard length, from the Red Sea, No. 1263 Senckenberg Mus. (PI 50, H). This has D VI+I 9, A II 13, P 2,10,2. L.1. 25. Tr 2/6. Predorsal 6. Gillrakers (3)3+1+15, total 22. Depth equals head, 2.5 in body. Eye 3 in head, 1.7 times snout, 1.3 times interorbital. Preopercle ridge smooth, produced into flat triangular spine at angle; hind margin finely serrulate above, more coarsely below. Mouth oblique, maxilla below hind pupil margin, fine villiform teeth in narrow bands in each jaw, only fine remnants on vomer and palatine (crumbled from age?). First dorsal spine about  $\frac{1}{3}$  of 2nd, which is longest,  $1\frac{1}{2}$  times eye. Soft rays of median fins broken. 2nd upper divided pectoral ray longest, reaches halfway along anal. Pelvic not to anal origin. Two scale rows on cheek and on opercle, head otherwise naked, predorsal scales end before hind edge eye. In life stated to be pink with 13 narrow angular reddish bars round body, a dark spot at caudal base. As preserved yellowish, also traces of 13 narrow cross-bars down sides, circular black spots at caudal base, 2.3 in peduncle



depth. It is curious that there has been no certain record or description of any Red Sea specimen since those found by Ruppell. Dr. J. Guibe states that the types of *lineolatus* C & V, 1828, and of *macropterus* C & V, 1828 cannot be found, but C & V's original description, while brief, mentions "13 lines" across the body. The species is reported by Lachner 1951, 591 to extend to the Pacific, his specimens show: D VI+I 9. A II 13-15 (Av 14). Gillrakers (1-3)3-4+1+14-16, total 21-24 (Av 22.1). No colour description, but dark spot at caudal base variable from obscure to dark, in adults averages 2.0-2.5 in depth of peduncle. Generally stated to have 13 reddish lines encircling the body as in Ruppell's 1828 colour plate 12, fig 1 (Red Sea), and to reach 76mm, but Lachner's 1953, Pl 39A of a Pacific fish shows at least 18 lines across the body. It is curious that among many specimens of *Archamia* in the W. Indian Ocean we did not find this species.

***Archamia mozambiquensis* n. sp. (Pl 46, A)**

**Apogon (Archamia) sansibaricus** Pfeffer 1893, 7, Pl 3, fig. 5 (Zanz. in part) **Apogon macropteroideus** (non Bleeker, 1852) Var.b, Playfair 1866, 21 (Zanz.) **Archamia lineolata** (non C & V), Fowler 1925, 219 (Del.Bay). **Archamia macroptera** (non C & V), Smith 1949, 206, Pl 23 fig. 489 (Inhaca). **Apogon lineolatus** (non C & V) Barnard 1927, 516 (Natal, Delagoa). D VI+I 9. (10). A II 13-15 (Av 14). P 2,10,2. L.1. 23-25. Tr 2/6. Predorsal 5. Gillrakers (2-3)3-4+1+16, total 22-24 (Av 23). Depth about 2.5, head 2.8 in body. Eye about 3 in head, 1.7-2 times snout, 1.2 times interorbital. Preopercle ridge irregular, produced to blunt flat spine at angle; hind margin above angle mostly smooth, fine serrae near angle, few larger about angle below. Mouth oblique, lower jaw projects slightly, maxilla to below hind edge pupil, less far with age. Fine villiform teeth in narrow bands in jaws, in upper uniserial larger teeth across the front, uniserial small teeth on vomer and palatine. First dorsal spine less than half of 2nd, which is longest, 1.3-1.5 times eye. Front soft rays of dorsal and anal highest, twice eye, edge of anal concave. 2nd anal spine subequal with spine in 2nd dorsal, about 1.2 times eye. Caudal emarginate. Only few large scales on cheek. Predorsal scales not to hind edge eye. In life as **Pl 46, A**, southern Mozambique forms as in Smith 1949, Pl 23, fig. 489, i.e. pinkish with 2 golden stripes along upper side, 1st dorsal dusky, other fins pinkish. Preserved, uniform yellowish, small dark spot at caudal base, usually distinct, 3.5-4 in peduncle depth. Minute dark spots on body. 70-100mm, among weeds inside Inhaca Island, one from Inhambane estuary, a few from inner harbour of Mozambique island, one from Shimoni, Kenya, not found in the open sea. Appears distinct from all others by anal fin and gillraker counts and small caudal spot. Its nearest relatives are *lineolata* C & V, 1828, and *buruensis* Bleeker, 1856, it differs from both in colouration and in the small caudal spot. A male from Inhaca has the mouth full of eggs. By kindness of Dr. W. Ladiges, of Hamburg, I have been able to examine the two (surviving) types of *sansibaricus* Pfeffer, 1893 both from Zanzibar: One is labelled "Lectotype H 397 (originally 6754) Stuhlmann 1888." It is 45mm standard length, has D VI+I 9. A II 16. P 2,9,2. Gillrakers (2)3+1+15=21; spot at caudal base diffuse, faded. This is clearly *fucata* Cantor. The other, "Paratype H 396 (originally 3487) Erichsen" (no date), 68mm total length is a different species. It has D VI+I 10. A II 15. P 2,9,3 (or 2,10,2?). Gillrakers (3)3+1+15=22; spot at caudal base about 3.5 in peduncle depth. It agrees in all particulars with this species described here. In his original description Pfeffer 1893, 7 mentions only 2 specimens, his type "223 Sansibar. 30-V-1888. Ein stuck," and "one other (3487) from Zanzibar" in the Hamburg Museum. This indicates clearly that the 2 specimens from the Hamburg Museum now examined are the same as seen by Pfeffer, and that H 397 (originally 6754) of Stuhlmann 1888 is Pfeffer's orthotype. His description and illustration do not agree. He states D VI+I 10. A II 15-16, whereas his Pl 3, fig. 5 shows D ?+I 8. A II 13, and the caudal spot about 2.5 in peduncle depth. Pfeffer, therefore, like many others before and since confused the 2 species (which he had), viz. the type, which is *fucata* Cantor, and the 2nd specimen, (3487) Erichsen, which is the species described here.

**ARCHAMIA FUCATA** (Cantor), 1850. (**Pl 46, B**). **Apogon fucatus** Cantor 1850, 986 (Sea of Pinang). **Apogon macropteroideus** (non Bleeker, 1852) Var.a, Playfair 1866, 20 (Zanz.) **Archamia lineolata** (non C & V), Smith 1949, 209, Pl 23, fig. 490 (Moz.), and 1955, 690 (Aldabra). **Apogon (Archamia) sansibaricus** Pfeffer 1893, 7 (Zanz. in part). D VI+I 9. A II 16-17 (Av 16.3). (**Pl 46, B** shows in error A II 13). P 2,9,2. L.1. 24-26. Tr 2/6. Predorsal 5. Gillrakers (2-3)2-3+1+13-15, total 20-22 (Av 20.8). Depth about 2.5, head 2.6 in body. Eye 3 in head, 1.6-2 times snout, 1.2 times interorbital. Edge of preopercle ridge irregular below, produced into wide flat spine at angle; hind margin finely serrate above and below. Mouth oblique, lower jaw projects slightly, maxilla to below mid-eye, fine villiform teeth in narrow band on side of upper jaw, across the front uniserial fine larger recurved teeth, a narrow band of villiform teeth in lower jaw, in front slightly larger. First dorsal spine  $\frac{1}{2}$  of 2nd, which is longest, 1.3 times eye, lower than front soft ray of 2nd fin. 1st anal soft ray subequal to front dorsal ray, margins of both fins concave. Upper 2nd simple pectoral ray longest,



reaches to or near mid-anal. 2nd anal spine about equals spine in 2nd dorsal, 1.2 times eye. Predorsal scales to above preopercle ridge. Alive, chiefly as **PI 46, B**, the cross-bars vary to orange. Sometimes a light black-bordered narrow bar from tip of snout to eye. The dark spot at caudal base highly variable from faint and diffuse to large and dense, mostly round and distinct. Preserved, yellowish, speckled darker, faint indications of 22-25 narrow cross-bars as in **PI 46, B**, variable dark spot or blotch at caudal base, about 2 in peduncle depth, sometimes dusky blotch at shoulder. Numerous specimens 50-80mm, Inhaca northwards along E. Africa to 4°S, at many islands in the W. Indian Ocean to Seychelles, and one from the Red Sea kindly sent by Dr. A. Bentuvia is undoubtedly this species, which has not previously been reported from the Indian Ocean or the Red Sea. There has clearly been widespread confusion of species. Jordan & Seale, Fishes of Samoa, 1906, 252 describe **Archamia lineolata** (C & V), as abundant at Samoa. They give C & V's 1828, 160 data, viz. A II 14, but state that they find no specimens with less than 16 soft anal rays and that there are 18 narrow bronzy bars across the body, but their PI 38, fig. 1, shows 15 anal rays and 24 cross-bars, clearly based on **fucata** (Cantor). This species therefore ranges from Southern Africa to the central Pacific, confirmed by Lachner 1953, 477.

#### 4. **Lepidamia** Gill, 1863

Type **Amia kalosoma** Bleeker, 1852, (E. Indies). Rather deep body with more than 30 series of ctenoid scales, at least 3 series above L.1. Caudal emarginate. Seven spines in 1st dorsal. Teeth on palatines. A broad band on vomer. Lateral line complete. Body red with many longitudinal stripes. Rather larger than most species. Chiefly tropical Pacific, several species named, possibly only one, this found in W. Indian Ocean.

**LEPIDAMIA MULTITAENIATA** (C & V), 1828 (**PI 49, A**). **Apogon multitaeniatus** C & V 1828, 159 (Red Sea). Ruppell 1828, 47 (Red Sea). Klunzinger 1870, 713 (Red Sea) and Klunzinger 1884, 20 (Red Sea). Smith 1949, 208, PI 22, fig. 488 (Natal). **Apogon natalensis** Gilchrist & Thompson 1908, 149 (Natal). Barnard 1927, 520 (Natal). **Apogon polylepis** Regan 1919, 197 fig. 1 (Natal). D VII+I 9. A II 8. P 2,12,1. L.1. 35. Tr 3/11. 5 median predorsal. Gillrakers (3-4)2+1+6-7(7) total 19-21, Av 20. Depth about 2.6, head 2.7-2.8 in body. Eye 2.4(J)-3.6(A) in head, slightly exceeds snout, 1.2 times interorbital. Preopercle ridge smooth, margin finely serrate whole length, suprascapula smooth or with a few fine points below. Gillrakers stout, moderately developed. Mouth little oblique, maxilla to below hind margin of pupil. Villiform teeth in bands in each jaw, a broad triangular band on vomer and a triserial band on palatines, wider in front, tongue smooth. First dorsal spine minute, about 1/5th of 2nd which is less than, equal to, or more than 1/2 of 3rd, which is generally longest, about 1.3 times eye. Spines stout, increasingly so with age, in large specimens the 1st spine becomes much reduced and is virtually obsolete, difficult to find. 2nd anal spine stout, slightly exceeds eye. Pectoral 1.6 in head, reaches to or near front of anal, pelvic 1.8-2 in head, not to anal origin. Caudal emarginate. L.1. complete. 8 specimens, 90-180mm, Durban, Inhaca, Bazaruto, Shimon, rarely seen, taken only by bombing at coral. Alive as in **PI 49, A**. Preserved, brown with darker lines along the scale rows, those above lateral line parallel with it, those below horizontal. Base of pectoral dark. 1st dorsal dusky, other fins faint dusky.

#### 5. **NEAMIA** Smith & Radcliffe, 1912

Type **N. octospina** Smith and Radcliffe, 1912. Short rather deep translucent body with less than 25 series of large ctenoid scales. Lateral line complete. Ridge and margin of preopercle both smooth. Mouth large, no canines, villiform teeth in bands in jaws, a few on vomer, none on palatines. First dorsal of 8 spines, deeply notched before but joined to 2nd fin. Caudal rounded. A single small species, Indo-Pacific. Lachner 1953, 442, keys the genotype as having "Lateral line incomplete."

**NEAMIA OCTOSPINA** Smith and Radcliffe, 1912. (**PI 46, F**). Smith and Radcliffe 441, pl 36, fig. 2 (Pelawan, Pac.). Fowler and Bean, 1930, 22. Smith 1955, 689 (Aldabra). D VIII+I 9. A II 8. P 1,16,1. L.1. 21-23. Tr 2/7. 4-5 predorsal. (1)1+1+5(4-5), total 12-13 gillrakers. Depth 2.3 (ripe female) -2.6, head 2.3 in body. Eye 4.5-5, twice interorbital, 1.2 times snout. Predorsal profile fairly convex in young, more gibbous at nape with age, front of snout blunt. None of the opercles with serrae. Gillrakers stout, spinate, above one and below 4-5 spinate knobs. Mouth oblique, maxilla to well behind eye, blunt villiform teeth in bands in jaws and on vomer,



none on palatines. 1st dorsal origin above hind end opercle, 3rd spine longest, about twice eye, hinder spines shorter, last short, almost hidden, joined to base of 2nd fin. 2nd anal spine about equals eye. Soft dorsal and anal rounded. Pectoral about 1.4 in head, reaches beyond anal origin, pelvic about 1.4 in head, not to anal. Caudal rounded. Lateral line complete, tubes wide, with expansion above and below. Alive, translucent pink much as in **PI 46, F**, preserved, almost uniform yellowish with 3 radiating bars from eye. Described from 22 specimens, mostly ripe females (July-Aug.), 35-48mm total length, obtained at various localities from 15°S in E. Africa northwards, also at Aldabra, mostly in coral in tidepools, always rare. An interesting discovery previously known only from the unique type from Palawan, Pacific, not found elsewhere in that ocean. Despite the great distance from the type locality I cannot find any marked difference in my specimens.

6. **Fowleria** Jordan & Evermann, 1902.  
(**Papillapogon** Smith, 1949).

Type **Apogon auritus** C & V, 1831 (Maurit.) Small fishes with ctenoid scales. Seven spines in 1st dorsal. Caudal well rounded. Lateral line incomplete. No teeth on palatines. Few formed gillrakers. Few species, most doubtful, only the type species in the W. Indian Ocean.

**FOWLERIA AURITA** (C & V), 1831 (**PI 51, D**). **Apogon auritus** C & V, 1831, 443, (Mauritius). Klunzinger 1870, 709 (Red Sea). **Apogon punctulatus** Ruppell 1835, 88, **PI 22**, fig. 4 (Red Sea).

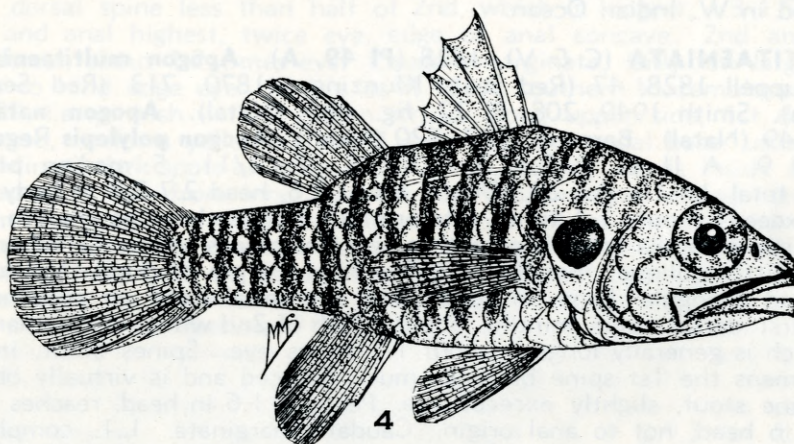
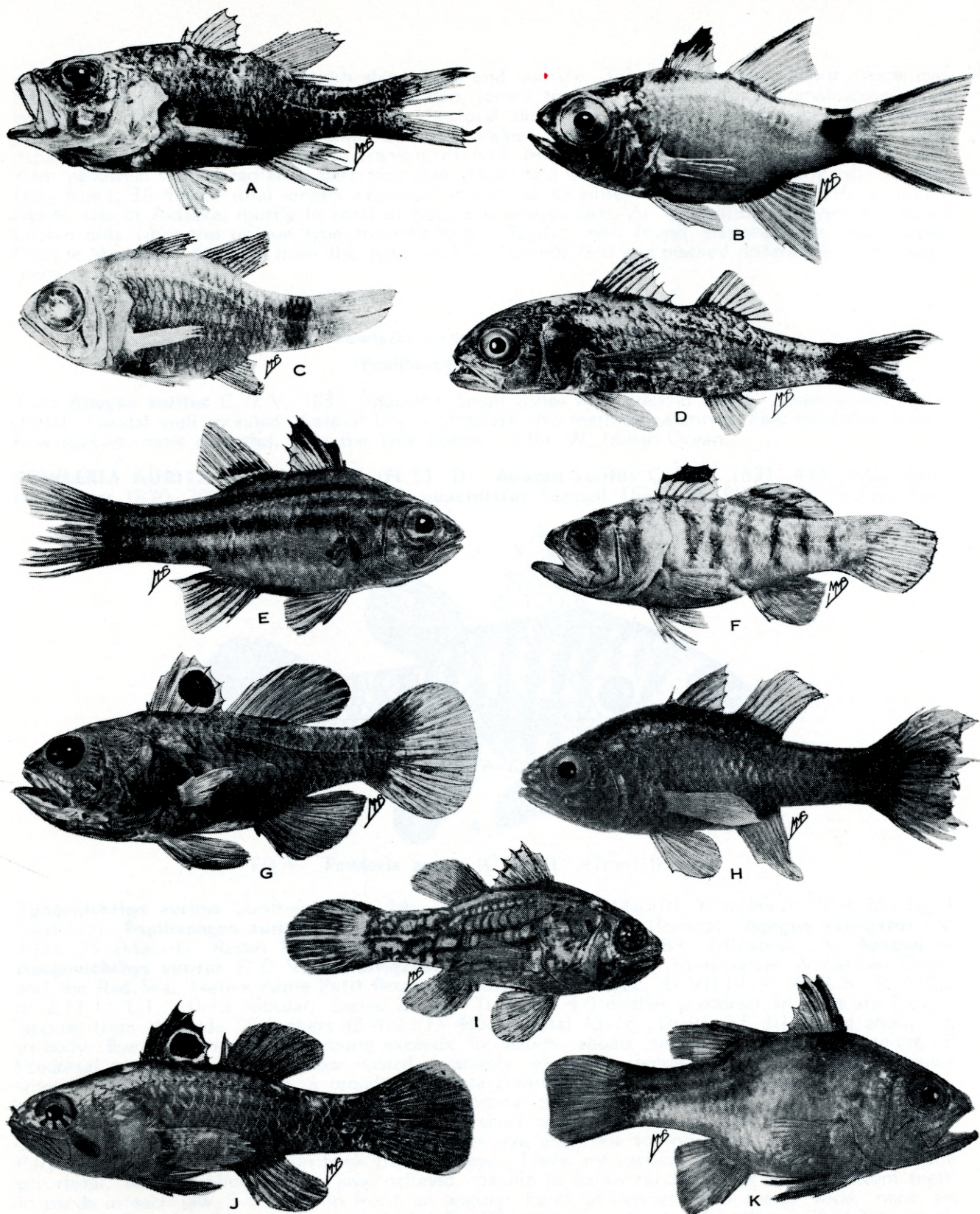


Fig.4. **Fowleria aurita** (C & V). 47mm (Pinda).

**Apogonichthys auritus** Gunther, 1859, 246 (Reunion, Red Sea, Maurit). Klausewitz 1959, 251 fig. 1 (Red Sea). **Papillapogon auritus** Smith 1949, 209, **PI 23**, fig. 491 (Inhaca). **Apogon variegatus** Val 1832, 55 (Maurit). Regan 1908, 224 (Ind. Ocean). Smith 1955, 689. (Aldabra). As **Apogon** or **Apogonichthys auritus** C & V, or **variegatus** Val, numerous records from whole W. Indian Ocean and the Red Sea. Native name Petit Rouge (Maurit), **fide** Baissac. D VII+I 9. A II 8. P 2,10,2 or 2,11,1. L.1. 10-13 tubular. Series 22-23. Tr  $1\frac{1}{2}/6$ . 4-5 median predorsal, in front are 2 overlapping from the side. Gillrakers (3-4)0+1+4(6-7), total 15-16. Depth 2.5-3(J), head about 2.5 in body. Eye 3-3.5 in head, in young exceeds, in adults equals snout about twice interorbital. Predorsal profile straight. Anterior nostril a variably elongate slender tubule. Preopercle ridge smooth, hind margin smooth, a broadly undulate cutaneous flap below. Other opercles and suprascapula smooth. On each side of naked interorbital a line of pores, which joins its fellow over front of snout, each line crossed by about 8-10 short series of pores at right angles in the interorbital. Each line continues backwards over the eye and runs to the upper part of the opercle. Parallel series of fine pores run back from the eye. There are vertical short series of pores on the preorbital. Mouth oblique, lower jaw included, maxilla to below hind edge of eye. Villiform teeth in bands in each jaw, 5-6 series in front, an angular band on vomer, 3-6 series wide, none on palatines. First dorsal spine minute, about  $1/5$  of 2nd which is about or less than half of 3rd, which is longest, or 4th subequal, or little shorter, 3rd about twice eye. Tip of 1st dorsal folded down about reaches 2nd dorsal origin at all stadia. Spine at 2nd dorsal about equals 2nd spine in 1st dorsal, equal or slightly exceeds eye. Pectoral about 1.5 in head, pelvic 1.6 in head. L.1. not complete, ends below end of 2nd dorsal. Alive, mostly as in **PI 51, D**, but extremely variable in





#### PLATE 47

A. *Apogon talboti* n.sp. Type 110mm (Zanz). B. *Ostorhynchus savayensis* (Gnthr). 83mm (Mahe). C. *Ostorhynchus annularis* (Ruppell). Type, 52mm (Red Sea). D. *Synagrops japonicus* (Stndr & Doedrln). 160mm (Natal). E. *Ostorhynchus endekataenia* (Blkr). 88mm (Mozam). F. *Jaydia ellioti* (Day), 120mm (Madag). G. *Jaydia queketti* (Glch). 100mm (Natal). H. *Asperapogon rubellus* n.sp. Type 94mm (Matemo Is). I. *Apogonichthys perdix* Blkr. 55mm, (Zanz). J. *Apogonichthys ocellatus* Weber. 47mm (Bizana). K. *Apogonichthyoides taeniatus* (C & V). 105mm (Inhambane).



markings, most have a light-ringed dark ocellus on opercle, variable in intensity, sometimes absent. The most common form in shallow pools and weeds in the W. Indian Ocean, is more or less irregularly speckled with darker brown, with or without about 9 narrow darker cross-bars. Some specimens have plain fins, in most others they are spotted or speckled. Some specimens show hardly any mottling or spots, being almost uniform, some have bars, others not. In some there is an oblique bar across the cheek from the eye, sometimes on one side only. Buccal eggs are red. I have seen many thousands of these fishes alive and have several hundreds preserved, 25-95mm in length from the whole W. Indian Ocean, usually found among rubble or in weeds in tide pools, one of the most abundant species in tide pools. Lachner 1953, 442 accepts four species, viz. **auritus** C & V; **variegatus** Val, **marmoratus** Alleyne & Macleay and **isostigma** J & S. I cannot satisfactorily divide my material on the basis of his differentiation. While individuals may be selected there is almost complete intergradation in markings. A few lack the opercular ocellus, but all specimens are alike in the basic characters and I cannot but identify them all as **aurita** C & V, regarded as a species highly variable in markings. Dr A. Ben-Tuvia has sent me 2 specimens 40mm length from the Red Sea that lack the ocellus. They exactly resemble mine that are similar.

#### 7. **Foa** Jordan & Evermann, 1905

Type **Fowleria brachygrammus** Jenkins, 1902 (Hawaii). Tiny fishes of shallow waters covered with ctenoid scales. Seven spines in 1st dorsal. Preopercle ridge and margin not spinate. Caudal well rounded. Palatine teeth present. Lateral line incomplete, ends at front of 2nd dorsal. No marked stripes or bars. Only 2 species in the W. Indian Ocean, one of doubtful authenticity.

- |                            |                         |
|----------------------------|-------------------------|
| A. Depth 2.4 in body ..... | <b>brachygramma</b>     |
| B. Depth 2.7 in body ..... | <b>madagascariensis</b> |

**FOA BRACHYGRAMMA** (Jenkins), 1902 (PI 48, C). **Fowleria brachygrammus** Jenkins 1902, 447, fig. 18 (Honolulu). **Foa brachygramma** Jordan & Evermann 1905, 211, fig. 82 (Hawaii). **Apogonichthys zuluensis** Fowler 1934, 424, fig. 10 (Zululand). Smith 1949, 209, fig. 493, PI 22, (Natal & Moz.). D VII+I 9. A II 8. P 2,8,2. L.1. tubes 9-10. Tr 1/5. 3-4 median predorsal. Gillrakers (2)1+1+5(2-4), total 11-13, formed rakers 7. Depth about 2.3, head about 2.6 in body. Eye 3.3 in head, 1.4 times snout, about twice interorbital. Dorsal profile of head straight. Preopercle ridge slightly undulate, hind margin entire, other opercles and suborbital entire. Gillrakers short and stout. Mouth oblique, jaws equal, maxilla to below hind edge pupil. Villiform teeth in bands in each jaw, angular band on vomer, narrow band on palatines. First dorsal spine short, about  $\frac{1}{3}$  of 2nd, which is little more than  $\frac{1}{2}$  of 3rd, which longest, 1.5 times eye. 2nd anal spine about equals spine in 2nd dorsal, subequal to eye. Pectoral 1.5 in head, barely reaches anal, pelvic 1.8 in head, not to anal. Caudal gently rounded. L.1. incomplete, ends below front of 2nd dorsal. Alive as in PI 48, C. Preserved similar, pelvics dark. Numerous specimens 30-70mm, Natal northwards to Mozambique and Kenya, mainly from among weeds. In his 1934, 424, fig. 10, description and illustration Fowler stated and showed only 6 spines in 1st dorsal, stressing this as difference from **brachygramma**. His illustration however shows a dorsal shape typical of 7 spines. At my request Dr. J. E. Böhlke has examined the type of **zuluensis**, ANSP 53447, and finds that 7 spines are present. I can find nothing else by which my specimens may be held to be distinct from the Pacific **brachygramma** Jenkins 1902.

**FOA MADAGASCARIENSIS** Petit, 1931. Petit 1931, 91 (Madagascar). Not seen. D VII+I 9. A II 8. P 10. (Later stated as P 11-12). V I 5. L.1. 22, tubular scales 7-9. Tr 1/5. No information about predorsal scales or gillrakers. Depth 2.7, head 2.8 in body. Eye 2.8 in head 1.2 times maxilla and 1.7 times interorbital, which is flat. Mouth short, 3.5 in head. Villiform teeth on vomer and palatines. Preopercle smooth. Pectoral 4.5 in body, equals pelvic, the latter not to anus. 1st dorsal spine very short, the 3rd twice the 2nd, height of 1st dorsal 5.8 in body. The anal origin is below the 5th branched ray of the 2nd dorsal. Its height is 6.8 in body. Colour (alcohol), brownish, lighter below. Whole body with small brown spots, larger and more widely spaced on ventral scales. Membrane of 1st dorsal dusky, that of 2nd fin lighter. Pelvic light basally and apically, mid-part dusky. Pectoral and caudal light. Two specimens, one 41mm total, the other 34mm standard length. From Saradrano, Madagascar, from weeds and coral sand. Both stated to be females, but earlier Petit states that one of his specimens shows buccal incubation. This species is only doubtfully distinct from **brachygramma**. Its more slender body, depth 2.7 against 2.4 in **brachygramma** inclines me to keep them separate at present. All attempts to track the type (or types) of **madagascariensis** have failed. Dr. Petit states that he left them in Paris, but Dr. J. Guibe has informed me that he cannot trace them in the Museum there.



## 8. *Asperapogon* n. genus

Type *A. rubellus* n.sp. Small fishes with ctenoid scales. Six spines in 1st dorsal. Caudal large and well rounded. Lateral line complete. Teeth on palatines. Preopercle ridge rough, spinulose and escalated. Only the type species. W. Indian Ocean. Differs from related genera in having only 6 spines in 1st dorsal. See Key above.

### *Asperapogon rubellus* n.sp. (PI 47, H and PI 49, D)

D VI+I 9. A II 8. P 2,10,1. L.1. 24-26. Tr 2/9. 7 predorsal. Gillrakers (3)1+1+6(7) total 18, 8 formed rakers. Depth 2.9, head 2.8 in body. Eye 3.1 in head, 1.6 times snout, 1.3 times interorbital. Predorsal profile straight, snout rather blunt. Preopercle ridge rough; hind margin spinulose above, broadly escalated round angle, other opercles and suborbital entire. Gillrakers well developed, one in angle about  $\frac{1}{2}$  eye. Mouth oblique, lower jaw projects slightly, maxilla to below hind edge pupil. Villiform teeth in bands in each jaw, an angular band on vomer, a patch on the head of each palatine. First dorsal spine less than  $\frac{1}{3}$  of 2nd, which is longest, about 1.5 times eye, rest shorter to last, shortest. 2nd anal spine equals eye, little shorter than spine in 2nd dorsal. Pectoral 1.5 in head, reaches above mid-anal, pelvic about 2 in head, not to anal. Caudal notably large, rounded. Lateral line complete. Alive as PI 49, D. Preserved uniform brown, fins light. Only 3 specimens, 2 from Zanzibar, 65 and 100mm, the type 94mm Matemo Is. (Mozambique), taken from coral rubble at low tide. Clearly a rare form, brilliant in life.

## 9. *Sphaeramia* Fowler & Bean, 1930.

Type *Apogon nematoptera* Bleeker, 1856a (Celebes). Small semitransparent fishes with almost orbicular bodies covered with ctenoid scales which extend predorsally into the interorbital. Caudal emarginate, with spine-like procurent rays above and below. Six spines in 1st dorsal. Preopercle ridge smooth, margin denticulate. Teeth on palatines. Lateral line complete. Gillrakers well developed, more than 20 formed rakers. Body with a dark cross-bar from 1st dorsal, and prominent dark spots. This dainty species differs from most others in being free-swimming, often seen as shoals about wrecks and piers. Probably does not merit more than subgeneric distinction but differs from most others in body shape, predorsal scaling and habits, for convenience here given full generic rank. Two species, one from the Pacific, the other, widespread, in the W. Indian Ocean as well.

**SPHAERAMIA ORBICULARIS** C & V, 1828. (PI 48, E). *Apogon orbicularis* C & V, 1828, 155 and 1830, 495 (Java). Meinken, 1938, 171 (Dar Es Sal.) Smith 1949, 206, PI 22 fig. 475 (Mozamb). Smith 1955, 690 (Aldabra). D VI+I 9. A II 8. P 2,9,1. L.1. 24. Tr  $1\frac{1}{2}$ /6. 6-7 median predorsal, anterior in interorbital. Gillrakers (2-4)2-4+1+20, 27 total. Depth 1.9-2, head about 2.5 in body. Eye about 3 in head, exceeds snout, 1.3 times interorbital. Predorsal profile convex. Preopercle ridge smooth, hind margin wholly serrate, other opercles smooth. Gillrakers well developed, longest near angle, equal filaments. Mouth oblique, lower jaw longer, maxilla to below mid-eye. Villiform teeth in bands in each jaw, a narrow angular band on vomer, a narrow band on palatines. First dorsal spine barely  $\frac{1}{7}$  of 2nd which is longest, about twice eye. 2nd anal spine equals or slightly shorter than spine in 2nd dorsal, about 1.6 times eye. Pectoral 1.3 in head, reaches to about mid-anal, pelvic longer, about 1.2 in head, reaches beyond anal origin. Caudal emarginate. L.1. complete. Alive mostly as in PI 48, E, sometimes more greenish when in muddy swamps, dark markings vivid in life. Preserved, dark markings as in PI 48, E. Many specimens 28-100mm, from Delagoa Bay northwards over E. Africa and most Islands in W. Indian Ocean to Aldabra, mostly in turbid areas and mangrove swamps, especially abundant and unusually large inside lagoon at Aldabra. First known, described and recorded chiefly from the Western Pacific, fishes from the coast of Africa appear undoubtedly identical.

## 10. *Apogon* Lacepede, 1802.

Type *Apogon ruber* Lacepede, 1802 (Medit.). Fairly elongate oblong body with ctenoid scales. Six spines in 1st dorsal. Teeth on palatines. Preopercle ridge usually smooth, margin at least partly denticulate or serrate. Caudal emarginate or forked, never rounded. Numerous small reef haunting species, living in all tropical seas, mostly about coral, 9 species in the W. Indian Ocean.



### Key to species in the W. Indian Ocean

A	8 soft rays in anal .....	C
AA	9-10 soft rays in anal .....	B
B	Filamentous spines in 1st dorsal. No spot at caudal base .....	1. <b>leptacanthus</b>
BB	No filamentous spines in 1st dorsal. A dark spot at caudal base .....	2. <b>fragilis nov</b>
C	A dark spot each side at caudal base .....	D
CC	No dark spot each side at caudal base .....	E
D	Narrow dark stripe curves down from opercle, runs to spot at caudal base. 17-18 formed rakers plus rudiments .....	3. <b>lateralis</b>
DD	Distinct dark bar from snout through eye, fades on opercle. 21-22, rakers, all formed .....	4. <b>sangiensis</b>
E	No definite dark bars or stripes on body, at most irregular transverse light and dark areas .....	F
EE	Body with some type of dark bars or stripes .....	H
F	Depth about 2.5 in body. Light zones across body. Pelvics dark. 24-27 formed rakers .....	5. <b>nigripes</b>
FF	Depth 2.8-3.0 in body. 8-17 formed rakers .....	G
G	In life red, body uniform, at most a few small dark blotches about nape. Only 8 formed rakers .....	6. <b>coccineus</b>
GG	Body uniform, a dusky or brown blotch on almost every scale. 17 formed rakers .....	7. <b>talboti nov</b>
H	Depth 2.8. Oblique dark bar from eye to pectoral base. Only 8-9 formed rakers .....	8. <b>semiornatus</b>
HH	Depth 3.5. Two stripes along body, one into caudal. 22-23 formed rakers .....	9. <b>kiensis</b>

1. **APOCON LEPTACANTHUS** Bleeker, 1856 (PI 46, G). *Apogon leptacanthus* Bleeker 1856, 204 (E. Indies). Bleeker 1873, 97, PI 71, fig. 3 (E. Indies). Smith 1955, 690, (Aldabra). D VI+I 9. A II 9. P 2,9,3. L.1. 24. Tr 2/6. 5 median predorsal. Gillrakers 6-7+1+21-22. Depth 2.2, head 2.6 in body. Eye about 2.5 in head, exceeds snout, twice interorbital. Predorsal profile concave over eye. Preopercle ridge irregular but not denticulate, hind margin vertical limb more or less smooth, small spines round angle and retrorse on lower margin. Suprascapula smooth. Mouth oblique, lower jaw longer, maxilla to below front edge of pupil. Villiform teeth in narrow bands in each jaw, narrow angular band on vomer, a few feeble asperities along palatines. First dorsal spine about 2/3 eye. 2nd usually filamentous may reach almost or to caudal base, 3rd and 4th also filamentous but progressively shorter, 5th about 1.5 times as long as 1st, 6th shortest, shorter than 1st. 2nd anal spine about 1/2 of spine in 2nd dorsal, which about equals eye. Pectoral about 1.4 in head, to or beyond mid-anal, pelvic 2 in head, not to anal. Caudal emarginate. L.1. complete. Alive as in PI 46, G preserved almost uniform yellowish brown, head with many fine spots chiefly about eye. Filamentous 1st and 2nd dorsal spines dusky. In life translucent pink with dark alimants visible. Many specimens, 30-55mm, from 14°S in East Africa northwards and at most Islands to Seychelles. Nowhere abundant, sometimes found as small shoals at coral heads in deepish water, quickly take refuge when startled.

### 2. *Apogon fragilis* n.sp. (PI 46, H).

**A.hypselonotus** (non Bleeker), Smith 1955, 690, (Aldabra) D VI+I 9. A II 9 (one has A II 10). P 2,9,3. L.1. 24. Tr 1½/6. 5 median predorsal. Gillrakers 5+1+20-21. Depth equals head, about 2.6 in body. Eye about 3 in head, exceeds snout, 1.6 times interorbital. Predorsal profile gently concave above eye. Preopercle ridge smooth, hind margin smooth above, denticulate below, other opercles entire. Gillrakers well developed. Mouth oblique, lower jaw longer, maxilla to below mid-eye. Villiform teeth in narrow bands in each jaw, at most a narrow angular band of faint asperities on vomer, none apparent on palatines. First dorsal spine slightly exceeds ½ of 2nd, which is longest, about 1.5 times eye, the tip flexible, 6th spine shortest. 2nd anal spine about equals spine in 2nd dorsal, which about equals eye. Pectoral 1.3 in head, reaches anal origin, pelvic 1.8 in head, reaches anal. Caudal forked. L.1. complete. Alive translucent, with delicate



colours as in **PI 46, H**. Preserved: uniform milky yellow, snout dusky, minute dark specks about head, front and tip of 1st dorsal dusky, a 2/3 pupil diameter distinct black spot median on end of lateral line at caudal base. Many specimens, 40-52mm some from Pinda (Moz.) a number from Seychelles, by bombing about coral in deepish water. It is almost certainly this fish that Fowler & Bean 1930, 91 have named **hypsilonotus** Bleeker, 1855 and state it to be the male form of **leptacanthus** Bleeker, 1856. While this fish and **leptacanthus** are remarkably in agreement in way of life and in many characters we did not ever find them in the same shoal, and I find ripe females in both forms. **hypsilonotus** Bleeker is described by Bleeker 1855, 309 (and later) as having D VII, confirmed by Weber & de Beaufort 1929, 309 so that this name can scarcely be applied to the fish described here. Fowler & Bean further put **Amia gilberti** J & S. (1905) from Philippines in the synonymy of **hypsilonotus** and **leptacanthus** (repeated by Herre 1953, 309) but this has little to support it. My specimens agree closely with the original description of **gilberti** by Jordan & Seale 1905, 777, fig. 3 (Negros), but differ in having no sign of the distinct black spot on the opercle shown and described by them as characteristic of **gilberti**. **gilberti** does not seem to have been described again, certainly not from any part nearer the Indian Ocean, so this Africa fish is at present held as distinct. The type, 47mm (Pinda).

3. **APOGON LATERALIS** Valenciennes, 1832 (**PI 48, F**). **Apogon lateralis** Valenciennes 1832, 58 (Vanicolo). Guichenot 1866, 145 (Madag). Bleeker & Pollen, 1875, 93 (Rec.Madag). Sauvage 1875-91, 513, (Rec.Madag). Lachner 1953, 446, PI 34 A (Marshall Is.). **Amia ceramensis** Bleeker 1852, 91; and 1876, PI 58, fig. 1 (E. Indies). **Apogon hyalosoma** (non Bleeker) Playfair 1866, 19; and 1867, 850 (Seychelles). Bleeker & Pollen 1874, 93 (Seych). Sauvage 1875-91, 513 (Seych). Dupont 1927, 238 (Seych). D VI+I 9. A II 8. P 2.10.2. L.1. 24. Tr 2/6. 5 median predorsal. Gillrakers (3)4+1+12-13(4), total 24-25. Depth 2.5, head 2.6 in body. Eye 3.8 in head, about equals snout, 1.3 times interorbital. Predorsal profile concave above eye. Preopercle ridge smooth, hind margin finely denticulate above, more coarsely about angle and below, other opercles smooth. Gillrakers well developed. Mouth oblique, jaws about equal, maxilla to below mid-eye. Villiform teeth in bands in each jaw, a moderately wide subangular band on vomer, a band on palatines. First dorsal spine less than  $\frac{1}{3}$  of 2nd, which is equal to or little shorter than the 3rd, this about 1.5 times eye. 2nd anal spine about equals eye, spine in 2nd dorsal longer, about 1.2 times eye. Pectoral about 1.5 in head, reaches anal origin, pelvic 2 in head, not to anal. Caudal forked. L.1. complete. In life as **PI 48, F**: preserved milky yellow, interorbital, snout, and area behind eye on opercle dusky. A narrow dusky line along body from hind angle of opercle slightly down, runs along mid-side to caudal base where ends in small black spot, this more prominent in live fish. Front and apex of 1st dorsal black. A dusky line along out from anal base, fins light. 14 specimens 60-90mm, all from Mahé, Seychelles in mouth of small stream, found by us nowhere else in the W. Indian Ocean. Lachner 1953, PI 34 A, is not a good likeness, and does not show the lateral stripe. Previously recorded from Madagascar and Nicobar Is. Playfair's 1866 and 1867 records of **hyalosoma** Bleeker from "Freshwater of Seychelles" are almost certainly erroneous as **lateralis** Val is the only species in fresh or brackish water at Seychelles, in parts we found it abundant. The other records of **hyalosoma** from Seychelles are copied from Playfair.

4. **APOGON SANGIENSIS** Bleeker, 1857. (**PI 51, E**). **Apogon sangiensis** Bleeker 1857, 375. Bleeker, 1873, PI 41, fig. 4, (E. Indies). ? Regan 1919, 458 (Rec Natal) ? Barnard 1927, 575 (Rec Natal). Smith 1949, 207 fig. 478 (Mozamb.) Smith 1955, 690 (Aldabra). D VI+I 9. A II 8. P 2.11.2. L.1. 25. Tr  $1\frac{1}{2}$ /6. 4 median predorsal. Gillrakers 5+1+15-16. Depth 2.6 in body, equals head. Eye 3 in head, 1.5 times snout, 1.4 times interorbital. Predorsal profile straight, snout bluntly conical. Preopercle ridge smooth, margin very finely serrate above, larger round angle, and feebly below, other opercles smooth. Gillrakers well developed. Mouth oblique, jaws equal, maxilla to below about mid-eye. Villiform teeth in moderate bands in each jaw, in a narrow angular band on vomer and narrow band on palatines. First dorsal spine short, about 1/5 of 2nd, which is stoutest, slightly shorter than 3rd and 4th, subequal, longest, tip slightly filamentous, about 1.8 times eye. 2nd anal spine about equals spine in 2nd dorsal, about 1.3 times eye. Pectoral about 1.7 in head, to about anal origin, pelvic 2 in head, not to anal. Caudal emarginate. L.1. complete. Alive as in **PI 51, E**. Preserved: milky yellow body and head with fine black speckles, dusky bar from snout through eye, fades on opercle, a half pupil diameter black spot on end of lateral line at caudal base. A blackish area at origin of 2nd dorsal, and a similar one at hind end of base. First dorsal black in front and apically, front of 2nd dorsal and tip of spine black, other fins light. Many specimens, 38-66mm from Mozambique northwards in East Africa and at all islands to Seychelles. Bleeker's 1873, PI 41 fig. 4 is a poor representation of the species.



5. **APOGON NIGRIPES** Playfair, 1866 (PI 46, E). **Apogon nigripes** Playfair 1866, 19, PI V, fig 1 (Zanz.) Barnard 1927, 514 (Mozamb.) Smith 1949, 207, PI 22, fig. 476 (male with buccal eggs Mozamb.). D VI+I 8. A II 8. P 2,11,1. L.1. 23. Tr  $1\frac{1}{2}/6$ . Gillrakers (2-3)3-5+1+20-21 total 28-30. Depth about 2.5, head about 2.8 in body. Eye about 2.6 in head, twice snout, 1.3 times interorbital. Predorsal profile with concavity at occiput, nape prominent in adults. Preopercle ridge smooth, the whole preopercle margin denticulate above and below. Suprascapula serrate. Gillrakers well developed. Mouth oblique, lower jaw projects, maxilla to below front of pupil. Villiform teeth in jaws in very narrow bands. A narrow angular band on vomer, 1-2 series of fine teeth on palatines. 1st dorsal spine short, not  $1/6$  of 2nd, which is stoutest, the 3rd variably subequal, little longer or shorter, always more slender, 2nd and 3rd up to twice eye, the remainder shorten rapidly, but 6th at least double 1st. 2nd anal spine equal to, longer or shorter than spine in 2nd dorsal, about 1.2 times eye. Pectoral 1.4 in head, reaches well over anal fin. Pelvics 1.2 in head, to or well behind anal origin. Caudal emarginate. Alive as PI 46, E, somewhat variable but always with metallic sheen. Preserved: brownish with slightly dusky cross markings as in PI 46, E. 1st dorsal and front of 2nd dorsal dusky, pelvics black, other fins lightish. Many specimens 40-65mm, Inhambane, Island of Mozambique, and Zanzibar, always among weeds in sheltered waters, several males with buccal eggs. In life they appear to drop these eggs, but scoop them up at once when danger threatens. My specimens all have 8 soft rays in the 2nd dorsal fin.

6. **APOGON COCCINEUS** Ruppell, 1835, (PI 49, C). **Apogon coccineus** Ruppell, 1835, 88, PI 22, fig. 5. (Red Sea). Klunzinger 1870, 710 (Red Sea), and 1884, 20 (Red Sea). Klausewitz 1959, 256, fig. 3 (Red Sea). **Apogon erythrinus** Snyder 1902, 526, PI 9, fig. 17 (Hawaii). Lachner 1953, 446 (Marshall Is.). **Apogon doryssa** Schultz 1943, 96 (Bikini). **Amia cardinalis** Seale 1909, 509 (Palawan Pacific). **Apogon campbelli** Smith 1949, 506, PI 97, fig. 479a (Delagoa) and 1955, 690 (Aldabra). D VI+I 9. A II 8. P 2,10,1. L.1. 22. Tr  $1/6$ . 5 median predorsal. Gillrakers (2-3)1+1+6(4-5), 15-17 total. Depth 2.8, head 2.9 in body. Eye 3 in head, twice snout, 1.3 times interorbital. Predorsal profile slightly convex, snout blunt. Preopercle ridge smooth, hind margin denticulate, with scalloped skinny flap below, other opercles smooth. Gillrakers poorly developed. Mouth oblique, maxilla to below hind edge pupil. Villiform teeth in bands in each jaw, an angular narrow band on vomer, a narrow band on palatines. First dorsal spine small, about  $1/4$  of 2nd, which is longest and strongest, 1.8-2 times eye. 2nd anal spine about equals eye, spine in 2nd dorsal slightly longer. Pectoral 1.4 in head, to or beyond mid-anal, pelvic 1.7 in head, not to anal. Caudal emarginate. L.1. complete. Alive as PI 49, C; preserved uniform yellowish brown, fins light, interorbital dark, numerous dark marks on scales along nape and back. Numerous specimens, 35-50mm, from Inhaca north along E. Africa, and at all islands to Seychelles, mainly among coral, taken by poison and explosives. This species, first found in the Red Sea by Ruppell in 1835, must be one of the most widespread of small fishes. Under various names it has been described from a vast area reaching from southern Mozambique to the central Pacific. By kindness of Dr. W. Klausewitz I have been able to examine a specimen from the Red Sea and find that my specimens cannot be distinguished in any way except that **coccineus** from the Red Sea has a total of 18-19 gillrakers. Those from the W. Indian Ocean have 15-17 total, and only 8 formed rakers. Lachner 1953, 446 records Pacific specimens as having 13-17 (mostly 15-16) rakers, and those (**erythrinus**!) from the Red Sea, 17-18. This increased rakers in Red Sea specimens shows in other groups in this family. It is an open question as to whether this should not be expressed by sub-specific distinction. I cannot find any reason for maintaining **erythrinus** as distinct.

#### 7. **Apogon talboti n.sp. (PI 47, A).**

D VI+I 9. A II 8. P 2,9,2. L.1. 24. Tr  $1\frac{1}{2}/7$ . 7 median predorsal. Gillrakers (2)3+1+13. Depth 3, head 2.5 in body. Eye 3.4 in head, exceeds snout, 1.6 times interorbital. Preopercle ridge not denticulate but somewhat irregular: margin denticulate behind, lower edge with undulate skinny flap. Front nostril a low tube with short skinny flap. 1st dorsal spine short, slightly less than  $\frac{1}{2}$  of 2nd which is stoutest and longest, 1.6 times eye. 2nd anal spine equals spine in 2nd dorsal, 1.1 times eye. Pectoral 1.6 in head reaches little beyond anal origin. Pelvic 2 in head, to anal origin. Caudal emarginate. Mouth oblique, lower jaw longer, maxilla to below hind edge pupil. Villiform teeth in moderate bands in each jaw, a narrow angular band on vomer, a single row along palatines, a cluster on the head. Tongue smooth. Live colour unknown. As preserved, brownish, centres of scales darker giving closely mottled appearance. The type and only known.



specimen 110mm length, from Zanzibar, got by Dr. F. H. Talbot by bombing? at coral at Zanzibar. Named in honour of Dr. Talbot from whom many valuable specimens have been received. I cannot find any species to which this can be certainly assigned. In some respects it resembles *trimaculatus* C & V, 1828 (E. Indies) but differs in preopercle ridge not denticulate and in absence of any sign of dark bars.

8. **APOGON SEMIORNATUS** Peters, 1876. (PI 49, E). *Apogon semiornatus* Peters 1876, 436 (Maurit). Bleeker 1879, 11 (Maur). Mobius 1880, 39 (Maur). Peters 1883, 50 (Maurit). Sauvage 1875-91, 513 (Maur). *Apogon warreni* Regan 1908a, 251, PI 42 (Zululand). Barnard 1927, 515 (Copied). Smith 1949, 207, PI 22, fig. 477 (Mozamb). 1955 Smith, 690 (Aldabra). Fourmanoir 1954, 216 (Comores) and 1957, 82 (Comores). D VI+I 9. A II 8. P 2,9,1. L.1. 25. Tr 2/6. 6 predorsal. Gillrakers (0-1)1+1+6-7(3-4), 12-14 total. Depth about equals head, 2.8 in body. Eye 3 in head, exceeds snout, 1.6 times interorbital. Preopercle ridge smooth, produced into a flat spine at angle, hind margin finely serrate on vertical edge, lower edge smooth. Gillrakers feebly developed. Mouth oblique, maxilla to below hind edge of eye. Villiform teeth in bands in each jaw, a few inner in front enlarged, retrorse, a narrow angular band on vomer, a narrow cluster on head of palatines. First dorsal spine short, less than  $\frac{1}{4}$  of 2nd, 3rd subequal, longest, 1.5 times eye. 2nd anal spine equals spine in 2nd dorsal, about 1.2 in eye. Pectoral about 1.7 in head, reaches to mid-anal, pelvic 2.0 in head, barely reaches anal. Caudal fully emarginate. L.1. complete. Alive, brilliant red as in PI 49, E. Preserved, yellow brown, dark bars mostly faded except that from eye to pectoral base, and hind part of median bar on peduncle and caudal. Many specimens 15-65mm length, from 32°S in S. Africa, also in Natal, more abundant northwards, all along E. Africa and at most islands in the W. Indian Ocean, not at Seychelles proper. Peters original description is brief but leaves no doubt it is this species.

9. **APOGON KIENSIS** Jordan & Snyder, 1901. *Apogon kiensis* Jordan & Snyder 1901, 905, fig. 9 (Japan). *Amia kiensis* Seale 1914, 64 (Hong Kong). Fowler & Bean 1930, 66, (Philippines).

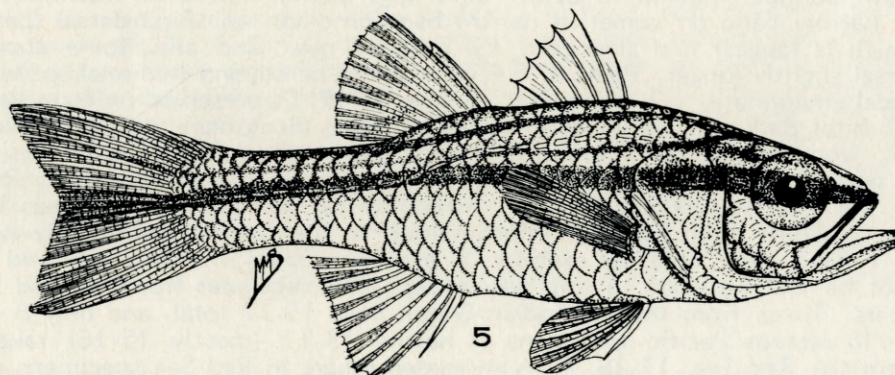


Fig. 5. *Apogon kiensis* J & S. 52mm (Lurio, Moz.)

D VI+I 9. A II 8. P 2,10,2. L.1. 23. Tr 2/5. 4-5 median predorsal. Gillrakers 5+1+16-17. Depth about 3.5, head about 2.8 in body. Eye 3-3.3 in head, exceeds snout, 1.3 times interorbital. Predorsal profile straight, snout subconical. Preopercle ridge smooth, hind margin of preopercle serrate, larger points at angle, other opercles entire. Gillrakers well developed, almost twice filaments. Mouth oblique, lower jaw longer, maxilla to below hind edge of pupil. Villiform teeth in bi- or triserial bands in each jaw, narrow angular band on vomer, a single row on palatines. First dorsal spine little more than half of 2nd, which is longest, 1.3 times eye, barely longer than 3rd spine. 2nd anal spine about equals spine of 2nd dorsal, little more than eye. Pectoral 1.6 in head, not to level of anal, pelvic 1.7 in head, not to anal. Caudal emarginate. L.1. complete. Alive silvery grey with dark stripes as in fig. 5. Fins faint pink. Preserved similar. 5 specimens 40-75mm, Mozambique Is., Nacala Bay and Lurio estuary, all Mozambique, all in turbid water. I have examined two small specimens, 40-45mm standard length, from the Red Sea, kindly sent by Dr. A. Ben-Tuvia. This species has not previously been described from the Indian Ocean or the Red Sea. (Jordan & Snyder 1901, 906 remark "smallest of the Japanese Apogonidae, none exceeding 650mm in length!")



# 11. **Pristiapogon** Klunzinger, 1870.

Type **Apogon fraenatus** Valenciennes, 1832. Moderately elongate body covered with less than 30 series of ctenoid scales. Seven spines in 1st dorsal. Caudal emarginate. Preopercle ridge and sub and preorbitals armed with strong sharp spines, also preopercle margin. Teeth on vomer and palatines. Gillrakers well developed, total 17-20, about 12 formed rakers. Prominent dark stripe from snout through eye to caudal, united round front of snout, ends posteriorly in a dark spot at caudal base. This genus is not generally recognised, but the exceptionally strong armature of some head bones makes its recognition not only convenient but desirable. There has been much confusion in the species that fall here, they are so closely related as to be a difficult problem for the systematist, at least ten have been described but probably only four are valid. These are **fraenatus** Val, 1832, (New Guinea), **snyderi** J & E, 1902 (Hawaii) **taeniopterus** Bennett, 1835 (Mauritius) and possibly **exostigma** J & Starks, 1906 (Samoa); in the W. Indian Ocean **snyderi** J & E, is fairly abundant and widespread, **fraenatus** Val, is not rare, but in our material we cannot positively identify **exostigma** J & S, and we did not find **taeniopterus** Bennett. By Lachner (1953, 437) **exostigma** is held to differ from **snyderi** in that its caudal spot never touches the lateral line and is smaller than that of **snyderi**, in which it does touch the L.1. We have specimens that by themselves might be identified as **exostigma**, but there is complete graduation to those that are clearly **snyderi**. There are apparently no meristic characters that support the slender distinction by the caudal spot for **exostigma**, and I cannot record its presence in the W. Indian Ocean. We found **fraenatus** C & V nowhere but in sand, hiding by day, whereas **snyderi** was free-swimming about coral in deeper water. In life they may immediately be distinguished by colour, **fraenatus** is notably lighter in colour with yellow on the fins, there is none in **snyderi**.

- A. Stripe along side straight, narrows posteriorly. Spot at caudal base at least partly on L.1. Body generally light, no marked dark area on back along bases of dorsals ..... **fraenatus**
- B. Stripe along side may be convex below but remains almost uniform width. Spot at caudal base touches but wholly above L.1. Body darker, marked dusky (in life dark red) areas on back along bases of dorsals ..... **snyderi**
- C. No stripe along side. Dark bars on fins ..... **taeniopterus**

**PRISTIAPOGON FRAENATUS** (Val), 1832 (PI 51, F and PI 52 E (type). **Apogon fraenatus** Val 1832, 57, PI 4, fig. 4 (New Guinea). Peters 1876, 436 and 1883, 50 (Maur). Lachner 1953, 453, PI 33, B (Bikini, Guam, Hawaii). Klauswitz 1959, 256, fig. 5 (Red Sea). D VII+I 9. A II 8. P 2,10,2. L.1. 22. Tr 2/6. 4 predorsal. Gillrakers (2)2+1+6-8(4-5), total 17-18. Depth about 3.7, head about 2.8 in body. Eye 3-3.3 in head, 1.2-1.3 times snout, almost twice interorbital. Preopercle ridge strongly and regularly spinose, those at angle sometimes enlarged, few smaller on lower margin. Preopercle margin regularly spinose, slightly enlarged round angle, spines on front part of lower margin feeble. Suborbital and preorbital with spines, other opercles entire. Gillrakers well developed, those about angle equal filaments. Mouth oblique, maxilla to or beyond below middle of eye. Villiform teeth in bands in each jaw, few in front behind little enlarged, a sharply angular band on vomer, a narrow band on palatine. Tongue smooth. 1st dorsal spine short, barely 1/4th of 2nd, which is about 1/2 of 3rd, the longest, about 1.4 times eye. Pectoral 1.6 in head, reaches above anal origin, pelvic 1.8 in head, almost or to anus. Caudal deeply emarginate. Described from 12 specimens, 40-95mm total length, from Pinda, Mozambique, northwards along E. Africa and to Seychelles, usually taken in sandy areas with poison. Nowhere more than an occasional capture. Alive as PI 51, F. Preserved similar, dark stripe passing round front of snout then through eye about pupil width there, narrows along side, becomes almost obsolete just before median pupil-size spot on end of lateral line at caudal base. This spot is always on the lateral line, most of it above, but part always below. General body colour light, front of 1st dorsal dark, faint dusky bar (deep yellow in life) along base of anal fin, upper and lower margins of caudal distinctly dark. While close to and often confused with **snyderi** J & E this fish both alive and preserved is notably lighter in colour and never has dark patches along the top of the body below the dorsals. The end of the membrane of the 1st dorsal ends close to the origin of the 2nd. Through the kindness of Dr. J. Guibe I have examined Valenciennes' 1832 type from New Guinea No. 8709 Paris Museum, it is in fair condition and has a total length of 85mm, D VII+I 9. A II 8. P 2,10,2. L.1. 23. 4 predorsal, preopercle ridge and margin spinose, gillrakers (2)2+1+7(6), total 18. Caudal blotch while central is mostly above the lateral line. My material agrees with the type.



**PRISTIAPOGON SNYDERI** (Jordan & Evermann), 1902. (PI 49, B). **Apogon snyderi** Jordan & Evermann 1902, 180 (Honolulu). **Apogon kallopterus** Regan 1916, 168 (Natal). Barnard 1927, 519 (Natal). **Apogon fraenatus** (non Val), Klunzinger 1870, 715 (Red Sea). Barnard 1927, 518 (Natal). Smith 1949, 208, PI 22, fig. 484 (Mozambique). Fourmanoir 1957, 83, fig. 60 (Comores). ~~Klauswitz 1959, 256, fig. 5 (Red Sea).~~ **Apogon vittiger** Bennett 1833, 32 (Maurit). Regan 1908, 225 (Seych). "Marie-Jeanne" (Maurit), *fide* Baissac 1952, 209. D VII+I 9. A II 8. P 2,9,2 or 2,10,1. L.1. 21-22. Tr 2/6. 4-5 predorsal. Gillrakers (2)2+1+8-10(3-4), total 17-18. Depth 2.8(J)-3.5(A), head 2.6-2.8 in body. Eye 3-3.5 in head, equals snout with age, almost twice interorbital. Ridge of preopercle densely and strongly spinate, spines at angle larger, extend halfway over flange, those on lower margin smaller, whole hind margin of preopercle strongly spinate. 5-6 spines on suborbital, a few on upper edge of preorbital, other opercles entire. Gillrakers well developed, stout, those near angle equal filaments. Mouth oblique, maxilla extends to below middle of eye. Villiform teeth in bands in each jaw, hind series in front of upper jaw enlarged. A sharply angular band on vomer, and a row on palatines. Tongue smooth. 1st dorsal spine short, about 1/4th of 2nd, this barely half of 3rd, which is longest, about twice eye. Membrane from 1st fin ends half eye diameter before 2nd, soft fin higher. 2nd anal spine 1.3 times eye, about equals spine in 2nd dorsal. Pectoral 1.8 in head, to above anal origin. Pelvic 1.8 in head, to anus. Caudal forked. Alive as in PI 49, B, preserved, similar markings. In all stages an about pupil-width dark stripe on snout joining that from other side, back through eye along side, remaining subequal in width, usually curves down and up over pectoral tip. This stripe distinct on peduncle, ends in a dark spot at caudal base, in young less than pupil size, with age usually larger, lower margin of spot usually touching end of lateral line, mostly also a small dusky patch opposite and below. Upper spot often surrounded by dusky area, upper and lower margins of caudal dusky, usually not to the tips. Broad red-brown band about eye width from shoulder along dorsal bases to end of 2nd dorsal, usually more distinct below 2nd dorsal, fainter below 1st dorsal, often absent there. Spinous dorsal dark in front, 1st spine of 2nd dorsal dusky, often a dark bar just above base of 2nd dorsal, a similar bar along and below base of anal, the whole body when preserved generally darkish. Numerous specimens, 30-150mm, over whole region of Western Indian Ocean from Natal northwards, in the tropics found chiefly around coral heads, mostly free-swimming, obtained chiefly by explosives, often in numbers, greatly relished by the natives. Both in life and preserved there is variation in the bar along the flank, it may be dark and distinct, or merely a series of blotches on the scales. It may be distinctly curved, mostly it hardly tapers towards the tail, or it may be broader along the peduncle than behind the eye. The caudal spot is smaller in juveniles than in adults. The dark markings often disappear entirely on preservation. In the field this species is always more strikingly and strongly marked and more abundant than **fraenatus** Valenciennes. The adults are deeper in body than **fraenatus**. By kindness of Mr. G. Palmer I have been able to examine the specimen from Natal, B.M. No. 1915, 7.6.8, identified by Regan 1916, 168 as **kallopterus** Bleeker. It is clearly **snyderi**. I have examined a 67mm specimen from the Red Sea kindly sent by Dr. Ben-Tuvia.

1. **PRISTIAPOGON TAENIOPTERUS** Bennett, 1835. Bennett 1835, 206 (Mauritius). Gunther 1859, 235 (Mauritius). Gunther 1866, 20 (Zanz.Rec.). Bleeker & Pollen 1875, 93 (Maur.). Bleeker 1879, 11 (Maur.). Sauvage 1891, 513 (Mad.Rec.). Gudger 1929, (Rec.Maur.). **Apogon menesemops** Lachner 1953, 455, fig. 78 (Bikini). Native name Samedi (Maurit) *fide* Baissac.

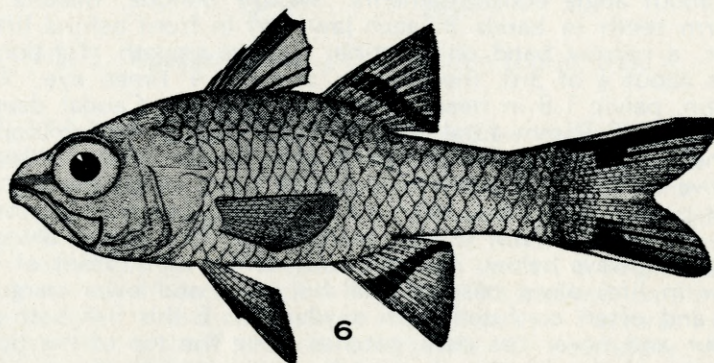


Fig. 6. **Pristiapogon taeniopterus** Bennett, 1835. (After Lachner).

I am greatly obliged to Mr. G. Palmer of the British Museum who kindly examined Bennett's 1835 type and reported the following: "Standard length 141mm. D VII+I 9 (3rd spine longest). A II 8.



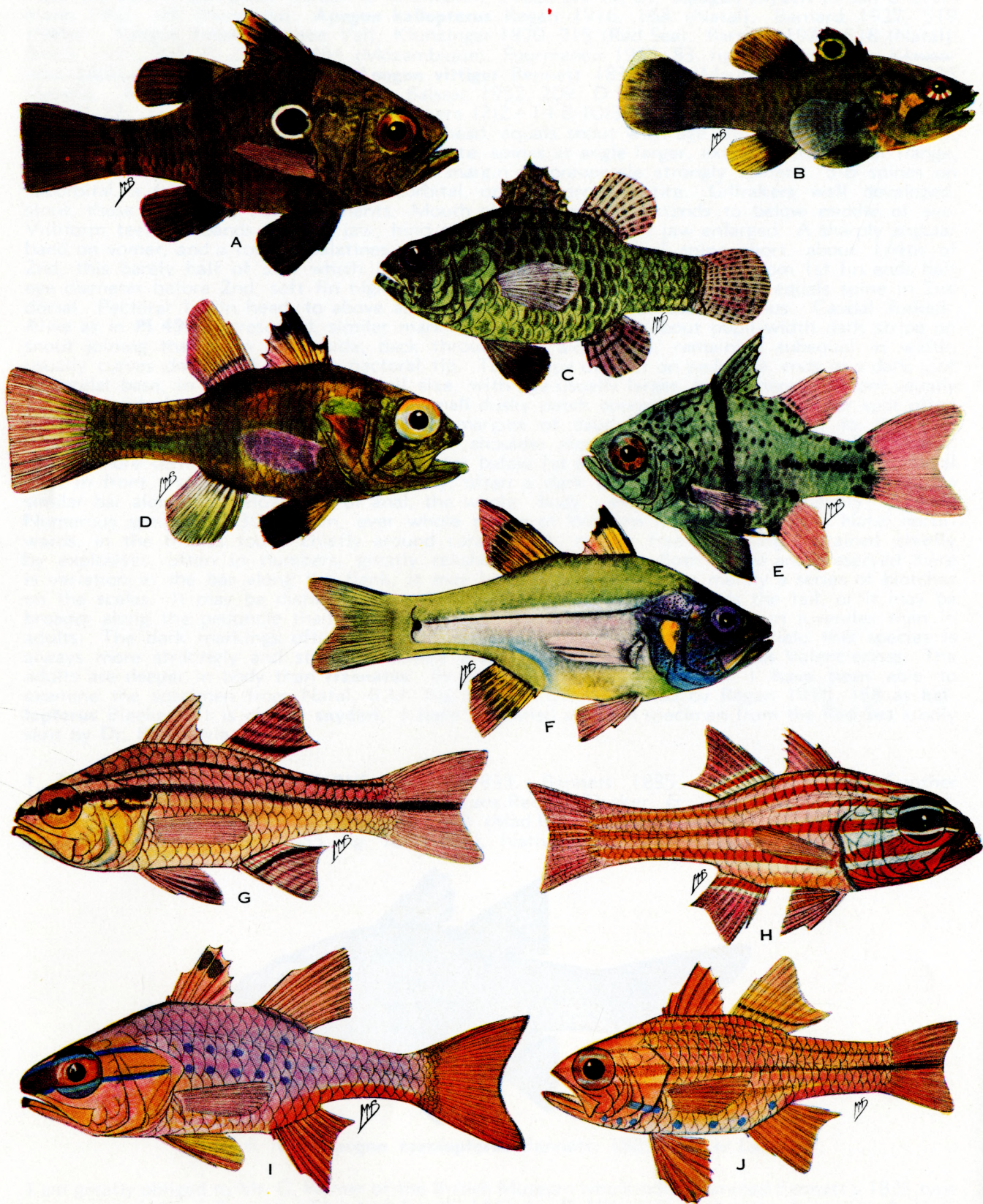


PLATE 48

- A. *Apogonichthyoides nigripinnis* (C. & V.), 87 mm. (Inhaca). B. *Apogonichthys ocellatus* Weber, 45 mm. (S. Africa).  
 C. *Foa brachygrammus* Jenkins, 65 mm. (Inhaca). D. *Apogonichthyoides fraxineus* n. sp. Type 75 mm. (Pinda).  
 E. *Sphaeramia orbicularis* (C. & V.), 94 mm. (Aldabra). F. *Apogon lateralis* Val., 90 mm. (Mahe). G. *Ostorhynchus quadrifasciatus* (C. & V.), 65 mm. (Del. Bay). H. *Ostorhynchus cyanosoma* (Blkr.), 59 mm. (Pinda).  
 I. *Ostorhynchus apogonides* (Blkr.), 90 mm. (Is. Mozamb.). J. *Ostorhynchus nitidus* n. sp. Type 73 mm. (Inhaca).



L.1. 25. Tr 2/7. Teeth on vomer in angular patch. No palatine teeth. Gillrakers 4+1+15. The figure of **Apogon menesemops** Lachner 1953 p. 455 fig. 78 can be used as an exact illustration of the markings of **taeniopterus**. Dr. Trewavas and I are both of the opinion that **menesemops** and **taeniopterus** are the same species." Gunther 1859, 235 states that the inner edge of the preopercle and the orbit to be denticulate. Lachner 1953, 455-9, states "P. 13. 5-6+1+16-17 gillrakers. Preopercle ridge and margin denticulate. No palatine teeth." It is difficult to accept that **menesemus** Jenkins 1902 (Hawaii) and **menesemops** Lachner 1953 are different. Jenkins 1902, 448 states **menesemus** to have only 10 rakers on lower limb of outer arch, Lachner 1953, 456, gives 5-6+1+16-17 for **menesemops**, but does not mention this apparent difference, which could be a more conclusive character in differentiating his new species than the slight variation in markings described. It is here considered that both **menesemus** Jenkins 1902 and **menesemops** Lachner 1953 fall away as synonyms of **taeniopterus** Bennett, extending the range of this species to the Pacific. We did not find it in East Africa.

## 12. **Apogonichthys** Bleeker, 1854.

Type **A. perdix** Bleeker, 1854 (E. Indies). Small fishes, with ctenoid scales. Caudal distinctly rounded. Preopercle ridge and margin both entire. Gillrakers poorly developed, not more than 7 formed rakers on outer arch. Lateral line complete. Seven spines in 1st dorsal. No teeth on palatines. Two species in the W. Indian Ocean.

- A. Distinct round black ocellus on 1st dorsal, long narrow flap on front nostril ..... **ocellatus**
- B. No ocellus on 1st dorsal, no marked flap on front nostril ..... **perdix**

**APOGONICHTHYS OCELLATUS** Weber, 1913. (PI 47, J & PI 48, B). **Apogon ocellatus** Weber 1913, 231. (E. Indies). Fourmanoir 1954, 216. (Comores): and 1957, 84 (Comores). **Apogon queketti** (non Weber) Barnard 1927, 517 (in part). D VII+1 9. A II 8. P 1,13,2. L.1. 24. Tr 2/5-6. 4 predorsal. Gillrakers (2)1+1+3-4(7-8) total 15-16, only 5-6 formed rakers. Depth 2.9, head 2.6 in body. Eye 3.8 in head, 1.3 times snout, almost twice interorbital. Predorsal scales end behind eye level. Profile of head gently convex above, snout blunt. Preopercle ridge and hind margin both smooth, other opercles entire. A  $\frac{1}{2}$  eye long narrow flap at front nostril. No opercular spines visible. Suborbital smooth, orbital margin undulate behind. Gillrakers poorly developed, only 4-5 short formed rakers. Mouth oblique, maxilla to below hind part of eye. Villiform teeth in bands in each jaw, an angular band on vomer, none on palatines. First dorsal spine short, about  $\frac{1}{4}$  of 2nd, which is about  $\frac{1}{2}$  of the 3rd, this longest, 1.7 times eye. 2nd anal spine about equals eye. Pectoral about 1.3 in head, reaches almost to mid-anal, pelvic shorter, 1.6 in head, not to anal. Caudal rounded. L.1. complete. Alive as PI 48, B, sometimes with faint dusky bars across body, and dusky spots. Preserved, brown-black light-edged ocellus on 1st dorsal, dusky dark-edged elongate oval bar from eye to preopercle angle, (PI 47, J). Numerous specimens, 22-54mm, some ripe females, from Pondoland (31°20'S) in South Africa along the E. African coast northwards to 3°S., and at all islands to Seychelles. Mainly in tide pools among rubble. Gobiid in appearance, and has habits of those fishes, does not swim free. The maximum size appears to be less than 60mm.

**APOGONICHTHYS PERDIX** (Bleeker), 1854. (PI 47, I). **Apogon perdix** Bleeker 1854, 321 (E. Indies): and At.lch.VIII PI 44 fig. 2 (E. Indies). **Apogonichthys perdix** Steinitz & Ben-Tuvia 1955, 5, (Red Sea rec. with doubt). **Apogon (Apogonichthys) infuscus** Roux-Estève & Fourmanoir 1955, 197, and Roux-Estève, 1956, 72, (Red Sea). D VII+1 9. A II 8. P 1,11,2. L.1. 24. Tr 1 $\frac{1}{2}$ /6. 5 predorsal. Gillrakers (2)0+1+5(5), or (2)1+0+5(5), total 13-14, only 5-6 short formed rakers. Depth 2.6, head 2.5 in body. Eye 4.5 in head, 1.3 times snout, twice interorbital. Predorsal profile convex, snout blunt, subconical. Preopercle ridge and hind margin entire, other opercles and suborbital entire, hind orbital margin finely undulate. Gillrakers poorly developed, apically expanded. Anterior nostril a low tube without flap. Mouth little oblique, jaws equal, maxilla to below hind edge eye. Villiform teeth in bands in each jaw, subangular band on vomer, none on palatines. First dorsal spine short, about  $\frac{1}{4}$  of 2nd, 3rd or 4th longest, about 1.5 times eye. 2nd anal spine about equals eye. Pectoral 1.8 in head, reaches to or beyond mid-anal, pelvic 2 in head, barely reaches anal. Caudal strongly rounded. Lateral line complete. Alive olive brownish, sometimes spotted and streaked darker. Mostly a line back from eye above, and one from below eye back across cheek. Fins olive yellow. Preserved similar. Numerous specimens, 26-54mm lbo, Pinda, Zanzibar, Shimoni, Aldabra, Seychelles, among coral rubble at low tide. My specimens agree in all details with descriptions from the Pacific. Not before described from the W. Indian Ocean.



### 13. *Jaydia* n. genus.

Type ***Apogon ellioti*** Day, 1875 (India). Fairly elongate body with ctenoid scales. Seven dorsal spines. Caudal well rounded. Palatine teeth present. More than 15 gillrakers, more than 10 formed rakers. Angle of preopercle ridge either with a group of spines or escalloped. Larger than averaged sized fishes and from deeper water, not found in tide pools. 2 species in the W. Indian Ocean. One endemic, one widespread in the tropical Indo-Pacific.

- A. Preopercle ridge with group of spinelets at angle. 1st dorsal dark apically ..... **ellioti**
- B. Preopercle ridge escalloped at angle. Distinct rounded ocellus on 1st dorsal ..... **queketti**

**JAYDIA ELLIOTI** (Day), 1875. (Plate 47, F). ***Apogon nigripinnis*** (non C & V) Gunther, 1873, 21 (E. Indies). ***Apogon ellioti*** Day, 1878, 63, Pl 17, fig. 1 (India). ***Apogonichthys australis*** (non Steindachner) Munro 1960, 147, fig. 914 (Australia). ***Apogonichthys queketti*** (non Gilchrist) Fourmanoir 1957, 86, fig. 62 (Comores). ***Apogon marginatus*** Jordan & Snyder 1901, 896, fig. 3 (Japan). ***Apogon arafurae*** Gunther 1880, 38, Pl 16, fig. C (Arafura Sea).

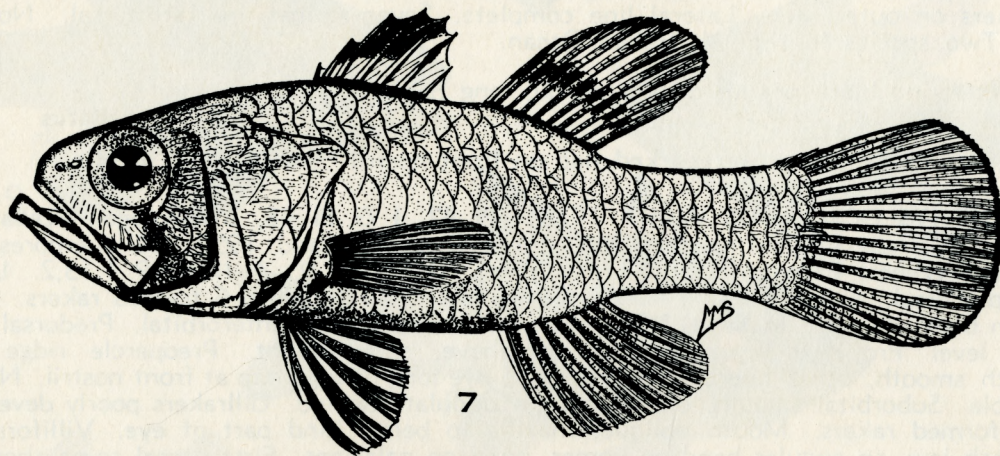


Fig. 7. ***Jaydia ellioti*** Day. 135mm (Pemba).

D VII+19. A II 8. P 2,12,2. L.1. 22. Tr 2/6. 4 predorsal. Gillrakers (3)1+1+11, total 16. Depth 3-3.2, head 2.5 in body. Eye 3.5 in head, 1.4 times snout, 1.4 times interorbital. Preopercle ridge spinate round angle, hind margin spinose, larger about angle, other opercles and suborbital entire. Postorbital margin coarsely serrate. Gillrakers well developed. A dark gland about anus, possibly of luminous function. Front nostril with raised margin, slightly lobate behind. Mouth oblique, lower jaw projects, maxilla to below hind margin of eye. Villiform teeth in bands in each jaw, angular band on vomer, band on palatines. First dorsal spine short, less than  $\frac{1}{4}$  of 4th and 5th, which are subequal longest, about 1.3 times eye. 2nd anal spine about equals eye. Spine in 2nd dorsal about 1.2 times eye. Pectoral 1.8 in head, pelvic 2 in head, neither to anal. L.1. complete. Caudal gently rounded. Alive, pearly with rosy sheen: preserved, yellowish, in each case dark marks as in fig. 7 and Pl 47, dusky spot at pectoral base. Dusky bar above 2nd dorsal base, 3 specimens, 100-130mm, by bombing in about 10 fathoms off Pemba Island, not found elsewhere, also 2 specimens from 25 metres off Northwest Madagascar kindly sent by M. P. Fourmanoir, and a specimen from the Red Sea kindly sent by Dr. A. Ben-Tuvia. This appears to be a widespread species that inhabits deepish sheltered water. Its markings are apparently variable. My specimens lack the dark bar on the anal fin shown by Day 1878, Pl 17, fig. 1. Day, (Proc.Zool.Soc. 1881, 650) states that "most of the specimens named ***A. nigripinnis*** (C & V), in the British Museum are young examples of ***A. ellioti***. They were received from Zanzibar, E. Indies and China." IWAI and ASANO 1958, 6, fig. 1, describe a pair of luminous organs close to the vent of ***A. ellioti***, but the emission of light from a living fish has not yet been observed.

Munro, Fishes Australia 1960, 147, fig. 914 has described what is clearly this species as ***australis*** Steindachner, 1867, and he has reproduced Day's 1875 Pl 17, fig. 1 in illustration. However, ***australis*** Steindachner 1867, 10 is certainly not this species, it may not be an Apogonid fish



at all as the original description states clearly A III 8 and describes the 2nd and 3rd anal spines as subequal. Also it states Depth as 2 in body, 13 transverse scales, and the caudal as concave with the lobes rounded. The markings described do not agree with **elliotti** Day.

**JAYDIA QUEKETTI** Gilchrist, 1903. (PI 47, G). **Apogon queketti** Gilchrist 1903, 206, PI XIV (40 fms off Natal). Barnard 1927, 517, PI 24 fig. 5 (Natal 40 fms). **Apogonichthys queketti** Smith 1949 209, PI 23, fig. 492 (Natal). D VII+I 9. A II 8. P 2,12,2. L.1. 23. Tr 2/6. 2 predorsal. Gillrakers (3)2+1+9-10(1), 12-13 formed rakers. Depth 2.6, head 2.5 in body. Eye 4.2 in head, equals snout and interorbital. Predorsal scales end behind eye level. Dorsal profile of head gently convex, snout blunt. Preopercle ridge smooth, hind margin escalloped at edge, other opercles entire. Suborbital smooth. Gillrakers well developed, one in angle longest. Front nostril with rim expanded behind, no distinct flap. Mouth large, oblique, maxilla to below hind edge eye. Villiform teeth in bands in each jaw, angular band on vomer, a single row on palatines. First dorsal spine about 1/6 of 3rd which is longest, 1.6 times eye. 2nd anal spine 1.3 times eye. Pectoral 1.7 in head, barely reaches anal origin, pelvic 1.5 in head, reaches anal. Caudal rounded. L.1. complete. Live colour unknown: preserved, yellowish with dark ocellus on 1st dorsal, as in **PI 47, G**. 5 specimens all about 50-100mm total length, including the type, 100mm, all from about 40 fms off Natal. Munro 1960, 147 synonymises this species with **ocellatus** Weber but that species is distinct in several characters, notably in smaller size, it has no palatine teeth and only 4-5 formed rakers as against 12-13 in **queketti**, also **ocellatus** has a marked flap to the anterior nostril. The colours in Smith PI 23, fig. 492 are those of **Apogonichthys ocellatus** (Weber), which was malidentified as a juvenile of this species. A 45mm specimen from 30 fms off Eritrea Red Sea kindly sent from Dr. A. Ben-Tuvia in rather poor condition is almost certainly a juvenile of this species. This is the first record outside Natal waters. **Amia queketti** recorded by Fowler 1935, 385 from Natal Bluff is almost certainly not that species but **ocellatus** Weber, which lives in shallow water and has been found even south of Natal.

#### 14. **Apogonichthyoides** Smith, 1949.

(Smith 1949, 209).

Type stated as **Amia uninotata** Smith & Radcliffe, 1912, but this since found a malidentification and the type = **Apogon nigripinnis** C & V, 1828. Rather deep compressed body. Fairly large mouth with wide bands of villiform teeth, outer sometimes enlarged. Teeth on vomer at least triserial, 2-4 series on palatines. 7 spines in 1st dorsal. Preopercle ridge irregular but not denticulate, hind margin smooth or denticulate. Not more than 15 formed rakers. Caudal subtruncate or at most feebly emarginate. Lateral line complete. Fins dark, often a dark ocellus on shoulder. Small weed and rubble haunting fishes of the tropical Indo-Pacific, sometimes in deeper water. Few species of characteristic shape, and almost truncate caudal, mostly with a dark bar below each dorsal fin, and a striking ocellus on the side.

This genus has an admittedly tenuous taxonomic basis but it is a convenient method of grouping the species below, which are of characteristic shape and appearance and have curious habits that set them apart from most others in the family. They progress in shallow water in short-jerky runs and feign death when trapped in the open. Differentiation of the species in the W. Indian Ocean has been one of the most troublesome of the many problems presented by these variable fishes. In large numbers of specimens 4 species appear to be present, of these 3 have been found to be widespread in the W. Indian Ocean, one has so far been found only in Durban Bay. They have proved extremely troublesome to co-ordinate partly because of inadequate early descriptions. This genus is a useful characterisation for these fishes for it is plain that others similar occur in other parts of the Indo-Pacific.

#### Key to Species

- A. Body with distinct cross-bars below each dorsal fin. Either a dark band round peduncle or a dark blotch on side of it or both. Often a light-ringed ocellus on side below L.1. and 1st dorsal.
  - 1. A light-ringed ocellus on side distinct in young and half grown, not often in larger fishes. Eye about 3-3.3 in head. Preopercle margin feebly serrate below in front, front half of lower edge smooth. Spine in 2nd dorsal at least as long as least depth of



peduncle. No outer series of enlarged teeth in jaws. In larger fishes alternate irregular narrow light and dark stripes along hinder part of body and tail. 11 divided rays in pectoral, gill-rakers (2-4)1+1+6-9(2-5), total 17-20, average 17.9 total, and 9.9 formed rakers. Distinct cross-bars below dorsals; a dark blotch on peduncle near caudal base .....

**taeniatus**

- II. Ocellus on side present at all stadia, easily visible in fresh specimens. Eye smaller, about 3.8 in head. No alternating light and dark stripes along side. Preopercle margin below usually completely serrate or only a small part smooth or almost so. Spine in 2nd dorsal less than least depth of peduncle. Outer series of teeth distinctly enlarged in both jaws. 12 divided rays in pectoral. Gillrakers (2-3)2+1+7-9(3-4), total 16-18, average 17 total and 11 formed rakers. Distinct cross-bars below dorsals and one encircling peduncle. No stripes along body. All specimens with light-ringed dark ocellus in bar on side below L.1. and 1st dorsal .....

**nigripinnis**

- B. Body more or less uniform, at most vague dusky cross-bars. No ocellus on side.

- I. Teeth not enlarged. At most 8 formed rakers, total rakers 15-16
- II. Few lower teeth larger. 15 formed rakers, total rakers about 22

**fraxineus**

**enigmaticus**

**APOGONICHTHYOIDES TAENIATUS** (C & V), 1828 (PI 47, K & PI 50, D) and PI 52, A & B (Types) **Apogon taeniatus** C & V 1828, 159 (Red Sea). Ruppell 1828, 48 and 1835, 87 (Red Sea). Klunzinger 1870, 712 (Red Sea). Smith 1949, 208, fig. 483 (E. Africa). **Apogon bifasciatus** Ruppell 1835, 86 PI 22, fig. 2 (Red Sea). Gunther 1866, 20 (Zanz.) Klunzinger 1870, 711 (Red Sea). As **Apogon taeniatus** C & V 1828 and as **Apogon bifasciatus** Ruppell 1835, numerous records from whole Western Indian Ocean. D VII+I 9. A II 8. P 2,11-12,1-2 total 14-15. L.1. 25. Tr 2/6. 3-4 median predorsal. Gillrakers (2-4)1-2+1+7-8(4-5). Total formed rakers 9-10, total rakers 16-19. Depth 2.4, head about 2.4 in body. Eye 3-3.5 in head, slightly exceeds snout, 1.2-1.3 times interorbital. Predorsal profile straight to bluntly conical snout. Preopercle ridge smooth with slight undulations at angle and below, margin denticulate behind and to below angle mostly smooth in front and below. Gillrakers moderately developed, that in angle 1.5 times filaments, always rudiments above and below. Mouth oblique, lower jaw projects, maxilla to below mid-eye or hind margin of pupil. Villiform teeth in bands in each jaw, none noticeably enlarged, a subangular band 4-5 series wide on vomer, one of similar width on palatines. First dorsal spine small,  $\frac{1}{3}$  of 2nd which is always less than  $\frac{1}{2}$  of 3rd. 3rd spine usually longest sometimes 3rd and 4th subequal, stout, about 1.4-1.6 times eye, spine in 2nd dorsal shorter than 4th spine, longer than 5th spine of 1st dorsal, about 1.4 times eye. 2nd anal spine equals or usually slightly more than eye. Pectoral 1.8-2 in head, not to anal origin, pelvic 1.7 in head, rarely to anal origin. Caudal feebly emarginate or even subtruncate, never rounded. Alive dull silvery, 1st dorsal and pelvics dusky. Fins mainly faint pink, margins dusky. Iris yellow. Dark bars across body as in PI 50. Preserved somewhat variable (PI 47, K), all specimens show 2 somewhat variable irregular dark cross-bars, the 1st from below front of 1st dorsal reaches variably to or just below lateral line or as far down as mid-pectoral. This bar is sometimes vertical but mostly inclines slightly backwards. In the young at level of upper eye in this bar is a pupil-size light-ringed dark ocellus variably present, often absent, sometimes present on one side only. Usually this disappears with age since it is rarely seen in larger fishes. A variable dark spot or patch on the lateral line near the base of the caudal on side of peduncle usually present. Typical specimens show in addition several alternating narrow light and dark stripes along the scale rows, starting on mid-side and running to near the caudal base. 1st dorsal deep dusky, front of 2nd dorsal dusky, pelvic membrane almost black, other fins light to faint dusky, top of head and snout usually dark. I have examined one of Ruppell's types of **bifasciatus** No. 4622 Senckenberg Museum (Red Sea) standard length 70mm, total 80mm (caudal broken) kindly lent by Dr. W. Klausewitz. This fish (PI 52, A) agrees in almost all particulars with my specimens, it has D VII+I 9. A II 8. P 15, the 3rd dorsal spine longest, gillrakers (3)1+1+7(6), total 17, the preopercle ridge smooth, the margin serrate above and round angle, smooth, below, 3 median predorsal scales, L.1. 26, and the teeth are exactly as in my specimens, i.e. no enlarged teeth in jaws. By kindness of Dr. W. Klausewitz, I have also been able to examine a 58mm specimen in excellent condition from the Red Sea, labelled as **taeniatus** C & V, No. 4621 Senckenberg Museum. This has 2 distinct cross-bars with an ocellus in the anterior, but no longitudinal stripes: D VII+I 9. A II 8. P 15. L.1. 23, no enlarged teeth, and gillrakers (3)2+1+9(3), total 18, 12 formed rakers. While these



two Red Sea specimens have the same total number of gillrakers they differ in the number of formed rakers, viz the type of **bifasciatus** Ruppell has 9 while the Red Sea **taeniatus** has 11. This is possibly not significant, though it may be noted that the E. African specimens have total rakers 16-19 and 9-10 formed rakers, in that respect agreeing with Ruppell's type of **bifasciatus**. By kindness of Dr. J. Guibe I have also been able to examine the two types of **taeniatus** C & V (Red Sea) No. 8693 Paris, 59 and 60mm standard length (PI 52, B). These show no markings, being stained almost black. They agree in most discernable features with my E. African specimens, but have (2)2+1+9(4) and (3)2+1+9(5), i.e. total 18 and 20 gillrakers respectively, but 12 formed rakers, in that respect agreeing with the cited specimen 4621 (above) and differing from my E. African fishes and from the type of **bifasciatus** Ruppell. It would appear that the Red Sea **taeniatus** has a few more formed rakers than the typical **bifasciatus**, and this is not a matter of age. C & V have given a very clear description of their type (s?) of **taeniatus**, with which my E. African fishes agree, but these latter are now shown to accord with the type of **bifasciatus** Ruppell. My specimens have mostly (3)1+1+8(5) rakers, i.e. 10 formed rakers, but agree otherwise exactly with the types (No. 8693) of **taeniatus** from the Red Sea described above. It would therefore appear as if the Red Sea specimens have more formed rakers than those of the Indian Ocean. On the other hand Ruppell's type of **bifasciatus** described above has (3)1+1+7(6) gillrakers, i.e. 9 formed rakers, exactly as my W. Indian Ocean specimens. Were it not for C & V's very clear description of the markings on their type of **taeniatus**, i.e. dark spot on side of shoulder, one at caudal base, and 5 stripes along the side, exactly as most of my W. Indian Ocean specimens that clearly agree with **bifasciatus** Ruppell, it would almost appear as if **bifasciatus** Ruppell could be different from **taeniatus** C & V, e.g. it has more formed rakers. Further detailed study of Red Sea material is clearly desirable. Meanwhile **bifasciatus** Ruppell is here recorded as identical with the above noted reservation about gillrakers.

**APOGONICHTHYOIDES NIGRIPINNIS** C & V, 1828 (PI 48, A and PI 52, C & D). **Apogon nigripinnis** C & V 1828, 152 (India). Day 1875, 60, PI XVI, fig. 6. (India). **Apogon pharaonis** Bellotti, 1874, 264 (Suez). **Apogon suezi** Sauvage 1883, 156 (Suez). **Apogon gardineri** Regan 1908, 227 (Cargados. Ind. Ocean). **Apogon punctatus** Regan 1908, 225, PI 24, fig. 1. **Amia ocellata** (non Weber) von Bonde 1923, 14 PI 1 fig. 2 (Natal). **Apogon duops** (nom nov) Barnard 1927, 522 (Natal). **Apogonichthys uninotatus** (non Smith & Radcliffe 1912) Fowler & Bean 1930, 18 (Natal). **Apogonichthoides uninotatus** (non Smith & Radcliffe), Smith 1949, 206, PI 23, fig. 494 (Mozam.). D VII+1 9. A II 8. P 2,12,1-2. L.1. 23. Tr 1/6. 2-3 median predorsal. Gillrakers (2-3)2+1+7-9(2-4). Total 16-18, average 17 (see below). Depth about 2.4 in body, about equals head. Eye 3.5-4 in head, about equals snout, 1.0-1.1 times interorbital. Predorsal profile slightly undulate. Preopercle ridge irregular round angle, hind margin denticulate, except front part of lower limb. Other opercles smooth. Gillrakers moderately developed. Mouth oblique, lower jaw longer, maxilla to below hind edge pupil or beyond. Villiform teeth in bands in each jaw, the outer teeth in upper jaw distinctly longer, also distinctly, but less so in lower, an angular band on vomer, a narrow band on palatines. First dorsal spine short, about 1/7 of 2nd which is about 1/2 of 3rd, this usually longest or slightly less than 4th, 1.5-2 times eye. 2nd anal spine about equals spine in 2nd dorsal, which is about 1.2 times eye, and distinctly less than least depth of peduncle. Pectoral about 1.8 in head, not to anal, pelvic 1.6 in head, usually reaches anal. Caudal subtruncate or slightly emarginate. L.1. complete. Alive as PI 48, A. Preserved: darkish, with faint darker cross-bars and faint ocellus as PI 48, A, fins dark. 12 specimens 70-105mm, most Inhaca, one from Palma (N. Moz). It has been difficult to select a clearly valid early name for this species: several are available, e.g. **nigripinnis** C & V, 1828 (India): **pharaonis** Bellotti, 1874 (Suez): **thurstoni** Day, 1878, (India): and **suezi** Sauvage, 1883 (Suez). By kindness of Dr. J. Guibe I have been able to examine the type of **nigripinnis** C & V 1828, No. 8694, Paris from India, 80mm total length (caudal tips broken) (PI 52, C) and of **suezi** Sauvage, 1883 (PI 52, D) from Suez, No. 5137 Paris, 65mm total length. One unusual feature of this species is the markedly larger outer teeth in the bands in the jaws, which shows distinctly in the W. Indian Ocean fishes, equally in the types of **nigripinnis** C & V and of **suezi** Sauvage. By kindness of Dr. A. Ben-Tuvia I have seen an 83mm specimen of the same species from the Mediterranean, near Suez. It agrees exactly with the type of **suezi**. My Mozambique specimens have enlarged teeth and (2-3)2+1+7-9(2-4) gillrakers, total 16-18. The type of **nigripinnis** is plain dark with no sign of cross-bars and (3)2+1+7(3) = 16 gillrakers. The type of **suezi** has (3)2+1+10(2) = 18 gillrakers and the Mediterranean-Suez specimen (3)2+1+9(3) = 18. Here again Red Sea fishes have a few more formed rakers than those of the Indian Ocean. The use of the name **nigripinnis** for this species is proposed with some doubt, for though the type agrees well with my fishes in shape, general features, smallish eye, short spine in 2nd dorsal and anal fins, it is curious that C & V 1828, 152 did not mention any cross-bars on their (Kuhl & van Hasselt) type which could then not have been very old. Day examined the type of **nigripinnis** and in 1876, 60 reported it as in



good condition. He states that his specimens from India which are described as with cross-bars, agree well with that type. There are no signs of any bars now on the obviously stained C & V type. Day 1876, 60 states his **nigripinnis** to have eye  $3-3\frac{1}{4}$  in head but his Pl XVII, fig. 6 shows eye no larger than 4 in head. The status of **thurstoni** Day, 1888 (India) is doubtful. It agrees in most particulars with **nigripinnis** as defined here, but Day makes no mention of enlarged teeth, which he did in the case of his specimens of **nigripinnis**. My specimens are marked almost exactly like **uninotatus** Smith and Radcliffe 1912, from Philippines and were earlier so identified. At my request, however, Dr. A. E. Lachner has kindly examined the type of that species and reports that the preopercle margin is smooth. **nigripinnis** as here defined is found commonly in shallow water at low tide. When chased it cants over and feigns death. Most live specimens show the ocellus clearly, in a few it is absent, in some it is visible or on one side only. In all, however, it comes up on both sides on death and preservation. **A. pharaonis** Bellotti is provisionally included here. The original description agrees exactly with that of **suezi**, but there is not sufficient data for certain definition. There is, e.g. no information about gillrakers or whether the jaw teeth are enlarged. In trying to locate the type of **pharaonis**, I have been told by Dr. E. Tortonese that the Milan Museum collections were destroyed (by bombing) during the last war and Bellotti's collections were among them. By kindness of Mr. G. Palmer I have been able to examine a specimen (No. B.M. 1908.3.23.89) of **punctatus** Regan, 1908, 225, Pl 24, fig. 1. Though it has no colour or dark markings, it agrees in all else with **nigripinnis**, e.g. enlarged teeth, fin formula and has  $(2)2+1+7(4)$  gillrakers. Regan noted that **punctatus** was "close to **nigripinnis**" but gave no indication of how it differed. Records of **thurstoni** Day from the Red Sea area are not identifiable.

#### **Apogonichthyoides fraxineus n.sp. (Pl 48, D, Type).**

**Apogon monochrous** (non Bleeker), Klunzinger 1870, 715 (Red Sea). D VII+I 9. A II 8. P2,12-13,1-2 total 15-16, Av. 15.4. L.1. 24. Tr 2/6. 3 predorsal. Gillrakers  $(2-3)1+1+5-6(4-6)$  total 15-16, average 15.4 total, and 7.9 formed gillrakers. Depth equals head, 2.5-2.7 in body. Eye 2.8-3 in head, 1.4 times snout, 1.5 times interorbital. Predorsal profile gently convex, snout bluntly conical. Preopercle ridge quite smooth, rarely undulated at angle, hind margin finely denticulate but lower margin smooth. Gillrakers moderately developed, those at angle 1.5 times filaments. Mouth little oblique, maxilla to below about mid-eye, rarely beyond. Villiform teeth in bands in each jaw, narrow subangular band on vomer, 2-3 series, similar band on palatines. Tongue not dilated apically, very finely papillose. First dorsal spine minute, less than  $\frac{1}{3}$  of 2nd which is almost but usually less than  $\frac{1}{2}$  of 3rd which is longest, 1.4 times eye or 1.8-2 in head. Spine in 2nd dorsal about equal to 4th in 1st dorsal, and longer than 5th spine, slightly longer than postorbital part of head. 2nd anal spine slightly exceeds eye. Pectoral about 1.8 in head, not or barely reaches anal origin, pelvic about 1.7 in head, not to anal origin. Caudal faintly emarginate or subtruncate. Alive as in **Pl 48, D**. Most specimens show faint indications of a dusky cross-bar below each of the 2 dorsals. Sometimes a dark line from eye to preopercle angle. Caudal lobes dusky. Pelvics dark, almost black, 1st dorsal dusky, other fins light. Numerous specimens 35-85mm length, only in truly tropical parts of East Africa from about 17°S northwards to 4°S mainly among weeds, usually taken with poison, the type 75mm, Pinda. This species is closely related to **taeniatus** C & V, with which it agrees in most characters. Both alive and preserved however it may be distinguished visually by having at most faint dark cross-bars below the dorsals and no light lines along the side, as well as by the absence of the peduncular spot. Its distinction is further confirmed by gillraker and pectoral ray counts as follows: **taeniatus** has an average of 17.8 gillrakers and an average of 9.8 formed gillrakers, pectoral rays average 14.9, 11 branched. **fraxineus** has a gillraker average of 15.4, average 8 formed rakers, and pectoral rays 15.8, 12-13 branched rays. **fraxineus** is also a notably smaller species than **taeniatus**. A 70mm specimen from the Red Sea, kindly sent by Dr. A. Ben-Tuvia agrees well with E. African material. It has a distinct bar from eye to preopercle angle and faint cross-bars below the 2 dorsals.

#### **Apogonichthyoides enigmaticus n.sp. (Pl 50, I).**

**Apogon monochrous** (non Bleeker), Barnard 1927, 517 (Natal). D VII+I 9. A II 8. P 2,11,2. L.1. 25. Tr 2/6. 3-4 median predorsal. Gillrakers  $(3)3+1+11(3) = 21$ . Lateral line complete. Depth 2.3, head 2.6 in body. Eye 3.2 in head, exceeds snout, 1.1 times interorbital. Predorsal profile almost straight. Preopercle ridge smooth, hind margin serrate, finely above, more coarsely about angle and below, small part in front entire. Gillrakers well developed. Mouth oblique, lower jaw longer, maxilla to beyond mid-eye. Villiform teeth in bands in each jaw, some on



side of lower jaw slightly enlarged, a narrow angular band, on vomer, a narrow band on palatines. Dorsal defective, first spine short, 4th apparently longest. 2nd anal spine broken. Pectoral 1.5 in head, pelvic 1.8 in head, neither to anal. Caudal broken. Live colour unknown, as preserved; brown, edges of scales darker forming network. Few dark speckles on nape and top of head, remains of fins dusky. Described from a specimen from Durban, 80mm standard length, No. SAM 13817, described by Barnard 1927, 517 as **monochrous** Bleeker, no gillraker count given. It is in very poor condition, the fins broken and fragile. This specimen has proved most troublesome. Despite the utmost search I have not been able to find another in any museum, nor has intensive collection about Durban yielded any more. It is not identical with the 2 specimens described by Regan 1916, 198 from Durban, as **monochrous** Bleeker, which prove to be **apogonides** Blkr (q v). Nor can I align it for certain with any known species, it certainly does not agree with any from the Western Indian Ocean which we have been able to see. It is with hesitation that I describe it as new, especially in view of the poor condition of the specimen, but the body and scaling are in good condition as also the gillrakers and the dentition, and it is given a new name together with its description chiefly for purposes of record in case further specimens come to light. Although the caudal is broken it is included in this genus because of its characteristic body shape which resembles closely that of the other members of the genus. Type, SAM No. 13817 from Durban.

# 15. **Ostorhynchus** Lacepede, 1802.

Type **Ostorhynchus fleuriu** Lacepede, 1802 (Indo-Pac.). Moderately elongate body with ctenoid scales. Seven spines in 1st dorsal, the 1st small. Teeth on palatines, a narrow band on vomer. Preopercle ridge smooth, sometimes rough with age, margin at least partly denticulate or serrate. Caudal emarginate or forked, never rounded. Numerous species, small fishes of reefs and coral, 12 species in the W. Indian Ocean. The remarks under **Apogon** about systematic problems apply with equal force in this genus, whose retention as against **Apogon (sensu lato)** appears to be fully justifiable.

## Key to the species of **Ostorhynchus** in the W. Indian Ocean

- |     |  |                             |
|-----|--|-----------------------------|
| A.  | An oblique bar or line from eye back across cheek .....  | B                           |
| AA. | No such bar or line .....  | D                           |
| B.  | A black band completely encircles peduncle at caudal base .....  | 1. <b>annularis</b>         |
| BB. | Dark blotch or saddle at caudal base, above L.1. but not encircling peduncle .....   | C                           |
| C.  | 22-23 formed rakers. Line across cheek thin .....  | 2. <b>nubilus</b>           |
| CC. | 25-27 formed rakers. Bar across cheek wider .....  | 3. <b>savayensis</b>        |
| D.  | A black band encircles peduncle at caudal base .....   | 4. <b>fleuriu</b>           |
| DD. | No black band encircles peduncle .....   | E                           |
| E.  | A distinct black spot on side at caudal base .....   | F                           |
| EE. | No distinct black spot at caudal base .....  | I                           |
| F.  | Broad dark or deep red stripes cover about half of side .....  | G                           |
| FF. | No such stripes .....  | H                           |
| G.  | A distinct narrow shorter dark stripe between the others from upper part of eye, ends below 2nd dorsal .....                 | 5. <b>endekataenia</b>      |
| GG. | No such narrow stripe as in G .....  | 6. <b>angustatus</b>        |
| H.  | Distinct small black spot on back each side of dorsal origin and each side of hind end of dorsal. Only 9 formed rakers ..... | 7. <b>heptastigma</b>       |
| HH. | 2nd dorsal ray usually filamentous. 22 formed rakers .....   | 8. <b>flagelliferus nov</b> |
| I.  | Light or dark stripes along body .....   | J                           |
| II. | No stripes along plain body. Lower teeth enlarged .....  | 9. <b>apogonides</b>        |



- J. Light (in life yellow) stripes along body, none extend as dusky into mid-caudal. 19 formed rakers ..... **10. cyanosoma**
- JJ. At least some darkish stripes on body, median runs to mid-caudal then dusky along median rays. 15-17 formed rakers ..... K
- K. Preopercle ridge smooth at angle: also orange lines in life. Teeth on side of lower jaw enlarged ..... **11. nitidus nov**
- KK. Preopercle ridge rough round angle. Lines dusky or bluish. Lower teeth normal ..... **12. quadrifasciatus**

1. **OSTORHYNCHUS ANNULARIS** (Ruppell), 1828 (PI 47, C). **Apogon annularis** Ruppell 1828, 48 (Red Sea) and 1835, 85 (Red Sea). Kossmann & Rauber 1877, 8 (Red Sea). **Apogon aureus annularis** Klausewitz 1959, 253, fig. 6 (Red Sea). **Apogon erdmani** Lachner 1951, 595, PI 18, A (Red Sea). Lachner 1953, 438 (Red Sea). D VII+I 9. A II 8. P 2,8,2. Tr 1/6. 3 predorsal. Gillrakers (1)5+1+21. Depth about 2.5, head 2.6 in body. Eye 2.3 in head, twice snout, 1.3 times interorbital. Predorsal profile gently convex to snout. Preopercle ridge smooth, slightly undulate about angle, preopercle margin denticulate behind, scalloped round angle, scarcely rough below. Gillrakers well developed, slender, those in angle almost thrice length of filaments, developed rakers right to front of arch. Mouth oblique, lower jaw projects, maxilla to below hind edge of pupil. Villiform teeth in bands in jaws, apparently uniserial angular row on vomer, at most 2 rows on palatines. Tongue strongly papillose behind. First dorsal spine minute, about 1/5th of 2nd, which is about 1/2 of 3rd, the 4th subequal, longest, little exceeds eye, 2nd anal spine about equals eye. Pectoral 1.5 in head, barely reaches anal origin, pelvic 1.8 in head, not to anal origin. Caudal emarginate. L.1. complete. Described from one of Ruppell's paratypes, 52mm total length, No. 4679, Senckenberg Museum. Life colour (according to Ruppell 1828, 48) dark red with bronzy sheen. 1st dorsal brown red, other fins hyaline red. Iris brown with silvery ring round pupil. Preserved: dark brown above lateral line, also head, triangular dark stripe from below eye to preopercle angle. Body below lateral line variegated with irregular dark and light cross zones less than eye width, a dark band across caudal. Because of the dark band round the peduncle this species has probably long been confused with **fleurieu** Lac. and in pointing this out, Klausewitz 1959, 253 was the first to call attention to characters in which the Red Sea **annularis** differs from **fleurieu**. Despite the marked dark band round the peduncle I had not considered them as any but distinct. Dr. Klausewitz has kindly sent me one of Ruppell's types as well as another specimen from the Red Sea, and these clearly confirm their specific distinction from other species, e.g. **fleurieu** which has no dark bar from eye to preopercle angle, and (2)5+1+15-17(0-1) gillrakers. I find in these two specimens of **annularis** (1)5+1+21, i.e. 27 formed rakers as against 22-23 in **fleurieu**. Lachner 1951, 595, PI 18a, described as new **Apogon erdmani** from the Red Sea, but this is quite clearly **annularis** Ruppell, 1828. At my request Dr. Klausewitz has confirmed that Ruppell's orthotype has 21 rakers on the lower limb and that it agrees in every way with **erdmani** Lachner, 1953. We did not find this fish anywhere in the Western Indian Ocean. It is possibly confined to the Red Sea. Regan 1916, recorded this species from Natal, but I have seen his specimen, which is **fleurieu** Lacepede.

2. **OSTORHYNCHUS NUBILUS** (Garman), 1903 (PI 50, L). **Apogon nubilus** Garman 1903, 229 (Fiji): Lachner 1951, 600 PI 18c, (Red Sea, Philipp. Oceania). Lachner 1953, 459, fig. 79b, PI 35c (Marshall Is.). D VII+I 9. A II 8. P 2,9,2. L.23. Tr 1/6. 3 median predorsal. Gillrakers (3)4-5+1+18, total 26-27. Depth about 2.5, head about 2.6 in body. Eye 2.5 in head, almost twice snout, 1.4 times interorbital. Predorsal profile straight, snout blunt. Preopercle ridge smooth, hind margin serrate, little below, other opercles smooth. Gillrakers well developed, no rudiments at front of arch. Mouth oblique, lower jaw projects, maxilla to below mid-eye. Villiform teeth in narrow bands in each jaw, at most 2 rows in subangular band on vomer, narrow band on palatines, wider in front, tongue smooth. First dorsal spine about 1/3 of 2nd which is about 1/2 of 3rd, the 4th subequal or slightly longer, 1.3 times eye. 2nd anal spine equals eye. Pectoral 1.5 in head, reaches anal origin, pelvic 1.6 in head, not to anal origin. Caudal emarginate. Alive brown with pinkish sheen. Narrow dark line from lower part of eye to angle of preopercle. Fins all pinkish, 1st dorsal dusky. Preserved: mainly brownish on upper part of body, flanks lighter, sometimes indications of lightish cross-bars. A dark blotch over upper part of peduncle, near base of caudal, continued faintly below lateral line, often a darkish patch on back at hind part of 2nd dorsal base. Numerous specimens, 30-95mm, including males with buccal ova, from Inhaca northwards in East Africa, Zanzibar, Pemba, Tanganyika and Kenya. Mainly sheltered weedy waters, nowhere abundant. My specimens agree closely with descriptions of specimens from the type area and the Pacific generally. Not before described from the Indian Ocean.



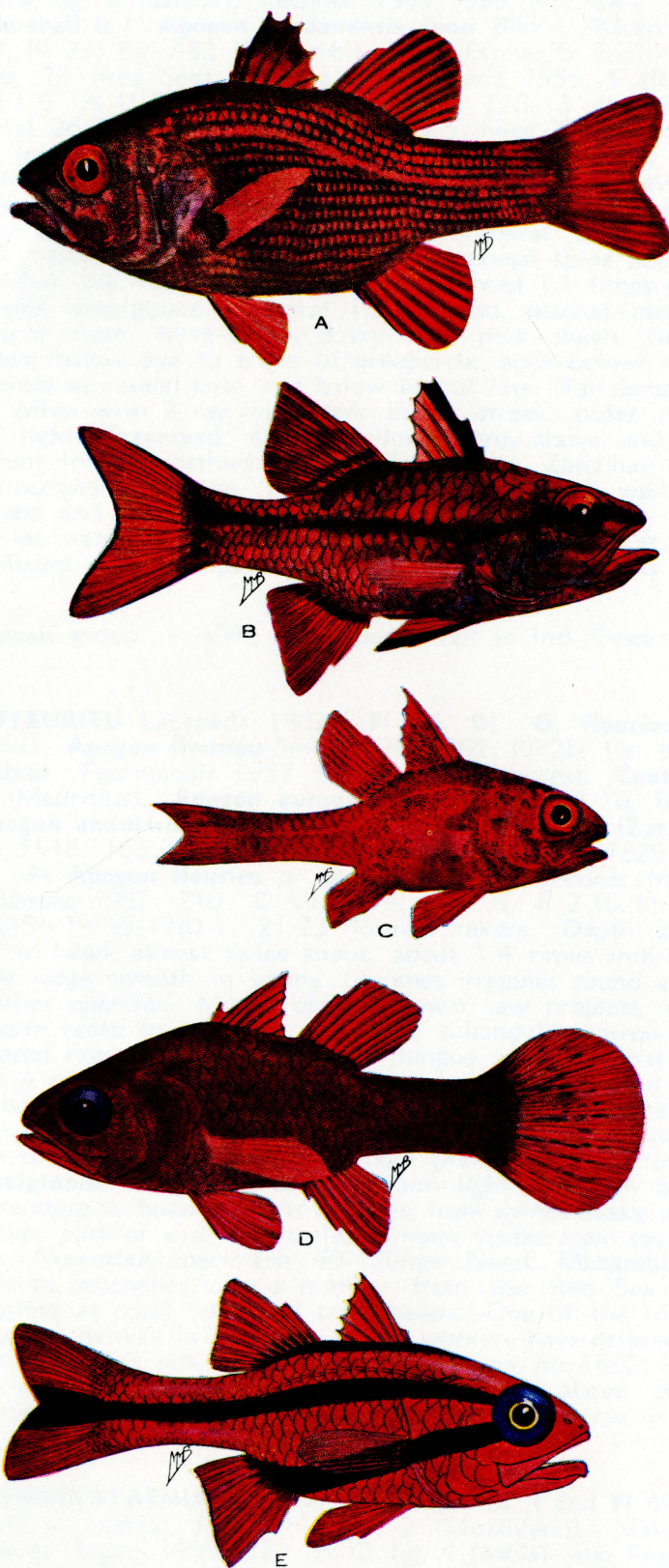


PLATE 49

A. *Lepidamia multitaeniata* (C. & V.), 140 mm. (Inhaca). B. *Pristiapogon snyderi* (J. & E.), 140 mm. (Inhaca).  
 C. *Apogon coccineus* Ruppell, 52 mm. (Inhaca). D. *Asperapogon rubellus* n. sp., 98 mm. (Matemo). E. *Apogon semiornatus* Peters, 65 mm. (Bazaruto).



3. **OSTORHYNCHUS SAVAYENSIS** (Gunther), 1871 (PI 47, B). **Apogon savayensis** Gunther 1871, 656 and 1873, 21, PI 19, fig. B (Samoa). Lachner 1951, 598, PI 19a-c (Philip. Oceania): and 1953 fig. 79a PI 36 (Marshall Is.). **Apogon bandanensis** (non Blkr). ?Klunzinger 1870, 715 (Red Sea). Smith 1949, 207, PI 23, fig. 482 (Mozamb.). Roux-Esteve & Fourmanoir 1955, 197 (Red Sea), Roux-Esteve 1956, 72 (Red Sea), Steinitz & Ben-Tuvia 1955, 5 (Red Sea). Smith 1955, 690 (Aldabra). D VII+I 9. A II 8. P 2,9,2. L.1. 25. Tr 1/6. 3 median predorsal. Gillrakers (0-2)5-8+1+18-19, total 26-28, av. 27. Depth about 2.5, head 2.5 in body. Eye 2-2.5 in head, twice snout, 1.3 times interorbital. Preopercle ridge smooth, or slightly escalloped at angle, margin denticulate behind lower margin feebly spinate. Gillrakers well developed, those in angle twice filaments, mouth oblique, lower jaw projects slightly. Maxilla to below hind margin of pupil. Villiform teeth in bands in each jaw, and feeble uniserial teeth on vomer, similar on palatines, tongue narrow, slightly papillose in front. First dorsal spine about  $\frac{1}{3}$  of 2nd which is more than  $\frac{1}{2}$  as long as 3rd, the 4th spine usually longest, about 1.1 times eye. 2nd anal spine as long as eye. Caudal feebly emarginate. Pectoral 1.5 in head, reaches above anal origin, pelvic 1.5 in head to or near anal origin. Alive silvery dusky with pink sheen, fins pinkish, a distinct triangular dusky bar from below eye to angle of preopercle, apex below. A distinct dark saddle over upper part of peduncle at caudal base, not below lateral line. 1st dorsal mostly dusky, upper and lower caudal lobes often with 2 ray wide dark dusky streak, outer ray and main part of body of fin contrasted light. Preserved: similar, yellowish grey above, and below, no colours. 17 specimens 50-90mm from Inhaca northwards along East Africa, Zanzibar, Pemba and Seychelles. Nowhere more than an occasional capture. My specimens agree quite well with both Gunther's and Lachner's descriptions and illustrations though I have not found any young with the band encircling the peduncle as stated by Lachner and shown in his 1951 PI 19c. The latter figure may possibly have been confused with his species **erdmani**, which (= **annularis** Ruppell and) is related to **savayensis**.

N.B.—Note on **bandanensis** group. P 404. Type species not in Ind. Ocean.

4. **OSTORHYNCHUS FLEURIEU** Lacepede 1802, (PI 46, D). **O. fleurieu** Lacepede 1802, 23 PI 32, fig. 2 (Indo-Pacific). **Apogon fleurieu** Smith 1949, 207, PI 22, fig. 487, (Natal, Mozamb.) Smith 1955, 690 (Aldabra). Fourmanoir 1957, 83 fig. 59 (Comores). **Centropomus aureus** Lacepede 1803, 253, 273, (Mauritius). **Apogon aureus** Day 1875, 60, PI 16, fig. 5 (E.Afr.). Barnard 1927, 521 (Natal). **Apogon annularis** (non Ruppell) Playfair 1866, 20 (Zanz.). Klunzinger 1870, 713, (Red Sea). Regan 1916, 168 (Natal). **Apogon roseipinnis** C & V 1829, 490, (Ceylon). Peters 1855, 234, (Mozamb.). As **Apogon fleurieu** or **aureus** numerous records from W. Indian Ocean. Petit Rouge (Maur.), Baissac 1952, 210. D VII+I 9. A II 8. P 2,10-11,2. Tr 2/6. 4 median predorsal. Gillrakers (2)5+1+15-17(0-1) 21-23 formed rakers. Depth 2.5-2.7(j), head about 2.5 in body. Eye 2.7-3 in head, almost twice snout, about 1.4 times interorbital. Predorsal profile straight. Preopercle ridge smooth in young, becomes irregular round angle with age. Suprascapula smooth, also other opercles. Mouth oblique, lower jaw projects, maxilla to below hind margin of pupil. Villiform teeth in bands in each jaw, subangular narrow band on vomer, (2-3 rows), more or less biserial row on palatines. Whole tongue smooth. First dorsal spine about  $\frac{1}{3}$  of 2nd, which is about  $\frac{1}{2}$  of 3rd, the 4th subequal about 2 in head. 2nd anal spine equals 6th dorsal spine, about equal eye. Spine in 2nd dorsal slightly longer. Pectoral 1.4 in head, reaches beyond anal origin. Pelvic 1.7 in head, not to anal origin. Caudal emarginate. Alive, brilliant as in PI 46, D always blue stripes through eye, lower more prominent, sometimes a brown-blue bar along base of anal (**roseipinnis**). Preserved, body uniform light yellowish brown, prominent dark bar round peduncle, extending to basal margins of lobes, front spines dusky, other fins light. Traces of blue bar through lower part of eye to opercle, no mark visible from eye across cheek in either preserved or live fishes. Numerous specimens, 60-120mm Natal, Mozambique northwards along E. Africa and all islands to Seychelles, also a number from the Red Sea. Mainly about coral, usually obtained by blasting at coral reefs and coral heads. One of the most beautiful of these fishes, and eagerly eaten by natives in E. Africa. Most workers have refused to accept Lacepede's **fleurieu** on the grounds that it is not an Apogonid fish. To me his 1802, PI 32, fig. 2 of **fleurieu** represents nothing else, it is very clearly the fish now described above, and I find it a better representation of the species than others of his, whose names are now in common use.

5. **OSTORHYNCHUS ENDEKATAENIA** (Bleeker), 1852 (PI 46, I and PI 47, E). **Apogon endekataenia** Bleeker 1852, 449 (E. Indies). Pellegrin 1904, 2 (Somaliland). Marshall 1952, 229, (Red Sea). **Apogon melanotaenia** Regan 1905, 320, PI C, fig. 4 (India), and Regan 1917, 458 (Natal). Barnard 1927, 519 (Natal 0-33 fms). **Apogon novemfasciatus** (non C & V), Smith, 1949, 208,



PI 22, fig. 487 (Natal northwards). Schultz 1943, 95 (Pacific). **Amia robusta** Smith & Radcliffe 1911, 254, fig. 2 (Philip. E. Indies). **Apogon robustus** Lachner 1953, 464, fig. 80 (Marshall Is.) Petit Rouge (Maurit. fide Baissac). Lion Roche (Seych.). D VII+I 9. A II 8. P 2,11-12,1-2. L.1. average 25. Tr 2/5. 3 predorsal. Gillrakers (3)2+1+9-10(3-4), total 18-20. Predorsal profile almost straight, snout blunt. Preopercle ridge smooth, hind margin finely denticulate, other opercles smooth, suprascapula denticulate. Gillrakers well developed, that in angle longer than filaments. Mouth oblique, jaws equal, maxilla to below hind margin of pupil or beyond. Villiform teeth in jaws, in angular band on vomer, band on palatines, wider in front. 1st dorsal spine barely  $\frac{1}{3}$  of 2nd, which is about  $\frac{1}{2}$  of 3rd, longest, about 1.5 times eye, 4th spine slightly shorter. 2nd anal spine little exceeds eye. Spine in 2nd dorsal longer. Pectoral 1.4 in head, barely to anal origin, pelvic 1.5 in head, not or seldom to anal origin. Alive as in PI 46 I, somewhat variable in shade, in nature and intensity of stripes, those from sandy areas lighter. Preserved: a dark stripe starts between eyes, runs to dorsal origin, there divides and usually shows a series of blotches to hind end of fin, and runs to caudal origin. 2nd stripe unites with fellow on snout, runs above eye, along front of lateral line above, then to caudal base. From upper 4th of eye a fainter stripe runs just below lateral line to origin of 2nd dorsal where it ends, more or less joining median stripe. The median stripe is widest and most prominent, and runs through eye about pupil width to caudal where it ends in a pupil sized dark blotch, usually elongate oval, continues behind as faint median stripe on caudal. The 5th stripe runs from below eye through pectoral base along lower part of peduncle to caudal base. There is a faint stripe below this from side of chin along side of belly to hind margin of anal. 1st dorsal usually dusky, a dusky stripe along above base of 2nd dorsal, sometimes one similar on anal. Pelvics dusky apically. Numerous specimens 25-100mm length, from Natal north along East Africa and over the whole W. Indian Ocean, one of the commonest of littoral fishes, easily caught among coral rubble, even by hand. Also six specimens, to 90mm, from the Red Sea, kindly sent by Dr. Ben-Tuvia. This has proved a troublesome species to name. An unmistakable designation is **melanotaenia** Regan, 1905, based on specimens from Zanzibar and India. I sent two of my W. Indian Ocean specimens to Dr. Lachner at the U.S. National Museum and he finds they agree well with **Apogon robustus** Smith & Radcliffe, 1911 (E. Indies). **Apogon endekataenia** Bleeker, 1852 has hitherto been a somewhat mysterious species. From our observations of live or newly dead Apogonidae we have come to mistrust colours and markings shown in Bleeker's numerous illustrations of these fishes. That of **endekataenia** in Bleeker's Atlas Ich. 1876, VII, PI 32, fig. 2 is probably not accurate, and it is significant that no further record or description of the fish as portrayed there can be traced. As the species described here is so widespread and abundant in the Indian Ocean, and clearly extends to the Pacific (**robustus**) it seemed unlikely that Bleeker did not find it. For that reason at my request Dr. M. Boeseman has kindly sent me five of Bleeker's East Indian specimens of **endekataenia** Bleeker, 1852, one of them considered critically as identical with Bleeker's type of **endekataenia**. Lachner, who examined all Bleeker's specimens of this species when at Leiden, in 1953, 463 states that he cannot decide on the status of **endekataenia** Bleeker, and that the location of the type is not known. Dr. Boeseman has recently informed me that he has a 57mm specimen (RMNH No. 5593 from Banka) that agrees exactly with Bleeker's measurements of his type and that he considers this to be Bleeker's type, which opinion is here accepted. While most of the markings on these five specimens have faded, in the one stated to be identical with the type there remains sufficient to enable me to be satisfied that this at least is identical with my specimens, and in gillraker count and all other features these five specimens of Bleeker's and my own are identical. I have therefore no hesitation in identifying the Indian Ocean form with **endekataenia** Bleeker, 1852. This is clearly a most successful and widespread species, and probably in consequence rather subject to variation in markings. I find among my numerous specimens, all with 18-20 gillrakers, variation in the terminal markings on the caudal. In most there is a distinct rounded dark spot, in others it is merely a rounded dilation of the median band, in some it does not show at all. In some cases this band continues on the median rays to the fork, in others not, and there are intermediate stages. In some specimens the upper and lower bands extend on the caudal, some bending inwards towards the median stripe. In this W. Indian Ocean material, however, I have been unable to identify with certainty the spotless **novemfasciatus** C & V. I have some examples with the markings of **nigrofasciatus** Lachner, 1953 but they have (3)3+1+9(3-4), i.e. total 19-20 gillrakers whereas Lachner 1953, 468 states **nigrofasciatus** to have (2-3)3+1+12-14(2-4) total 21-24. It is therefore difficult to regard my material as more than one variable species. One variant found only between 5-14°S in E. Africa is shown in PI 47, E. It is characterised by the dusky areas on the 2 dorsals and most specimens have only the front part of the short postorbital stripe, this rarely as long as in PI 46, I. These specimens agree in all other details with the remainder.

Numerous records of **Apogon fasciatus** (White), 1790 an Australian species, and of **A. novemfasciatus** C & V, 1828 from the Red Sea and the W. Indian Ocean probably fall here.



By kindness of Dr. Klausewitz I have been able to examine an 80mm specimen from Ceylon, which agrees in all minutiae with those from the W. Indian Ocean.

6. **OSTORHYNCHUS ANGUSTATUS** (Smith & Radcliffe), 1911 (Philippines) (PI 46, J) **Amia angustata** Smith & Radcliffe 1911, 253, fig. 1 (Malanspa Is. Pac.) **Apogon angustatus** Lachner 1953, 439, fig. 77, (Copy). D VII+I 9. A II 8. P 2,11,2. L.1. 25. Tr 2/6. Gillrakers (3)2+1+9-10(3-5) total 19-20. Depth 3, head 2.8 in body. Eye about 3 in head, exceeds snout, 1.3 times interorbital. Preopercle ridge smooth, margin denticulate, suprascapula smooth or faintly serrate. Gillrakers well developed, mouth oblique, maxilla to below hind part of eye, teeth in angular band on vomer, narrow band on palatines. 1st dorsal spine short, barely 1/6th of 2nd which is about half of 3rd, this longest, 1.4 times eye and slightly longer than 4th spine. Hind rays of 2nd dorsal and of anal longer, fins with concave edge. 2nd anal spine about equals eye. Spine in 2nd dorsal longer. Pectoral 1.4 in head about reaches anal origin. Pelvic 1.5 in head not to anal origin, caudal emarginate. Alive as PI 46, J, preserved: marked as shown in plate. A dark stripe from between eyes to origin of dorsal fin where it divides and runs along the base of the dorsal each side not markedly visible behind, 2nd stripe unites with its fellow on snout, runs above eye along upper part of lateral line from origin then back to caudal base. 3rd stripe through eye, along middle of side of caudal base where it ends in a conspicuous rounded pupil sized black spot, no dusky median line on mid-caudal. 4th stripe runs from below eye through pectoral base along lower edge of peduncle to caudal base, there is a faint stripe along the ventral profile of the chest and belly apparently ends at end of anal. All fins light, 2nd dorsal and anal with faint dusky stripe parallel with base. 12 specimens, 40-82mm Inhaca Island northwards along E. Africa to Seychelles, among coral rubble in pools. My specimens agree quite well with the original description of **angustatus** Smith & Radcliffe, 1911. I cannot find any difference between this and **endekataenia** except in the markings. Smith & Radcliffe state that **angustatus** has a more slender compressed body and larger eye, narrower interorbital, shorter dorsal spines and ventrals and narrower stripes. My material does not confirm this. In life these two forms are easily distinguished by the coloured stripes and by the marked dark stripe just below the lateral line from the upper part of the eye, distinct in even the smallest specimens of **endekataenia** but never in **angustatus**. A characteristic feature in **angustatus** is that the hindmost dorsal and anal rays are elongated. A 52mm specimen from the Red Sea, kindly sent by Dr. A. Ben-Tuvia, agrees in all respects.

7. **OSTORHYNCHUS HEPTASTIGMA** (C & V), 1828 (PI 50, J). **Apogon heptastigma** C & V, 260 (Red Sea). Gunther 1859, 231 (Copied). Klunzinger 1870, 714 (Red Sea). Kossman & Rauber 1877, 8 (Red Sea). Klunzinger 1884, 22 (Red Sea). **Apogon enneastigma** Ruppell 1835, 87, PI 22, fig. 3 (Red Sea). Gunther 1859, 236 (Copied). D VII+I 9. A II 8. P 2,10,2. L.1. 25. Tr 1/7. 3 median predorsal. Gillrakers (3)1+1+7(4). Depth 2.7, head 2.5 in body. Eye 2.6 in head, almost twice snout and interorbital. Predorsal profile slightly undulate. Preopercle ridge scalloped on hind margin round angle, margin serrate behind and round angle, below entire. Maxilla to below hind margin of pupil. Villiform teeth in bands in each jaw, a narrow angular band on vomer, narrow band on palatine. Hind part of tongue with asperities. First dorsal spine minute barely  $\frac{1}{4}$  of 2nd which is  $\frac{2}{5}$ ths of 3rd, the 4th subequal, longest about 1.3 times eye. 2nd anal spine almost equals eye. Pectoral about 2 in head, possibly broken, not above anal origin, pelvic 2 in head, not to anal origin. Caudal broken, emarginate according to Ruppell. L.1. complete. By kindness of Dr. W. Klausewitz I have been able to examine one of Ruppell's types dated Red Sea 1834, standard length 38mm, about 48mm total length. Alive, (according to Ruppell) the whole body and fins flesh colour, the body with brown sheen. The fins more red apically, the front part of the 1st dorsal is black. A black spot above each pectoral circled with yellowish red. There are 5 spots about the bases of the 2nd dorsal fins, one each side at the beginning and end and one in the middle between the 2 fins. Each side at the base of the tail is a similar black spot. Ruppell reports his specimens as all  $1\frac{3}{4}$ " long, the size of this type, which is light brownish, 1st dorsal slightly dusky in front. There are 5 black spots about bases of dorsals, the first pair in front of base of 1st fin, one each side of base of 1st and 2nd spines. One median on back, just before the base of the spine in 2nd dorsal, with a small dark stripe in front, the last pair as one on each side of hind part of base of 2nd dorsal. These spots tiny, not  $\frac{1}{2}$  pupil diameter, a similar spot on the lateral line at the base of the caudal. A dark  $\frac{2}{3}$  pupil diameter spot on the 2nd scale below lateral line above pectoral base, clearly light-ringed in life. All this exactly as originally described by Ruppell. We did not find this fish anywhere in East Africa, it appears therefore to be confined to the Red Sea.



8. *Ostorhynchus flagelliferus* n.sp.

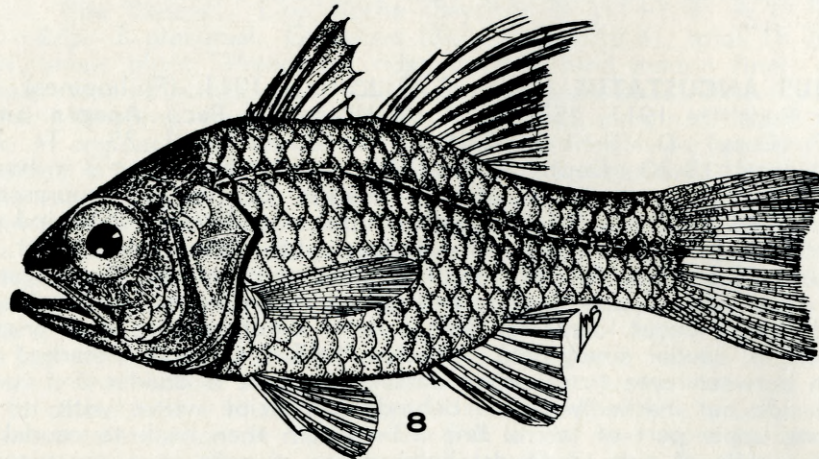


Fig. 8. *Ostorhynchus flagelliferus* n.sp. Type 135mm.

D VII+I 9. A II 8. P 2,10,2. L.1. 24. Tr 2/6. 3-4 median predorsal. Gillrakers (3)4+1+16-17, total 24-25. Depth exceeds head 2.5, head 2.7 in body. Eye 3 in head, 1.5 times snout, 1.4 times interorbital. Predorsal profile straight, snout bluntly pointed. Preopercle ridge irregular, strongly undulate round angle, finely so below, margin strongly denticulate round whole margin, largest points at and below angle. Gillrakers well developed, those in angle 1.5 times filaments, developed rakers mostly dusky, especially round angle. Mouth little oblique, lower jaw projects, maxilla to below hind edge pupil. Villiform teeth in bands in each jaw, rather wider in front, bands well separated at symphysis, a narrow subangular band of 2-3 small series of teeth on vomer, a similar band on each palatine. Tongue smooth. First dorsal spine about  $\frac{1}{3}$  of 2nd which is less than  $\frac{1}{2}$  of 3rd, which is longest, about 1.5 times eye. 3rd and 4th spines stout. Spines of 2nd dorsal slightly longer than eye, first 3 rays elongated, the 2nd longest, almost equals head length. 2nd anal spine equals eye. Pectoral 1.4 in head, to above anal origin, pelvic 1.7 in head, not to anal. Caudal emarginate (broken). Almost all of exposed part of L.1. scales covered with arborescent tubular system. Top of head densely beset with small pores. Colour in life probably pink or red. Preserved: more or less milky brown, prominent dark stripes before the eye to snout, lower edge of lip dark across snout, indications of dusky patch behind eye, lower surface of chin and mentum dusky. A dusky half pupil size spot at caudal base. Upper part of 1st dorsal faint dusky. 2 specimens, about 130 and 135mm length, the latter the type, from sheltered waters near coral, Island of Mozambique. This species is remarkably close to if not identical with *Amia griffini* Seale, 1910 hitherto known only from the Philippines. It is with hesitation that I describe my specimens as new, but Seale's original description 1910, 118 states specifically "no marks on head" and both my specimens have this distinct preocular bar, also Seale states 15 gillrakers on lower limb of arch, Fowler 1929 states 6+16 gillrakers, but my specimens have 17 and 18 formed lower gillrakers. Further material may indicate the African specimens as identical, but in the meantime on these 2 characters they are held as distinct.

9. **OSTORHYNCHUS APOGONIDES** (Bleeker), 1856 (Pl 48, I). **Cheilodipterus apogonides** Bleeker 1856a, 37 (E. Indies). **Amia apogonides** Bleeker 1873, 97, Pl 63, fig. 2 (E. Indies). **Apogon apogonides** Weber & de Beaufort 1929, 324 (E. Indies). **Apogon monochrous** (non Bleeker) Regan 1916, 168 (Durban). D VII+I 9. A II 8. P 2,10,2. L.1. 25. Tr 2/6. 5 median predorsal. Gillrakers (2-3)2-3+1+12-13(2) total 20-21. Depth 2.8-3, head 2.6 in body. Eye 3-3.2 in head, 1.2 times snout, 1.2 times interorbital. Predorsal profile straight, snout bluntly conical. Preopercle ridge smooth, slightly irregular around angle: hind margin denticulate, front of lower edge smooth, suprascapula smooth or entire. Gillrakers well developed, those in angle equal filaments, most formed rakers have distinct dusky stripe almost full length. Mouth moderately oblique, maxilla to below mid-eye or little beyond. In upper jaw behind a row of villiform teeth, outside this a row of slightly larger teeth; from halfway along jaw to the front an irregular band of distinctly larger caniniform incurved sharp teeth. In lower jaw sharp small caniniform teeth in a narrow band on side of jaw, largest halfway along jaw, are similar near the front, on each side of symphysis a cluster of small teeth with one or two distinct recurved caniniform teeth on



each side. A narrow angular band of small sharp teeth on vomer, the hindmost in each limb caniniform, larger, an irregular double row of small teeth on palatines. Tongue smooth in front, rugose behind. First dorsal spine barely  $\frac{1}{4}$  of 2nd which is about  $\frac{1}{2}$  of 3rd, the 4th usually slightly longer, about 1.4 times eye. 2nd anal spine and spine in 2nd dorsal about equal eye. Pectoral 1.7 in head, reaches anal origin, pelvic 1.8 in head, not to anal origin. Caudal emarginate, lobes rather pointed. L.I. complete. 16 specimens 17-110mm, Bazaruto, Mozambique Island, Zanzibar, Seychelles, not often seen, taken mostly by explosives in fairly deep water. Alive as in **PI 48, I**, darkish spots on 1st dorsal prominent, also blue lines through eye. Preserved: more or less uniform yellowish or brownish, most of apex of 1st dorsal dusky, a dusky stripe from snout tip to eye, usually prolonged as 2 faint dusky lines through eye to opercle, fins light. This species before known only from the E. Indies, now described for the first time from the Indian Ocean. It can always easily be recognised by the hooked caniniform teeth on the side of the jaws, as well as by the dusky striped gillrakers. One large male with buccal ova. One 100mm from stomach of **Lutianus rivulatus** (C & V) from deep water off Lamu, Kenya (Dr. J. Croil Morgans). By kindness of Mr. G. Palmer I have been able to examine the 2 specimens described by Regan 1916, 168 as **monochrous** Blkr. stated to be from Durban. These, No. BM 1915 7.6.6-7, 75mm and 95mm length respectively prove to be **apogonoides** Blkr. I suspect the locality stated as we did not find this species south of Bazaruto. Bleeker's 1873 PI 63, fig. 2 must have been based on a faded fish as this species is brilliant when fresh.

10. **OSTORHYNCHUS CYANOSOMA** (Bleeker, 1853. (**PI 48, H**). (Inhaca). **Apogon cyanosoma** Bleeker 1853, 71 (E. Indies). Klunzinger 1870, 714 (Red Sea). Steinitz & Ben-Tuvia 1955, 5 (Rec.Red. Sea). Smith 1955, 690, (Aldabra). **Apogon chrysotaenia** (non Bleeker) Klausewitz 1959, 255, fig. 9 (Red Sea). D VII+I 9. A II 8. P 2.10.2. L.I. 25. Tr 2/6. 3 predorsal. Gillrakers (3)3+1+15(0-1). Depth about 3, head 2.7 in body. Eye 3 in head, 1.6 times snout, twice interorbital. Predorsal profile straight, snout subconical. Preopercle ridge slightly undulate, hind margin serrate. Suprascapula feebly serrate, other opercles entire. Gillrakers well developed, mouth oblique, maxilla to below hind edge pupil. Villiform teeth in bands in each jaw, in subangular band on vomer, few on head of palatines. First dorsal spine minute, less than  $\frac{1}{4}$  of 2nd, which is about half of 3rd, this longest, 1.3 times eye. 2nd anal spine and spine in 2nd dorsal subequal to eye. Pectoral 1.6 in head, reaches above anal, pelvic 1.7 in head, not to anal. Caudal emarginate. L.I. complete. Alive as in **PI 48, H**; preserved: light yellowish, head dusky, with traces of bands on body as in **PI 48, H**, no trace of darker spot at caudal base or of dusky band along median rays of caudal. Fins all light as preserved. Numerous specimens 30-75mm from Pinda (Moz.) (14°S) northwards in E. Africa and to Seychelles, also some from the Red Sea. Ever since Bleeker's questionable illustrations of fishes of this type there has been confusion of species, largely resolved by Weber & de Beaufort who were able to examine the types. I cannot agree with Klausewitz (**loc cit** above) who unites **cyanosoma** Bleeker with **chrysotaenia** Bleeker, there seem to be good reasons for keeping them distinct. My specimens agree with most diagnoses of **cyanosoma** Bleeker.

#### 11. **Ostorhynchus nitidus** n.sp. (**PI 48, J** (type).

**Apogon novemfasciatus** (non C & V) "golden form" Smith, 1949, PI 102, fig. 487 (Inhaca). D VII+I 9. A II 8. P 2.9-10.2. L.I. 24. Tr 2/6. 4 predorsal. Gillrakers (3)3+1+12-13(1-2) total 21. Depth equals head, 2.8 in body. Eye 2.8 in head, 1.3 times interorbital. Predorsal profile straight, snout subconical. Preopercle ridge smooth, hind margin finely serrate, suprascapula finely serrate, other opercles smooth. Suborbital smooth. Gillrakers slender, well developed, mouth oblique, lower jaw slightly longer, maxilla to below hind edge pupil. Villiform teeth in bands in upper jaw, in lower rather larger sharp teeth more or less biserial on side, form irregular cluster each side in front, angular narrow band on palatines. First dorsal spine short, not  $\frac{1}{6}$ th of 3rd which is longest, about 1.3 times eye, 4th little shorter. 2nd anal spine little less than eye, spine in 2nd dorsal equals eye. Pectoral 1.5 in head, reaches anal origin, pelvic 1.5 in head, not to anal. L.I. complete. Caudal emarginate. Alive as **PI 48, J** (**the type**), golden-orange with dusky orange lines, a beautiful and brilliant small fish. Preserved: more or less uniform yellow-brown, slight remains of central dusky stripe on peduncle and median caudal rays, and of dusky bar along above 2nd dorsal base. 3 specimens 70-75mm, all Inhaca, about coral, taken by explosives, found nowhere else, the type 73mm from there. I can find no known species to which this can certainly be assigned. Related in colour to **cyanosoma** Bleeker 1853, and **chrysotaenia** Bleeker, 1851, **nitidus** appears to be clearly distinct in its markings; no dark spot at caudal base but there is a dark bar along median caudal rays. In the enlarged teeth in the lower jaw this species is allied with **apogonoides** Bleeker, 1856, but diverges widely in livery.



12. **OSTORHYNCHUS QUADRIFASCIATUS** (C & V), (PI 48, G) 1828. **Apogon quadrifasciatus** C & V, 1828, 153 (India). Peters 1855, 234 (Moz). Gunther 1859, 239 (Mozamb.). Guichenot 1863, 23 (Reunion). Bleeker & Pollen 1874, 93 (Borbonia). Sauvage 1891, 513 (Borbonia rec.) Norman 1939, 59 (Gulf of Aden). Smith 1949, 208, PI 23 fig. 485 (Mozamb.). Fourmanoir 1957, 83 (Comores). D VII+I 9. A II 8. P 2,11,2. L.1. 24. Tr 2/6. 5 predorsal. Gillrakers (3)3+1+11(2), total 20. Depth about 3-3.2, head 3 in body. Eye 3.5 in head, little exceeds snout, 1.4 times interorbital. Predorsal profile slightly undulate. Snout moderately pointed. Preopercle ridge smooth in young, becomes coarsely spinate round angle with age, margin denticulate at all stages, other opercles smooth. Gillrakers well developed, slender, those at angle longer than filaments. Mouth oblique, jaws about equal, maxilla almost below hind margin of eye. Villiform teeth in bands in each jaw, subangular narrow band on vomer, narrow band on palatines. First dorsal spine minute, less than  $\frac{1}{4}$  of 2nd, which is less than  $\frac{1}{2}$  of 3rd, the latter slightly shorter than 4th, which is longest, about 1.3 times eye. Caudal emarginate. Pectoral 1.4 in head, barely to anal origin, pelvic 1.6 in head, not to anal origin. Alive as in PI 48, G. Preserved: yellow-brown, with dusky stripes as in PI 48 G. That part of the lower stripe (that runs through eye) often develops on the opercle as a dusky subquadrangular spot darker than the rest of the stripe. 15 specimens, 45-95mm, from Inhaca northwards along E. Africa, taken mostly from rather deep sheltered water down to 30 fms by trawling or explosives. Nowhere more than an occasional capture. 2 specimens from 60mm off Eritrea kindly lent by Dr. A. Ben-Tuvia agree in all respects. Munro 1956, 17 considers this species the same as **fasciatus** Shaw (in White, 1790) from Australia. The latter appears to be different in having an extra well defined bar below the median bar that runs from eye to mid-caudal.

#### DOUBTFUL RECORDS, MALIDENTIFICATIONS, UNCERTAIN IDENTITIES

**Apogon amboinensis** Bleeker, 1853. Recorded from Zanzibar by Gunther 1866, 19 and by Sauvage 1891, 513.

**Apogon bandanensis** Bleeker, 1854. This species has been recorded from a wide area of the Western Indian Ocean, including Smith 1949, 207, PI 23 fig. 482, but this latter proves to have been malidentified; my specimens are all **savayensis** Gunther, 1871. We found no true **bandanensis** Bleeker in the W. Indian Ocean, but **savayensis** is not rare and it is likely that both Red Sea records (e.g. Klunzinger 1884, 21) and others in the W. Indian Ocean were malidentifications. I can find no evidence that **bandanensis** occurs in the Indian Ocean. Day 1875 does not record it from India.

**Apogon cupreus** C & V 1828, 159 from the Red Sea.

**Apogon fuscus** Quoy & Gaimard, 1825, p 345 (Guam) is described as brownish with a dusky blotch at caudal base, but has never been adequately described from material of certain identity, certainly not by comparison with the type, if that exists. It was recorded from Natal by Fowler & Bean 1930, 59. The record of **fuscus** Q & G in Smith 1949, 208 was based on an old specimen about 75mm in length found unlabelled at that time in the collection in the Museum at Lourenco Marques. Recently there I was unable to find this again and the record must be considered as doubtful. Fourmanoir 1957, 84 states **fuscus** to be common among weeds in the Comores, but as we did not find this species anywhere in the W. Indian Ocean it seems preferable to regard its presence there as doubtful.

**Apogon hyalosoma** Bleeker 1852. This has been recorded from Zanzibar, Seychelles, Mauritius and Mozambique. The S. African record (Smith 1949, 206 PI 23, fig. 479) was based on 3 old specimens found in the Museum at Lourenco Marques in 1946, stated by the Curator, the late A. Peao Lopes, to come from Inhaca Island, and he had colour notes of them. On re-examining these specimens (in poor condition) I now find them to be **lateralis** Valenciennes, 1832. From our experience in the Seychelles it is almost certain that Seychelles records of **hyalosoma** were based on **lateralis**, which is quite abundant there, especially in rivulet mouths. By kindness of Dr. M. Boeseman I have been able to examine a number of Bleeker's specimens, 80-160mm, of **hyalosoma** Bleeker, from the E. Indies, and we certainly did not find this species anywhere in the W. Indian Ocean. These specimens have a larger than pupil size dark blotch at caudal base and (2)1-2+1+5-6(4-6) gillrakers, i.e. only 7-9 formed rakers, also 7-8 median predorsal scales, more than any other large scaled species yet examined. All but the smallest specimens have a concavity in the profile of the head, the largest as shown in Bleeker 1873, PI 31, fig. 1. I have recently examined a 50mm specimen from Acre in the Mediterranean kindly sent by Dr. A. Ben-Tuvia, which he suspected might be **hyalosoma** Bleeker, 1852. This specimen differs from



**hyalosoma** Bleeker in having a dark bar from snout to eye, a large dark postorbital blotch and a less than pupil size dark spot median at caudal base. It has (?)?+1+8(4) gillrakers, and 4 predorsal scales, also a straight predorsal profile. If its origin is the Red Sea it may represent a new species. A 23mm length specimen from Eilat (Red Sea) reported by Fowler & Steinitz 1956, 275 as **Apogon hyalosoma** Bleeker may be the same.

The presence of **Apogon hyalosoma** Bleeker in the area covered by this revision cannot be regarded as other than doubtful, though it has been described from India by Day 1875, 64, Pl 17, fig. 5.

**Apogon latus** C & V, 1828, 159 (Red Sea). Dr J. Guibe has informed me that the type is not in the Museum in Paris.

**Apogon melanopus** Weber, 1911. Recorded by Fourmanoir 1954, 216 from Comores. This is, however, a brackish water species, before known only from the Aru Islands, Pacific.

**Apogon monochrous** Bleeker, 1856 has been recorded from the Red Sea and the W. Indian Ocean. That of Regan 1916, 168 from Natal proves to be **apogonides** Bleeker, that of Barnard 1927 is dealt with above (see **enigmaticus n.sp.**), that of Klunzinger 1870, 715 from the Red Sea I consider was likely **fraxineus n.sp.** Dr. M. Boeseman has kindly sent me a number of Bleeker's specimens of **moluccensis** Bleeker and of **monochrous** Bleeker. These are clearly identical, and have D VII+1 9. A II 8: 4th dorsal spine longest: (2-3)2-4+1+12-13(1-2) gillrakers: depth about 3: no bars or stripes, the body finely speckled. We did not find this fish in East Africa nor any evidence that it occurs there.

**Apogon rex-mullorum** C & V. Wuitner, 1935 Poiss Reunion, 61. (Reunion). This is a North Atlantic species.

## 2. Subfamily Siphamiinae.

Small feeble fishes of shallow water of the Indo-Pacific, the body with thin scales, some feebly ctenoid. Lateral line complete or incomplete. Preopercle margin smooth or spinate. Mouth large, with fine teeth in bands in jaws, sometimes on palate, no canines. First dorsal of 6-7 spines, 2nd with 7-11 soft rays, anal of 7-8 or 10-11 soft rays. Caudal forked. A tubular silvery gland each side from beneath the tongue to abdomen, then passing vent and anal, almost to caudal fin. At least 3 genera, one **Siphamia** Weber, 1909 first known from the Western Pacific, found also in East Africa, and 2 others from Australasia.

### **Siphamia** Weber, 1909.

Type **S. tubifer** Weber 1909, 168 (Timor). With the subfamily characters, definitive are: First dorsal with 7 spines, second with a spine and 9 soft rays. Body rather deep. Palatines toothed. Margin of preopercle spinate about angle. Probably not more than 6 species, one in East Africa.

**SIPHAMIA MOSSAMBICA** Smith, 1955 (PI 50, G). Smith 1955, 63 Pl 1 (E. Africa). D VII+1 9. A II 8. P 15. About 22 series of scales, L.1 incomplete, ends below second dorsal. Tr 7. Predorsal 5. Gillrakers (1-3)1+1+7(2-4). Body deep, well compressed. Depth 2.5, head 2.2 in body. Eye 2.8-3 in head, 1.5 times snout and interorbital. Flat spines about angle of preopercle. Mouth large, maxilla concave behind, reaches below hind edge pupil. Minute teeth in bands in jaws, on vomer and palatine. First dorsal slightly lower than soft fin, which is higher than the anal, the origin of the latter well behind 2nd dorsal origin. Pectoral about 1.8, pelvic about 2 in head, both short of anal. Caudal well forked. Scales feeble, mostly cycloid, some with feeble ctenae with age. Head naked except one series down cheek and 4 series on opercle. Alive translucent, with many dark specks forming lines along the body. Fins light. Preserved similar, but opaque generally, speckled dusky, the ventral tubes outlined by dark dots and numerous vertical streaks. Dark spots along ventral surface of peduncle. Two dark spots at caudal base, a few on dorsals, on caudal and anal base. Numerous specimens, 15-37mm, from Bazaruto (21°S) north along E. Africa, in shallow intertidal pools among coral, on rare occasions in small shoals, live in shelter by day.



### 3. Subfamily **Cheilodipterinae**.

Djomboudji (Comores).

Moderately small fishes with elongate subcylindrical bodies, covered with large ctenoid scales. Lateral line complete. Mouth large, canines in jaws, sometimes powerful, also bands of villiform teeth in upper, sometimes also in lower jaw, teeth on vomer and palatines. Preopercle ridge smooth, hind margin usually serrate. First dorsal of 6-7 spines. Caudal forked. Vent well in advance of anal. Mostly active predacious fishes found chiefly in shallow water among weeds and coral, free swimming, some only from deeper water. The larger species are good eating. Three genera of the tropical Indo-Pacific, one in the W. Atlantic.

#### Key to Genera

- A. Six spines in 1st dorsal. Caudal emarginate.
  - I. Villiform teeth in a band in lower jaw ..... 1. **Paramia**
  - II. No band of villiform teeth in lower jaw ..... 2. **Cheilodipterus**
- B. Seven spines in 1st dorsal. Caudal rounded ..... 3. **Coranthus nov.**

#### 1. **Paramia** Bleeker, 1863.

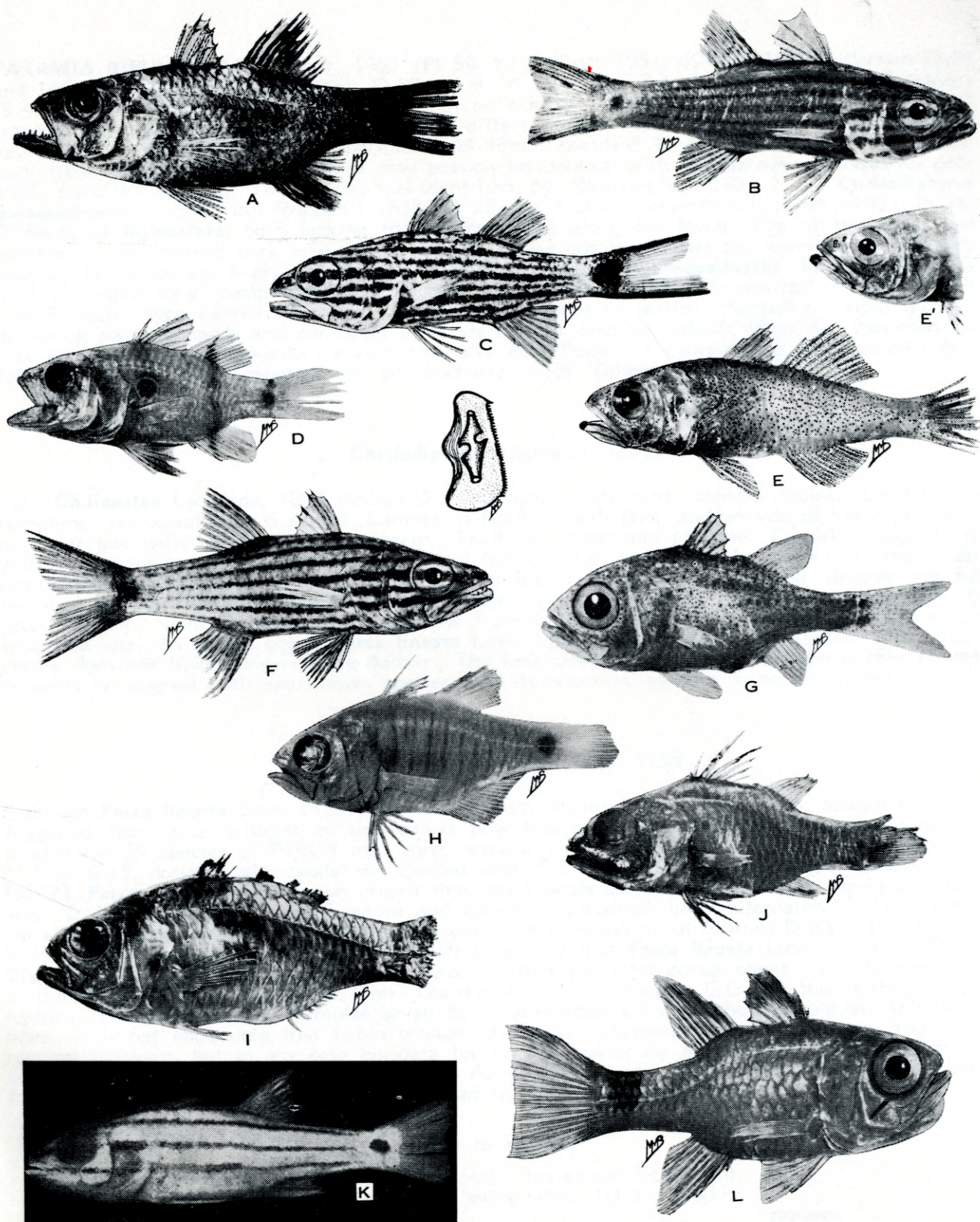
(**Jadamga** Shultz, 1940).

Type **Cheilodipterus quinquelineatus** C & V, 1823 (Society Isl. Pacific). Elongate body with ctenoid scales. Lateral line complete. 1st dorsal with 6 spines. Anus near anal origin. Canines on side of each jaw, none at symphysis. Bands of villiform teeth in each jaw, continuous in lower, interrupted at canines each side near front of upper jaw. Small teeth on vomer and palatine. Caudal forked. Body with horizontal dark stripes. Only 2 species, one widespread in Indo-Pacific, the other so far recorded only from the Persian Gulf, also in the Red Sea.

- A. 5 dark lines along side of body, one lateral along ventral profile of belly. Mid-ventral stripe ends at anus. No black spot on dorsal surface of peduncle ..... **quinquelineata**
- B. 4 dark lines along side of body, none lateral along ventral profile of belly. Mid-ventral stripe divides at anus, encircles anal fin and reunites behind. A small black spot on dorsal side of peduncle at base of upper caudal lobe ..... **bipunctata**

**PARAMIA QUINQUELINEATA** (C & V), 1828. **PI 51, A**. **Cheilodipterus quinquelineatus** C & V 1828, 167 (Society Is.). Klunzinger 1870, 716, (Red Sea). Barnard 1927, 526 (Mozamb.). Smith 1949, 205 (Inhaca). Roux-Estève 1956, 71 (Red Sea). Arnoult 1958, 62, Aldabra, and numerous records from the Red Sea and W. Ind. Ocean. D VI+I 9. A II 8. P 2,8-9,2. L.1. 25. Tr 2/6. 6 median predorsal. Gillrakers (2-3)1-2+1+7-10(2-5) total 17-18. Depth about 3.5, head 2.6 in body. Eye 3.1-3.3 in head, 1.3 times snout, 1.6 times interorbital. Preopercle ridge smooth or feebly undulate, hind margin above serrate to angle, where a few larger, lower margin undulate. Gillrakers vary from (2)2+1+10(2-3) in juveniles up to about 60mm, to (2-3)2+1+7(4-5) in adults. Maxilla to or beyond mid-eye level, mostly 2 canines each side above in front, pairs well separated, in lower jaw 3-5 canines on side, none in front. Bands of villiform teeth in each jaw, in both interrupted at canines. Vomerine teeth in angular band, a series on palatine. 1st dorsal spine about  $\frac{1}{2}$  of 2nd, which is longest about 1.7 times eye. 2nd anal spine about equals eye, spine in 2nd dorsal 1.2 times eye. Pectoral 1.8 in head, pelvic 2 in head, neither to anal. Pre-dorsal scales end behind hind eye level. 2 series on cheek. Prominent longitudinal stripes, the upper dorsal from occiput to dorsal, divides, encircles dorsal, reunites behind to caudal base: 2nd starts each side of snout, above eye: 3rd from snout, through eye, 4th from maxilla through pectoral base: 5th from side of chin, above pelvic base, along anal base, unites behind, then mid-ventral on peduncle: a mid-ventral stripe from isthmus to vent. Caudal spot about half pupil diameter. In life as **PI 51, A**: preserved yellow or brownish, stripes and spot dark, front of 1st dorsal dusky. Many specimens, 42-120mm from Inhaca north over whole W. Indian Ocean, at all islands to Seychelles, nowhere abundant, taken mostly by explosives in moderately deep water.





# PLATE 50

A. *Coranthus polyacanthus* (Vaillant). Type 170mm (Reunion). B. *Cheilodipterus lachneri australis* n.sub.sp. Type 80mm (Inhaca). C. *Cheilodipterus lachneri lachneri* Klausowitz. 85mm (Red Sea). D. *Apogonichthyoides taeniatus* (C & V). 58mm (Red Sea). E. *Bentuviaichthys nigrimentum* n.sp. Type 50mm (Red Sea). E'. Head of 2nd specimen 60mm. Inset 1st L.I. scale. Depth 4mm. F. *Cheilodipterus artus* n.sp. Type, 116mm (Mahe). G. *Siphamia mossambica* Smith. Type, 31mm (Bazaruto). H. *Archamia lineolata* (C & V). 62mm, (Red Sea). I. *Apogonichthyoides enigmaticus* n.sp. Type 80mm (Durban). J. *Ostorhynchus heptastigma* (C & V). 45mm (Red Sea). K. *Paramia bipunctata* Lachner (After Lachner). L. *Ostorhynchus nubilus* (Garman). 95mm (Shimoni).



**PARAMIA BIPUNCTATA** Lachner, 1951 (PI 50, K) Lachner, 1951, 604, PI 18, D, (Persian Gulf and 1955, 53 (Red Sea). (Not seen). D VI+ I 9. A II 8. P 2,8,2. L.1. 23. Tr 2/6. Gillrakers (3-4)3+1+10-11(2-4) total 20-21. Dark spot on side of peduncle about equals pupil. In most respects resembles **quinquelineata** C & V, but differs in larger spot on peduncle and as shown in key above. Known from 3 small specimens, 44-48mm standard length, from the Persian Gulf, later from the Red Sea. This species may possibly be identical with **Apogon novemstriatus** Ruppell, 1835, from the Red Sea. This species was identified by Klunzinger 1870, 7 as **Cheilodipterus quinquelineata** C & V, but Ruppell's 1835, PI 22, fig. 1 closely resembles Lachner's 1951, PI 18, D figure of **bipunctata**, both lacking the ventral stripe along the lower edge of the belly, and not having any marked dark area on 1st dorsal. I have confirmed that the lower stripe and dark area on 1st dorsal are easily visible in even small specimens of **quinquelineata**. Ruppell's fish was only 1½ inches long, comparable with Lachner's specimens. Dr. W. Klausewitz has informed me that Ruppell's type cannot be traced, so this issue cannot be settled. Ruppell describes his fish as having pairs of bands and concludes "Das vierte paar endlich verläuft längs der Bauchschräge von der Spitze der Dillenkante bis zum ende der Afterflosse." I cannot find anybody who certainly knows the exact meaning of "Bauchschräge" or of "Dillenkante."

## 2. **Cheilodipterus** Lacepede, 1802.

Type **Ch. lineatus** Lacepede, 1802 (Indian Oc.). Elongate body with ctenoid scales. Lateral line complete. 1st dorsal with 6 spines. Canines in front of both jaws, and on side of lower jaw, side of upper jaw with band of villiform teeth. Teeth on vomer and palatine. Caudal forked. Body with 8 or more horizontal dark lines. Tropical Indo-Pacific and Atlantic. One of the most puzzling groups of fishes, there has long been confusion in classification and despite careful revisions such as that of Lachner 1953, 481 there still is. There are possibly not more than 6 species in all. Many records and descriptions from the W. Indian Ocean are not resolvable when types are lost. As shown below **Perca lineata** Linn, 1758 long accepted as falling in this genus, clearly does not belong even to the family. The long used name **arabicus** Gmelin, 1788, cannot certainly be aligned with any known species, and its rejection, as here, is recommended.

## The status of **Perca lineata** Linn, 1758.

Although **Perca lineata** Linn, 1758 (from an unknown locality) has long been accepted as an Apogonid fish, it is difficult to understand how this could ever have come to pass. Linnaeus divided his 29 species of PERCA into three groups, viz: \* Nos. 1-5, two distinct dorsal fins: \*\* Nos. 6-15, dorsal single, caudal not divided, and, \*\*\* Nos. 16-29, dorsal single, caudal bifid. No. 23, **Perca lineata** (of unknown origin) thus has a single dorsal fin, and divided (forked) caudal, also "D 17/33. A 3/10, and 5 white and brown longitudinal lines alternately." The "pinna dorsali" is "ramentacea," probably a single deeply cleft dorsal fin of formula D XVII 16; A III 7, P 15. Cuvier & Valenciennes, 1830, V, 309 suggested that **Perca lineata** Linn was a species of **Diagramma** Cuvier, 1815 on the slender grounds that the total dorsal count, i.e. 33, was close to the DXII 20 of **D. diagramma** Linn. Gunther 1859, 330, followed C & V in this, without giving reasons. However, the fin formulae given by Linn indicate a fish of the Australasian Aplodactylidae. It is not impossible that fishes brought by earlier voyagers from those parts may have reached Linnaeus, but in any case his data for **lineata** cannot by any stretch of imagination or later designation be made to fit any type of Apogonid fish, and **Perca lineata** Linn should therefore no longer be used for any fish of that family. It is not accepted here.

## Key to species

- I. Distinct broad black band encircling peduncle, but caudal lobes light. More than 14 crowded narrow dark lines along sides. 1st dorsal spine usually shorter than half 2nd ..... **caninus**
- II. If any band over peduncle then at most diffuse, usually a distinct spot on side. Not more than 12 stripes along body. 1st dorsal spine usually longer than half 2nd.
  - A. 8-12 narrow dark lines along side, intermediates narrower. Distinct variably sized yellow-edged black spot on peduncle ..... **lachneri**



B. 8-10 rather broader dark subequal stripes along sides. A dark blotch on peduncle, sometimes diffused as dusky band.

1. Stripes wider than interspaces. Almost whole first dorsal dusky. Peduncle encircled by dusky band that extends all along caudal lobes. Formed gillrakers in adults not exceeding 9

**lineatus**

2. Stripes not wider than interspaces. A dark less than eye size spot on peduncle, sometimes diffused larger. Caudal uniform light or lobes at most faint dusky. First dorsal light. Formed gillrakers in adults 11-12

**artus nov**

**CHEILODIPTERUS CANINUS** Smith, 1949. (PI 51, C). **Cheilodipterus caninus** Smith 1949, 205, PI 22, fig. 472 (Inhaca). Smith 1955, 690, (Aldabra). Fourmanoir 1957, 87, fig. 63 (Madag). Arnoult 1958, 62 (Aldabra). **Cheilodipterus lineatus** (non Linn) Klausewitz 1959, 258, fig. 10 (Red Sea); numerous records of **lineatus** Linn which are not identifiable. Native name LION LICHIE (Mauritius). D VI+I 9. A II 8. P 2,10,2. L.1. 25. Tr 3/7. 6 predorsal scales, end at hind eye level. Gillrakers (3-4)2+1+8-10(5-6)=21-22. Depth about 3.3-3.5, head 2.8 in body. Eye about 3.3 in head, little exceeds snout, 1.3 times interorbital. Preopercle ridge smooth, hind margin serrate behind, on expanded angle, and feebly below. Maxilla to below hind part of eye, dentition typical, variable canines in lower jaw, largest separated pair in front, no villiform teeth. In upper jaw band of villiform teeth from behind to halfway along jaw, then usually 3-4 canines each side 2nd from front usually largest. Angular band on vomer, hinder larger, narrow band on each palatine. 1st dorsal spine less than half 2nd. Pectoral and pelvic short of anal origin. Caudal emarginate. In life as PI 51, C, preserved more or less brownish with more than 14 crowded dark lines along sides. A black 2/3rds eye width bar encircling peduncle at base of caudal, barely extends to lobes, spinous dorsal apically dusky. Inhaca Island, Pinda, Mozambique, Aldabra, Red Sea, to 160mm nowhere abundant. This species has long borne the name **lineatus** Linn, but as indicated above that name can no longer be used. Forskal's 1775, 42 **Perca lineata** from the Red Sea may be this species but as a homonym of **Perca lineata** Linn, 1758 that name cannot be used. There is no certain indication of the true nature of **arabica** Gmelin 1788, and there is no justification for applying that name to any species. The only certain recent name is **caninus** Smith 1949, which is used here.

**CHEILODIPTERUS LACHNERI** Klausewitz, 1959. (PI 50, B & C). **Ch.lachneri** Klausewitz 1959, 260, fig. 11 (Red Sea). D VI+I 9. A II 8. P 2,9,2-3. L.1. 23. Tr 2/6. 5 predorsal. Gillrakers (4-5)2+1+8-11(4-6), total 21-22. Depth 3.5-3.8, head 2.6 in body. Eye 3-3.2 in head, 1.3 times snout, 1.3 times interorbital. Preopercle ridge smooth; hind margin almost completely undulate. In the young 12 formed rakers on lower limb, reduced to 9 in adults. Maxilla almost below hind margin of eye, dentition typical, no villiform teeth in lower jaw, usually 4 canines on side, and 2 separated in front. Upper jaw usually 3-4 canines each side in front, villiform teeth end at 1st lateral canine. Angular band on vomer, hinder teeth largest, a narrow band on palatine. 1st dorsal spine longer than half 2nd, which is longest. Predorsal scales end before level of hind margin of eye. Life colour according to Klausewitz 1959, 260 silvery grey, the stripes dark brown. Fins reddish. Preserved, light yellow, with 10-12 variable dark brown stripes along body, fewer in young fishes. Spot at caudal base rounded, distinct, variable, in Red Sea fishes almost eye size, in larger specimens with dusky expansion above and below sometimes extends full length of caudal lobes. 10 specimens, 58-80mm, Inhaca and Wamizi Is. and Baixo Pinda, Mozambique, also 3 specimens, 47, 75, and 86mm total length, from Sharm el Sheikh, Red Sea, kindly sent by J. Ben-Tuvia. Klausewitz' type from the Red Sea was 128mm total length. The 10 Mozambique specimens agree with those from the Red Sea in almost every particular except that the caudal spot is markedly smaller. It is possible that the two forms merit subspecific rank on this character and would thus be **Ch.lachneri lachneri** Klausewitz, the Mozambique form may be named **Ch.lachneri australis n. subsp.**, the type 65mm standard length, from Inhaca Is., Mozambique. I agree with Klausewitz (*loc cit*) that this species cannot clearly be identified with any known form and that it merits a new name. Although **Cheilodipterus lineatus** as figured by Day 1875, PI 18, is listed by Klausewitz as this species, Day's figure accords with neither Klausewitz' figure nor with my fishes.

**CHEILODIPTERUS LINEATUS** Lacepede, 1802. (PI 51, B). **Cheilodipterus lineatus** Lacepede, 1802, III, 539, PI 34, fig. 1 (Ind. Ocean). Smith 1955, 690 (Aldabra). Fourmanoir 1957, 87 fig. 64 (Comores). **Centropomus macrodon** Lacepede, 1802, IV, 252 (Reunion). **Ch.macrodon** Roux-Esteve 1956, 71 (Red Sea). **Ch.octovittatus** Cuvier 1828, 163 (Maur). Gunther 1859, 248 (Maur). Playfair 1866, 21 (Zanz). Peters 1876, 436 and 1883, 50 (Maur).



Klunzinger 1870, 717 (Red Sea) and 1884, 23 (Red Sea). Ben-Tuvia and Steinitz 1952, 6 (Red Sea). D VI+I 9. A II 8. P 2,9,2. L.1. 24. Tr 2/57. 5 predorsal. Gillrakers (4-5)1-2+1+6-7(5-8), total 19-21, 10 formed rakers in juveniles, reduced to 8 in adults. Depth about 3.5, head about 2.7 in body. Eye 3.3(I)-4(A) in head, equals snout in adults, 1.3 times interorbital. Preopercle ridge smooth, margin serrate. Maxilla to or near level of hind margin of eye, dentition typical, 3-4 canines each side of front of upper jaw, about 6 along lower jaw, largest in front, angular band on vomer, narrow band on palatine. 1st dorsal spine little more than half 2nd, which is longest or equals 3rd. Predorsal scales end behind hind eye level. Pectoral 1.8 in head, not to anal, pelvic 2.4 in head, not to anus. 2nd anal spine and spine in 2nd dorsal subequal, about 1.2 times eye. Alive as **PI 51, B**. Preserved: yellowish, 8-9 brown lines, wider than interspaces, 1st dorsal almost wholly black, pelvics dusky distally, diffused dusky bar encircles peduncle, extends typically along margin of caudal lobes. 12 specimens, 85-220mm, from about 16°S in East Africa to Shimon, Kenya, also at islands to Seychelles, nowhere abundant. Apparently the largest species, this is clearly one of the most widespread, extending from E. Africa to the central Pacific. Since **Perca lineata** Linn, 1758 long held to fall in this family, no longer pertains there, the unmistakable definition and figure of **Ch. lineatus** Lacepede, 1802 becomes valid for this species.

### **Cheilodipterus artus n.sp. (PI 50, F).**

In most respects similar to **lineatus** Lacepede, differs as follows: dark medio-dorsal line from interorbital to dorsal, where divides, encircles dorsal and reunites behind, very distinct: 8-10 dark lines along body distinctly narrower than interspaces; 1st dorsal at most faint dusky; pelvics all light; a pupil size usually distinct spot at caudal base; with age more diffuse; caudal lobes at most faint dusky. Gillrakers (4-5)2+1+9-11(4-7), total 22-23, 14 formed rakers in young, 12 in adults. 1st dorsal spine distinctly more than half 2nd, which is longest. 9 specimens, 80-140mm, only Zanzibar and Mahé (Seych), the type, 110mm standard length, from Mahé. This species, both alive and preserved, is readily distinguished from closely related **lineatus** Lacepede, by the narrow stripes and general lighter colour. Nowhere more than rare it has probably previously been confused with **lineatus** Lacepede.

### **3. Coranthus n. genus.**

Type **Cheilodipterus polyacanthus** Vaillant 1877, 27 (Reunion). Elongate body with ctenoid scales. First dorsal with 7 spines. Lower jaw with variable canines on sides and in front, no villiform teeth. In upper jaw a band of villiform teeth whole length to near symphysis, with an outer series of incurved small teeth, 1-2 large canines each side of symphysis. Teeth on vomer and palatine. Caudal rounded. A single obscure stripe along side. Only the type species, so far found only in deep water off Reunion. An interesting form. The dentition is closest to **Cheilodipterus** Lacepede.

**CORANTHUS POLYACANTHUS** (Vaillant), 1877 (Reunion). (**PI 50, A**). **Cheilodipterus polyacanthus** Vaillant 1877, 27 (Reunion). Sauvage 1875, 146, PI 18, fig. 2 (Type). Blanc & Postel 1958, 368 (Rec). D VII+I 10. A II 8. P 2,8,4, or 2,9,3, total 14. L.1. 24. Tr 2½/6. 6 median predorsal. 2-3 cheek scales. (2)2+1+7(7) or (3)1+1+8(6) gillrakers, total 19. Depth 2.8-2.9, head 2.5 in depth. Eye 3.3 in head, 1.2 times snout, 1.2 times interorbital. Preopercle ridge smooth, hind edge of flange with a feeble serrae on upper half, the rest almost smooth to angle, this and lower edge with numerous fine serrae, other opercles entire or feebly crenulate. 2 opercular spines, the lower larger. Suprascapula with 2 strong points. Raker in angle longest, exceeds filaments, the 7-8 in front shorter, then 6 or 7 knobs in front. Mouth oblique, maxilla expanded, extends to below middle of eye. In upper jaw a fairly wide band of villiform teeth on side runs to near symphysis, outside this band irregular uniserial incurved sharp teeth, larger anteriorly, the front 4-5 largest, strongly exsert, the groups on the 2 sides widely separated by an edentate space. Behind the cluster in front on each side are 1-2 large and 1-2 small retrorse canines. Along the side of the lower jaw a single wide spaced series of 5-7 large canines with smaller teeth between. In front on each side these merge into a band of 2-4 series of smaller caniniform teeth, widest in front, those of the two sides narrowly separated, the outer series of the band slightly larger and exsert. On each side behind the teeth in front 1-2 larger retrorse canines. Sharp



conical teeth in 1-2 series in chevron shaped band on vomer, hinder largest, an irregular narrow band of smaller teeth on palatine. Dorsal inserted close behind head, the 1st spine short,  $\frac{1}{4}$  of 2nd. 3rd spine longest, 1.6 times eye, soft fin higher, 3rd ray twice eye. 1st anal spine short,  $\frac{1}{3}$  of 2nd, which slightly exceeds eye, soft fin higher in front, slightly less than 3rd dorsal ray. Pectoral equals pelvic, about 1.7 in head, not to anal origin. Caudal rounded or truncate (broken). Scales finely ctenoid with radiating striae, lateral line tubes with many branches above and below, fins naked, predorsal scaling to above hind margin of eye. Life colour unknown. Preserved light brown, a  $\frac{1}{3}$  eye-width dark streak along body, slightly curved down from tip of opercle, then up to hind part of lateral line behind end of 2nd dorsal. Described from 2 specimens the type, (Reunion) No. 4096, Paris Museum, standard length 140mm, total length about 170mm, still in good condition; kindly lent by Dr. J. Guibe, and one from 75 fathoms off Reunion, 125mm standard length, kindly sent by M. P. Fourmanoir. This is clearly a rare species so far found only about Reunion and apparently from fairly deep water.

#### 4. Subfamily Pseudamiinae

Small to minute translucent slimy soft bodied fishes, with feebly ossified skeletons. The body naked or with feeble cycloid scales. Lateral line absent or incomplete. No serrae on head bones. Large mouth with fine teeth and canines in jaws. Teeth on vomer and palatines, sometimes on pterygoid. Gillrakers few. First dorsal of 6 spines. Three Indo-Pacific genera, all in the W. Indian Ocean.

A. Cycloid scales present. Caudal rounded.

- |   |                       |
|---|-----------------------|
| I. Incomplete but distinct L.1. Front nostril with large flap ..... | 1. <b>Pseudamia</b>   |
| II. No L.1. No flap on front nostril .....                          | 2. <b>Pseudamiops</b> |

B. Body naked. Caudal emarginate ..... 3. **Gymnapogon**

**Lachneria** Smith, 1954 was founded on **Gymnapogon gracilicauda** Lachner, 1953 (from Marshall Islands, Pacific) stated to have no scales. Later work has shown that **gracilicauda** has scales, and **Lachneria** falls with **Pseudamiops** Smith.

#### 1. PSEUDAMIA Bleeker, 1865.

Type **Cheilodipterus polystigma** Bleeker, 1859. In life translucent, the slimy body covered with 40-45 series of fine cycloid scales, head mostly naked. Lateral line ends below 2nd dorsal. Transverse and longitudinal series of papillae on head and body. Few gillrakers. Mouth large, jaws with 2 series of fine teeth, and canines. Teeth on vomer, palatines and pterygoids. Anal and 2nd dorsal each with 8 soft rays. Caudal rounded. 2 species, the type from the E. Indies and a related species from the W. Indian Ocean.

**PSEUDAMIA GELATINOSA** Smith, 1955 (PI 51, G). **P. polystigma** (non Bleeker) Smith 1954, 778, PI 23, D & E (E. Africa, 3°-21°S), and Smith 1955a, 9, PI 1, fig. 8 (Mozamb.). **P. gelatinosa** Smith 1955, 690, PI 18, A (Aldabra). D VI+1 8. A II 8. P 1,14,1. V 1 5. About 43 series of scales. L.1. about 20. Tr 3/15. Predorsal 15-18. Gillrakers (2-3)1+1+6(3-4). Depth about 5, head about 2.6 in body. Eye 3.5 in head, exceeds snout, about equals interorbital. Front nostril with large flap. No opercles serrate. Head and body covered with elaborate network of papillae. Mouth large, maxilla to or beyond hind eye edge. In each jaw small canines and fine teeth in bands, wider in front. Small canines on vomer, a single row of small teeth on palatine, a few on pterygoid. Body with thin cycloid scales, also on nape and opercle, rest of head naked. Lateral line incomplete and rudimentary, ends below front of 2nd dorsal. First dorsal of feeble spines, lower than soft fin, which is rounded, anal rounded, origin behind that of 2nd dorsal. Pectoral 1.5, pelvic 2 in head. Caudal rounded-hastate. In life translucent purplish with spots, streaks along scales form lines along body. Juveniles with dark ocellus on upper caudal rays, this fades with age while a dark ocellus develops on peduncle at caudal base. Fins mainly dusky. Length 30-70mm, Bazaruto (21°S) northwards and to Seychelles, among coral rubble, seldom seen.

#### 2. Pseudamiops Smith, 1954.

(**Lachneria** Smith, 1954).

Type **P. pellucidus** Smith, 1954 (E. Africa). In life transparent, the body covered with thin cycloid scales, on nape and opercle, head otherwise naked. No lateral line. Transverse and longitudinal series of papillae on head and body. Few gillrakers. Mouth large with series of fine teeth and some canines in jaws. Teeth on vomer, palatines and pterygoids. Caudal rounded. Only 2 species known, the type and **gracilicauda** Lachner, 1953 from Marshall Is., Pacific.



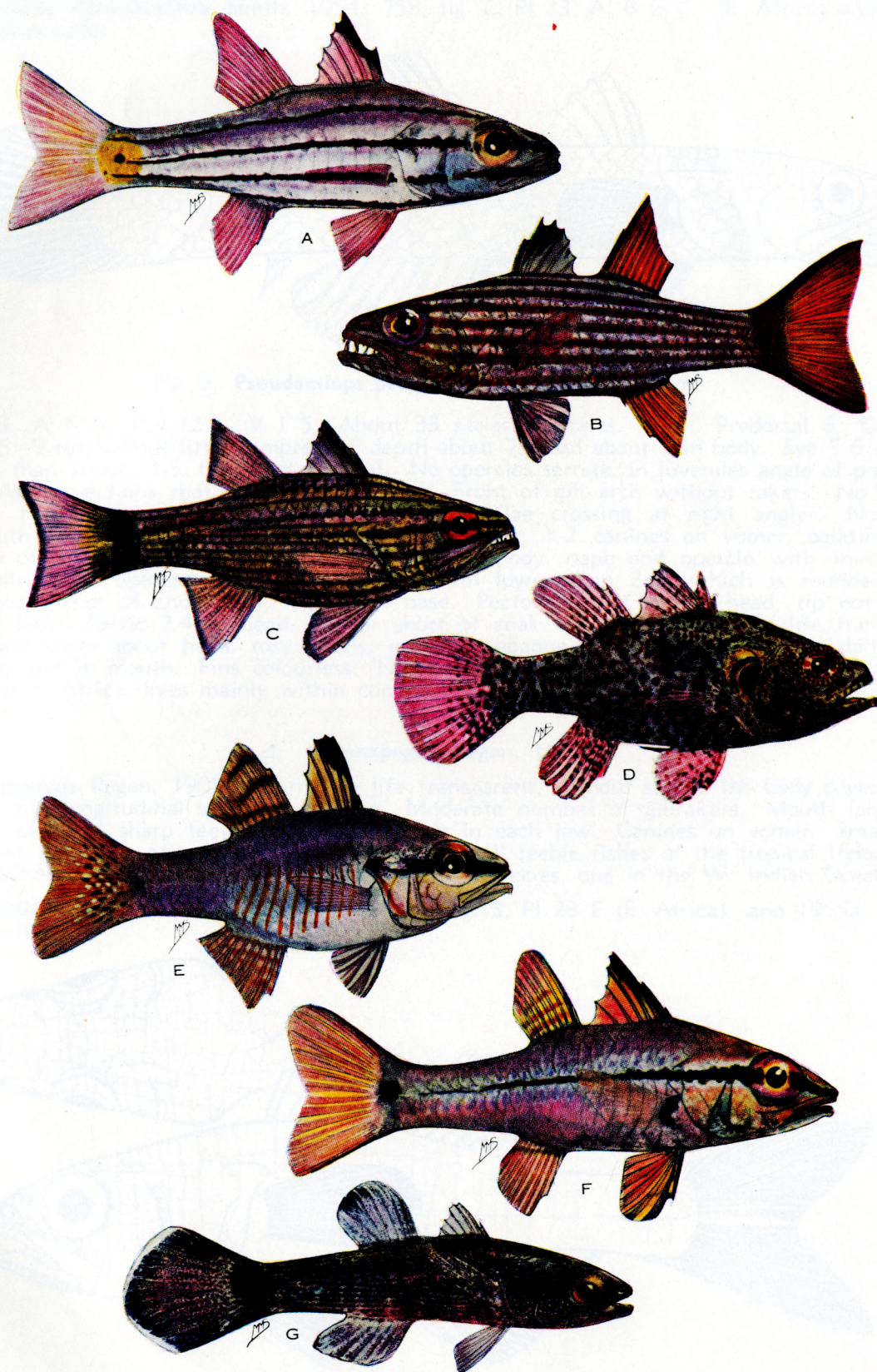


PLATE 51

A. *Paramia quinquelineata* (C. & V.), 110 mm. (Pinda). B. *Cheilodipterus lineatus* Lacep., 205 mm. (Shimoni).  
 C. *Cheilodipterus caninus* Smith, 155 mm. (Pinda). D. *Fowleria aurita* (C. & V.), 90 mm. (Pinda). E. *Apogon*  
*sangiensis* Blkr., 66 mm. (Pinda). F. *Pristiapogon fraenatus* (Val.), 105 mm. (Pinda). G. *Pseudamia gelatinosa*  
 Smith, Type 77 mm. (Aldabra.).



**PSEUDAMIOPS PELLUCIDUS** Smith, 1954, 758, fig. 2, Pl 23, A, B & C. (E. Africa) and 1955a, 9, fig. 9 (Bazaruto).

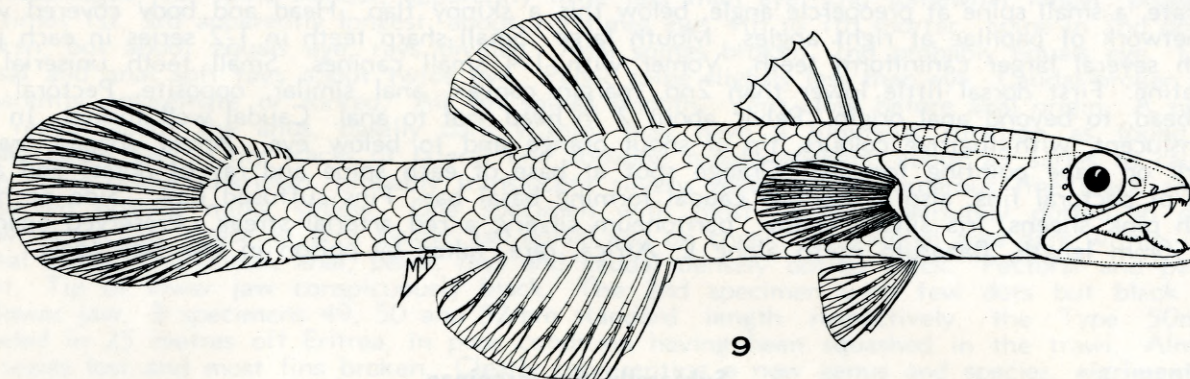


Fig. 9. **Pseudamiops pellucidus** Smith. Type 47mm.

D VI+I 8. A II 9. P 1,12,1. V I 5. About 33 series of scales. Tr 9. Predorsal 8. Gillrakers (2)1+1+5=9 total. Body little compressed, depth about 7, head about 3 in body. Eye 5-6 in head, little less than snout, 1.5 times interorbital. No opercles serrate, in juveniles angle of preopercle with angular projections that disappear with age. Front of gill arch without rakers. No pseudo-branchiae. Head and body covered with series of papillae crossing at right angles. No lateral line. Mouth large, maxilla beyond eye, canines on side, 1-2 canines on vomer, palatines with single row of fine teeth, a few similar on pterygoids. Body, nape and opercle with thin cycloid scales easily shed. Spines of 1st dorsal slender, fin lower than 2nd, which is rounded. Anal origin opposite that of 2nd dorsal, has longer base. Pectoral about 2.2 in head, tip not beyond 1st dorsal base. Pelvic 2.4 in head, tip far short of anal. Caudal rounded. In life transparent, dark stellate spots about head, rosy pupils, intestines opaque. Preserved opaque, a few dark specks about head and in mouth. Fins colourless. Numerous specimens 18-48mm, from Bazaruto (21°S) north along E. Africa, lives mainly within coral rubble.

### 3. **Gymnapogon** Regan, 1905.

Type **G.japonicus** Regan, 1905 (Japan). In life transparent, without scales, the body covered with transverse and longitudinal series of papillae. Moderate number of gillrakers. Mouth large with 1-2 series of small sharp teeth and small canines in each jaw. Canines on vomer. Small teeth on palatines, none on pterygoids. Caudal forked. Small feeble fishes of the tropical Indo-Pacific, living in shelter in broken coral in tide pools. A few species, one in the W. Indian Ocean.

**GYMNAPOGON AFRICANUS** Smith, 1954, 791, fig. 3, Pl 23 F (E. Africa): and 1955a, 10, fig. 10 (Bazaruto).

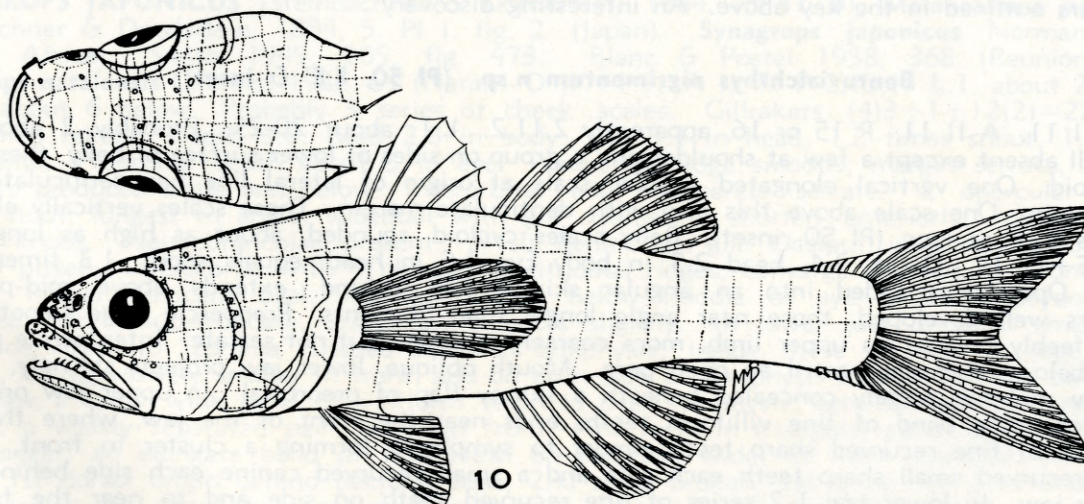


Fig. 10. **Gymnapogon africanus** Smith. Type. 50mm.



D VI+I 9. A II 8. P 13+2. V I 5. Gillrakers (1-2)1+1+9. Body compressed, depth about 4, head about 2.6 in body. Eye 3.5 in head, exceeds snout, almost twice interorbital. No opercles serrate, a small spine at preopercle angle, below this a skinny flap. Head and body covered with a network of papillae at right angles. Mouth large. Small sharp teeth in 1-2 series in each jaw, with several larger caniniform teeth. Vomer with 1-4 small canines. Small teeth uniserial on palatine. First dorsal little lower than 2nd, margin convex, anal similar, opposite. Pectoral 1.8 in head, to beyond anal origin. Pelvic about 2 in head, not to anal. Caudal well forked. In life translucent, with fugitive colours, tip of snout orange and to below eye. Arrow shaped orange mark on nape pointing forward. Orange spot at base of each spine and ray of dorsal and anal and of pectoral fins, also at base of caudal forming basal bar. Fins suffused pink. Side of head with pink sheens, iris silvery yellow, peritoneum silvery, a red arterial streak. Preserved opaque. 30-50mm length, Bazaruto north along E. Africa, rare, taken by poison in low tide pools.

## 5. Subfamily Synagropinae.

Rather small fishes of deep water of the Indo-Pacific. Elongate body covered with less than 35 series of thin cycloid or ctenoid scales, easily shed. Lateral line complete. 7-9 feeble spines in first dorsal. Some fin spines may be serrate. Canines present, jaws, vomer and sometimes palatines with bands of fine teeth. Vent close before anal. Previously only the type genus. This subfamily usually diagnosed with 8-9 dorsal spines, cycloid scales and teeth on palatines. It has to be amended as above for the interesting new genus described below.

### KEY TO GENERA

- A. 7 spines in 1st dorsal. Scales with serrate margin. No palatine teeth. **Bentuviaichthys**
- B. 8-9 spines in 1st dorsal. Scales all cycloid. Palatines toothed ..... **Synagrops**

### **Bentuviaichthys nov.**

Type **B.nigrimentum n.sp.** (Eritrea). compressed elongate body with deciduous scales, those on most of body vertically elongate with serrate hind margin, those on belly subcircular, cycloid. Lateral line probably complete. Upper jaw with a band of villiform teeth most of its length, small pointed teeth in front, also a small retrorse canine each side. Lower jaw with fine biserial sharp teeth on side, small sharp teeth in a cluster in front with small curved canines each side. Teeth on vomer, none on palatines. 1st dorsal with 7 feeble spines, 2 anal spines. Soft dorsal and anal each with 11 soft rays. No fin spines serrate. Gillrakers well developed. Caudal probably forked. Only the type species. Related to **Synagrops** Gunther 1887 but clearly distinguished by the characters outlined in the key above. An interesting discovery.

### **Bentuviaichthys nigrimentum n.sp. (Pl 50, E,E' & inset).**

D VII+I 11. A II 11. P 15 or 16, apparently 2,11,2. L.1. about 20-25. Probably 2 above L.1. Scales all absent except a few at shoulder and a group on sides of lower surface of belly, these latter all cycloid. One vertical elongated tubular scale at origin of lateral line has denticulations on hind margin. One scale above this also with denticulate margin. These scales vertically elongate, twice as high as long (Pl 50, inset). Belly scales cycloid, rounded, about as high as long. Gillrakers 5+1+14. Depth 3.4, head 2.5 in body. Eye 3.6 in head, equals snout, 1.3 times interorbital. Opercle expanded into an angular skinny flap behind, extends above mid-pectoral. Gillrakers well developed, those near angle longer than filaments. Preopercle ridge smooth, hind margin feebly uneven on upper limb, more coarsely on lower but not serrate. Interopercle possibly serrate below. Anterior nostril an open pore. Mouth oblique, lower jaw projects strongly, maxilla to below mid-eye, largely concealed beneath a skinny flap of preorbital. In upper jaw on side a moderately wide band of fine villiform teeth, ends near the front of the jaw, where there are 1-2 series of fine recurved sharp teeth almost to symphysis forming a cluster in front, with a row of recurved small sharp teeth each side and a small recurved canine each side behind front of upper jaw. In lower jaw 1-2 series of fine recurved teeth on side and to near the front of the jaw. On each side of lower jaw in front 1-2 small recurved caniniform teeth. Small teeth



in 1-2 rows in subangular band on vomer, the hinder larger, no palatine teeth visible. Dorsals both damaged, 1st spine slender, apparently little less than eye, 2nd somewhat longer, probably  $1\frac{1}{2}$  times 1st, 3rd apparently longest, about 1.5 times eye, 4th to 7th shorter. Spine in 2nd dorsal broken, but about equals eye, rays divided. Anal spines broken, 2nd probably equals eye. First dorsal and anal soft rays about twice eye. Pelvic spine slightly less than eye. Caudal broken but apparently emarginate or forked. All fin spines smooth. Vent close before anal origin. A swollen region about the anus, basally dark within, may have a luminous function as found in *Jaydia ellioti* Day. Only traces of lateral line showing tubule pockets, about 23 series to caudal base. Live colour unknown, probably translucent silvery yellow with numerous fine black spots. Preserved opaque milky yellow. One specimen with most of body minutely dotted in dark brown especially dense in area below 1st dorsal and on cheek. Abdominal area dark within. 1st dorsal dusky, 2nd dorsal, anal, pelvic rays and caudal densely dotted black. Pectoral and pelvic light. Tip of lower jaw conspicuously black. The 2nd specimen with few dots but black tip to lower jaw. 3 specimens 49, 50 and 52mm standard length respectively, the Type 50mm, trawled in 25 metres off Eritrea, in poor condition having been squashed in the trawl. Almost all scales lost and most fins broken. Clearly representing a new genus and species, **nigrimentum** falls closest to **Synagrops** Gunther, in general physiognomy resembling **Synagrops malayanus** Weber 1913, fig. 52, (= **philippinensis** Gunther), its dentition similar to that of **Synagrops**, but **nigrimentum** differs widely in the dorsal and anal fin formulae, in lacking palatine teeth and in the serrated scales. By a curious coincidence **Synagrops microlepis**, 1935 also related to **nigrimentum** also has 5+1+14 gillrakers, but differs clearly on a generic basis, **microlepis** has D IX+I 10 and 40 series of cycloid scales. The 3 specimens kindly sent by Dr. A. Ben-Tuvia in a valuable and useful collection of Apogonid fishes from the Red Sea. Considering these to be new I offered to return them to Dr. Ben-Tuvia for description and naming, but at his request they are included in this monograph.

#### **Synagrops** Gunther, 1887.

Type **Melanostoma japonicum** Steindachner and Doederlein, 1884 (Japan). Elongate body with feeble cycloid scales, easily shed. Lateral line complete. 8-9 feeble spines in 1st dorsal. Some fin spines may be serrate. Canines and small teeth in bands in jaws. Teeth on vomer and palatine. Small fishes of deepish water of the Indo-Pacific, one species in the W. Indian Ocean, another recorded close by.

- A. Pelvic spine smooth. 16 formed gillrakers ..... **japonicus**  
 B. Pelvic spine serrated. 12 formed gillrakers ..... **philippinensis**

**SYNAGROPS JAPONICUS** (Steindachner & Doederlein), 1884. (PI 47, D). **Melanostoma japonicum** Steindachner & Doederlein, 1884, 5, Pl I, fig. 2 (Japan). **Synagrops japonicus** Norman 1939, 60 (E. Africa). Smith 1949, 205, fig. 473. Blanc & Postel 1958, 368 (Reunion; Rec). **Synagrops natalensis** Gilchrist 1922, 69 (Natal). D IX+I 9. A II 7. P 2,13,1. L.1. about 28. Tr 2 above, about 6 below. Probably 3 series of cheek scales. Gillrakers (4)3+1+12(2)=22 total, 16 formed rakers. Depth 3.8, head 2.8 in body. Eye 3.3 in head, 1.2 times snout, 1.1 times interorbital. Preorbital depth about 5 in eye. Preopercle ridge smooth; margin serrate, stronger at lobate produced angle and below. Interorbital and subopercle serrate. 2 opercular spines. Rakers stout, longest in angle, subequal with gill filaments, shorten anteriorly, rudiments low spinate knobs. Pseudobranchiae present. A slit behind last gill. Occiput, interorbital and muzzle coarsely pitted. Interorbital with 4 oblique longitudinal ridges, converge at occiput. Front nostril circular, hinder vertically oval. Maxilla reaches below middle of eye or little beyond, hind expanded margin sub-truncate, lower jaw projects slightly. In lower jaw uniserial small teeth along side widen to "comma" shaped bands at symphysis; inside these on side 3 large spaced canines, 2 progressively smaller in front, and on each side of symphysis a large retrorse canine. In upper jaw a fairly wide band of villiform teeth to near symphysis, between edentate, no lateral canines, a widely separated pair, large, in front. Fine teeth in triangular patch on vomer, hinder teeth longer, an elongate band of fine teeth on palatine, wider in front, rounded, inner teeth larger. 1st dorsal origin behind pectoral base, 2nd spine broken, 1st spine not  $\frac{1}{4}$  of 2nd, which is (?) longest,  $1\frac{1}{2}$  times eye, rest shorten to last, subequal with 1st. 2nd dorsal origin behind base of last spine by twice its length, spine of fin about  $\frac{1}{2}$  eye, soft rays broken, base of fin



2/3 that of 1st dorsal, hind end of last fin 1.6 times its base from caudal base. Anal origin below 4th dorsal soft ray, 1st spine  $\frac{1}{3}$  of 2nd which is 1.8 in eye, soft rays broken, base of fin 2/3 that of 2nd dorsal, ends behind that fin. Pectoral 1.3 in head, tip below 2nd dorsal origin, pelvic 1.5 in head, reaches 2/3 to anal. Caudal forked. No fin spines serrate. Scales almost all missing, even pockets abraded. Few remaining cycloid, L.1. almost straight from origin to caudal base, tubes simple. Predorsal scales missing, no pockets. Isolated small embedded scales on occiput, become very small between eyes, a few about snout. As preserved brownish, dorsals and caudal dusky. One specimen, 130mm standard, about 160mm total length, trawled from 100 fathoms off Durban. It seems likely that this is identical with **Synagrops natalensis** Gilchrist, 1922 from 233 fathoms off Natal. The original description is brief, the length of the specimen not given, unfortunately the type has disappeared, it was said to have D IX+I 10; A II 8; L.1. about 33. There appears to be no valid reason for keeping **natalensis** distinct from **japonicus** Steindachner & Doederlein, which has been found from Japan to the Persian Gulf and now to Natal. Fowler & Bean 1930, 138 place **natalensis** Gilchrist in synonymy of **philippinensis** Gunther, but that has serrated pelvic spines.

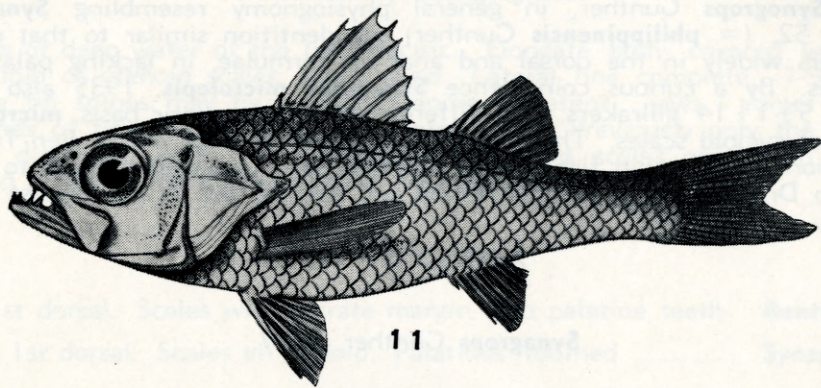


Fig. 11. **Synagrops philippinensis** (Gnthr). After Alcock.

**SYNAGROPS PHILIPPINENSIS** (Gunther), 1880. **Acropoma philippinensis** Gunther 1880, 51 (Philipp). Alcock 1894, 116 (India). **Synagrops p.** Norman 1939, 60 (Aden). Not yet found in the W. Indian Ocean, but certain to occur there. Not seen. D IX+I 8-9. A II 6-7. L.1. about 28. Tr 2-3/6-7. 6 predorsal. Gillrakers (3)2+1+10(3). Resembles **japonicus** in most features. differs in having spinules at angle of preopercular ridge, distinct serrae on pelvic spine and fewer gillrakers. Attains 130mm, average smaller, Indian Ocean to Philippines.



## WESTERN INDIAN OCEAN BIBLIOGRAPHY

- ALCOCK 1894, Journ.As.Soc.Bengal LXIII. Pt.2.  
 ANGOT 1950, Asp.Phys.Solara.  
 ARNOULT 1958, Arnoult,Bauchot-Boutin et Roux-Esteve. 1958 Poiss.Aldabra.
- BAISSAC 1952, Fishes of Mauritius.  
 Ann.Rep & Fish.App.  
 BARNARD 1927, Ann.S.A.Mus. XXI.  
 BELLOTTI 1874, Atti.Soc.Ital.  
 BENNETT, 1833,P.Z.S. I.  
 BENNETT 1835, P.Z.S. III.  
 BEN-TUVIA & STEINITZ 1952,  
 Bull. No. 2 State of Israel Dept. of Fish.  
 BLANC & POSTEL 1958, Mem.Inst.Sci.Madagas.  
 BLEEKER 1852, Nat.Tijds.Ned.Ind. III.  
 BLEEKER 1853, Nat.Tijds.Ned.Ind. V.  
 BLEEKER 1854, Nat.Tijds.Ned.Ind. VI.  
 BLEEKER 1855, Nat.Tijds.Ned.Ind. VIII.  
 BLEEKER 1856, Nat.Tijds.Ned.Ind. X-XII.  
 BLEEKER 1856a, Act.Soc.Sc.Indo-Neerl. 1.  
 BLEEKER 1857, Nat.Tijds.Ned.Ind. XIII.  
 BLEEKER 1859, Nat.Tijds.Ned.Ind. XX.  
 BLEEKER 1873, Atlas Ichthy. 7.  
 BLEEKER 1876, Atlas Ichthy. 8.  
 BLEEKER 1877, Atlas Ichthy. 8.  
 BLEEKER 1879, Verh.Akad.Amsterdam XVIII.  
 BLEEKER & POLLEN 1874 (1875),  
 Faune de Madagascar.
- CANTOR 1850, Cat.Mal.Fish.  
 CUVIER & VALENCIENNES 1828,  
 Hist.Nat.Poiss. II.  
 CUVIER & VALENCIENNES 1829,  
 Hist.Nat.Poiss. IV.  
 CUVIER & VALENCIENNES 1831,  
 Hist.Nat.Poiss. VII.
- DAY 1875, Fishes of India.  
 DUPONT 1927 (1940), in Hornell & Dupont.  
 Report on Fish. Seychelles Is.
- FOURMANOIR 1954, Ich.Comores.  
 FOURMANOIR 1957, Poiss.Can.Moz.  
 FOWLER 1925,  
 Proc.Acad.Nat.Sci.Phil. LXXVII.  
 FOWLER 1934,  
 Proc.Acad.Nat.Sci.Phil. LXXXVI.
- FOWLER 1934a, Ann.Natal Mus. VII.  
 FOWLER 1935, Proc.Nat.Sci.Phil. LXXXVII.  
 FOWLER & BEAN 1930,  
 U.S.Nat.Mus.Bull. 100 Vol.X.
- GARMAN 1903, Bull.Mus.Comp.Zool.vol.39.  
 GILBERT 1903, Bull. U.S. Fish.Comm. vol.23.  
 GILCHRIST 1903, Rep.Govt.Biol. for 1902.  
 GILCHRIST 1922, Mar.Biol.Rep. No.3.  
 GILCHRIST & THOMPSON 1908,  
 Annals S.A.Mus. VI.  
 GILCHRIST & THOMPSON 1916,  
 Marine Biol.Rep.III.  
 GILCHRIST & VON BONDE 1924,  
 Fish Mar.Survey Rep. VII.  
 GILL 1864, Proc.Ac.Nat.Sci.Phil.  
 GOODE & BEAN 1895, Oceanic Ichthyol.  
 GUDGER 1929, Bull.Amer.Mus.Nat.Hist.  
 GUICHENOT 1863, Faun.Ich.Reunion.  
 GUICHENOT 1866, Mem.Soc.Nat.Cher.  
 GUNTHER 1859, Cat.Fish.Brit.Mus. I.  
 GUNTHER 1866, Fishes of Zanzibar.  
 GUNTHER 1871, Proc.Zool.Soc. Lond.  
 GUNTHER 1873, Fische der Sudsee I.  
 GUNTHER 1880, Challenger Rep. I.  
 GUNTHER 1887, Challenger Rep. XXII.
- IWAI & ASANO 1958,  
 Sc.Rep.Yokosuka City Mus. No.3.
- JENKINS 1902, Bull.U.S. Fish Comm. XXII.  
 JORDAN & EVERMANN 1902,  
 Bull.U.S.Fish Comm. XXII.  
 JORDAN & EVERMANN 1905,  
 Fishes Hawaii, XXIII.  
 JORDAN & JORDAN 1922,  
 Mem.Carnegie Mus.Vol.10 No.1.  
 JORDAN & SEALE 1905,  
 Proc.U.S.Nat.Mus. 28.  
 JORDAN & SEALE 1906, Fishes of Samoa.  
 JORDAN & SNYDER 1901,  
 Journ.Coll.Sci.Imp.Univ.Tokyo Vol.15.  
 JORDAN & STARKS 1906, in Jordan & Seale,  
 Fishes of Samoa.
- KLAUSEWITZ 1959, Fisch.Roth.Meer.Sencken  
 Mus. vol.40.



- KLUNZINGER 1870, Syn.Fische Roth. Meer.  
 KLUNZINGER 1884, Fisch.Roth.Meer.  
 KOSSMAN & RAUBER 1877,  
 Verhandl.Naturh.Med.Vereins.
- LACEPEDE 1802, Hist.Nat.Poiss. III and IV.  
 LACEPEDE 1803, Hist.Nat.Poiss. V.  
 LACHNER 1951, Proc.U.S.Nat.Mus. Vol. 101.  
 LACHNER 1953, in Schultz et al.  
 Bull.U.S.Nat.Mus. 202, Vol.1.  
 LINNAEUS 1758, Syst.Nat X.
- MARSHALL 1952,  
 The Manihine Exped. 1948-49.  
 MATSUBARA 1936,  
 Journ.Imp.Fish.Inst.Tokyo XXXI.  
 MEINKEN 1938,  
 Dent.Kol.Ubersee Mus.Bremen 2.  
 MOBIUS 1880, Beitr.Meer.Ins.Mauritius.  
 MUNRO 1956, Fishes Ceylon.  
 MUNRO 1960, Fishes Australia.
- NORMAN 1939, John Murray Expd.
- PELLEGRIN 1904,  
 Bull.Mus.Hist.Nat. Paris 10.  
 PELLEGRIN 1907,  
 Bull.Mus.Hist.Nat. Paris 13.  
 PETERS 1855,  
 Monat. Akad.Wiss.Berlin; 1876 ibid.  
 PETERS 1876, Monat. Akad.Wiss.Berl.  
 PETERS 1883, Trans.Roy.Soc.Maur.  
 PETIT 1931, Bull. Mus. Hist. Nat. Paris (2) 3.  
 PFEFFER 1893, Ostafrikanische Fische.  
 PLAYFAIR 1866, Fish. Zanzibar.
- QUOY & GAIMARD 1825, Voy. "Astrolabe".
- RAFINESQUE 1810, Carat. Al. Nov. Ge. Sicily.  
 REGAN 1905, Rev. Suisse Zool. 13.  
 REGAN 1908, Trans. Linn. Soc. Lond. XII.  
 REGAN 1908a, Ann. Natal Mus. I.  
 REGAN 1916, Ann. Durb. Mus. I.  
 REGAN 1917, Ann. Durb. Mus. I.  
 REGAN 1919, Ann. Durb. Mus. II.
- RISSO 1810, Ichth. de Nice.  
 ROUX-ESTEVE 1956, Calypso II.  
 ROUX-ESTEVE & FOURMANOIR 1955,  
 Calypso I.  
 RUPPELL 1828, Fische Rothen Meeres.  
 RUPPELL 1835, Neue Wirbel. (Red Sea).
- SAUVAGE 1875-91 Poiss. Madagascar.  
 SAUVAGE 1883, Bull. Soc. Philom. (7) VII.  
 SCHULTZ 1940, Proc. U.S. Nat. Mus. 88.  
 SCHULTZ 1943, U.S. Nat. Mus. Bull. 180.  
 SEALE 1909,  
 Philippine J. Sci. Manila A Gen Sci. 4.  
 SEALE 1910, Philip. Journ. Sci. V.  
 SEALE 1914, Fishes of Hong Kong.  
 SHAW 1790, in WHITE, Journ. Voy. to N.S.W.  
 SMITH 1949, Sea Fishes of South Africa.  
 SMITH 1954, Ann. Mag. Nat. Hist. (12) VII.  
 SMITH 1955,  
 Ann. Mag. Nat. Hist. Ser. 12 Vol. VIII.  
 SMITH 1955a, Mem. Mus. Dr. Alv. da Castro.  
 SMITH & RADCLIFFE 1911, in RADCLIFFE.  
 Proc. U.S. Nat. Mus. Vol. 41.  
 SMITH & RADCLIFFE 1912, in RADCLIFFE.  
 Proc. U.S. Nat. Mus. Vol. 41.  
 SNYDER 1902,  
 Bull. U.S. Fish Comm. 1902 (1904).  
 STEINDACHNER 1867,  
 Sitzber Akad. Wiss. Wien. 55.  
 STEINDACHNER 1902, (07),  
 Denk. Akad. Wiss. Wien.  
 STEINDACHNER & DOEDERLEIN 1884,  
 Denks. Akad. Wiss. Wien. Fische Japans.  
 STEINITZ & BEN-TUVIA 1955, Fish. Bull. 2.
- VAILLANT 1877,  
 Bull. Soc. Philom. Paris 1875 (1877) 6 ser.  
 VALENCIENNES 1832,  
 Ann. Mus. Nat. Hist. Paris.  
 VON BONDE 1923, Mar. Biol. Survey S.A. 3 (1).
- WEBER 1909, Not. Leyd. Mus.  
 WEBER 1911,  
 Abhande. Sench. Nat. Gesel. XXXIV.  
 WEBER 1913, Siboga Expd.  
 WEBER & DE BEAUFORT 1929,  
 Fish Indo-Aus. Archip. V.  
 WHITE 1790, Journ. Voy. to N.S.W.  
 WHITLEY 1935, Rec. Aus. Mus. XIX No. 4.  
 WUITNER 1935, Poiss. Reunion.



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# PLATE 52

A. **Apogon bifasciatus** Ruppell, 1835. Cotype Frankfurt, No. 4622. 80mm (Red Sea). B. **Apogon taeniatus** C & V, 1828. Type Paris, No. 8693, 60mm std. (Red Sea). C. **Apogon nigripinnis** C & V, 1828. Type Paris, No. 8694. 80mm (India). D. **Apogon suezi** Sauvage, 1883. Type Paris, No. 5137. 65mm (Suez). E. **Apogon fraenatus** Val, 1832. Type Paris, No. 8709. 85mm (N. Guinea).