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FISHES FROM THE CORAL SEA AND THE SWAIN REEFS*

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Australian Museum

Plates 8-10 Figs. 1-15

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INTRODUCTION

The scattered islets and reefs in or near the Coral Sea to the east of Queensland are very remote and few zoologists have visited them. An account of the only zoological collection made at Elizabeth and Middleton Reefs appeared in the *Australian Zoologist* 8 (4), 1937: 199-273.

Over the last 15 years or so the Australian Museum has received several well-preserved collections of fishes from Queensland, the Coral Sea, New Caledonia, Lord Howe Island and other South Pacific localities. The fish-fauna of Lord Howe Island has been catalogued by Waite (1904, *Rec. Aust. Mus.* 5 (3): 187-230; 180 species listed), but many new records have appeared in the last few decades.

The Australian Museum's acquisitions from New Caledonia were listed by Whitley (1961, *Proc. Roy. Zool. Soc. N.S. Wales* 1958-59: 60-65) but a valuable collection of 456 fishes made by Dr. D. F. McMichael from remote islands in the Coral Sea when he was aboard H.M.A.S. *Gascoyne* in 1960 has not hitherto been reported upon, except for the description of one new species (Whitley, 1962, *N. Queensland Nat.* 30 (131): 3). This collection contains many Melanesian species and has been of value in studies on their distribution; several novel species or ones of special interest are described or figured in this paper in association with the 577 fishes obtained during the brief visit to Swain Reefs, at the south-eastern end of the Great Barrier Reef, Queensland, of the Australian Museum's 1962 Expedition, which is the main object of this report. Altogether 102 different species were collected, but only the more interesting sharks and fishes are dealt with below.

Most of them are conspecific with Queensland coral reef forms (especially with those already known from the Capricorn and Bunker Groups) and with New Caledonia and Lord Howe Island species and all of them may be expected to range over a wide area of Indo-Pacific seas when their distribution is better known. Only three of the Swain Reefs species appear to be new: a shark related to a Papuan one, a sea-horse also dredged in Moreton Bay, and an Apogonid with no known affiliations.

Two tunnies of possible commercial importance occurred in schools during our visit: the Frigate Mackerel, *Auxis thazard*, and the Mackerel Tuna, *Euthynnus wallisi*.

Some species of fishes (notably parrot and unicorn fishes) were seen but not collected—they are not listed here. Larval fishes and a few "difficult" species have not been identified.

* Including results of the Australian Museum 1962 Swain Reefs Expedition.

By hand-lining we obtained Red Emperor, *Diacope sebae*; Coral Cod, *Plectropomus maculatus*; Emperor-Sweetlips, *Lethrinus chrysostomus*, also *Variola louti* and *Epinephelus forsythi*, all good food-fishes.

Time did not permit investigation of the fascinating inter-relationships of fishes with invertebrates and other fishes. Parrot-fishes were, however, observed to upend themselves to be cleaned by *Labroides dimidiatus*. The association between a sea-urchin and the fish *Siphamia zaribae* and a shrimp (Whitley, 1959, *Proc. Roy. Zool. Soc. N.S. Wales* 1957-58: 15-17) already recorded from the Capricorn Group, was observed afresh. When the urchin was taken from the water some of the fishes sheltered in the collector's trouser-legs! Some *Lovamia* were practising buccal incubation. Fertile eggs were found in a female *Merogymnus jacksoniensis* suggesting that internal fertilization takes place, although it is not known if this would be followed by oral incubation as in its West Indian ally, *Opisthognathus* (see Böhlke and Chaplin, 1957, *Science* 125 (3243), Feb., 22: 353, fig. 1). *Dascyllus aruanus* was scarce although its usual host coral was present, and there were few *Amphiprion* with sea-anemones. Mimicry of a toadfish (*Canthigaster*) by a leatherjacket (*Paraluteres*) was noticed; several blennies (*Meiacanthus*) were nesting in empty gastropod shells and juveniles floated under sargasso weed. Other fishes were attacked by crustacean parasites.

Acknowledgments

For help with the loan of fishing nets, wire, winches and other collecting gear the expedition is grateful to the C.S.I.R.O. Division of Fisheries and Oceanography, Cronulla, New South Wales, and to Dr. Donald Francois, of the State Fisheries Branch, Chief Secretary's Department of New South Wales. Mr. A. Mitchell, of Port Stephens, lent shark-lines.

The angling experience of Mr. Athel D'Ombraïn, of our party, was of great value in the course of the expedition, and Mr. Robert Poulson's pilotage amongst the reefs as well as his hospitality at Heron Island were much appreciated. The Great Barrier Reef Committee's Marine Biological Station, Heron Island, kindly made facilities and specimens available.

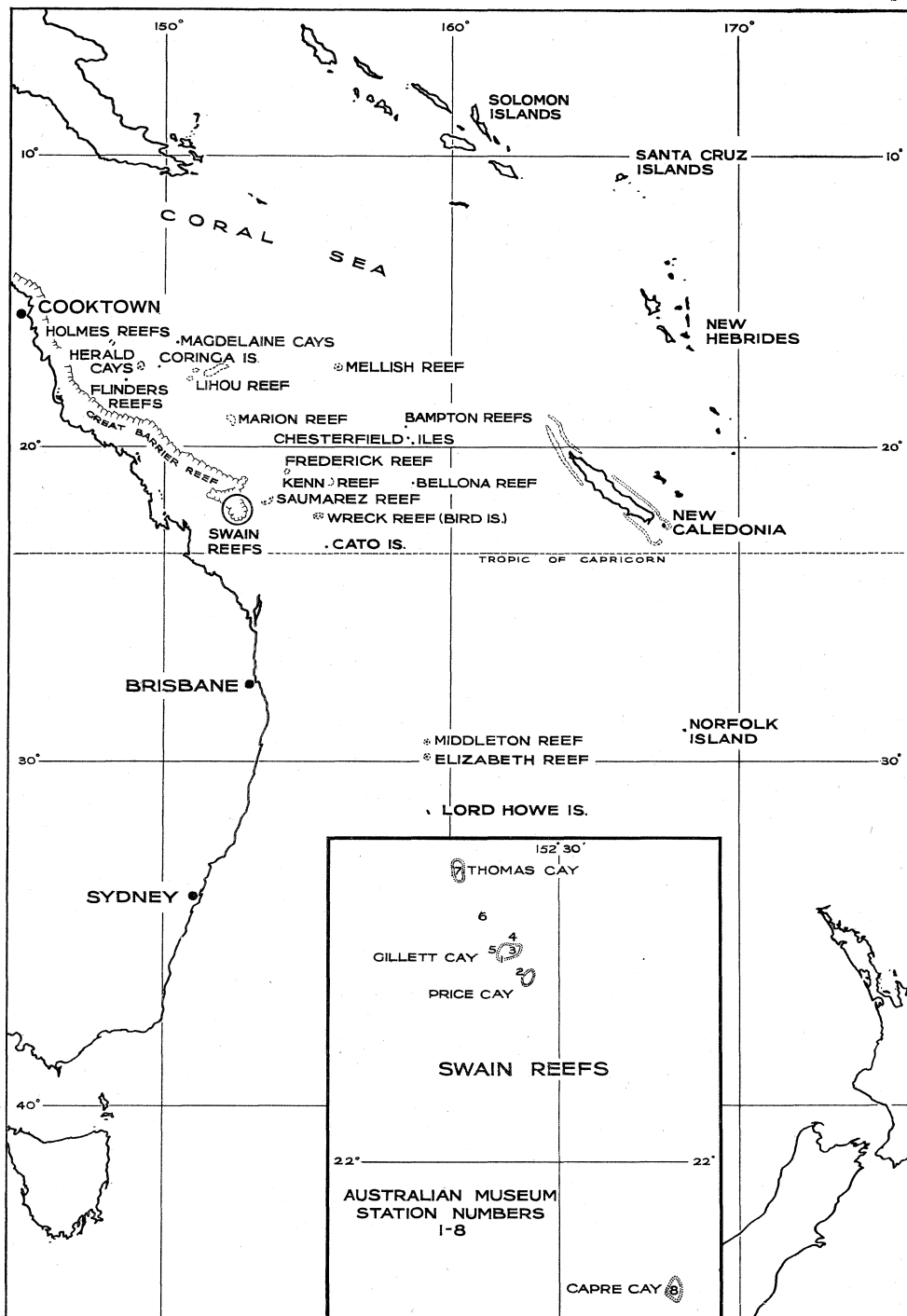
Excellent photographs from fresh specimens were taken by Mr. Anthony Healy, to whose skill I am indebted for several illustrations to this report and for kodachrome records of transient life-colours.

I am obliged to my former assistant, Miss L. Carter, for help in arranging this paper for the press and in preserving and cataloguing the specimens.

HISTORICAL NOTES ON SWAIN REEFS

Because of their isolation, distance from suitable ports, and the dangerous reefs in their waters, the Swain Reefs have received little attention from naturalists or fishermen until recent years. The earliest published reference to them seems to be Matthew Flinders' remarks (1814, *Voy. Terr. Austr.* 2: 101) that the easternmost parts of the barrier are probably connected with those further distant which Captain Swain of the *Eliza* fell in with in 1798. "If so, the Barrier Reefs will commence as far south-eastward as the latitude 22° 50' and longitude about 152° 40' and possibly still further . . ." "Mr. Swain did, indeed, get out at the latitude 22°; but it was by a long, and very tortuous channel."

MAP OF THE CORAL SEA



The reefs were visited over the years by trepang fishermen but were probably avoided as much as possible by whalers and traders in the nineteenth century. They are not mentioned in P. P. King (1826, Narrative of a Survey of the intertropical and western coasts of Australia, 2 vols.) who, however, gave Sailing Directions (l. c. 2: 259) for Lady Elliot's Island and (*ibid.*: 384 et seq.) for Elizabeth Reef, Kenn's Reef and other shoals and reefs in the Coral Sea.

J. B. Jukes (1847, Narrative of the Surveying Voyage of H.M.S. *Fly*, 1: 13) visited Swain Reefs aboard H.M.S. *Fly*, with the *Bramble* in company, in January, 1843. The *Bramble* investigated the inner reefs but the *Fly* worked outside them and up towards Bowen. Dirty weather was experienced for a while. Jukes landed on more than one reef and mentioned various corals and collected shells, holothurians, crustacea and echinoderms, including a dark purple comatula or sea-lily (*ibid.*: 16). The ship's anchor brought up a block of coral rock which the naturalist broke open to obtain an amazing variety of living creatures: "this block was not above a foot in diameter, and was a perfect museum in itself . . . What an inconceivable amount of animal life must be here scattered over the bottom of the sea, to say nothing of that moving through its waters, and this through spaces of hundreds of miles."

Many "flat circular disks" were brought up on the lead which Jukes thought were the "marginopora of De Blainville", but Professor Forbes informed him that they were disks of acetabularia (see also page 325).

Jukes made no mention of any fishes amongst the Swain Reefs.

On page 320 et seq. of his book he briefly described the reefs and soundings and mentions they were named because first traversed by Mr. Swain, in the brig *Eliza*, 1798.

A less formal account of Jukes' life and travels appeared in "Letters and extracts from the addresses and occasional writings of J. Beete Jukes . . ." (London: Chapman and Hall), 1871. On page 175 the Swain Reefs are mentioned but no natural history is related. Jukes was relieved by the passing of the storm there: "*Feb. 2* [1843] What a relief! A lovely morning, smooth, and clear skies. Up, top-masts, top-gallants and royals! Heave away on the Capstan; up with the anchor, and away we go again."

H.M.S. *Herald* may have surveyed in about the 1850's in the vicinity of Swain Reefs. I have not traced any published consecutive account of her voyages, which were extensive around Australia. (Compare, however, Whitley, 1937, *Austr. Zool.* 8: 207-208, also Ingleton, 1944, *J. Roy. Hist. Soc. Austr.* 30 (4): 268, and his book "Charting a Continent", 1944, *passim.*, as well as Whittell, 1954, *Lit. Austr. Birds:* 465 and 608 and Denham, 1873, *Table of Positions in the Pacific Ocean in H.M.S. Herald*, 1852-1860.)

In the 1880's, an old sandalwood trader and South Seas skipper, A. E. Sykes, wrote some articles under the pseudonym "S.E.A." in a Rockhampton (Queensland) newspaper (probably the "Bulletin" of October 25, 1913, and some undated cuttings seen in the Mitchell Library) but there is no particular natural history in such of his accounts as are available; he had been to the Swains and to Wreck Reef and other places in the Coral Sea in 1850 and the late 1860's.

Saville-Kent noted fishes from Lady Elliott Island in his classic book on The Great Barrier Reef of Australia, 1893.

Norman Caldwell (1952, *Outdoors and Fishing*, June, 1952: 107) referred to numerous dangerous eels infesting the waters of Swain Reefs.

Mr. Keith Gillett visited Swain Reefs in October, 1960, and favoured me with a copy of his manuscript journal. At Poulson Cay on October 31, 1960, his small dinghy was attacked by a large shark which struck at the propeller of the outboard motor; he thought it may have been attracted by the noise and vibration. A preliminary illustrated account of Gillett's visit appeared in the magazine "People", November 8, 1961: 27-30.

The first zoological data to emerge from the Reefs and some excellent photographs were published in the second edition of Gillett and McNeill's "The Great Barrier Reef and Adjacent Isles", published in September, 1962.

As regards ichthyology, the first fishes from Swain Reefs came to my attention from the more venturesome fishermen who went there from Gladstone or Rockhampton in the late 1950's or early 1960's; some of their fishes were forwarded to the Australian Museum through the good offices of the harbour-masters at those ports or through the Department of Harbours and Marine, Brisbane. Mr. A. J. Meagher, in particular, supplied not only specimens but kodachrome transparencies of some of the commercial fishes which, as might have been expected, proved to belong to the same species as those of much of the Queensland coastline, even though the fishermen bestowed local vernacular names on them.

Mr. A. J. Meagher's vernaculars for fishes of Swain Reefs—identified from kodachromes:—

Red Emperor, *Diacope sebae*.

Tomato Cod, *Aethaloperca rogaa*.

33 lb Turrum, *Turrum emburyi*.

Crescent Trout, *Variola louti*.

Coronation Trout, *Plectropomus maculatus*.

Coral Trout, *Plectropomus maculatus*.

600 lb. Grouper, 8 feet, *Epinephelus vel Promicrops* sp.

40 lb. Mackerel, *Cybium commerson*.

"Blue Cod", *Epinephelus* sp. Pale blue with inky spots, small and fewer large spots.

Yellow Sweetlips, 15 lb., *Lethrinus perselektus*.

Sweetlip, *Lethrinus chrysostomus*.

Plum-pudding Cod, *Chromileptes altivelis*.

Chinaman, *Symphorus nematophorus*.

Trout, *Plectropomus maculatus*—variety with black saddles on white ground.

Unicorn fish, *Cyphomycter* sp. Silver with blue spots and lines. Lips, gill-openings and bar from eye to snout vivid blue.

Through these friends I was able to identify a number of species and obtain for the Australian Museum (regd. no. IB. 5205-5217, 5412-14, 5736), such species as *Lethrinus chrysostomus*, *Lutjanus* sp., *Grammatoryncus bicarinatus*, *Moolgarda compressa*, and other commercial kinds, besides *Variola louti*, *Plectropomus maculatus*, *Lethrinella miniata*, *Anyperodon leucogrammicus*, *Abalistes stellaris*, *Cheilinus radiatus* and the sucker-fish, *Echeneis neucrates*.

It was obviously a rewarding area to the line-fishermen who worked in fairly deep water, but no data were forthcoming about the shoreline and coral-reef fishes of the cays and reefs, many of which were unexplored. Some light on these was thrown by the Australian Museum 1962 Swain Reefs Expedition, of which I was a member, since we collected 577 fishes referable to 102 species in the short period spent in the field (Austr. Mus. regd. nos. IB. 6006-6257, 6320 and 6351).

Considering the short time available for collecting, this haul compares favourably with those of other Museum trips to North-West Islet (44 species), Low Isles (96 species), Michaelmas Cay (72) and the Coral Sea (84).

**ALPHABETICAL LIST OF THE SHARKS AND FISHES COLLECTED AT
SWAIN REEFS BY THE AUSTRALIAN MUSEUM EXPEDITION IN
OCTOBER, 1962**

Abcichthys praepositus.
Acanthochromis maculosus.
Amblygobius phalaena.
Amphiprion clarkii.
Amphiprion verweyi.
Anampses pterophthalmus.
Apogonichthys coggeri, sp. nov.
Aspiscis savayensis.
Atherina sp. juv.
Atrosalaria fuscus
Auxis thazard

Bathygobius fuscus
Barbupeneus signatus
Belonepterygion fasciolatum
Blennodesmus scapularis

Callyodon toshi
Canthigaster valentyni
Caracanthus maculatus
Chaetodon rainfordi
Chaetodon setifer
Cheilinus chlorurus
Congrogadus subducens
Crenalticus meleagris
Cypsilurus melanocercus

Danichthys cribrus
Dascyllus aruanus
Dinematichthys mizolepis

Ecsenius mandibularis
Eviota viridis

Farhians marginatus
Foa fo
Fowleria aurita
Fusigobius neophytus

Galeocerdo cuvier
Galeolamna bogimba
Galeolamna coongoola, sp. nov.
Galeolamna stevensi
Glyphisodon coelestinus
Gobiodon verticalis
Graviceps angelus
Guntheria trimaculata

Halichoeres hoevenii
Halophryne diemensis
Hemicoris pallida
Hemiscyllium ocellatum
Hippocampus zebra, sp. nov.

Istiblennius edentulus
Istigobius stephensoni

Labroides dimidiatus
Lepadichthys frenatus
Leptochromis tapeinosoma
Lethrinus chrysostomus
Lovamia cookii
Lutjanus chrysotaenia
Lycodontis cribroris

Meiacanthus grammistes
Merogymnus jacksoniensis
Microcanthus joyceae

Nectamia fusca
Negoscartes irroratus
Newtonscottia haulti
Norfolkia squamiceps
Norfolkia thomasi, sp. nov.

Oxymonacanthus longirostris

Paradentex bitorquatus
Paragobiodon echinocephalus
Paraluteres prionurus
Parapercis cylindrica
Pardachirus pavoninus
Parupeneus luteus
Pervagor (Acreichthys) tomentosus
PlatyGLOSSUS notopsis
Plesiops nigricans
Priolepis necopinus
Pseudolabrus guntheri
Pseudopomacentrus flavicauda
Pseudopomacentrus sufflavus
Pseudopomacentrus wardi

Salarias fasciatus
Saurida gracilis
Scolecenchelys iredalei
Scorpaenodes guamensis
Scorpaenopsis diabolus
Sebastapistes bynoensis
Siphamia zaribae
Solenichthys leptosomus
Squamireedia obtusa
Stegostoma tigrinum
Stethojulis renardi
Stethojulis strigiventer
Stolephorus delicatulus
Strongylura incisa
Suggrundus sp.
Synchiropus microps
Synclidopus normani

Tathicarpus subrotundatus
Tetrachaetodon plebeius
Teuthis sp.
Thalassoma lunare
Triacnodon apicalis
Turram emburyi

Vauclusella atrogularis

A few doubtful species and larval material have been omitted. Other species were seen but not collected.

**ALPHABETICAL LIST OF SHARKS AND FISHES COLLECTED BY
 Dr. D. F. McMICHAEL IN THE CORAL SEA, 1960**

These totalled 456 specimens referable to 84 species, listed alphabetically below:—

C = Coringa Islet
 F = Frederick Reef
 He = Herald Cay
 Ho = Holmes Reef
 K = Kenn Reef
 L = Lihou Reef
 M = 12 miles E. of Magdalene Cay
 S = Saumarez Reef
 W = Wreck Reef (Bird Is.).

Acanthochromis polyacanthus. C, L.
Amblyglyhidodon curacoa. L.

Bothus mancus. W.

Caesio diagramma. F, L.
Callyodon lunula. K.
Callyodon sordidus. K.
Caranx sp. W.
Centropyge bispinosus. F, K, L.
Centropyge flavissimus. F.
Cephalopholis argus.
Cephalopholis urodelus. F.
Chaetodon dixsoni. F.
Chaetodon flavirostris. F.
Chaetodon lineolatus. F.
Chaetodon lunula.
Chaetodon melannotus. F.
Chaetodon pelewensis germanus. F, K.
Chaetodon setifer. K.
Chaetodon speculum. K.
Chaetodon trifasciatus. K.
Chaetodon unimaculatus. K, S.
Cheilinus oxycephalus. F.

- Cheilinus trilobatus*. K.
Chiloscyllium punctatum. S.
Chromis atripes. K.
Chromis dimidiatus. F, K, L.
Chromis dimidiatus var. F, K, L.
Chromis fragoris, sp. n. L.
Chromis kennensis, sp. n. K.
Chromis lepidolepis. K.
Ctenochaetus striatus. K.
- Dactylanthias macmichaeli*. L.
Dinematichthys ilucoetoides. K.
- Epinephelus marginalis*. F.
Exocoetus volitans vagabundus. M.
- Forcipiger longirostris*. F, K, L.
- Galeolamna* sp. F.
Glyphisodon septemfasciatus. He.
Gnathodentex aureolineatus. F, K.
- Hemibalistes chrysopterus*. F, K, S.
Hemitaenichthys zoster. F.
Holocentrus diadema. F, K, S, W.
Holocentrus laevis. F.
Holocentrus sammara. F, K, S.
- Iredaleichthys glaucus*. W.
- Kyphosus vaigiensis*. He.
- Lepicephalochromis westalli*, sp. n. K, L.
Lovamia properupta, sp. n. F.
- Macolor niger*.
Megaprotodon strigangulus. S.
Mirolabrichthys tuka pascalus. F, L.
Monotaxis affinis. F.
Mulloidichthys auriflamma. F, K.
Myripristis murdjan. K.
Myripristis pralinius. F, K, S.
- Naso hexacanthus*. K.
Naso lituratus. F.
Naso unicornis. F, K.
Negostegastes lacrymatus. C, F, K.
- Oedalechilus cirrhostomus*. He.
Ostracion sp. juv. F.
Ostracion sebae. F.
Ostracion tuberculatus. S.

Pellochromis reticulatus. F, K.
Pervagor melanocephalus. K.
Pristiapogon diversus. K.
Pristiapogon snyderi. F.
Pseudochromis mccullochi. C, W.
Pseudogramma polyacanthus. W.
Pseudopomacentrus gascoynei, sp. n. F, K, W.
Pseudopomacentrus imitator, sp. n. L.
Pseudopomacentrus navalis, sp. n. K.
Pseudopomacentrus wardi. F, K, L.
Pterocaesio tile. F, K.

Salarias (Alticops) periophthalmus. K.
Scorpaenodes guamensis. K.
Sebastapistes bynoensis.
Siderea picta. W.
Sufflamen sp. F.

Tetrachaetodon plebeius. F, L.
Teuthis dussumieri. K.
Teuthis lineatus. K.
Teuthis nigricans. F, K.
Teuthis nigroris. F.
Teuthis triostegus. Ho.

Variola louti. F.

NEW SPECIES, RECORDS AND FIELD NOTES

Family Galeidae

Genus *Galeolamna* Owen, 1853

Galeolamna coongoola, sp. nov.

Fig. 1

A Whaler Shark with broadly rounded snout, dental formula $\frac{14 \cdot 14}{14 \cdot 1 \cdot 14}$, cusps of upper teeth serrate, no interdorsal ridge, fairly large second dorsal and anal fins, mostly uniform grey in colour without white or black fin-tips.

Biometrics as in Table I.

Five small and eight larger pores in row external to corners of mouth. Last two gill-openings over pectoral base. Teeth of upper jaw slightly notched on inner edge, strongly notched on outer edge, coarsely serrate except towards tips. Teeth of lower jaw slenderer with rounded shoulders and only slightly serrated.

Predorsal profile sloping evenly, convex but not gibbous. No interdorsal ridge. L. lat. system inconspicuous. Denticles of skin crossed by 5 or 6 keels. No umbilical scar. Form elongate-cylindrical, depth 4.7 in standard length. Stomach contained fish bait (*Lethrinus chrysostomus*).

Colour, uniform grey above, greyish-white below. Fin-tips not coloured white or black, but the inferior surfaces of the lobes of the paired fins are dark smoky grey and the lobe of the anal is grey. An indistinct bar along the side as in most whalers.

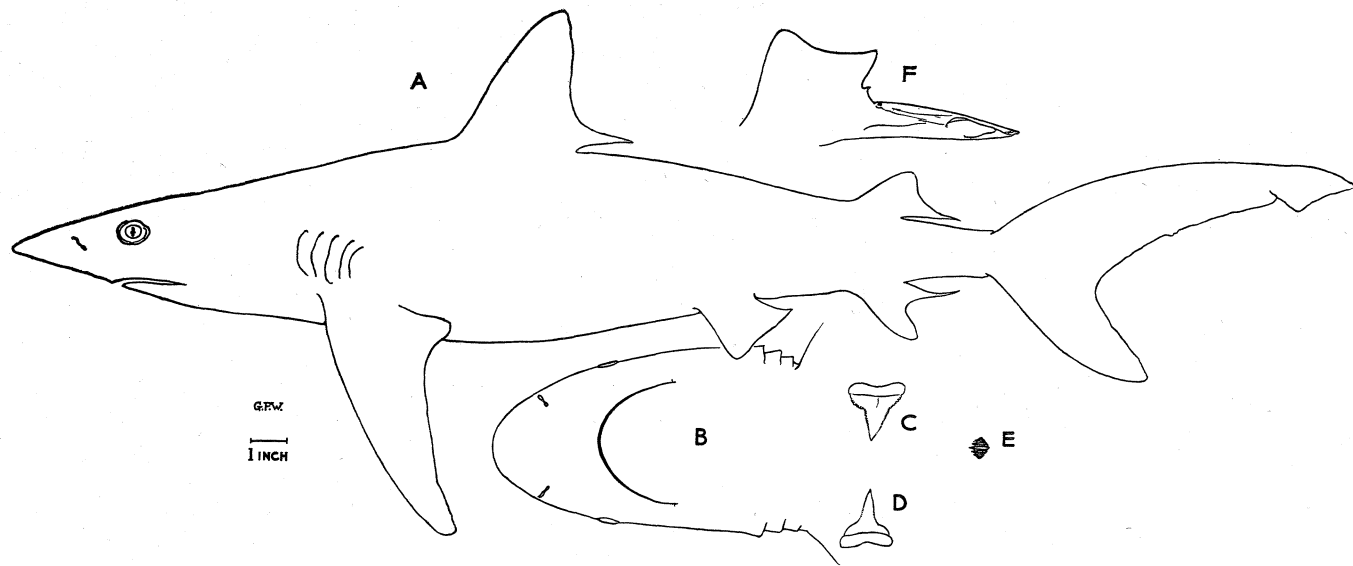


Figure 1.—Swain Reefs Whaler Shark, *Galeolamna coongoola*, sp. nov. A. Lateral view of female holotype. B. Ventral surface of head of same. C. Tooth from upper jaw of same. D. Tooth from lower jaw of same. E. Denticle from shoulder region of holotype. F. Ventral fin and clasper of male allotype, showing projecting spur between them.

Described and figured from the holotype, a quiescent or immature female, 37 inches (940 mm.) in length overall; weight 10 lb. Australian Museum regd. no. IB. 6006.

Loc.—Gillett Cay, Swain Reefs, Queensland; 14.x.1962. Australian Museum 1962 Swain Reefs Expedition.

The male of this new species is similar to the holotype but has the following characters:—

Nostrils without conspicuous, pointed lobes. Labial folds moderately small. Eight pores external to labial folds. Dental formula $\frac{14.1.14}{14.1.13}$. Teeth rather broad, those of upper jaw notched both sides and coarsely serrated, those of lower jaw slender and lightly serrate.

Predorsal profile evenly sloping, not gibbous. No interdorsal ridge, merely a slight median rise along back. Biometrics as in Table I. Depth 4.6 in standard length. Denticles crossed by 5 or 6 keels.

Origins and ends of bases of anal and second dorsal fins about opposite or anal a trifle posterior. Pectoral origin under fourth gill-slit. Lower caudal lobe acutely rounded.

The stomach contained one large, digested octopus. Testes well developed, stretching almost length of coelome. A pointed, cartilaginous spur between ventral fin and clasper.

Colour: Pale greyish-brown, the first dorsal fin particularly pale. Other fins smoky grey. No conspicuous dark or light tips to fins. Eye with black pupil and silver iris.

Described from the male allotype, a specimen 4 ft. 9 in. long and 41 lb. in weight hooked off Capre Cay, Swain Reefs, 22.x.1962 by Mr. Raymond Marshall, during the Australian Museum 1962 Swain Reefs Expedition. Australian Museum regd. no. IB.6009 (teeth, denticles, ventral fin and clasper preserved).

The new species is like my Papuan *G. tufiensis* [Whitley, 1949, *Proc. Roy. Soc. N.S. Wales* 1947-48: 24 and 1951, *Rec. Aust. Mus.* 22 (4): 389, fig. 1] but that species has fewer teeth (about 22 to 27 across each jaw instead of 28 to 29), the upper ones being more deflected, and it has a smaller second dorsal fin.

***Galeolamna (Ogilamia) stevensi* (Ogilby)**

Fig. 2 a-g

Carcharias stevensi Ogilby, 1911, *Ann. Qld. Mus.* 10: 38.

Bustard Bay and North-West Islet, Queensland.

Carcharhinus stevensi Ogilby, 1916, *Mem. Qld. Mus.* 5: 80 and 94. *Id.* McCulloch, 1919, *Austr. Zool.* 1 (7): 220, and of Australian lists. *Id.* Coppelson, 1933, *Med. J. Austr.*: 458.

Galeolamnoides stevensi Whitley, 1934, *Mem. Qld. Mus.* 10: 191.

Galeolamna (Ogilamia) stevensi Whitley, 1940, *Fish. Austr.* 1: 103 and 104 (not fig. 99) and 1943, *Proc. Linn. Soc. N.S. Wales* 58: 120 and 122, fig. 4.

Few examples of this species have been described, so details of two females from Gillett Cay and Capre Cay are appended. The diagnostic features are the presence of an interdorsal ridge, a tan or grey coloration, labial folds rather long and 13 or 14 teeth each side of the symphyseal 1 or 2 in each jaw. Biometrics are given in Table I.

(a) description of Gillett Cay example

Profile convex, not very gibbous. Snout bluntly rounded. Twelve rows of pores external to labial folds. Nostril with acute lobe. Dental formula $\frac{14.1 \text{ or } 2.15}{14.2.14}$. Teeth very finely serrate on base and cusp in upper jaw. Serrae almost obsolete on lower jaw teeth. Lateral line inconspicuous. Denticles with six or seven carinae.

Dorsal origin over hinder part of pectoral base. Ends and origins of second dorsal and anal fins opposite (see figure 2, *a*). The left pectoral fin had scarcely-healed bite marks from another shark. Tip of upper caudal lobe showing very shallow notch between the lower flanges (see figure 2, *a*); the end of the lower caudal lobe is acutely pointed.

Colour in life tan above, light below, turning to grey after death, this drab, upper colour passing below level of eye. No dusky or white tips to any fins.

Stomach walls not well defined. Stomach contained brown fluid. No eggs or embryos.

Described from a female, 6 ft. 7 in. in total length; weight, 110 lb. Australian Museum regd no. IB.6008.

Loc.—Gillett Cay, Swain Reefs, Queensland; October 17, 1962. Australian Museum 1962 Swain Reefs Expedition.

(b) notes on Capre Cay specimen

Similar to (*a*), but nostril without conspicuous pointed lobe. Dental formula probably 14.1.14 in both jaws but side of upper jaw damaged by hook. Teeth strongly serrated in upper jaw; those of lower jaw with few small serrae. Last two gill-slits over pectoral base. First dorsal origin just behind level of end of pectoral lobe. Anal origin and end of its base a trifle forward of levels of those of second dorsal fin. For biometrics, see Table I.

A short interdorsal ridge. Denticles with 6 or 7 keels. No umbilical scar.

The stomach contained digested carangid remains and half a frigate mackerel (*Auxis thazard*). Gonads quite immature.

Described from a young female, 960 mm. long and 10 lb. in weight. Australian Museum regd. no. IB.6010.

Loc.—Capre Cay, Swain Reefs, Queensland; October 23, 1962. Australian Museum 1962 Swain Reefs Expedition.

Galeolamna (Bogimba) bogimba Whitley

Fig. 2 h-j

Galeolamna (Bogimba) bogimba Whitley, 1943, *Proc. Linn. Soc. N.S. Wales* 68: 123, fig. 5. Bogimbah, Fraser Island, Queensland. Holotype in Australian Museum.

Eulamia bogimba Stead, 1963, *Sharks and Rays*: 86 and 200.

The second known example of this species was obtained. A large male, 8 ft. 4 in. long (2,500 mm.) and 295 lb. in weight, it was caught by Mr. Athel D'Ombra in at Gillett Cay on October 15, 1962, early in the afternoon on fish bait. Because of its large size and lack of time the full biometrics were not recorded, but some measurements appear in Table I. It is slightly smaller than the holotype of *bogimba*.

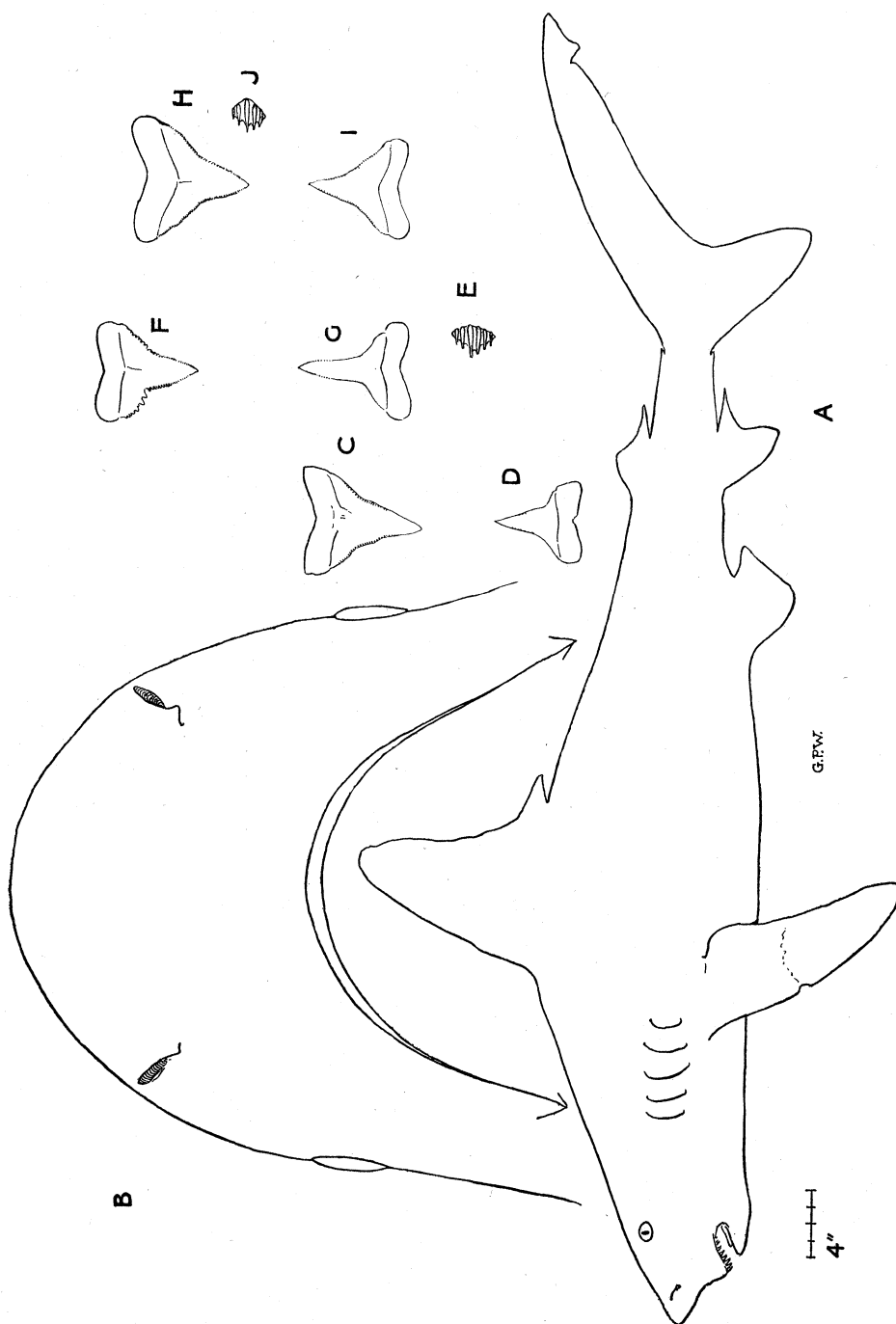


Figure 2.—Tan Whaler, *Galeolamna stevensi* (Ogilby). A. Lateral view of female, 6 ft. 7 in. long, from Gillett Cay. B. Ventral surface of head of same. C. Tooth from upper jaw. D. Tooth from lower jaw. E. Denticle from shoulder-region of same specimen. F. Tooth from upper jaw of Capre Cay female. G. Tooth from lower jaw of same. H. Tooth from upper jaw of large male *Galeolamna bogimba* Whitley. I. Tooth from lower jaw of same. J. Denticle for *G. bogimba*.

Snout bluntly rounded, almost semicircular. There was a pronounced bulge at the symphysis of the lower jaw. Last two gill-slits over pectoral. Dental formula $\frac{13.1.13}{12.1.12}$. Teeth serrated on base and cusp.

First dorsal fin situated behind level of pectoral base. Most of fin-lobes blunt, the second dorsal lobe short and stunted and the anal appeared as if worn down.

Denticles crossed by 5 or 6 keels. No interdorsal ridge.

Colour mostly uniform grey with no conspicuously marked fin-tips. Whitish below.

Stomach everted, empty; it had taken a fish bait (*Lethrinus chrysostomus*).

Described and illustrated from a mature male specimen, 8 ft. 4 in. long and 295 lb. in weight. Australian Museum regd. no. IB.6007. The complete specimen was not preserved, only denticles, jaws and teeth.

Loc.—Anchorage at Gillett Cay, Swain Reefs, Queensland. Australian Museum 1962 Swain Reefs Expedition, October 15, 1962, a clear sunny warm day. As in the case of the holotype, it was accompanied by three *Echeneis neucrates* and five *Gnathanodon speciosus*.

Galeolamna bogimba may now be recorded from New South Wales for the first time, since the third known specimen of the species was hooked in Sugarloaf Bay, Middle Harbour, Sydney, on January 29, 1963, by Mr. E. Campbell (Aust. Mus. regd. no. IB.6352). Biometrics are included in Table I. The specimen was the first female to be recorded and had the following characters:—

Preoral length 2.1 in width of mouth. Snout broadly rounded. Interorbital convex. Eyes small. A small symphyssial tooth in each jaw. Teeth roundly notched in lower jaw, slightly serrated on base; cusp strongly serrated to tip. Teeth of upper jaw broadly triangular, broader than long, slightly deflected, slightly notched, rather strongly serrated on base and cusp, some of the serrae tridentate. Dental formula $\frac{13.1.13}{12.1.12}$.

Profile rounded, hunched but not gibbous. Body robust. No interdorsal ridge. Dermal denticles of shoulder region crossed by five or (more usually) six carinae.

Dark brownish grey after death. No dark or light tips to fins.

Stomach contained some blood (not human) and miscellaneous fish hooks, digested fish remains and a piece of iron, according to donor, but it disgorged some food which could not be identified during a dark and wet night when it was hooked.

Ovaries quiescent. Uteri flaccid. Had probably pupped. No bite marks on pectoral fins.

G. bogimba is apparently not the adult of *spenceri* as the characters separating them are probably more than can be accounted for by growth.

Key:—

- A. Denticles tricarinate. Preoral length 1.2 to 1.5 in width of mouth. Pectoral short, 1.3 in head. Eye 4 or more in the preoral length. Depth of gill-slits about twice eye-diameter *spenceri*.
- AA. Denticles with five or six carinae. Preoral length 1.8 to 2.1 in width of mouth. Pectoral longer, 1.2 in head. Eye more than 7 in preoral length. Depth of gill-slits more than 5 times eye-diameter *bogimba*.

TABLE I

BIOMETRICS OF SWAIN REEFS WHALER SHARKS: measurements in mm.							N.S.W. Specimen	
<i>Galeolamna</i>		<i>coongoola</i> Holotype	<i>bogimba</i>	<i>stevensi</i>	<i>coongoola</i> Allotype	<i>stevensi</i>	<i>bogimba</i>	
Specimen. Australian Museum registered no.		IB.6006	IB.6007	IB.6008	IB.6009	IB.6010	IB.6352	
H.	1	Length of Head to First Gill-Slit	195	..	310	280	206	560
	2	Length of Head to Last Gill-Slit	238	600	460	340	240	690
	3	Tip of Snout to Anterior Margin of Eye	90	..	120	126	90	237
	4	Breadth of Snout Immediately before Eyes	102	..	200	170	108	360
	5	Snout to Origin of Pectorals	224	..	470	365	250	660
	6	Snout to Origin of Ventrals	485	..	..	710	490	?
	7	Eye—Horizontal Diameter	22	Circa 27	30	26	21	25
	8	Eye—Vertical Diameter	16.5	20	20	22	20	26
	9	Interorbital Width	107	..	..	160	111	365
	11	Length of Nostril	14	36	25	23	16	40
	12	Internarial, between Posterior Angles	59	180	120	89	60	180
	13	Preoral Length	74	..	114	105	77	180
	14	Width of Mouth, between Angles	83	..	180	152	97	380
	15	Labial Fold—Upper	2	..	10	6	3	20
	16	Labial Fold—Lower	3	..	5	4	3	20
	17	Height of First Gill Opening	27	..	50 to 60	51	32	140
	18	Height of Last Gill-Opening	21	..	35 to 40	43-5	22	90
B	1	Length, Snout to Upper Caudal Pit	680	1940	1460	1075	685	c. 2030
	2	Length from Snout to Middle of Vent	492	..	..	745	510	?
	3	Predorsal Length	323	800	565	460	310	c. 840
	4	Depth at Origin of First Dorsal Fin	144	..	330	230	165	?
	5	Breadth Below Origin of First Dorsal Fin	111	..	..	175	121	?
	6	Depth of Caudal Peduncle	34	..	80	48	34	130
	7	Breadth of Caudal Peduncle	30	..	..	46	32	..
	8	Claspers—Outer Margin	None	..	None	100	None	..
	9	Claspers—Inner Margin to Membrane at Base	None	260	None	132	None	..
		Interdorsal Ridge	None	None	Present	None	Short	None

Dental Formula		<u>14.14</u> 14.1.14	<u>13.1.13</u> 12.1.12	<u>14.1 or 2.15</u> 14.2.14	<u>14.1.14</u> 14.1.13	<u>14.1.(? damaged)</u> 14.1.14	<u>13.1.13</u> 12.1.12
F. 1	First Dorsal Fin—Anterior Margin.....	115	330+ (tip missing)	310 +	170	121	370 tip incomplete
2	" " Base	83	290	260	125	86	310
3	" " Last Ray	40	82	45	55	38	90
4	Interdorsal Space	196	560	445	330	201	570
5	Second Dorsal—Anterior Margin	45	130	90	54	46	150
6	" " Base	36	100	92	57	36	140
7	" " Last Ray	43	53	70	54	42	90
8	Second Dorsal to Caudal Pit	66	circa 180	131	107	70	190
9	Anal Fin—Anterior Margin	62	? (worn down)	127	63	63	185
10	" " Base	40	..	90	53	37	120
11	" " Last Ray	40	..	70	47	38	82
12	Anal Base to Caudal Pit	55	..	117	95	68	130
14	Pectoral Fin—Length.....	182	500	370	250	177	570
15	" " Base	50	190	130	83	51	190
16	Origin of Pectoral to that of Ventral	265	760	560	387	260	?
17	Ventral Fin: Length of Anterior Margin	47	145	120	72	48	170
18	" " Base (to Outer Angle of Clasper if Present).....	30	177	120	97	46	155
19	" " Length of Last Ray (Superiorly) ..	20	75	65	26	30	110
20	Ventral Origin to Anal Origin	108	..	..	208	103	360
21	Caudal Fin: Upper Lobe	251	620	520	335	258	685
22	" " Lower Lobe	127	310	230	185	133	360
	Sex.....	Female	Male	Female	Male	Female	Female
	Total Length	3 ft. 1 in.	8 ft. 4 in.	6 ft. 7 in.	4 ft. 9 in.	3 ft. 1½ in.	9 ft.
	Weight in lb.	10	295	110	41	11	?
	Locality and Date	Gillett Cay 14.x.62	Gillett Cay 15.x.62	Gillett Cay 17.x.62	Capre Cay 22.x.62	Capre Cay 24.x.62	Middle Harbour Sydney 29.1.63

Genus **Galeocerdo** Muller and Henle, 1837

Galeocerdo cuvier (Le Sueur)

Squalus cuvier Le Sueur, 1822, *J. Acad. Nat. Sci. Philad.* 2: 351. North-western Australia.

A large female Tiger Shark was hooked at Capre Cay, 23.x.62. Total length, 11 ft. 4 in. Standard length, 8 ft. 9 in. Upper caudal lobe, 2 ft. 7 in. Lower caudal lobe, 1 ft. 4 in. Girth, 4 ft. 6 in. Pectoral fin, 18 in. Interdorsal, 33 in., strongly ridged.

The stomach contained *Lethrinus* (bait), birds' feathers and a piece of shark. There were no eggs or embryos. A healed bite-mark on left pectoral fin.

Loc.—Capre Cay, Swain Reefs, October 23, 1962. Austr. Mus. regd. no. IB.6011.

Family **Solenichthyidae**

Genus **Solenichthys** Bleeker, 1865

Solenichthys leptosomus (Tanaka)

Solenichthys leptosoma Tanaka, 1908, *Annot. Zool. Japon.* 7: 29, fig. Sagami Sea, Japan.

Solenostomus leptosomus Jordan and Thompson, 1914, *Mem. Carneg. Mus.* 6: 237.

Solenichthys leptosomus Whitley, 1952, *Proc. Roy. Zool. Soc. N.S. Wales*, 1951-52: 30, fig. 8. *Id.* Whitley and Allan, 1958, *Sea-horse and its relatives*: 62-64, fig. 18 no. 1. *Id.* Whitley, 1962, *Mar. Fish.* 1: 43, fig.

A living specimen of this remarkable fish, first described from Japan, since found in New South Wales, and now to be recorded from Queensland for the first time, was found floating at the anchorage. It appears to swim on one side, not upright, and can twist laterally so that the caudal fin can sweep around to near the snout. The first dorsal and the ventral fins move together, more like ventral fins on opposite sides of a normal fish.

One (IB.6012). Gillett Cay, October 14, 1962. New record for Queensland.

Family **Syngnathidae**

Genus **Micrognathus** Duncker, 1912

Micrognathus boothae, sp. nov.

Fig. 3

D. 21; A. 2; P. 11; C. 7. Rings 14 + 42; sub-dorsal 1 + 5.

Head (10 mm.) 17, depth of body (4.5) 38 in total length (170). Preanal and predorsal length, 50 mm.; dorsal base, 15; snout, 3; eye slightly shorter than snout; length of caudal fin, 3 mm.

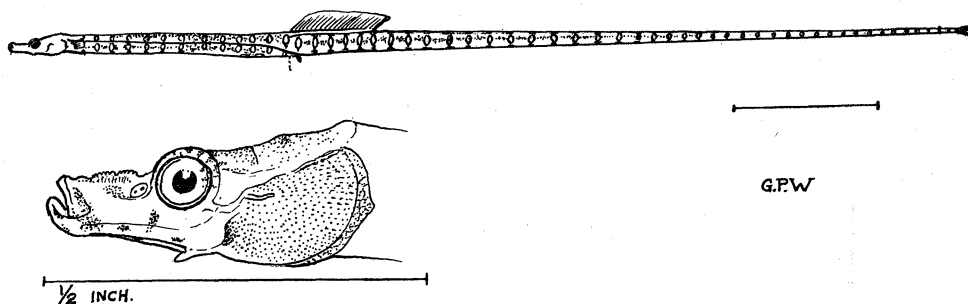


Figure 3.—Pipefish, *Micrognathus boothae*, sp. n. Holotype. Lord Howe Island.

Snout deep, its axis not tilted in relation to rest of head. Interorbital concave, broadening posteriorly. Supraorbital ridge not confluent with a high, serrated ridge over snout. This crest is divided into three adjacent portions, the first an entire convexity, the second and third with several serrae. Orbit cutting upper profile; occipital profile gently rising. A very short opercular keel from which broken radii spread across operculum.

Body seven-angled, tail quadrangular in cross-section. Trunk (43 mm.) about one-quarter of length. Tail more than twice as long as head plus body. Superior ridges of thorax converge towards end of dorsal base, not continuous with upper ridges of tail which extend forward to above vent. Median ridge of thorax continuous with lower ridge of tail. Inferior ridges of thorax ending each side of vent. A weak ventral keel on thorax. Conforms to Duncker's scheme no. 5. Edges of shields not spinose. Scutella oval. No brood-pouch in this specimen, probably subcaudal in male. No cutaneous appendages or cirri.

Dorsal origin opposite vent, its base extending over almost six tail-rings, not elevated. Anal minute. Pectorals and caudal fin small.

Colour in alcohol very pale yellowish-brown, the rings irregularly or partially outlined with light reddish-brown markings, often flecked with small light spots, the effect being rather chain-like. The median line of the chin is plain but on each side there are less than 10 rusty spots; ill-defined reddish-brown marks occur on the top and sides of the head. Pairs of rusty spots along ventral surface of body. Caudal light brown and white; other fins white. Eye blue with outer margin flecked with brown.

Described and figured from the unique holotype, 170 mm. or $6\frac{3}{4}$ in. in total length (Austr. Mus. regd. no. IB.5992).

Loc.—Far Rocks, Lord Howe Island, South Pacific; September, 1962. Collected and presented by Miss Julie Booth, after whom I have pleasure in naming the species. Miss Booth has presented many interesting fishes to the Australian Museum from New South Wales and Lord Howe Island.

To Herald's key to *Micrognathus* spp. [1953, *U.S. Nat. Mus. Bull.* 202 (1): 258] add "3c. Tail rings more than forty", to distinguish this new species from its congeners.

Genus **Hippocampus** Rafinesque, 1810

Hippocampus Rafinesque, 1810, *Caratt. Alc. Gen. Spec. Sicil.*, April, 1810: 18. Type-species, *Syngnathus hippocampus* Linne, by tautonomy and monotypy.

A list of the species of the world in the genus *Hippocampus* was given by Whitley and Allan (1958, *The Sea-horse and its relatives*: 37-42). A very beautiful new species was obtained by the Australian Museum 1962 Swain Reefs Expedition, which differs from all those known, by its zebra-like striped coloration and the combination of characters described below. The terms used are as defined by Ginsburg (1937, *Proc. U.S. Nat. Mus.* 83: 501) whose methods of measuring are also followed here.

Hippocampus zebra, sp. nov.

Plate 8

D. 17; A. 4; P. 16. Subdorsal rings 2 + 2. Eleven trunk-segments and about 37 tail-segments, but the ridges between the latter are obsolete posteriorly. Length from tip of tail to tip of coronet, 80 mm. Tail, 48 (i.e., 60% of length). Trunk, 29 (36%). Greatest depth (just behind dorsal origin), 14 (17.5%). Head, 21 (26.2%) Orbit, 4 (5%). Preorbital, 7 (8%). Snout, 10 (12%).

Coronet fairly high, preceded by a slightly granulose boss and bearing a crown of six backwardly curved, blunt spines. Profiles concave. A high spine over each eye. Snout more than half head, rising steeply over nostrils. Nuchal plates forming a ridge, irregularly outlined and slightly granular. Slightly rugose ridges along each side of snout and hyomandibular. Operculum with a slight tubercle from which striae radiate. A low spine halfway between eye and gill-opening. Four tubercles behind branchiostegal region on first trunk-segment. Four much smaller ones across chin just behind lower jaw. A median ventral keel on posterior trunk-segments. Trunk-segments septangular in cross-section. First caudal segment five-angled, rest four-angled in cross-section. Tubercles not stump-like but well developed, especially along dorso-lateral ridge, with a tendency to enlargement at intervals; three rather large tubercles each side of dorsal fin. Upper ridges of trunk and those of tail overlapping on two segments. Dorsal base elevated posteriorly. Skin smooth, without filaments, not even on tubercles, and without pimple-like excrescences. The absence of a brood-pouch indicates that the specimen is female. Tip of tail blunt, complete, not regenerated.

The coloration consists of yellowish-white and dark brown bands, most of them transverse, but some oblique or curved on the head and belly, as shown in the figure (plate 8), the whole forming a very beautiful and strongly contrasting arrangement with a tendency for broad and narrow bands to alternate. Eye blue with yellowish-white iris. Chin yellowish-white, without dark bands. Fins lighter; dorsal and anal fins brown proximally.

Described and figured from the holotype of the species, a specimen 94 mm. in total length when forcibly extended. Australian Museum registered no. IB.6015.

I am grateful to Mr. Anthony Healy for his photographs of the fish when fresh.

Loc.—Off Gillett Cay, Swain Reefs, Queensland; dredged in 38 fathoms on the afternoon of October 19, 1962. Australian Museum 1962 Swain Reefs Expedition.

A smaller female paratype (no. IB.2819) is in the Australian Museum from Moreton Bay, Queensland, collected by Mr. T. C. Marshall, June 6, 1952, received by exchange from the Dept. of Harbours and Marine, Brisbane, whose number 1630 it had been. The paratype agrees well with the holotype but the coronet has only two low tubercles, there are 21 dorsal rays and 17 pectoral rays and 41 tail-segments.

Apparently nearest *Hippocampus planifrons* Peters, 1877, and *mannulus* Cantor, 1850, but distinguished from both by its coloration and higher coronet.

Family **Apogonidae**

Genus **Pristiapogon** Klunzinger, 1870

Pristiapogon snyderi (Jordan and Evermann)

Plate 9

Apogon snyderi Jordan and Evermann, 1903, *Bull. U.S. Fish. Comm.* 22: 180 and 1905, *ibid.*, 23: 214, pl. 36 and text-fig. 85 (q.v. for synonym.). Honolulu. And of most later authors.

Amia snyderi Jordan and Seale, 1906, *Bull. U.S. Bur. Fisher.* 25, 1905: 237.

Pristiapogon snyderi Jordan and Jordan, 1922, *Mem. Carneg. Mus.* 10 (1): 42. *Id.* Herre, 1936, *Field Mus. Zool. Ser.* 21: 134. *Id.* Smith, 1961, *Ichth. Bull.* 22: 390, pl. 49, fig. B.

One specimen has the following characters:—

D. vii/i, 9 (10); A. ii, 8 (9); P. i, 12. L.lat. 25. Tr. 2/1/7. Predorsal sc. 4. Gill rakers 1, 3 + 1 + 12, 2.

Head (41 mm.) 2.4, depth (39) 2.6 in standard length (103). Eye, 12 mm.; interorbital, 10; snout, 10; maxillary, 19; longest dorsal spine, 18; height of second dorsal fin, about 23; of anal, 21; length of pectoral, 26; of ventral, 25; length of caudal peduncle 28.5, its depth, 16 mm. Maxillary reaches half-way below eye. Interorbital flat, porous. Villiform teeth in a boomerang-shaped patch on vomer, others on palatine; those of jaws in bands, none enlarged. Suborbital and both limbs of preopercle serrated.

Scales of l.lat. same size as those above and below it, l.lat. complete. No silvery glandular tubes. Scales ctenoid, adherent. Two scales between vent and anal fins and two between the dorsal fins.

Fourth dorsal spine slightly the longest. Caudal forked, without procurrent spines.

General colour in alcohol, horn-yellow. Each scale with light centre and greyish-brown margin. A dusky bar along snout before eye. Opercle dark brown. A dark brown saddle-like blotch on upper part of caudal peduncle posteriorly. A dusky lateral bar on body. Pectoral axil dark brown. Fins bone-yellowish: pectorals plain; dorsals with much dark brown infuscation; blackish-brown bars near soft dorsal and anal bases and along upper and lower caudal edges and along anterior ventral rays. Eye blue. Inside of mouth and gill-chamber yellowish.

Described and figured from a specimen (Austr. Mus. regd. no. IB.4828), 103 mm. in standard length or $5\frac{1}{8}$ inches overall.

Loc.—Frederick Reef, Coral Sea. Dr. D. F. McMichael, aboard H.M.A.S. *Gascoyne*.

Near *A. norfolcensis*, Ogilby 1887, *Proc. Linn. Soc. N.S. Wales* (Ser. 2) 2: 99. Lord Howe Island, but when compared with the types of that species and a long series of other specimens is seen to differ in having the dark spot on the caudal peduncle spread over the upper half of the peduncle, not restricted to a round spot on the l.lat. and has a blackish bar towards the base of the anal fin instead of a diffuse dusky front lobe to that fin as in typical *norfolcensis*. In these respects too it differs from *trimaculatus* Cuv. & Val. (1828, *Hist. Nat. Poiss.* 2: 156, pl. 22. Bourou, Moluccas).

***Pristiapogon diversus*, comb. nov.**

Plate 10, upper figure

Amia diversa Smith and Radcliffe, 1912, *Proc. U.S. Nat. Mus.* 41: 434, pl. 37, fig. 1. Luzon, Philippines. *Id.* Schultz and others, 1953, *U.S. Nat. Mus. Bull.* 202: 441.

D. vii/i, 9 (10); A. ii, 8 (9); P. 14. L. lat. 25 to hypural. Tr. 2/1/7. Predorsal sc. $2\frac{1}{2}$. 18 slender, spinose gill-rakers on lower limb of first gill-arch.

Head (32 mm.) 2.7, depth (31) 2.8 in standard length (89). Eye 11 mm.; interorbital, 9; snout, 7; maxillary, 16; depth of head, 16; body-width, 17; longest dorsal spine, 14; height of second dorsal fin, 20; of anal, 15; length of pectoral, 24; of ventral, 19; length of caudal peduncle, 19; its depth, 12 mm.

Maxillary reaching half-way below eye. Chin jutting. Tongue rounded, scoop-like. Villiform teeth on jaws and in a V-shaped patch on the vomer, none on palatine. Interorbital flat, partly occupied by predorsal fans. Both limbs of preopercle serrated. Suborbital entire. Opercular scales large, operculum with long, flat spine. Two rows of cheek-scales. Orbital rim serrated behind and below.

Scales mostly very finely ctenoid, some deciduous. L.lat. complete, its scales the same size as those above and below it. Suprascapula entire, covered by scales. No silvery glandular tube. Vent near anal fin. Two scales between the dorsal fins.

Fourth dorsal spine longest. First spine goes about $3\frac{1}{2}$ times in second spine of dorsal. Second anal spine (11 mm.) about one third of head. Soft dorsal margin concave, anal slightly so. Caudal forked, without procurent spines.

Colour in alcohol very pale yellow with silvery reflections. A brown bar from eye to tip of lower jaw. A conspicuous black spot on two lateral line scales on each side of caudal peduncle. Upper and lower caudal margins blackish. Fins pale yellow except for some blackish infuscations in front of either dorsal fin. Eye bluish grey with pale yellow iris with a blue smudge above iris. Inside of mouth and gill-chamber pale yellow.

Described and figured from a specimen (Austr. Mus. regd. no. IB.4993), 89 mm. in standard length or at least $4\frac{1}{4}$ inches overall (tail-tips are damaged).

Loc.—Kenn Reef, Coral Sea. October 2, 1960. Dr. D. F. McMichael, aboard H.M.A.S. *Gascoyne*.

Genus *Lovamia* Whitley, 1930

Lovamia Whitley, 1930, *Mem. Q'land. Mus.* 10: 10. Orthotype, *Mullus fasciatus* White, 1790.

***Lovamia properupta*, sp. nov.**

Plate 10, lower figure

D. vii/i, 9; A. ii, 8; P. 13. L.lat. 27. Tr. 2/1/7. Predorsal scales 3. Gill-rakers $4 + 1 + 15 = 20$ on first arch.

Head (21 mm.) 2.47, depth (19) 2.7 in standard length (52). Eye, 8; inter-orbital, 5 equals snout (5); maxillary, 10: depth of head, 16; breadth of body behind opercle, 9; longest dorsal spine, 10; length of pectoral, 14; length of caudal peduncle, 16; its depth 7.

Anterior nostril with small rim, posterior elongated pear-shaped. Maxillary emarginated, reaching below posterior half of eye. Villiform teeth in bands on jaws. No canines. Palatine teeth cannot be distinguished. A U-shaped band of fine teeth on vomer with the ends of the U expanded and turned outwards. Tongue spoon-like. Orbital rim slightly roughened supero-posteriorly. Suborbital entire. Posterior margins of preoperculum serrate, anterior margins smooth. Two rows of cheek-scales.

Body rather robust, its breadth less than half its depth, covered with thin but strong ctenoid scales, their serrations in more than one row. Lateral line complete, its scales about the same size as those above and below it. Suprascapula covered by scales. One or two scales between dorsal fins. No glandular peritoneal tube. Vent about halfway between ventral base and origin of anal fin.

Third dorsal spine longest, first very small, about one-third of second. Second anal spine (7 mm.) one-third of head. Margins of soft dorsal and anal fins sinuous. Ventrals pointed. Caudal forked, with very weak procurrent spines.

Colour in alcohol pale horn-yellow, the fins very pale yellow, almost white. No dark spot at base of tail. There are longitudinal brown stripes on head, body and dorsal fins, conspicuous on the head but faint elsewhere, wider than their light interspaces on the snout but not so behind the eye, and disposed as follows:—

(1) The first stripe runs half-way along posterior dorsal rays and is broken up into a row of dark patches on the membranes; (2) a dark band of varying intensity along each side of dorsal fins; (3) a row of dark-edged scales one scale-row below no. 2 and extending to upper caudal base; (4) a Y-shaped dark mark on top of head, the stem of the Y beginning at about level of nostrils, dividing over interorbital and each fork of the Y dividing to form a further Y-shaped mark at posterior level of eye and stretching over the nape; there is a V-shaped mark connecting the eyes anteriorly and passing over the snout, this is attenuated over the eye to continue as a brown band leading to (5), a faint dusky stripe along lateral line to upper half of caudal peduncle when it dips down to converge towards (6), a similar band from snout to opercle and below middle of side rising on caudal peduncle to converge towards no. 5—neither crosses the caudal fin. Between nos. 5 and 6 is a short stripe anteriorly from eye reaching only to end of postorbital. The chin is dusky and under the eye appears stripe (7) which runs to the lowest part of the operculum. Upper axil of pectoral brown-speckled. All ventral surface uniformly pale, also inside of mouth.

Described and figured from the unique holotype of the species, $2\frac{1}{2}$ inches overall. Australian Museum registered no. IB.4852.

Loc.—Frederick Reef, Coral Sea; coll. Dr. D. F. McMichael, 1960.

Differs from other species in the disposition of the colour bands, notably in that the lateral ones converge on the base of the caudal fin, without a median stripe between them, there is a Y-shaped mark on top of the head whose prongs point backwards and each of which divides into a further Y-shaped mark and there is a dark stripe below the eye to edge of opercle.

Keys down to *novemfasciata* in Radcliffe (1911, *Proc. U.S. Nat. Mus.* 41: 246) but the banding is quite different and the pectoral base is light in my species. McCulloch's key (1915, *Biol. Res. Endeavour* 3 (3): 116) elaborated on Radcliffe's but again will not fit the Coral Sea fish, neither will Lachner's key (sections 19 and subdivisions, in Schultz, 1953, *U.S. Nat. Mus. Bull.* 202 (1): 439).

Genus **Apogonichthys** Bleeker, 1854

Apogonichthys Bleeker, 1854, *Nat. Tijdschr. Ned. Ind.* 6: 312 and 321. Type-species, *A. perdix* Bleeker

Apogonichthys coggeri, sp. nov.

Fig. 4

D. vii, i, 9; A. ii, 8; P. 20; V. i, 5; C. 15 main rays + shorter ones above and below. L.lat. 24. Tr. $1\frac{1}{2}/1/7$. Predorsal, 5 scales. Gill-rakers 14.

Head (14 mm.) 3, depth (18) 2.3 in standard length (43). Predorsal length, 20 mm.; maxilla, 8; snout, 3; eye, 4; interorbital, 3; length of pectoral fin, 12; length of caudal fin, 14; depth of caudal peduncle, 8.

Head striated above. Nostrils round, without papilla, only low rim. A slender opercular spine. All opercles and orbital rim entire. Maxillary truncate, reaching beyond eye. Lower jaw very slightly the longer. Minute villiform teeth on jaws and vomer (none on palatines). Vomerine teeth in medium triangular patch. No canines. Tongue rounded, scoop-like. Six slender and six pad-like (rudimentary) gill-rakers on lower portion of first branchial arch, plus 2 on upper portion. Small pseudobranch present.

Form compressed. Suprascapular entire, covered by scales. Scales adherent, papery, ctenoid. L.lat. complete and continuous, rather high on sides. Caudal peduncle about as deep as long and less than half head. No silvery, subcutaneous prolongation of peritoneum. Vent immediately before anal fin.

Third dorsal spine longest, longer than ventral or anal spines. Dorsal bases equal, greater than anal base. No interdorsal scales, the fins being connected at the base. Caudal rounded; its upper and lower rays not spinelike, upper rays shorter than lower ones.

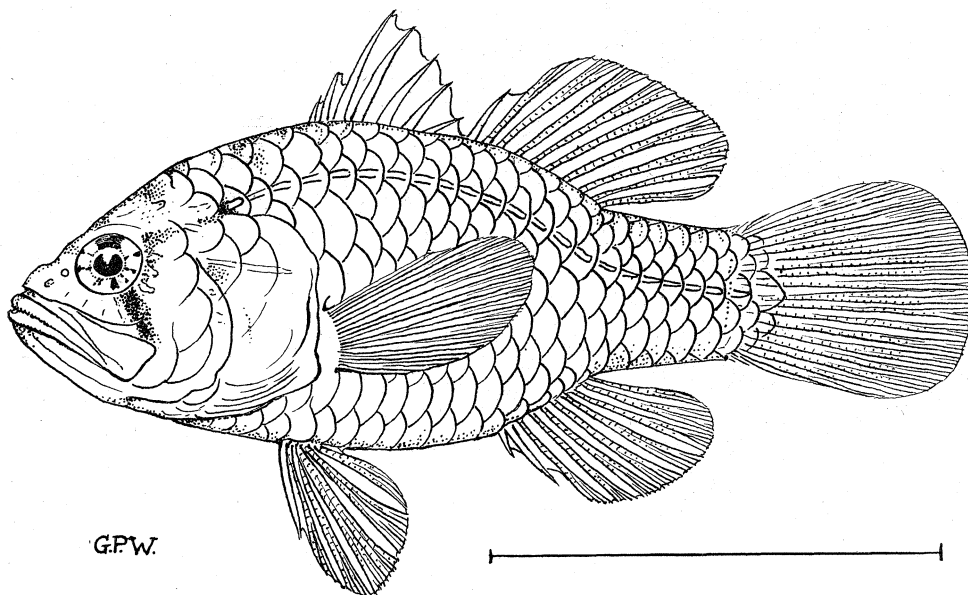


Figure 4.—Gobbleguts, *Apogonichthys coggeri*, sp. n. Holotype. Gillett Cay.

Colour in life, pinkish yellow with white flanks and belly, slightly pellucid. Fins white to hyaline with brown along their bases. Pupil dark blue, iris silver with several pink and orange spots. Several brown marks, fringed by silver, radiate from eye. After death, and preservation in alcohol, the general colour changed to pale yellowish, with traces remaining of the dark radii from the eye. Inside of mouth pale yellow, not black.

In the field this fish did not have the usual facies of the Apogonidae but recalled rather the Chandidae or some other percoid family. Unusual appearances such as this generally indicate remarkable habits in fishes but no observations of the living fishes were made. Three examples were killed by rotenone in separate situations of the lagoon at Gillett Cay, Swain Reefs, on October 20, 1962. One had an isopod in its left gill-chamber and yellow eggs in its mouth, so buccal incubation is practised as in most Apogonidae.

Described and figured from the holotype (regd. no. IB.6016), 54mm. or $2\frac{1}{8}$ inches long, and two slightly smaller paratypes (IB.6017-8) in the Australian Museum.

Loc.—Gillett Cay, Swain Reefs, Queensland; October 20, 1962; Australian Museum 1962 Swain Reefs Expedition.

Not like any described species, characterized particularly by the compressed habit, weak dentition, form and formulae of fins and in having five predorsal scales.

Named after Mr. Harold George Cogger, a member of the expedition, who has on numerous occasions presented interesting fishes to the Australian Museum, where he is Curator of Reptiles.

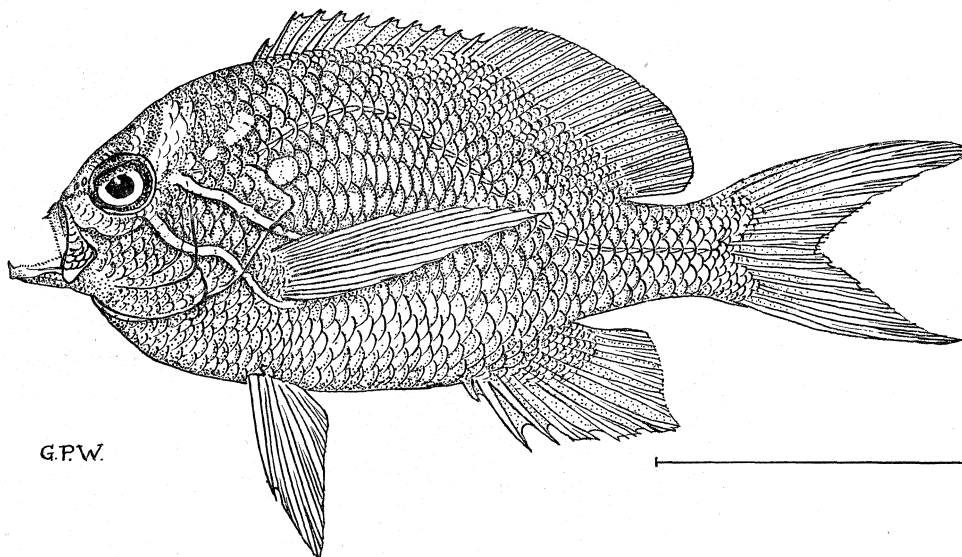


Figure 5.—Coral Perch, *Dactylanthias mcmichaeli*. Holotype. Lihou Atoll.

Family **Anthiidae**

Genus **Dactylanthias** Bleeker 1870

Dactylanthias mcmichaeli Whitley

Fig. 5

Dactylanthias mcmichaeli Whitley, 1962, *N. Qld. Nat.* 30 (131): 3, fig. 1.

Here figured from the holotype from Lihou Atoll, Coral Sea; D. F. McMichael, 30.ix.60.

Genus **Mirolabrichthys** Herre, 1927

Mirolabrichthys Herre, 1927, *Philip. J. Sci.* 32 (3): 413 Orthotype, *M. tuka* Herre. *Id.* Myers, 1929, *Copeia* 1929: 1. *Id.* Fowler, 1931, *Bull. U.S. Nat. Mus.* 100 (11): 226. *Id.* Weber and Beaufort, 1936, *Fish. Indo-Austr. Archip.* 7: 321. *Id.* Herre, 1955, *Copeia* 1955: 224. *Id.* Smith, 1955, *Ann. Mag. Nat. Hist.* (12) 8: 345. *Id.* Smith, 1957, *Copeia* 1956: 251.

Entonanthias Jordan and Tanaka, 1927, *Ann. Carneg. Mus.* 17: 385. Orthotype, *E. pascalus* Jordan and Tanaka. *Id.* Tanaka, 1927, *Fish. Japan* 41: 800, pl. 162, fig. 474.

Mirolabrichthys tuka pascalus (Jordan and Tanaka)

Fig. 6

D.x, 15 (16); A. iii, 6 (7); P. i, 17; V. i, 5; C. 14 branched rays. L.lat. 50. Tr. $5\frac{1}{2}/1/16$ to $6/1/6$ on caudal peduncle. 15 scales between l.lat. and origin of anal.

Head (30 mm.) 3.6, depth (37) 2.9 in standard length (108). Depth of caudal peduncle, 15. Eye (6) shorter than snout (7) and interorbital (9). Maxilla 16, its greatest depth, 4.1 mm. Predorsal length 32.

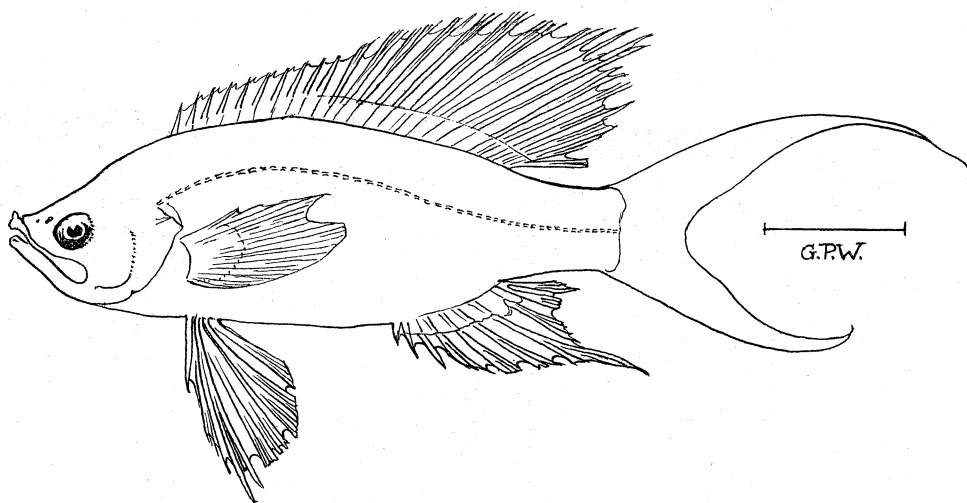


Figure 6.—Sea Gourami, *Mirolabrichthys tuka pascalus*. Lihou Atoll.

Form rather suggestive of a gourami, elongate-oval, rounded in transverse section of body anteriorly and compressed posteriorly. Upper profile of head concave over eyes and convex before dorsal; lower profile straight. Upper lip terminal, produced upwards. Tongue fleshy with an acutely pointed tip. Tongue toothless.

Fine conic teeth in jaws mostly in a single main row but with a few inner ones amongst the inner band of villiform teeth, broadly interrupted at the symphysis. A canine on each side of upper jaw anteriorly. A pair of canines on each side of front of lower jaw, deflected outwards and fitting into depressions in upper jaw. One or two backwardly directed fangs on each side of lower jaw. Mandibulary ramus steeply sloping. Many long, slender gill-rakers. Pseudobranchiae present. Isthmus narrow and trenchant.

Head scaly, including snout. Eye low in relation to the broad, very convex interorbital, upper margin of eye on level of upper lip, posterior margin of orbit crenulated. Maxilla broadly rounded, scaly, reaching below hind part of eye, without supplemental bone; only sheathed anteriorly. Suborbital shallow. Posterior margin of preoperculum serrate. lower limb smooth, without any antrorse spine. One exposed opercular spine on each side.

Nostrils round openings, posterior larger, somewhat pear-shaped.

Scapula exposed. Body entirely covered by imbricate ctenoid scales with some auxiliaries even on the lateral line. Lateral line complete, extending to caudal fin, its sensory tubes straight or with an ascending tubule extending along nearly the whole of each scale. Four rows of body-scales between lateral line and middle dorsal spines. Scaly sheaths to all fins.

Ten dorsal spines, increasing in length posteriorly to 12 mm. long. None of the spines produced. Rays branched.

Second dorsal and anal fins elevated with some produced rays; longest dorsal ray 39 mm. Second anal spine, 6.5 mm.; third, 10 mm.; fourth ray 35 mm. Pectorals as long as head, rays branched; third branched ray (28 mm.) longer than those below it until the eighth or ninth. Ventrals pointed, originating below lower pectoral insertion and reaching anal origin when adpressed. Caudal strongly forked, its lobes ending in filaments, upper one longer.

Colour, in preservative:—Most of upper half of fish bluish grey, darkest along back and as a series of chevron-like marks on the myomeres. Lower half yellow becoming white on snout, cheeks, chin and margin of operculum. A red mark on pectoral base. Pink tinge on breast. Fins very pale yellow, almost dull white. Eyes blue. Top of upper lip brown. A diffuse dusky blotch on opercle.

Described from a specimen 108 mm. in standard length, $4\frac{5}{8}$ inches to caudal fork, or $6\frac{3}{4}$ inches overall, collected by dropping explosives around deep holes or large coral masses in the lagoon at Lihou Atoll, Coral Sea; collected with *Caesio diagramma* by Dr. D. F. McMichael aboard H.M.A.S. *Gascoyne*, September 30, 1960. Australian Museum regd. no. IB.4810. A second, similar specimen (IB.4822) from Frederick Reef, Coral Sea; same collection.

Suggested vernacular name: Sea Gourami.

Similar to typical *Mirolabrichthys tuka* Herre and Montalban 1927 [*Philipp. J. Sci.* 32 (3): 413, pl. 1] from the Philippines but differing in the gradual increase in length posteriorly of the dorsal spines, and in lacking the dark blotch on the spinous dorsal. In these respects it resembles *Entonanthias pascalus* Jordan and Thompson, 1927 (*Ann. Carneg. Mus.* 17: 385, pl. 34, fig. 2), from Okinawa, Japan, which is regarded by Fowler, 1931 (*U.S. Nat. Mus. Bull.* 100 (11): 226) as a synonym of *M. tuka*, though Myers, 1929 (*Copeia* 1929: 2) separated them. Another species was named *dispar* by Herre, 1955 (*Copeia* 1955: 224) from the Solomon Islands, with l.lat. 58. The notched pectoral outline, characteristic of the Coral Sea fish, is also shown in Tanaka's 1927 figure (*Fish. Japan* 41: 800, pl. 162, fig. 474).

Family **Carangidae**

Genus **Turrum** Whitley, 1932

Turrum emburyi Whitley

Turrum emburyi Whitley, 1932, *Rec. Aust. Mus.* 18: 337, pl. 38, fig. 4. North-West Island, Queensland. *Id.* 1962, *Marine Fishes* 1: 112 and fig.

A *Turrum* taken by handline on October 19, had the following characters:—

D. vii/29; A. ii/24; P. 20. L.lat. 13 scutes plus some smaller scales. Head, 160 mm.; depth at second dorsal origin, 170; maxilla, 62; eye, 28; preorbital, below eye, 30; snout, 70; length of pectoral fin, 214.

Teeth villiform, not enlarged. Gill-rakers $7/1/14$ plus 3 to 4 rudiments. Maxilla reaching below front of eye.

Curved portion of l.lat. (250 mm.) greater than straight portion (202), the junction being below 18th dorsal ray. Lower half of breast naked; upper scaly, junction wavy.

Colour brilliant blue above, silvery below. Back and sides with four series of gold spots. Pectoral axil black. Grey blotch on operculum. Pupil black with yellow ring and bronze and yellow iris. Fins mostly olivaceous. Front of anal, most of ventrals and lower part of pectorals white; upper part of pectoral grey. A broken line of yellow marks at base of anal fin.

Described from a specimen 627 mm. L.C.F. or 700 mm. in total length. Weight 8 lb. Austr. Mus. regd. no. IB.6160.

Loc.—Gillett Cay: October 19, 1962.

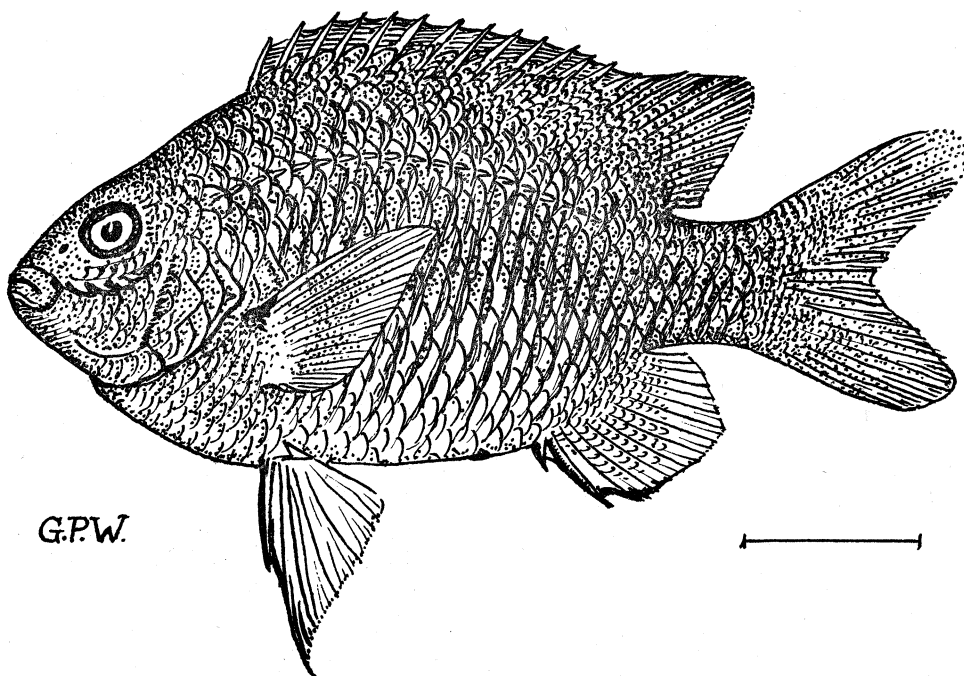


Figure 7.—Demoiselle, *Pseudopomacentrus gascoynei*, sp. n. Holotype. Kenn Reef.

Family Pomacentridae

Genus *Pseudopomacentrus* Bleeker, 1877

Pseudopomacentrus gascoynei, sp. nov.

Fig. 7

D. xiv, 15; A. ii, 13; P. i, 19; L.lat. 19 tubes. Sc. 27. Tr. 3/1/11. More than 20 predorsal scales. Head (33 mm.) 3.2, depth (55) 1.9 in standard length (107). Eye (8) less than snout (9) and interorbital (12). Maxillary, 8 mm.; length of ventral fin, 29; second anal spine, 17; length of pectoral 28.

Head scaly above to before nostrils, naked only on anterior parts of snout, preorbital and chin, where there are pores, and on mouth. Maxillary not reaching below eye. Teeth compressed, uniserial. Mandibular ramus very slightly raised. Suborbital serrate, not notched. Posterior preopercular limb serrate. Other opercles entire. Cheek-scales in three or four rows. A small, exposed opercular spine. Suborbital scales extend forward to below anterior part of eye. Interorbital roundly convex. Thirteen slender, spinose gill-rakers on lower part of first branchial arch.

Body deep, robust anteriorly, compressed posteriorly, covered with ctenoid scales with five or six basal radii and scored or pitted surfaces. Some auxiliary scales on head and shoulder-region. Scales, some lanceolate, extend thickly over bases of the fins, except ventrals, which have axillary scales.

Base of spinous dorsal much longer than that of soft; membrane not incised or pennanted. Fin-lobes rather rounded, except paired fins which are more pointed. Ventrals reaching vent.

Colour, in alcohol, dark greyish-brown, darkest on front of head, along back, dorsal fins and tail. Dark edges of scale-rows tend to form indistinct oblique, downward and forward-running stripes. Fins greyish-brown like the body but the ventrals and anal are mostly light yellowish with their anterior edges blackish. A small blackish spot at top of pectoral base; the axil and scaly base both light. No ocelli. Females are paler grey in ground-colour with dusky blotches on the body.

Variation: 15 to 17 dorsal, 13 to 14 anal and 18 to 19 pectoral rays. L.lat. tubes 18 to 21. About 5 to 7 pores along caudal peduncle. Sc. 25 to 27 and Tr. 3/1/11 to 13.

Described and figured from the holotype (Australian Museum registered no. IB.4987) evidently a male specimen, 107 mm. in standard length or $5\frac{3}{8}$ inches overall, also five male and two female paratypes (nos. IB.4856, 4950, 4984 to 4986, 4988 to 4989, all smaller than the holotype.)

Locs.—Reefs in the Coral Sea: Kenn Reef, October 10, 1960 (holotype and paratypes, IB.4984 to 4989), Frederick Reef (IB.4856); and Bird Islet, Wreck Reef, October 4, 1960 (IB.4950). Collected by Dr. D. F. McMichael, of the Australian Museum.

Recognizable from its congeners by the 14 dorsal spines, light ventral and soft anal fins with their front edges dusky, the oblique dusky bars down the body and other characters. In authors' keys it comes nearest the *tripunctatus*, *littoralis* and *wardi* group of species but is separable by fin- and scale-counts. *P. analis* Macleay has similar coloration but meristic differences.

Named after H.M.A.S. *Gascoyne*, from aboard which the new species was collected during a survey of the islands in the Coral Sea.

***Pseudopomacentrus navalis*, sp. n.**

Fig. 8

D. xiii, 15 to 16; A. ii, 12 to 13; P. i, 19; l.lat. tubes 17 to 20. Sc. 24 to 27. Tr. 3/1/11 to 12. About 23 predorsal scales.

Head (28 mm.) 2.6 to more than 3, depth (52) 1.8 to more than 2 in standard length (94). Eye (7 mm.) equal to snout and less than interorbital (10). Maxillary, 7 mm.; length of ventral fin, 27; second anal spine, 16; length of pectoral, 26.

General characters as described for *gascoynei*. Two rows of suborbital scales. Teeth uniserial, compressed, with cutting edge not compact but with free points. Opercular spine not fully exposed. Eleven gill-rakers on lower part of first gill-arch. Some lateral line tubes very weakly developed. Scales with 8 to 10 basal radii. Ventrals not reaching vent.

Colour dark brown to black. Some with indistinct light grey spots along row of scales from ventral origin to near anal base. Eye greenish.

Described from holotype (IB.4970) and four paratypes (IB.4967-4969 and 4971), up to $4\frac{7}{8}$ inches in total length.

Loc.—Kenn Reef, Coral Sea; October 2, 1960. Dr. D. F. McMichael.

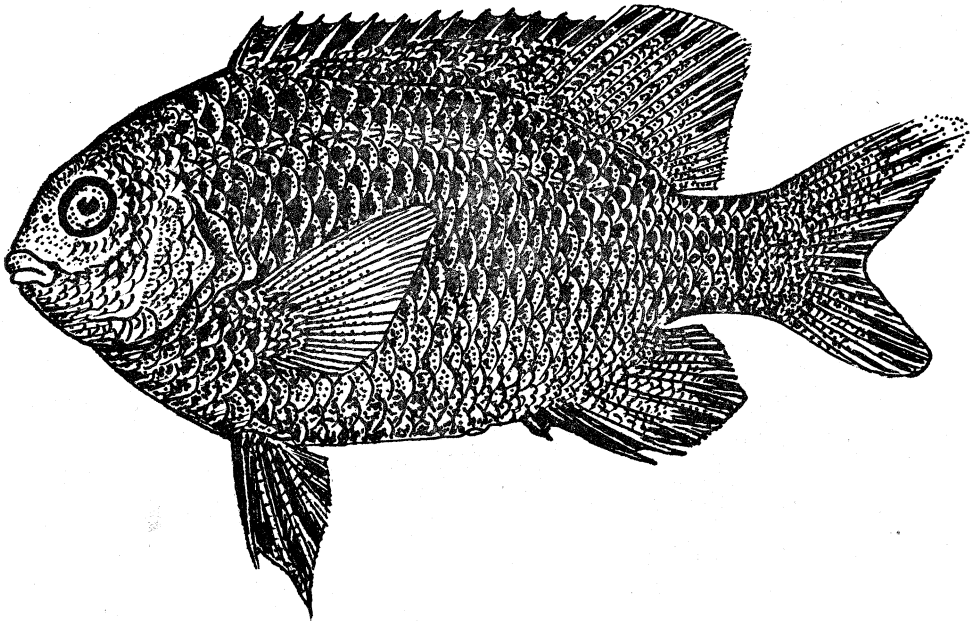


Figure 8.—Demoiselle, *Pseudopomacentrus navalis*, sp. n. Holotype, Kenn Reef.

Named *navalis* for the Royal Australian Navy, on one of whose surveys the specimens were collected.

Superficially like *Pseudopomacentrus gascoynei*, sp. n., but has black ventral and anal fins, and 13 dorsal spines.

***Pseudopomacentrus imitator*, sp. nov.**

Fig. 9

D. xiv, 14; A. ii, 14; P. i, 17. L.lat. 18. Sc. 24. Tr. 3/1/9. About 24 predorsal scales.

Head (23 mm.) 3.5, depth (43) 1.8 in standard length (80). Eye 7.5 mm., greater than snout, 6. Interorbital, 8; maxillary, 6; length of pectoral, 26.5; of ventral, 20; second anal spine, 7.

General characters as in *P. gascoynei*, sp. nov. (page 173), except as follows. Mandibular ramus steeply elevated. Suborbital slightly notched, entire, naked. Maxilla below eye in young, not in larger specimens. Fifteen gill-rakers on lower limb of first branchial arch.

Dorsal spines rather short, increasing in height backwards and with long pencils and incised membranes. Fin-lobes rather pointed. Ventrals reaching anal spine.

Colour in alcohol dark brown, each scale with darker border. Top of head and back and most of fins blackish. Pectoral base black, with a light area behind this. Posterior part of caudal peduncle pale orange becoming dirty white on caudal fin. The light caudal area and the dark brown ventrals and anal as well as the black pectoral axil and base, further distinguish this species from *gascoynei*.

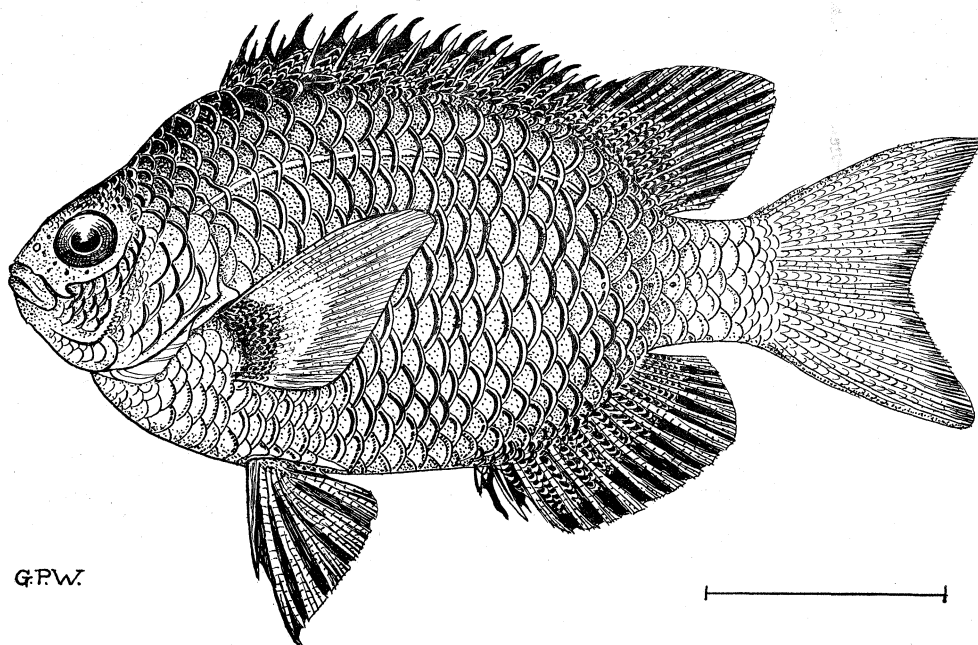


Figure 9.—Demoiselle, *Pseudopomacentrus imitator*, sp. n. Holotype. Lihou Atoll.

Coloration similar to that of *Lepicephalochromis westalli*, sp. nov. (page 180), but the dark colour of the body gradates into slightly lighter tail-region instead of being abruptly bounded, the pectoral axil is black and the upper and lower caudal lobes are not so dark. Nevertheless, mimicry between the two genera may be indicated.

Described and figured from the holotype (Austr. Mus. regd. no. IB.4945), a specimen 80 mm. in standard length or $4\frac{1}{8}$ inches overall, which is larger than three paratypes (IB.4908, 4909 and 4944) with identical data.

Loc.—Beyond the reef-crest, Lihou Atoll, Coral Sea; September 30, 1960 (Dr. D. F. McMichael).

Genus **Iredaleichthys** Whitley, 1928

Iredaleichthys glaucus (Cuv. & Val.)

Glyphisodon glaucus Cuvier & Valenciennes, 1830, *Hist. Nat. Poiss.* 5: 475. Guam.

Glyphidontops modestus Bleeker, 1877, *Atlas. Ichth.* 9, pl. 403, fig. 9.

Iredaleichthys modestus Whitley, 1929, *Mem. Qld. Mus.* 9 (3): 242.

Abudefduf glaucus Okada and Ikeda, 1937, *Bull. Biogeogr. Soc. Japan* 7 (7): 74, pl. 5, fig. 1. *Id.* Fowler, 1959, *Fishes of Fiji*: 384, fig. 168. *Id.* Smith, 1960, *Ichth. Bull.* 19: 336, pl. 29, fig. F. And of recent authors.

D. xiii, 12; A. ii, 12; P. 1, 17; L.lat. 19. Sc. 23 to hypural joint Tr. 3/1/9. Predorsal scales about 16.

Head (24 mm.) 3.2, depth (36) 2.1 in standard length (77). Eye 7 mm., interorbital, 7; snout, 6; maxillary, 8; length of pectoral fin, 18; of ventral, 19; second anal spine, 9; breadth of body (16). Base of spinous dorsal (35 mm.) much longer than that of soft (15), which is equal to that of anal fin. Height of second dorsal fin, 15 mm.

Eye rather small. Interorbital broadly convex. Predorsal scales end over front of eye. Cheek-scales in 3 rows. Preorbital and suborbital meeting at obtuse angle, about half depth of eye. Snout and preorbital naked, also lower preopercular flange. Suborbital and all opercles entire. Maxillary barely reaching below eye. Lips thick, normal. Teeth compressed with separate, chisel-like tips. Two opercular spines. About 16 long slender gill-rakers on lower portion of first branchial arch.

Form elongate-ovate. Lower profile more convex than upper. Body covered with ctenoid scales, small ones of which extend over lower parts of unpaired fins but do not form very dense sheaths; $1\frac{1}{2}$ rows of scales between last scales of l.lat. and dorsal sheath. About 12 basal radii. No auxiliary scales. Axillary scales at ventrals.

Membranes of first dorsal fin penicillate. Soft dorsal higher than the spinous. First two spines rather short, fifth and succeeding spines longest. Lobes of fins all rounded; pectorals rather short. Ventrals not reaching vent.

General colour in alcohol mostly pale lilac-greyish, especially on back, head, and on centres of body-scales; other parts pale yellowish-cream, especially over preorbital, lips, edges of opercles, branchiostegal region, isthmus, breast and paired fins. Dorsal fins dove-grey; anal and caudal fins pale dirty yellowish with narrow grey borders; vent black, eye blue. No ocelli, bands, stripes or notable markings. Pectoral axil and base white. Teeth golden.

Described from a specimen 77 mm. in standard length or 4 inches overall. Austr. Mus. regd. no. IB.4951.

Loc.—Bird Islet, Wreck Reef, Coral Sea, October 4, 1960; Dr. D. F. McMichael. Other specimens in the Australian Museum from the New Hebrides; Suva, Fiji, and Port Moresby, Papua. Occurs in Queensland.

Genus **Amblyglyphidodon** Bleeker, 1877

Amblyglyphidodon curacao (Bloch)

Chaetodon curacao Bloch, 1787, *Nat. Ausl. Fische* 3: 106, pl. 212, fig. 1. "Curaçao".

D. xiii, 13; A. ii, 15; P. ii, 17. L.lat. 16. Sc. 22. Tr. 4/1/10. About 22 predorsal scales. Gill-rakers 16 on lower part of first branchial arch.

Head (15 mm.) 3, depth (29) 1.5 in standard length (46). Eye, 6 mm.; second anal spine, 10.

Scales extending forwards to top and most of sides of snout. Preorbital and suborbital scaly, the latter free to behind eye. All opercles entire. Cheek-scales in two horizontal and seven transverse rows. Lips normal. Maxillary reaches below front of eye. Teeth slightly compressed with separate pointed tips. Mandibular ramus elevated.

Anterior profile gibbous at nape, concave to flat towards snout. Upper profile more convex than lower. Form deeply rounded, orbicular, strongly compressed. No auxiliary scales on body. Scales ctenoid, fine, with about seven basal radii. L.lat. ascending steeply at first, thence running with $1\frac{1}{2}$ scale-rows between it and the back. Scales extend over much of fins, except ventrals. L.lat. pores on caudal peduncle. Spinous dorsal membranes penicillate and deeply incised. Anal base (14 mm.) longer than soft dorsal base (9).

Colour in alcohol mainly brown above, yellow on the flanks and pearly white below. Mouth and chin dark-speckled. The brown is darkest on top of head and on an ascending patch just behind upper part of operculum. The dusky brown of the nape is carried down to the aforesaid patch and across the operculum and is associated with a brown streak bordering the preoperculum to descend to the throat as a brown band broken up into small spots. A lighter brown band descends from anterior part of spinous dorsal base to taper to just above the ventral fin. A similar band falls from farther back to fade out below just before the anal fin and a fainter shorter one descends about two-thirds of the distance between the soft dorsal and soft anal fins. Posterior part of second dorsal base brown. A small brown spot at pectoral origin; axil yellow. Spinous dorsal fin and first ray dark brown. Ventrals infuscated, also front half of anal. Other parts of all fins yellowish. Caudal plain. Central part of eye blue but before and behind the pupil the iris is silvery-green with a brown orbital rim. Inside of mouth white.

Described from a young specimen 46 mm. in standard length or about $2\frac{1}{2}$ inches overall (Austr. Mus. regd. no. IB.4906).

Loc.—Beyond reef-crest of Lihou Atoll, Coral Sea; September 30, 1960. Dr. D. F. McMichael.

Genus **Glyphisodon** Lacépède, 1802

Glyphisodon sordidus (Bonnaterre, 1788)

Chetodon sordidus Bonnaterre, 1788, *Tabl. Encycl. Meth. Ichth.*: 90. Red Sea (Forskal).

Fig. 10

D. xiii, 15; A. ii, 15; P. 19. L.lat. 22. Sc. 26. Tr. 4/1/11. Predorsal scales 14.

Head (9 mm.) 2.7, depth (13) 1.8 in standard length (25). Eye, 3 mm.; snout, 2; interorbital, 3; maxillary, 3; postorbital, 4; depth of caudal peduncle, 5; breadth of body, 4.5; length of pectoral, 7; of ventral, 8; second anal spine, 4; longest upper caudal ray, 8.

Maxilla reaching below front of eye. Teeth erect, not flared outwards; in single row, slightly compressed but with separated points. Mandibular ramus slopes very slightly upwards. Head scaly, except eyes, most of interorbital, snout, suborbital, middle of isthmus and around mouth. Suborbital free under most of anterior half of eye. All opercles entire. Three rows of cheek-scales. Preorbital naked. About 14 slender gill-rakers on lower portion of first branchial arch.

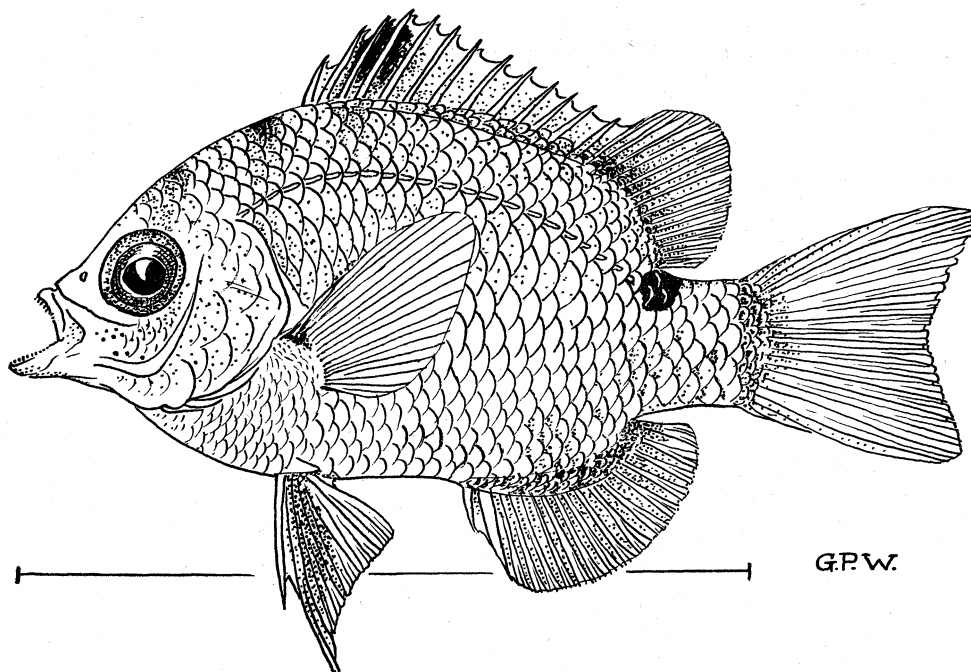


Figure 10.—Demoiselle, *Glyphisodon sordidus*. Juvenile from Lord Howe Island.

Form ovate, compressed, upper profile not much more convex than lower one. Greatest depth below front of first dorsal fin. Body covered with ctenoid scales with no auxillary scales. Between l.lat. tubes and back (dorsal sheath) are 3 rows of scales. L.lat. tubes to below posterior half of soft dorsal fin; pores along caudal peduncle absent. Scales extend on bases of all fins. Ventrals with axillary scales.

Membranes of spinous dorsal fin very slightly incised and pencilled. Base of first dorsal greater than that of second. Both fins of equal height. Anal base greater than soft dorsal base. Ventral ray reaching beyond second spine of anal. Caudal forked, upper lobe longer.

Colour in alcohol yellowish. Distal third of body faint grey. Black blotch over longest dorsal spines. Another on anterior and superior part of caudal peduncle. Slight infuscations on lips and before dorsal origin and a speckling of dusky chromatophores on head and body generally. Dorsal fins mostly dark grey, especially basally. Other fins lighter; pectorals almost white with dusky brown spot over upper part of base and axil light. Eye blue.

Described and figured from a juvenile specimen 25 mm. in standard length or about $1\frac{1}{4}$ inches overall. Australian Museum regd. no. IB.5517.

Loc.—Lord Howe Island; Miss Julie Booth, early 1962.

Distinguished by its coloration, naked anterior parts of head, low number of gill-rakers, slightly compressed teeth, &c.

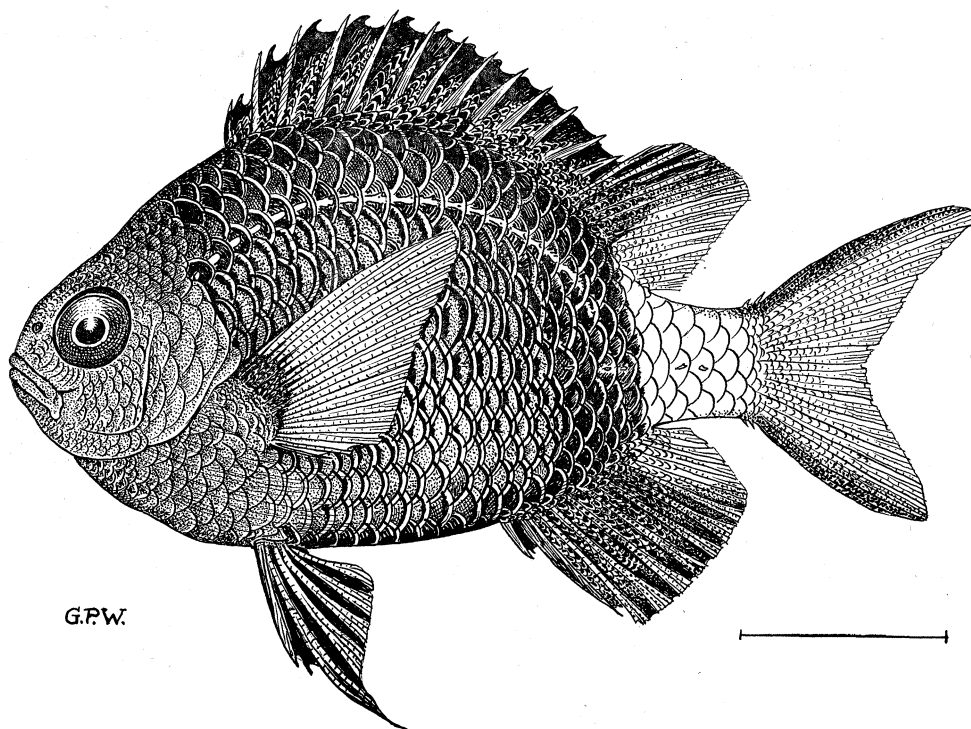


Figure 11.—Demoiselle, *Lepicephalochromis westalli*, sp. n. Holotype. Kenn Reef.

Genus **Lepicephalochromis** Fowler, 1943

Lepicephalochromis Fowler, 1943, *U.S. Nat. Mus. Bull.* 100 (14, part 2): 78.

Type-species, *Chromis cupreus* Fowler and Bean, 1923.

Lepicephalochromis westalli, sp. nov.

Fig. 11

D. xiii, 14; A. ii, 12; P. 19. L.lat. 19. Sc. 25. Tr. 3/1/9. Predorsal scales more than 20. Gill rakers $9 + 1 + 22 = 32$ on first gill-arch.

Head (28 mm.) 3.1, depth (50) 1.7 in standard length (89). Eye, 10; snout, 6.5; interorbital, 12; maxillary, 7; length of pectoral fin, 34; of ventral, 29; second anal spine, 18; breadth of body, 19; base of spinous dorsal fin, 45, much longer than that of soft, 17; anal base, 22.5; longest dorsal spine, 13; height of second dorsal fin, 16; depth of caudal peduncle, 14 mm.

Eye large. Interorbital broadly convex. Snout scaly to before nostril. Preorbital scaly, entire; infraorbital exposed for very short distance before being covered with scales. All opercles entire. Single small opercular spine. Mouth reaching below front of eye. Lips normal. Teeth conic, spaced, uniserial; no second series of posterior teeth, otherwise as in *Lepicephalochromis cupreus*. Mandibular ramus elevated. Mandibular teeth not flared outwards. Tongue scoop-like. Four rows of cheek-scales with six to eight vertical rows. Some auxiliary scales on head and a few on forequarters of body. $9 + 1 + 22$ external gill-rakers on first branchial arch. 15 internal gill-rakers.

Form deeply oval, compressed. Upper profile more convex than lower; predorsal trenchant. Body covered by ctenoid scales with several rows of apical denticles and up to about seven basal radii, without auxiliary scales. Small scales form sheaths to dorsal and anal fins. Two rows of scales between posterior tubed scales of 1.lat. and back. Axillary scales at ventral fins small and rounded or long and pointed.

Base of spinous dorsal fin more than twice that of soft. Fin notched. Spinous dorsal membranes penicillate and incised. Fourth to sixth dorsal spines longest. First spine notably shorter than second and half the length of the third. First anal spine two-fifths of second. Second anal spine not nearly as long as head. Fin-lobes rather pointed; pectorals and ventrals long, the latter reaching first anal spine. Caudal forked.

Colour in alcohol, very dark brown, almost black on head, body and most of fins back to a line joining the anterior half of the second dorsal fin to the posterior rays of the anal fin. Behind this the posterior dorsal and anal rays and the intervening caudal peduncle and fin are cream with a light orange tinge except for the upper and lower caudal margins which are blackish. Eye blue, surrounded by a black orbit. Pectoral base black. No ocelli, bands, spots or notable markings.

Superficially the coloration resembles that of a *Pseudopomacentrus* in the same collection (regd. nos. IB.4908-9 and 4944-5) but that, of course, has serrated preoperculum.

Described and figured from the holotype of the species, a specimen 89 mm. in standard length or $4\frac{1}{2}$ inches overall (Austr. Mus. regd. no. IB.4975) and a series of 23 paratypes (IB.4946-47 and 4976).

Locs.—Kenn Reef, Coral Sea; October 2, 1960 (Holotype and nine paratypes, IB.4976) and beyond the reef crest of Lihou Atoll, Coral Sea; September, 30, 1960 (14 paratypes, IB.4946-47); all collected by Dr. D. F. McMichael.

Named in honour of William Westall, A.R.A., F.L.S. (1781-1850), landscape painter aboard Matthew Flinders's *Investigator* voyage of 1801, who was wrecked aboard the *Porpoise* in August, 1803, and in whose painting of Wreck Reef we see some of the first representations of the coral fauna of the Great Barrier Reef system.

Distinguished from the only other species of the genus, originally named *Chromis cupreus* Fowler and Bean (1923, *Proc. U.S. Nat. Mus.* 63: 22, from "Fiji or Samoa"), by having uniserial teeth, more dorsal rays, fewer scales between anal fin and lateral line, and in its coloration: light caudal area margined above and below with darker on the caudal rays, black pectoral base and generally dark body in advance of a boundary joining the posterior portions of the anal and second dorsal fins.

Genus *Acanthochromis* Gill, 1863

Acanthochromis polyacanthus (Bleeker)

Dascyllus polyacanthus Bleeker, 1855, *Nat. Tijdschr. Ned. Ind.* 9: 492 & 503. Batjan, Indonesia.

Acanthochromis polyacanthus Fowler and Bean, 1928, *U.S. Nat. Mus. Bull.* 100 (7): 27 (refs and synonymy).

D. xvii, 13 to 15; A. ii, 15. Head (28 mm.) 3.6, depth (58) nearly 1.8 in standard length (103). Profile deeply oval, nape gibbous; form compressed. Teeth conic. Preorbital and preoperculum finely serrated.

Fairly uniform blackish-brown. Centres of thoracic scales of adults with black streaks. Young with a milky-white curved band along l.lat. and a milky spot over caudal peduncle. One specimen (IB.4955) light brown with a bruise-like black area around the vent.

Four specimens, up to 5½ inches long from off Lihou Reef, Coral Sea; September 30, 1960. (IB.4910-13) and one (IB.4955) from an offshore coral pool, Coringa Islet, about 250 miles east of Cairns in the Coral Sea, September 29, 1960.

Genus **Chromis** Cuvier, 1814

Subgenus **Chromis** Cuvier, 1814

Chromis kennensis, sp. nov.

Fig. 12

D. xiii, 11 (12); A. ii, 10; P. 20. L.lat. 17. Sc. 24. Tr. 3/1/9. Predorsal scales 25.

Head (22.5 mm.) 3.4, depth (36) 2.1 in standard length (78). Eye, 7 mm.; snout, 5; interorbital 8; maxillary, 7; postorbital 11; depth of caudal peduncle, 11; length of pectoral, 26; of ventral, 22; second anal spine, 12.5.

Profile broadly rounded. Form ovate, deepest near origins of dorsal and ventral fins. Snout scaly. Three rows of cheek-scales; six transverse rows of cheek-scales. Maxilla reaching below front of eye. Lips papillate. Teeth conic, not directed outward. Mandibular ramus gently sloping. Suborbital covered by scales, little free. All opercles entire. Twenty gill-rakers on lower limb of first gill-arch.

Body covered with ctenoid scales with about eight basal radii. Some auxiliary scales on or near head but not on body proper. One and a half rows of scales between l.lat. and back. Seven to ten lateral line pores along sides of caudal peduncle. Scales extend over bases of all fins except ventrals which have a lanceolate axillary scale.

Middle dorsal spines longer than the second one. Soft dorsal fin much higher than spinous one. Second anal spine shorter than soft rays. Fin-lobes all pointed. Anal base notably longer than soft dorsal base. Ventrals reaching beyond vent. Caudal forked, subequal to head.

General colour in alcohol mostly blackish but centres of lower scales grey, becoming silvery grey with brown margins on the belly, thorax and lower parts of head. Pectorals pale grey; other fins blackish—middle and posterior portions of caudal lighter grey. A large black mark over all pectoral base bordered behind by a lighter tone. Pectoral axil black. Eye silver. No notable bands or colour-marks. No blotch at end of soft dorsal. Tubes of l.lat. light greyish-brown.

Described and figured from the unique holotype (Austr. Mus. regd. no. IB.4973), 78 mm. in standard length or a little more than four inches overall.

Loc.—Kenn Reef, Coral Sea; October 2, 1960. Dr. D. F. McMichael.

Similar to *Chromis aripes* Fowler and Bean (1928, *U.S. Nat. Mus. Bull.* 100 (7): 43 pl. 2), from the Philippines and Indonesia, but distinguished from that, and from other species, by the large black blotch on pectoral base and other characters described above. The high number of predorsal scales, presence of l.lat. pores along caudal peduncle, and the scaly snout are useful recognition features.

Chromis atripes Fowler and Bean

Chromis atripes Fowler and Bean, 1928, *U.S. Nat. Mus. Bull.* 100 (7): 43, pl. 2. East Indies and Philippines.

D. xii, 13; A. ii, 13; P. i, 15. L.lat. 13 tubes plus a few rudimentary pores. Sc. 24. A median row of small pores along each side of caudal peduncle. Tr. 3/1/9. Predorsal sc. 17.

Head (15 mm.) 3.5; depth (34) 1.5 in standard length (53). Eye, 6 mm.; second anal spine, 8; upper caudal lobe about 21 mm.

Teeth conic, not flared outwards. Mandibular ramus gently curved upwards.

Preorbital and suborbital covered with scales, little free. All opercles entire. Head very scaly, only eyes and mouth naked. A few auxiliary scales on head but not on body.

Anterior profile steep, gibbous predorsally. General form deep oval, strongly compressed. Dorsal spines compressed and thick, membranes pencilled and incised, the longest spines are about the fifth to eighth. Fin-lobes all pointed. Ventrals filiform, reaching anal spine. Caudal forked.

Colour in alcohol greyish-brown over most of head and body becoming dark brown peripherally: notably around the dorsum, over the dorsal fins (except posterior rays which are dirty whitish), over the ventral and anal fins (except posterior rays which are like those of the soft dorsal) and above and below the caudal peduncle and fin which thus has dark brown upper and lower margins and dull white median rays. A small dark brown blotch on pectoral base, followed by a light diffuse area before the greyish-brown of the main part of the pectoral fin. Eye dark blue, surrounded by a blackish ring which is surmounted by a milky-blue crescent around most of the "eyelid". A slight dusky brown smudge just behind preopercular margin. Body-scales not dark-edged.

Described from a specimen 53 mm. in standard length or 3 inches overall. (Austr. Mus. regd. no. IB.4978).

Loc.—Kenn Reef, Coral Sea; October 2, 1960. Dr. D. F. McMichael.

Chromis dimidiatus (Klunzinger)

Heliastes dimidiatus Klunzinger, *Verh. Zool. Bot. Ges. Wien* 21:529. Red Sea.

D. xii, 13; A. ii, 13; P. ii, 16. L.lat. 16. Sc. 23. Tr. 3/1/9. Predorsal scales 21.

Head (19 mm.) 3.4, depth (37) 1.7 in standard length (65). Eye 6 mm.; snout, 5; interorbital, 8; maxillary, 5.5; postorbital, 8.5; depth of caudal peduncle, 11; length of pectoral, 21; of ventral, 22; second anal spine, 8.

Form deeply oval, upper profile more convex than lower, greatest depth about half-way along standard length. Snout scaly. Four rows of cheek-scales. Maxilla not quite reaching below level of eye. Lips normal. Teeth conic, not directed outwards. Mandibular ramus gently curved upward. Suborbital covered by scales, free to below posterior part of eye. All opercles entire. About 20 gill-rakers on lower part of first branchial arch.

Body covered with ctenoid scales with about eight basal radii. No auxiliary scales but the scales over the lateral line and towards dorsal bases are diminished. About seven pores along sides of caudal peduncle. Scales extend over bases of all fins except ventral which have axillary scales.

Fourth dorsal spine longest. Soft dorsal much higher and, like the other fins, with rather pointed lobe. Second anal spine shorter than soft rays. Anal base much longer than soft dorsal base. Ventrals filiform, nearly reaching anal spine. Several spine-like procurrent caudal rays. Caudal strongly emarginate, slightly longer than head.

General colour in alcohol greyish-brown of varying tones with tendency towards broad, diffuse, darker bars, one occupying most of front, the other most of posterior part of body. Just before the hypural joint the colour changes abruptly to pale yellow or white on the caudal fin. All pectoral base and axil black. Eye blue. Orbital with black ring. A brown blotch over tip of operculum. Dorsal, anal and ventral fins very dark grey. Distal portions of dorsal and anal lobes whitish. Pectorals pale yellow behind the black base, then dirty whitish distally.

Described from a specimen 65 mm. in standard length or $3\frac{1}{2}$ inches overall. Austr. Mus. regd. no. IB.4939.

Loc.—Beyond reef-crest, Lihou Atoll, Coral Sea; September, 1960. Dr. D. F. McMichael.

Distinguished by 21 predorsal scales, 1 lat. pores on caudal peduncle, 13 anal rays, deep body, spine-like procurrent caudal rays, and in coloration.

Many smaller specimens from various Coral Sea localities.

Chromis dimidiatus, variation

A colour-variant which I at first thought might be quite distinct from other *Chromis dimidiatus* in the Coral Sea collection may be described as follows.

D. xii, 13; A. ii, 13; P. 18. L.lat. 14. Sc. 23. L.lat. pores on caudal peduncle rudimentary. Tr. 3/1/9. Predorsal scales about 17.

Head (19 mm.) 3.5, depth (37) 1.8 in standard length (67). Eye, 7 mm.; snout, 3.5; interorbital, 8; maxillary, 5; postorbital, 9; depth of caudal peduncle, 10; length of pectoral, 22; of ventral, 23; second anal spine, 6; longest upper caudal ray, 29; breadth of body, 13 mm.

Teeth conic, not flared outwards, outer enlarged row followed by some smaller ones. Mandibular ramus steep. General characters as in typical *dimidiatus*.

Form oval, upper profile more convex than lower, greatest depth about half-way along standard length. Snout scaly. Four rows of cheek-scales. Maxilla not quite reaching below level of eye. Lips normal. Teeth conic, not directed outwards. Mandibular ramus steeply curved upward. Suborbital covered by scales, little free. All opercles entire. About 9 + 21 gill-rakers on lower part of first branchial arch.

Body covered with ctenoid scales with about eight basal radii. No auxiliary scales but the scales over the lateral line and towards dorsal bases are diminished. About seven pores along sides of caudal peduncle. Scales extend over bases of all fins except ventrals which have axillary scales.

Middle dorsal spines longest. Soft dorsal much higher and, like other fins, with rather pointed lobe. Second anal spine shorter than soft rays. Anal base much longer than soft dorsal base. Ventrals filiform, reaching vent. Several spine-like procurrent caudal rays. Caudal strongly emarginate, longer than head.

General colour in alcohol brown, becoming lighter on the head, breast and tail. A vertical brown streak often present behind preopercular margin and another broader one at end of opercle. A large, conspicuous black blotch more than covers pectoral base and its axil. Pectoral greyish white. Caudal without dark edges above and below, usually dirty white but sometimes light grey or brown. Dorsal and anal fins dark brown, except posterior rays in each case which are light grey. Ventrals dark grey to blackish. Eye blue. Some scales of flanks dark-edged but not conspicuously so. One specimen (Austr. Mus. regd. no. IB.4863) has black interorbital. In all the others it is brownish in varying tones.

Described from a female (Austr. Mus. regd. no. IB.4938) specimen, 67 mm in standard length or $3\frac{3}{4}$ inches overall, also from 21 other specimens, from $2\frac{1}{2}$ to $3\frac{3}{4}$ inches overall, but the upper caudal lobe may be produced and threadlike to make a total of 4 inches in some.

Localities.—Beyond reef, Lihou Atoll, Coral Sea; September 30, 1960 (Austr. Mus. regd. nos. IB.4938, and 4940-41, three specimens). Frederick Reef, Coral Sea (IB.4863-65, three specimens). Kenn Reef, Coral Sea; October 2, 1960 (IB.4990-91, 16 specimens). Obtained by Dr. D. F. McMichael.

***Chromis fragoris*, sp. nov.**

Fig. 13

D. xii, 13; A. ii. 12; P. 16. L.lat. 15. Sc. 24. Tr. 3/1/8. Predorsal scales 19.

Head (19 mm.) 3.4, depth (42) 1.5 in standard length (65). Eye, 6.5 mm.; snout, 5; interorbital, 7.5; maxillary, 5; postorbital, 9.5; depth of caudal peduncle, 11; breadth of body, 14; length of pectoral, 22; of ventral, 23; second anal spine, 8; longest upper caudal ray, 40 mm.

Maxilla not reaching eye. Teeth conic, erect, in more than one row anteriorly. Mandibular ramus rising by about 45 degrees. Head scaly except eyes, middle of isthmus and around mouth. Suborbital free to half-way below eye. All opercles entire. Four rows of cheek-scales. Preorbital with one row of scales. About 23 gill-rakers on lower part of first branchial arch.

Form deeply oval and fairly compressed, upper profile more convex than lower, greatest depth about midway along standard length.

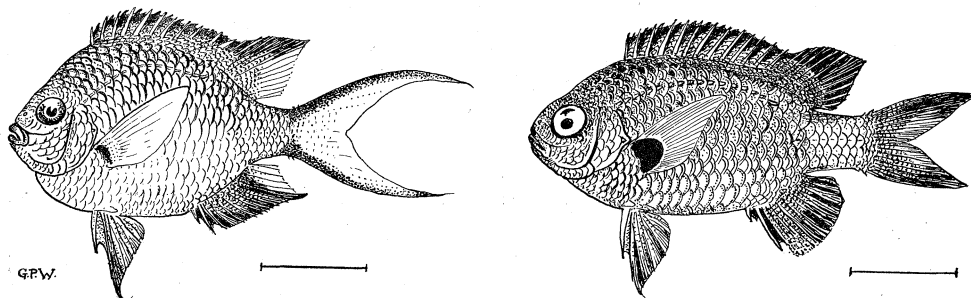


Figure 12—(right): Demoiselle, *Chromis kennensis*, sp. n. Kenn Reef.
Figure 13—(left): Demoiselle, *Chromis fragoris*, sp. n. Lihou Atoll.

Body covered with ctenoid scales with 6 to 10 basal radii. No auxiliary scales. Between l.lat. tubes and the back are $1\frac{1}{2}$ rows of scales. Some six to nine rudimentary l.lat. pores along side of caudal peduncle. Scales extend over bases of all fins except the ventrals which have axillary scales.

Spinous dorsal membranes incised and briefly pencilled, the fourth spine slightly the longest. Soft dorsal much higher than the spinous and, like all the other fins, pointed. Anal base longer than soft dorsal base. Ventrals reaching anal spines. Caudal forked with filamentous lobes. Two procurrent caudal spines above and below.

General colour in alcohol light reddish-brown, many of the scales with darker brown margins. Belly plain light orange-brown. A small brown blotch on most of upper portion of pectoral base, more on the rays than on the body. Pectoral axil pale. Paired fins mostly pale yellowish with some infuscation on ventrals. Dorsal and anal fins mostly blackish except for posterior rays and membranes which are white. Caudal dirty white, broadly margined above and below with dark smoky grey, almost black, these margins almost meeting at middle of caudal base. Eye blue with dark smoky orbital ring. Around lips dusky. No vertical dark bars behind preopercular or opercular edges.

Described and figured from the holotype, a specimen 65 mm. in standard length or $4\frac{1}{8}$ inches overall (Aust. Mus. regd. no. IB.4935) and 30 paratypes, $2\frac{3}{8}$ to $4\frac{1}{4}$ inches in total length (IB.4936-37 and 4942-43). Nearly a quarter of the total length of larger specimens is due to the elongation of the caudal rays.

Loc.—Beyond the reef-crest, Lihou Atoll, Coral Sea; September 30, 1960. Dr. D. F. McMichael. Obtained by explosives, hence Latin *fragoris*, of the explosion, alternatively, the thunder of the sea.

Similar to the variety of *dimidiatus* mentioned above (page 184), but differing in being deeper, having broad dark margins to caudal fin, a much smaller dark pectoral blotch and less contrast between the tones of the body and tail, longer snout, more produced caudal rays, and light-toned ventral fins.

Nearest *Chromis reticulatus* Fowler and Bean [1928, *Bull. U.S. Nat. Mus.* 100 (7): 40] from Borneo and Indonesia but differs in having deeper body (depth 1.5 instead of 2 or more in standard length), shorter maxillary, preorbital free, 12 dorsal spines and in being of smaller size.

Subgenus **Lepidochromis** Fowler and Bean, 1928

Lepidochromis Fowler and Bean, 1928, *U.S. Nat. Mus. Bull.* 100 (7): 58. Type-species, *Chromis lepidolepis* Bleeker.

Serrichromis Fowler, 1943, *U.S. Nat. Mus. Bull.* 100 (14): 77. Type-species, *Dascyllus pomacentroides* Kendall and Goldsborough.

Chromis (Lepidochromis) lepidolepis Bleeker

Chromis lepidolepis Bleeker, 1877, *Nat. Verh. Holl. Maatsch. Wetens.* (3) 2 (6): 163; *Atlas*, pl. 403, fig. 2. Timor.

D. xii, 11; A. ii, 11; P. 18. L.lat. 17. Sc. 25. Tr. 3/1/9. Predorsal scales 25.

Head (18 mm.) 3.2, depth (30) 1.9 in standard length (58). Eye, 6 mm.; second anal spine, 11 mm.

Teeth in several rows, the outer ones conic, spaced. External teeth of mandible erect, mandibular ramus elevated. Snout scaly to before nostrils. Preoperculum finely serrated, other opercles entire. Eye circular, without orbital papillae. Profile sloping from snout to swell below spinous dorsal so that upper profile more convex than lower. Form compressed. Body with ctenoid scales which extend over fin bases. Many auxiliary scales. Middle scales of caudal peduncle each with a lateral line pore.

Spinous dorsal membranes pencilled and incised. Lobes of fins pointed. Caudal fin strongly forked, upper lobe longer.

Colour in alcohol dark brownish grey, most scales with dark margins. No black or white bands or notable markings. Chin and breast silvery. Paired fins dull grey. Unpaired fins mostly blackish except for posterior anal rays and inner caudal rays which, with their membranes, are dull white. Pectoral axil whitish; a black dot over pectoral origin. Eye blue and silvery-green; a blackish line round the pale orbit. Mouth yellowish.

Described from a specimen 58 mm. in standard length or about 3 inches overall. Austr. Mus. regd. no. IB.4965.

Loc.—Kenn Reef, Coral Sea; October 2, 1960. Dr. D. F. McMichael.

Family **Coridae**

Genus **Anampses** Quoy and Gaimard, 1824

Anampses pterophthalmus Bleeker

Anampses pterophthalmus Bleeker, 1857, *Act. Soc. Sci. Indo-Neerl.* 2: 81. Amboina (*vide* Weber and Beaufort, 1911, *Fish. Indo-Austr. Archip.* 1: 65, q.v. for other refs.).

Id. Bleeker, 1862, *Atlas Ichth.* 1: 102, pl. 24, fig. 3.

Id. Macleay, 1883, *Proc. Linn. Soc. N.S. Wales* 8: 272.

Id. Jordan and Seale, 1906, *Bull. U.S. Bur. Fish* 25, 1905: 296.

Id. Weber, 1913, *Siboga-Exped., Fische*: 367.

Id. Fowler, 1928, *Mem. Bishop Mus.* 10: 331.

Id. Fowler and Bean, 1928, *Bull. U.S. Nat. Mus.* 100 (7): 225.

Id. Weber and Beaufort, 1940, *Fish. Indo-Austr. Archip.* 8: 98.

Id. Kamohara, 1955, *Bull. Biogeogr. Soc. Japan* 16-19: 312, fig. 1, and in his later papers.

Id. Randall, 1958, *J. Wash. Acad. Sci.* 48 (3): 107.

Id. Scott, 1959, *Trans. Roy. Soc. S. Austr.* 82: 85, fig. 5 (Shark's Bay, new record for Australia).

Id. Schultz, 1960, *U.S. Nat. Mus. Bull.* 202 (2): 220.

Id. Woodland and Slack-Smith, 1963, *Univ. Qld. Pap., Dept. Zool.* 2 (2): 44.

One (IB.6087), killed by rotenone at Gillett Cay, had the following characters:—

Head (52 mm.) 2.7, depth (50 mm.) 2.08 in standard length (143). Sc. 43 to hypural joint.

General colour in life dark chocolate brown. A milky stripe above upper lip to below eye, a second connects eyes over top of snout. Lips pink. Teeth white. Pupil black surrounded by brown, this surrounded by yellow, then blue on iris. Dorsal and anal fins brown, each with a dark blue ocellus, ringed by gold, posteriorly. Pectoral fin yellowish. Caudal brown with milky margin. Ventrals very dark brown.

Length $6\frac{3}{4}$ inches and thus about maximum size for the species. Australian Museum regd. no. IB.6087.

Gillett Cay, Swain Reefs, Queensland. 20.x.62.

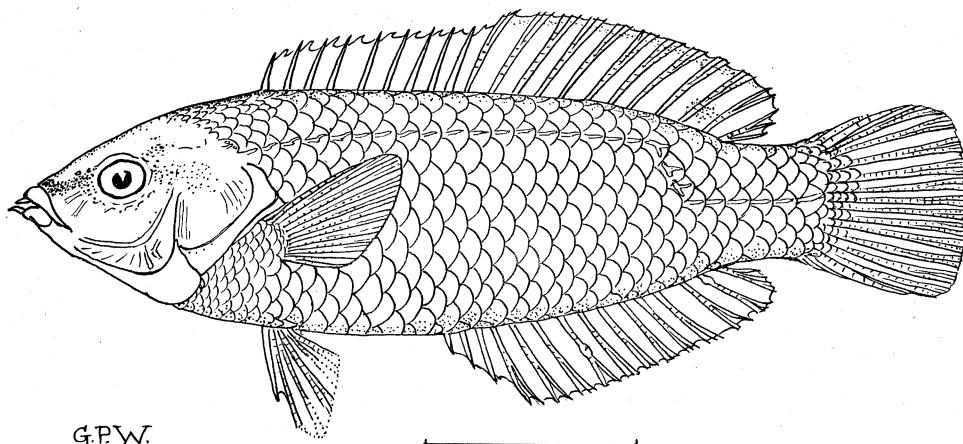


Figure 14—Wrasse, *Anampses elegans*, Ogilby. Holotype. Lord Howe Island.

Anampses elegans Ogilby

Fig. 14

Anampses elegans Ogilby, 1889, *Austr. Mus. Mem.* 2: 67. Lord Howe Island. Syntypes in Australian Museum, Sydney. *Id.* Waite, 1916, *Trans. R. Soc. S. Austr.* 40: 454 (listed from Lord Howe and Norfolk Islands).

Anampses variolatus Ogilby, 1889, *Austr. Mus. Mem.* 2: 67. Lord Howe Island. Type in Australian Museum. *Id.* Whitley, 1957, List Type-Specimens Fish. Austr. Mus. (ronco'd): 26, no. 432.

Of eight specimens labelled “ (type) ” by Ogilby, I select the largest as lectotype of *Anampses elegans* and figure it here (reg. no. I.1932). The Australian Museum houses also the holotype of *A. variolatus* Ogilby (I.1938) which is conspecific. All the colour-markings described by Ogilby have long ago faded but there is still a trace of a dark blotch near the end of the soft dorsal fin in two of the syntypes. Since the Memoir in which *Anampses elegans* and its synonym *variolatus* were described is now rare I repeat here Ogilby's descriptions:—

Anampses elegans, sp. nov.

B. vi. D. 9/12. A. 3/12. V. 1/5. P. 12. C. 14. L.l. 26. L.tr. 4/10.

The length of the head is three and a half, the height of the body four in the total length. The diameter of the eye is four and two-thirds in the length of the head, two-thirds of that of the snout, and rather less than that of the flattened interorbital space. The mouth is small and oblique, and the maxilla does not extend to the vertical from the anterior nostril. The curve of the lateral line commences beneath the eighth dorsal ray.

Colors: Upper half of the head and back pale brown; sides and tail yellowish-grey; lower half of the head and thoracic region silvery; some blue dark-edged spots and lines on the upper surface of the head and behind the eye; scales between the lateral line and dorsal fin with numerous blue dots and transverse lines; below the lateral line seven longitudinal golden bands, as wide as the interspaces, which are ornamented by numbers of blue spots, which however fade gradually towards the abdominal region, which is immaculate. The dorsal and anal fins are golden with a very narrow dark border, the former with a basal and median row of pale-blue dark-edged spots, the latter spotless; the caudal fin is golden with its outer margin greyish; the pectorals and ventrals are grey, the base of the former with a broad golden band.

Mr. Saunders collected several specimens of this handsome *Anampses*, all of which measure between four and five inches in length, and were obtained from pools on the reefs. Register numbers I. 1932-1937.

Anampses variolatus, sp. nov.

B. vi. D. 9/12. A. 3/12. V. 1/5. P. 13. C. 14. L.l. 28. L.tr. 6/11.

Colors: Pale reddish-yellow with a broad brown band from the middle of the operculum through the eye to the anterior edge of the snout, where it joins the corresponding band on the opposite side; a curved band from the centre of the cheek to the angle of the preopercle; occiput brown: body with brown blotches, which sometimes coalesce to form semi-transverse bands, and are visible but indistinct on the dorsal fin; a broad silvery band from the mouth to the opercle, partly interrupted by the curved brown band, and continued as far as the caudal fin by means of large irregular blotches; above this is a much narrower and more indistinct band of similar blotches; the fins are pale yellow, with a small round black spot on the two penultimate rays of the dorsal and anal.

I have a single immature specimen only of this species, but the colors are so different from those ordinarily found in this genus that I am compelled to describe it as new. Register number, I.1938.

I am unable at present to synonymise Ogilby's species with any of the 28 or so nominal species which have been named. Due to variations in colour with growth or sex in these fishes, it is probable that the number of species may be drastically reduced. An alphabetical list of those so far named follows:—

Anampses (sensu lato) spp.

amboinensis Bleeker, 1857, *Act. Soc. Sci. Indo-Neerl.* 2: 80. Amboina, Indonesia.

caeruleopunctatus Ruppell, 1829, *Atlas zu Ruppell (Senckenb. Nat. Ges.)*, Fische: 42, pl. 10, fig. 1. Tor, Red Sea.

chlorostigma Cuvier & Valenciennes, 1839, *Hist. Nat. Poiss.* 14: 9. Ex Ehrenberg MS. Red Sea.

chrysocephalus Randall, 1958, *J. Wash. Acad. Sci.* 48 (3): 100, fig. 3. Oahu, Hawaii.

cuvier Quoy and Gaimard, 1824, *Voy. Uranie, Zool.* 276, pl. 55, fig. 1. Mowi, Sandwich Islands.

diadematus Ruppell, 1835, *Neue Wirbelth. Abyssin.*, Fische: 21, pl. 6, fig. 3. Red Sea.

dimidiatus Fowler and Bean, 1928, *Bull. U.S. Nat. Mus.* 100 (7): 225, errore pro *diadematus*. Red Sea.

elegans Ogilby, 1889, *Austr. Mus. Mem.* 2: 67. Lord Howe Island.

evermanni Jenkins, 1900, *Bull. U.S. Fish. Comm.* 19, 1899: 57, fig. 14. Honolulu.

fidjiensis Sauvage, 1880, *Bull. Soc. Philom. Paris* 7 (4): 224. Fiji.

geographicus Cuvier & Valenciennes, 1839, *Hist. Nat. Poiss.* 14: 10, pl. 389, "on ne connait pas le patrie".

godeffroyi Gunther, 1881, *J. Mus. Godef.* 4 (15), Fische Sudsee 7: 252, pl. 140. Sandwich Islands.

ikedai Tanaka, 1908, *J. Coll. Sci. Imp. Tokyo* 23 (7): 32, pl. i, fig. 2. Japan.

lennardi Scott, 1959, *Trans. Roy. Soc. S. Austr.* 82: 86, fig. 6. Point Sampson, W. Australia.

lineolatus Bennett, 1836, *Proc. Zool. Soc. London* 3 (36): 208, Mauritius.

melanurus Bleeker, 1857, *Act. Soc. Sci. Indo-Neerl.* 2: 79. Amboina, Indonesia.

meleagrides Cuvier & Valenciennes, 1839, *Hist. Nat. Poiss.* 14: 12. Mauritius.

moniliger Cuvier, 1827, *Planches de Seba* 5: 6. Indonesia.

nagayoi Tanaka, 1908, *J. Coll. Sci. Imp. Tokyo* 23 (7): 34, pl. 1, fig. 3. Japan.

neoguinaicus Bleeker, 1878, *Arch. Neerl. Sci. Nat.* 13: 57, pl. Dutch New Guinea, now Irian.

pterophthalmus Bleeker, 1857, *Act. Soc. Sci. Indo-Neerl.* 2: 81. Amboina, Indonesia.

pulcher Regan, 1913, *Proc. Zool. Soc. London* 1913: 371, pl. 58, fig. 3 and pl. 59. Easter Is. and Tahiti.

- rubrocaudatus* Randall, 1958, *J. Wash. Acad. Sci.* 48 (3): 103, fig. 4. Oahu, Hawaii.
taeniatus Sauvage, 1891, *Hist. Nat. Madagascar, Poiss.*: 457. Mauritius.
tinkhami Fowler, 1946, *Proc. Acad. Nat. Sci. Philad.* 98: 162, fig. 30. Riu Kiu Islands.
twistii Bleeker, 1856, *Act. Soc. Sci. Indo-Neerl.* 1: 56. Amboina, Indonesia.
variolatus Ogilby, 1889, *Austr. Mus. Mem.* 2: 67. Lord Howe Is.
viridis Cuvier & Valenciennes, 1839, *Hist. Nat. Poiss.* 14: 13. Mauritius.

Family **Caracanthidae**

Genus **Caracanthus** Kroyer, 1844

- Micropus* Gray 1831, *Zool. Misc.* 20. Type-species *M. maculatus* Gray, from "The Pacific Sea". Preoccupied by *Micropus* Meyer and Wolf, 1810, Taschenb. d. Vogel: 280, a genus of birds. Not *Micropus* Kner, 1868, another genus of fishes.
- Caracanthus* Kroyer, 1844, *Nat. Tidskr.* [2] 1 (3): 264. Type-species, *C. typicus* Kroyer from Oahu, Hawaiian Islands. *Id.* Troschel, 1847, *Rept. Zool.* 1844: 555.
- Amphiprionichthys* Bleeker, 1855, *Nat. Tijdschr. Ned. Ind.* 8: 170. Type-species, *A. apistus* Bleeker from Cocos Islands.
- Centropus* Kner, 1860, *Sitzungsber. Akad. Wiss. Wien* 39: 531. Type-species, *C. staurophorus* Kner from ? (not seen). Preoccupied by *Centropus* Illiger, 1811, *Prodromus*: 205, a genus of birds.
- Crossoderma* Guichenot, 1869, *Mem. Nouv. Arch. Mus. Paris* 5: 194. Type-species, *C. madagascariense* Guichenot from Madagascar.
- Trachycephalus* De Vis, 1884, *Proc. Linn. Soc. N.S. Wales* 8: 455. Type-species, *T. bankiensis* De Vis from Banks Group, South Pacific (Syntypes in Austr. Mus.). Four times preoccupied (in batrachians, fishes and reptiles).

Caracanthus maculatus (Gray)

- Micropus maculatus* Gray, 1831, *Zool. Misc.*: 20. "Pacific sea" [= Hao, Paumotu].
- Caracanthus maculatus* Fowler, 1900, *Proc. Acad. Nat. Sci. Philad.* 1900: 515, pl. 20, fig. 5.
- Id.* Jordan and Evermann, 1905, *Bull. U.S. Fish. Comm.* 23: 453, fig. 198.
- Id.* Jordan and Seale, 1906, *Bull. U.S. Fish. Comm.* 25, 1905: 380.
- Id.* Fowler, 1928, *Mem. Bishop Mus.* 10: 299 (q.v. for bibliography).
- Id.* Herre, 1936, *Field Mus. Zool. Ser.* 21: 266.
- Id.* Pietschmann, 1938, *Bull. Bishop Mus.* 156: 31, pl. 10, text-fig. 7.
- Id.* Kamohara, 1955, *Rept. Usa Mar. Biol. Stat.* 2 (2): 1, fig. 1.
- Id.* Smith, 1958, *Is. Bull. Rhodes Univ.* 12: 172, pl. 8, fig. G.

Two dark brown specimens (regd. no. IB.6064-5) from Capre Cay, Swain Reefs: 23.x.62. Caught at the same time as *Gobiodon verticalis*, with which it may have some special association as the two genera are several times recorded as having been taken together. The habits of the related *C. unipinnis* have been discussed by Hiatt and Strasburg, 1960, *Ecol. Monogr.* 30: 94.

An old specimen (IA.3669) in the Australian Museum from Somerset, Cape York, Queensland; coll. B. L. Jardine, 1914.

New record for Australia.

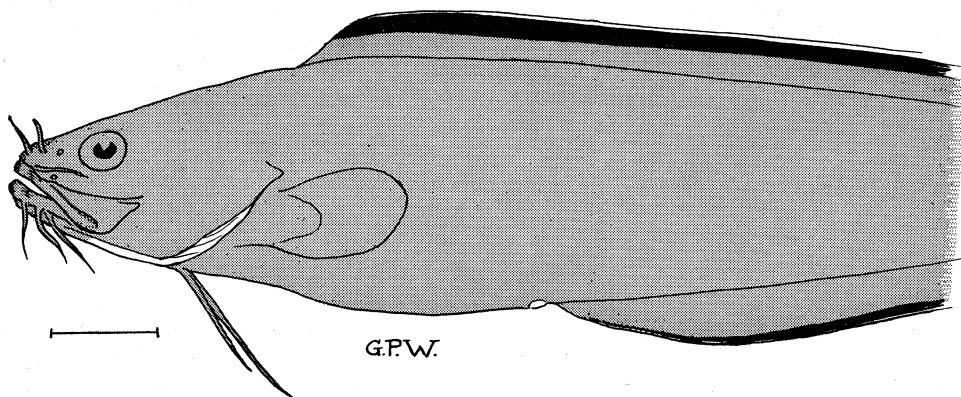


Figure 15—Beardie, *Brotula multibarbata*. Lord Howe Island.

Family **Brotulidae**

Genus **Brotula** Cuvier, 1829

Brotula multibarbata Temminck and Schlegel

Fig. 15

Brotula multibarbata Temminck and Schlegel, 1846, Fauna Japonica (Pisces); 251, pl. 111, fig. 2. Simabara Bay, Japan. *Id.* Hubbs, 1944, Copeia 1944 (3): 170 (q.v. for bibliography, synonymy, etc.). *Id.* Johnson, 1945, Copeia 1945: 55. *Id.* Gosline, 1953, Copeia 1953 (4): 216, figs. 1a, 2a, and 5a. *Id.* Kamohara, 1954, Rept. Usa Mar. Biol. Stat. 1 (2): 2, fig. 1. *Id.* Schultz and others, 1960, U.S. Nat. Mus. Bull. 202: 383.

Head (64 mm.) 5.3, depth (61) 5.5 in standard length (340). Eye, 12 mm; snout, 16; fleshy interorbital, 8.5; postorbital, 38; suborbital, 7; preorbital, 11; maxillary length, 33; its expansion, 12; depth of head, 52; its width, 38; predorsal length, 72; snout to vent, 130; to base of ventral fin, 49; ventral origin to vent, 88; length of ventral fin, 42 mm.

Head rather conic, jaws subequal anteriorly. Maxilla extending beyond the eye. Anterior nostril small, with barbel; posterior one open oval, nearer eye than end of snout. Eyes oval, interorbital flat; width of pupil less than half eye-diameter. Left narial barbel, 7 mm.; right, 11; preorbital barbel, 13; rostral barbel, 11; anterior mental barbel, 15; second mental barbel, 12; third, 18. Bands of small, curved, conic teeth around jaws, but with a gap at each symphysis, the upper gap the wider. Similar teeth in broad V-patch on vomer and curved bands on palatines. About 4 rows of teeth at sides of jaw and about 9 anteriorly. No enlarged teeth but the largest are atop the cushions of teeth each side of the lower symphysis. Tongue free, lanceolate. Head scaly, except on eyes, lips, and branchiostegal apparatus. Gill-membranes united across narrow isthmus. Gill-opening wide, reaching to below middle of eye. No pseudobranchiae. Preoperculum covered by skin and scales; no evident spine. First branchial arch with four, cushion-like, spinose, rather rudimentary gill-rakers on upper portion, a long (5 mm.) raker at the angle with its inner surface and distal extremity spinose, followed by two similar, shorter ones on the lower portion, with a roughened area between them and then 10 cushion-shaped rudiments below. Longest gill-fringes equal to longest raker.

Body deeper than wide, rounded anteriorly, strongly compressed posteriorly, originally covered with detachable scales which extend on to all fin-bases except ventrals. The scales are small, very numerous and counts cannot be made with certainty but there are some 40 between dorsal origin and level of narial barbels, a greater number on the linea transversalis and about 140 rows of scales between head and caudal base. Scales are imbricate, irregular or oval, cycloid, radially sculptured with lines joining the ridges rather like spider-web, nucleus eccentric, base deeply embedded in pocket. About three (yearly?) annuli and numerous basal radii. No lateral line now visible, perhaps destroyed. Vent large, without genital cage, situated slightly in advance of anal fin.

No fin-spines. The dorsal fin originates behind head and continues to join the much reduced and very acutely pointed caudal fin. Anal fin similar to dorsal, originating in anterior half of fish. Pectorals short and rounded, without free rays. Ventrals narrow, filiform, originating on isthmus below preoperculum, their bases close together, inner ray longer than outer one, neither bifid. Most fins covered with fatty skin making fin-counts difficult, so that the following are only very approximate: *D. circa* 110; *A.* 70 or more (some spurious rays developed between the true rays); *P.* 25 ?; *V.* 2; *C. circa* 6.

General colour in alcohol, white-skinned with the scales and edges of scale-pockets light brown. Lips and barbels greyish to brown. Eye blue, surrounded by dark grey orbital rim. Ventral fins light brownish-white. Other fins similar in colour to adjacent portions of body. Dorsal, anal and caudal fins broadly margined with black, the tips of some rays white. Pectoral base and axilla the same colour as the body. Inside of mouth and gill-chambers white. Vent dull white almost ringed with thin grey curved line. Premaxilla with dusky grey upper edge. Gill-arches pink. Vertex of head rusty red.

Described and figured from a specimen about 340 mm. in standard length and 365 mm. or 14 $\frac{1}{4}$ inches in overall length. Australian Museum registered no. IB.5833.

Loc.—Lord Howe Island, about July, 1962. Presented by Miss Julie Booth. Washed ashore after storm.

New record for Lord Howe Island.

Family **Clinidae**

Genus **Norfolkia** Fowler, 1953

Norfolkia Fowler, 1953, *Trans. Roy. Soc. N. Zeal.* 81: 262. Orthotype, *N. laird* Fowler = *Gillias squamiceps* McCulloch and Waite, 1916, *Trans. Roy. Soc. S. Austr.* 40: 449, pl. 41, fig. 1, from Lord Howe and Norfolk Islands.

Norfolkia thomasi, sp. nov.

Similar in most respects to *N. squamiceps* as described and figured in the reference cited above and agreeing with the type-specimens and others in the Australian Museum from Norfolk Island, Lord Howe Island and Queensland (Heron Island, Masthead Island and Swain Reefs), but consistently differing in having the cheeks and the lower parts of the opercula scaleless and in having only 13 instead of 21 or more tubes along the lateral line, the upper part of which ceases below the eleventh spine in the second dorsal fin, instead of below the second dorsal interspace.

The coloration and proportions are as in *squamiceps*, but the formulae are: D. iv/xiv-xv/ 11; A. i, 20-21; P. 9 branched + 6 simple; V. 2. L.lat. 13 plus a lower row of notched scales. Sc. 31-32. Tr. 2/1/7-8. The chest and pectoral base are scaly.

Described from the holotype (Austr. Mus. regd. no. IB.4040), the largest of three specimens 44, 46 and 47 mm. in total length, the other two (IB.4021) being paratypes, all from Heron Island. Another paratype (IB. 6245) from Gillett Cay, Swain Reefs.

Loc.—Heron Island, Queensland, 1957. Collected and presented by Mr. R. Slack-Smith whose field numbers for the specimens were H. 28 and H. 99. Seven specimens of true *squamiceps* (nos. H. 26 and J. 74) were taken at the same place.

The new species is named after Mr. Leonard Rees Thomas, organizer of the Australian Museum 1962 Swain Reefs Expedition.

Key to Australian *Norfolkia* spp.

- A. Three spines in first dorsal fin.
 - B. 14 to 16 spines in second dorsal fin. 21 or more anal rays. L.lat. extends to below 4th to 9th dorsal ray . . . *clarkii* (syn. *macleayana*).
 - BB. 13 spines in second dorsal fin. 20 or fewer anal rays. L.lat. extends to near end of third dorsal fin. *striaticeps*.
- AA. Four spines in first dorsal fin.
 - C. Scales on opercles and cheeks below. 21 to 24 tubes along l.lat. *squamiceps* (syn. *lairdi*).
 - CC. Cheeks naked below and opercle more or less naked below. 13 tubes along l.lat. *thomasi*, nov.

Norfolkia squamiceps (McCulloch and Waite)

Diagnosis—an Australian blenny with three dorsal fins, top and sides of head almost entirely scaly, also belly, breast and pectoral base, lower part of head naked.

D. iv/14, 9 (10) = 27; A. 20; P. 16; V. 2; C. 12 long rays. Sc. 30. Tubes on first 20. Tr. 4/1/8 or 5 on caudal peduncle. Pred. sc. 5 to interorbital. Supra-orbital rugose. Long tentacle at nostril.

General colour dull pearly white, plain on ventral surface but densely infuscated with brownish-grey elsewhere. The dark markings are irregular but tend to form cross-bars, (1) below eye, (2) just behind and below eye and (3) eight or more descending from back down the flanks. Fins mostly densely spotted with brownish-grey, but the anal is fairly uniform blackish along its centre and white proximally and distally. Ventrals white. Eye blue, surmounted by a black tentacle.

Total length 2 inches.

Australian Museum regd. no. IB.6161. Gillett Cay, Swain Reefs, Queensland, October 1962.

Family **Gobiomoridae**Genus **Nemateleotris** Fowler, 1938

Nemateleotris Fowler, 1938, *Proc. U.S. Nat. Mus.* 85: 129 and 131. Type-species, *N. magnificus* Fowler.

Nemateleotris magnificus Fowler

Nemateleotris magnificus Fowler, 1938, *Proc. U.S. Nat. Mus.* 85: 132, Tomini Gulf Buka Buka Island, Celebes. *Id.* Koumans, 1953, *Fish. Indo-Austr. Archip.* 10: 369 *Id.* Herre, 1954, *Philip. J. Sci.* 82: 349 and 371.

Head rounded, naked and with simple pores. No dermal ridge along nape. No serrated ridge over eye. No preopercular spine. No barbel. Snout bluntly rounded. Mouth reaching below front half of eye. Tongue rounded. Gill slits wide, separated by narrow isthmus. Eye (3 mm.) 3 in head.

Scales minute. Predorsal area naked. Tr. 15 on caudal peduncle. Pectoral base scaly. Two separate dorsal fins, the first elevated. V. i, 5; ventral fin short, pointed, not reaching vent. The ends of the dorsal and anal lobes are dusky, also, the middle of the base of the tail and there are two blackish stripes converging posteriorly on the caudal fin.

Total length 47.5 mm.

Three examples from a depth of 25 metres, outer reef at Noumea, New Caledonia (Dr. R. Catala).

Austr. Mus. regd. nos. IB.5279-81.

The genus and species was hitherto known only from the unique holotype from the Celebes of which I have seen an unpublished drawing by Mr. H. W. Fowler. This figure shows a shorter snout, longer fin-rays and slightly different caudal fin markings than in my specimens.

New record for New Caledonia.

Family **Aleuteridae**Genus **Paraluteres** Bleeker, 1866

Paraluteres Bleeker, 1866, *Ned. Tijdschr. Dierk.* 3: 14. Orthotype *Alutarius prionurus* Bleeker (*vide* Jordan, *Gen. Fish.* 340).

Paraluteres prionurus (Bleeker)

Alutarius prionurus Bleeker, 1851, *Nat. Tijdschr. Ned. Ind.* 2: 260. Banda, Indonesia.

One from Gillett Cay, Swain Reefs, Queensland, October, 1962. Austr. Mus. regd. no. IB.6155. Total length 95 mm. ($3\frac{3}{4}$ in.).

New record for Australia.

A mimic of *Canthigaster valentyni* caught at same time and place.

Compare Clark and Gohar (1953, *Publ. Mar. Biol. Sta. Al Ghardaqa* 8: 44-45, fig.), Clark (1954, Lady with a Spear: 115, fig.) and Smith (1958, *Ann. Mag. Nat. Hist.* (13) 1: 62, plate).

EXPLANATION OF PLATES

- Plate 8.—Sea-horse, *Hippocampus zebra*, sp. nov. Holotype, Gillett Cay. Photo, A. Healy.
- Plate 9.—Soldier Fish, *Pristiapogon snyderi*. Frederick Reef, Coral Sea. Photo, H. Hughes.
- Plate 10.—Upper figure: Soldier Fish, *Pristiapogon diversus*. Kenn Reef, Coral Sea. Photo, H. Hughes. Lower figure: Soldier Fish, *Lovamia properupta*, sp. nov. Holotype. Frederick Reef. Photo, H. Hughes.

[Text-figures are by the author.]

