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# STUDIES IN AUSTRALIAN FISHES.

## No. 3.*

By ALLAN R. MCCULLOCH, Zoologist.

(Plates xii.-xx. and figs. 54-55).

## Family CLUPEIDÆ.

### SARDINELLA KUNZEI. *Bleeker.*

(Plate xii. and figs. 54-55).

*Harengula kunzei*, Bleeker, Nat. Tyd. Ned. Ind., xii., 1856-7, p. 209.

*Clupea moluccensis*, Günther, Brit. Mus. Cat. Fish, vii., 1868 p 427 (part).

*Clupea klunzei*, Day, Fish. Ind., 1878, p. 636, pl. clxiii. fig. 1,

*Clupea (Harengula) kunzei*, Bleeker, Atl. Ichth., vi., 1870-2, p. 107, pl. cclxiii., fig. 1.

*Harengula stereolepis*, Ogilby, Proc. Linn. Soc. N. S. Wales, xxii., 1898, p. 759.

This species is very common at Murray Island, Torres Strait, where it swims in dense shoals in the lagoon. The natives obtain large numbers by simply throwing a three, or four-pronged spear into a mass of them (Pl. xii., fig. 1), generally securing several at each throw. They are also captured with small cast-nets which are simply thrown over them as they pass (Pl. xii., fig. 3), while a peculiar method of taking them, known as "Werir" (Pl. xii. fig. 2), was also commonly practised by small parties of natives. In this class of fishing the principal performer carries a cone-shaped basket, called "Weres" (fig. 54), which is formed of split-bamboo ribs held in position by lashings of bamboo bark or fibre. At the open end the ribs are few and widely spaced, but towards the head of the cone they are more

* For No. 2, see Vol. VII., p. 315.

numerous and very close together. Two attendants each carry a bamboo pole, ten or twelve feet long, and with a mop of twisted cocoa-nut fibre at one end.

The party walk along the beach until they see a shoal within reach, when the two polemen suddenly beat the water with their mops and so frighten the fish into a denser mass. At the same moment the man with the basket dives head-foremost into

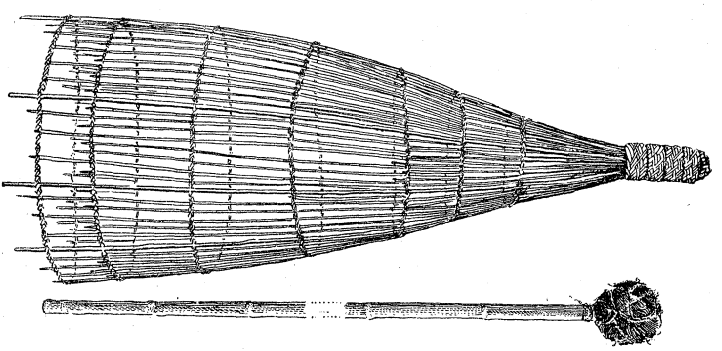

Fig: 54

their midst and scoops up as many as he can, often securing several pounds weight of fish at a time. These are emptied into other baskets carried by the girls of the party, and all then move on to repeat the process a little further along the beach.

[Since the above was set up I have seen the fourth volume of the "Reports of the Cambridge Anthropological Expedition to Torres Strait," in which Professor A. C. Haddon describes this method of fishing very fully on p. 155, fig. 170].

Sharks (*Carcharias melanopterus*, Quoy & Gaimard), four or five feet in length, also prey upon the unfortunate herrings, and on several occasions we saw them strand themselves as they rushed through a shoal which was too close to the edge of the water.

I have compared one of the types of *Harengula stereolepis*, Ogilby, with a co-type of *H. kunzei*, Bleeker, and consider that they are the same species. I have failed, however, to find the palatine teeth mentioned by both Bleeker and Day, and they are wanting in Bleeker's co-type. The Torres Strait fish as a whole are more slender than the figures of *S. kunzei*, but they vary

considerably, and some are quite as deep as the typical form. The position of the ventrals is also variable, being sometimes before the middle of the dorsal, and sometimes behind that point. The accompanying figure represents a Murray Island specimen.

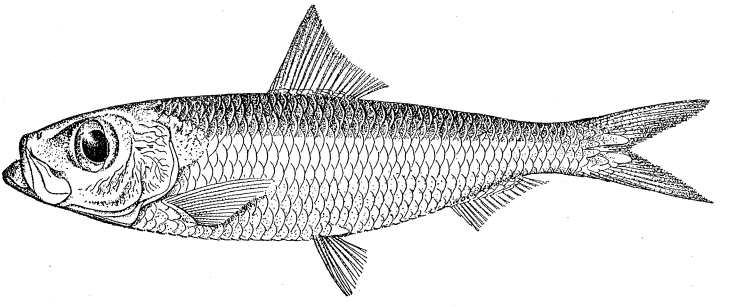

Fig. 55.

Ogilby has pointed out that his types of *Harengula stereolepis* are the specimens which Alleyne and Macleay[1] identified as *Spratelloides delicatulus*, Bennett. The latter species is recorded from Australia by Günther,[2] who examined specimens which were collected by Macgillivray, possibly in the neighbourhood of Torres Strait. I also have some very young examples from Murray Island which are probably *S. delicatulus*, so that although the specimens of *Harengula* (= *Sardinella*)[3] are the only herrings now in the Macleay Museum bearing Alleyne and Macleay's label, it is probable that those authors had specimens of both *Harengula* and *Spratelloides*, and their remarks really refer to the latter.

## Family ATHERINIDÆ.

### CRATEROCEPHALUS STERCUS MUSCARUM, *Günther*

*Atherina stercus muscarum*, Günther, Ann. Mag. Nat. Hist., (3), xx., 1867, p. 64.

*Craterocephalus maculatus* (Macleay), McCulloch, Proc. Roy. Soc. Q'land, xxiv., 1912, p. 52, pl. i., fig. 2.

Mr. Ogilby having suggested the identity of *C. maculatus* and *Atherina stercus muscarum*, I forwarded a specimen of the

[1] Alleyne and Macleay—Proc. Linn. Soc. N. S. Wales, i., 1877, p. 350.
[2] Günther—Brit. Mus. Cat. Fish., vii., 1868, p. 464.
[3] *Fide* Jordan and Richardson—Check-list Fish. Phillipine Is. (Manila Bur. Sci., No. 1, 1910. p. 6).

former to the British Museum for comparison with Günther's type. Mr. Tate Regan has very kindly looked into the matter and informs me they are the same species.

## Family BERYCIDÆ.

### TRACHICHTHODES, *Gilchrist*.

*Trachichthodes*, Gilchrist, Marine Invest. S. Afr. ii., 1903, p. 203 (*T. spinosus*, Gilchrist).

*Austroberyx*, McCulloch, Zool. Res. "Endeavour," i., 1911, p. 39 (*Beryx affinis*, Günther).

My genus *Austroberyx* is evidently identical with *Trachichthodes*. Gilchrist does not mention the trenchant abdomen with a row of slightly enlarged, keeled scales, though he notes that it is without scutes. He states that the only head-scales are on the cheeks, but his figure also shows them on the operculum as in *Austroberyx*. In all other details his definition agrees with mine.

## Family MACROURIDÆ.

### MACRURONUS NOVÆ-ZELANDIÆ, *Hector*.

*Coryphænoides novæ-zelandiæ*, Hector, Trans. N. Zeal. Inst., iii., 1871, p. 136, pl. xviii., fig. 1, and Cat. Fish. N. Zeal., 1872, p. 49, pl. viii., fig. 79.

*Macruronus novæ-zelandiæ*, Günther, Challenger Rept., Zool., i., 1880, p. 22, and xxii. 1887, p. 157 : *Id.*, Goode and Bean, Oceanic Ichth., Sp. Bull. U.S. Nat. Mus., ii., 1895, p. 390, pl. ci., fig. 150; *Id.*, Waite, Rec. Cantb. Mus., i., 1911, p. 181, pl. xxx., fig. 1.

*Coryphænoides Tasmaniæ*, Johnston, Proc. Roy. Soc. Tasm., 1882 (1883), p. 143.

Through the kindness of Mr. Robert Hall, Curator of the Tasmanian Museum, the Australian Museum has recently received a specimen of *Coryphænoides tasmaniæ*, Johnston. It was one of several in the old collection of the museum, which, though labelled as being that species, were without other data. I think they were very probably identified and presented by Mr. Johnston. Others are in the Australian Museum from the northern coast of Tasmania, and they agree perfectly with Waite's figure of *Macruronus novæ-zelandæ*, which species has already been recorded from Tasmania by Günther.

## *Family* SERRANIDÆ.

### HYPOPLECTRODES JAMESONI, *Ogilby.*

(Plate xiii., fig. 1).

*Hypoplectrodes jamesoni* Ogilby, Proc. Roy. Soc. Q'land, xxi., 1908, p. 16.

I collected an example of this species, 110 mm. long, at Cowan Creek, a salt-water branch of the Hawkesbury River, which is figured on Pl. xiii. It differs from a Moreton Bay specimen received from Mr. J. D. Ogilby, only in having the maxillary bone larger and reaching to below the hinder margin of the eye instead of only to its centre. Another smaller specimen has been presented by Dr. R. Pulleine who dredged it at Port Curtis, Queensland.

## *Family* THERAPONIDÆ.

### THERAPON BIDYANA, *Mitchell.*

*Acerina (Cernua) Bidyana*, Mitchell, Three Exped. Int. Eastern Austr., i., 1838, p. 95, pl. viii.

*Datnia elliptica*, Richardson, Voy. Erebus and Terror, Fish., 1848, p. 118, pl. lii., fig. 4-8.

*Therapon ellipticus*, Ogilby, Ed. Fish. N. S. Wales, 1893, p. 28, pl. xxviii.

*Terapon ellipticus*, Stead, Ed. Fish. N. S. Wales, 1908, p. 73, pl. xlii.

Mitchell's figure of *Cernua bidyana* from the Karaula River[4] New South Wales, leaves little doubt that it represents the *Therapon ellipticus* of later writers, though the fin formula given by him—D. xi./?, A. iii./6, V. i./6, is very different to what is found in that species. I know of nothing, however, having any such number of spines and rays, while it must be noted that the figure shows them to be more in accordance with *T. ellipticus*. The few notes given relating to colour and the sound-producing habit also agree with what is known of the Silver Perch or Grunter, though they might also apply to related species; and finally, *T. ellipticus* is apparently a common form in all the western rivers of New South Wales.

[4] The Macintyre River of later maps.

Mitchell's name does not appear to have been again noted in literature since he first used it, but as it is ten years earlier than that of Richardson's *Datnia elliptica* it must take precedence.

## *Family* CHÆTODONTIDÆ.

### HOLACANTHUS DUBOULAYI, *Günther.*

(Plate xiv).

*Holacanthus duboulayi*, Günther, Ann. Mag. Nat. Hist. (3), xx., 1867, p. 67 ; *Id.* Macleay, Proc. Linn. Soc. N. S. Wales, ii., 1878, p. 352 ; *Id.* Klunzinger, Sitzb. Akad. Wiss. Wien, lxxx. i., 1879, p. 361.

A fine specimen has been presented to the Australian Museum by Mr. F. B. Richmond. It was caught near Rat Island in Port Curtis, Queensland, and is figured on Pl. xiv. Other specimens are in the collection from Port Darwin and Cape York.

Klunzinger and Macleay have noted considerable variation in the arrangement of the lighter markings on the broad brown body band. These may form either a network with the lines descending from the back to the belly, or be longitudinal and nearly straight. In others, again, as in that figured, they may be absent and represented only by a few irregular spots near the edges of the otherwise uniform brown surface. The lines on the fins are characteristic, but appear dark violet in some specimens and pale blue in others ; the margins of the fins are similarly either light or dark.

## *Family* POMACENTRIDÆ.

### DASCYLLUS ARUANUS, *Linnæus.*

*Dascyllus aruanus*, Günther, Journ. Mus. Godeff., v., 1877, p. 235, pl. cxxiv., fig. B.

*Dascyllus aruanus* vel *blochii*, Castelnau, Res. Fish. Austr. (Vict. Offic. Rec. Philad. Exhib.), 1875, p. 33.

This species was recorded from Queensland by Castelnau but does not appear to have since been recognised from there. His specimen was young and had a rounded instead of a bifid tail, and thinking that it might prove to be a distinct species, he proposed the alternative name *blochii* for it. I have examined

young specimens of *D. aruanus* in the Museum collection and find that in worn specimens the lobes of the tail are often rounded off, though in all cases their ragged edges are easily detected. As Castelnau did not properly describe his specimen, I think it better to regard *blochii* as a synonym of *D. aruanus*, especially as I have collected fifteen typical examples of the latter at Murray Island, Torres Strait.

As *Tetradrachmum aruanum*, Fowler[5] has included this species in a collection said to have been made in Victoria, but there can be little doubt that several species from the South Pacific Islands have been mixed with the Victorian fishes, of which *D. aruanum* is one.

## Family LABRIDÆ.

For the preparation of these notes on the Australian species of *Pseudolabrus* and allied genera I have examined a much larger collection of both species and specimens than has been previously brought together. For this advantage I am indebted to the following gentlemen who have lent me material under their charge. Mr. J. A. Kershaw, Curator, National Museum, Melbourne; Dr. R. Hamlyn-Harris, Director Queensland Museum; Professor W. A. Haswell and Professor T. W. E. David, Committee of the Macleay Museum; Mr. Bernard H. Woodward, Director Western Australian Museum. Of the specimens in the Australian Museum a considerable number have been collected for the Trustees by Mr. A. Abjornssen, Inspector of Fisheries, Western Australia, while Mr. J. H. Wright has contributed a valuable series of our local species. My thanks are also due to Mr. E. La T. Armstrong, Chief Librarian and Secretary of the Public Library of Melbourne for a copy of Bleeker's description of *Pseudolabrus guntheri*.

*Characters which are variable.*—In describing various species of *Labrichthys* (= *Pseudolabrus*) Count Castelnau, Sir William Macleay and Mr. C. W. de Vis relied largely upon their colour and colour-markings to distinguish them, and often regarded important structural details as being of only secondary value. But if a series of fresh specimens of any one species of this genus be examined it will be found that the actual colouration of different individuals differs considerably, and that even the

[5] Fowler—Proc. Acad. Nat. Sci. Philad., lix, 1907 (1908), p. 433.

colour-marking varies greatly in degree of development, according to the age of the specimens. Again, as I have found in *P. tetricus*, the young may bear no resemblance whatever, either in form or colour to the adults, and I have good reason to suppose that similar changes occur in *P. gymnogenis* and *P. parilus*.

The colour variation has already been noted by Johnston [6] as follows:—"I consider the classification of the genus *Labrichthys* to be far from satisfactory. I have good reason to believe that dependence upon colour-markings, however peculiar and brilliant, is to a great extent delusive. Like the genus *Monocanthus*, many of them change colour with age."

One of the most striking changes in form with growth is the alteration of the form of the head. In the young it is more or less conical, the snout being pointed, whereas in adults the upper and lower profiles become convex, so that the head is larger and broader; the eye, also, is proportionately much smaller in adults. In some species in which the fins are not covered with scales the small body scales near the bases of the dorsal and anal may be so crowded in young specimens that they overlap the extreme bases of those fins; as the body increases in size they have more room and are then confined to their proper place. In the young the tubules of the lateral line are much less branched than in older specimens. Finally, the forms of the pectoral and caudal fins vary considerably, the latter being often rounded in the young, and truncate or even emarginate in adults; the upper rays of the pectoral sometimes grow out beyond the margin of the rest of the fin.

With all this extraordinary variation it is difficult to find characters by which the various species may be distinguished, but in the following key and diagnoses I have selected such as seemed to be constant in the specimens available to me.

*A.*—D. ix. / 12, A. iii. / 10-11. Body elongate. Pectoral fin rounded. EUPETRICHTHYS.

*AA.*—D. ix. / 11, A. iii. / 10. Body not elongate.

*B.*—Pectoral fin rounded. Membrane of dorsal and anal fins not produced beyond the spines as free pencils. ... PICTILABRUS.

*BB.*—Pectoral fin not rounded, the upper rays at least as long as the middle ones.

[6] Johnston—Proc. Roy. Soc. Tasm., 1881 (1882), p. 124.

*C.*—Membrane of dorsal and anal fins not produced beyond the spines as free pencils; the basal halves of both fins covered with large scales. ... AUSTROLABRUS.

*CC.*—Membrane of dorsal and anal fins produced beyond the spines as free pencils; the fins partly covered with scales or naked .....PSEUDOLABRUS.

Key to the Australian species of *Pseudolabrus.*

*a* Four or more rows of scales on the cheeks extending forward to below middle of eye.

*b* Dorsal and anal fins with large scales covering their bases.

*c* Broad dark bands from snout and interorbital space passing through the eye and on to the body. A black blotch usually present between the anterior dorsal spines. Young with more or less distinct cross-bands and 4-6 pairs of brown spots between the lateral line and the dorsal fin.....*guntheri.*

*cc* Only narrow, dark lines, radiating from the eye which are sometimes wanting. Interorbital space without markings. Anterior dorsal spot usually wanting 3-4 large, dark blotches, with white interspaces, at base of soft dorsal, sometimes wanting .. *luculentus.*

*bb* Dorsal and anal without scaly bases.

*P. convexus* appears to belong to this section.

*d* Caudal usually with one or both lobes produced. Pink or yellow, with or without a dark blotch at end of dorsal fin; no dark bar on base of pectoral ..... *miles.*

*dd* Caudal lobes not, or rarely slightly produced.

*e* Body darker, without distinct dark spots or blotches. Pectoral fin with a dark basal band.

*f* Back without light spots; scales with or without script-like markings. Membrane between anterial dorsal spines dark. Young light coloured with brown mottlings.....*inscriptus.*

*ff* Purple, with four more or less distinct yellow spots on the back; humeral region yellowish *fucicola.*

*ee* Body light green or reddish, with darker spots and blotches. Pectoral with or without a dark basal band. Young with ill-defined bands .....*celidotus.*

*aa* Cheek scales in 1-3, rarely 4 rows, usually confined to postorbital portion of head.

*g* Bases of dorsal and anal fins scaly .....*bostockii.*

*gg* Bases of dorsal and anal not scaly, except in young specimens.

*h* Cheek scales large, one row behind and two below the eye, extending well forwards on the cheeks..... *elegans.*

*hh* Cheek scales smaller, in one row above and usually three below, confined to posterior portions of cheeks. *tetricus*

*P. richardsonii*, *bleekeri* and *cuvieri* also appear to belong here.

*hhh* Cheek scales smaller, in one or two rows, confined to posterior portions of cheeks.

*i* Caudal usually truncate, the lobes often somewhat produced in adults. Cheek scales in one row ..... *gymnogenis.*

*ii* Caudal more or less rounded. Cheek scales usually in one row above and two below.

*j* Body with small brown spots, sometimes forming cross-bands. Brown marks radiating from the eye *parilus.*

jj Body closely dotted with small blue ocelli...*punctulatus.*

*aaa* No cheek scales .....*unicolor.*

## Genus EUPETRICHTHYS, *Ramsay and Ogilby.*

*Eupetrichthys*, Ramsay & Ogilby, Proc. Linn. Soc. N. S. Wales, (2), ii., 1888, p. 631; *Id.*, Gill, Proc. U.S. Nat. Mus., xiv., 1892, p. 404 (*E. angustipes*, Rams. and Ogil.).

D. ix./12; A. iii./10-11. Pectoral fin rounded; ventrals elongate in adults. Membrane of dorsal and anal fins produced beyond, but not behind the spines. Scales not extending on to the bases of the dorsal and anal fins. Tubes of lateral line ramose.

### EUPETRICHTHYS ANGUSTIPES, Ramsay & Ogilby.

(Plate xv.).

*Eupetrichthys angustipes*, Ramsay & Ogilby, Proc. Linn. Soc. N. S. Wales, ii., 1888, p. 631; *Id.*, Gill, *Loc. cit.*; *Id.*, Waite, Mem. Nat. Club N. S. Wales, 1904, p. 39; *Id.*, Hedley, Rec. Austr. Mus., vii., 1908, p. 134.

Cheek scales in one row above and two below, extending to below the centre of the eye. Colour dark green above, yellow below, with six transverse bands extending obliquely forward below where they are broadest. Head and throat with many dark bars and spots. Dorsal, anal, and caudal fins each with a broad, dark, inframarginal band, composed of wavy lines; an anterior dorsal spot.

Three specimens examined, 80-150 mm. long, including the type which is figured.

*Hab.*—Near Sydney, New South Wales.

## Genus PICTILABRUS, *Gill.*

*Pictilabrus*, Gill, Proc. U.S. Nat. Mus, xiv,, 1892, p. 403 (*Labrus laticlavius*, Richardson).

This name was proposed to distinguish *P. laticlavius* from *Pseudolabrus* in its restricted form on account of the membrane of the dorsal and anal fins not being produced as free pencils beyond the spines; also the head is proportionately smaller. A more definite character is afforded by the pectoral fins which

are broadly rounded, the medium rays being longer than the upper ones. The body scales slightly overlap the bases of the dorsal and anal, but do not extend on to the fins as in *Austrolabrus*.

PICTILABRUS LATICLAVIUS, *Richardson.*

*Labrus laticlavius*, Richardson, Proc. Zool. Soc., 1839, p. 99, and Trans. Zool. Soc., iii., 1849, p. 139.

*Labrus* vel *Tautoga laticlavia*, Richardson, Zool. "Erebus" and "Terror," 1848, p. 128, pl. lvi., figs. 3-6.

*Labrichthys laticlavius*, Günther, Brit. Mus. Cat. Fish., iv., 1862, pp. 115 and 507, and Ann. Mag. Nat. Hist. (3), xx., 1867, p. 66; *Id.*, Castelnau, Proc. Linn. Soc. N. S. Wales, iii., 1879, p. 354; *Id.*, Klunzinger, Sitzb., Akad. Wiss. Wien, lxxx. i., 1879, p. 402; *Id.*, Macleay, Proc. Linn. Soc. N.S. Wales, vi., 1881, p. 80; *Id.*, Johnston, Proc. Roy. Soc. Tasm., 1882 (1883), p. 124, and 1890 (1891), p. 35; *Id.*, Hector, Trans. N. Z. Inst. xvi., 1884. p. 323; *Id.*, Ogilby, Cat. Fish. N. S. Wales, 1886, p. 44; *Id.*, McCoy, Prodr. Zool. Vict., xvii., 1888, pl. clxiii.; *Id.*, Lucas, Proc. Roy. Soc. Vic. (2), ii, p. 32.

*Labrichthys labiosa*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 88, pl. i., fig. 2; *Id.*, Ogilby, Cat. Fish. N.S. Wales, 1886, p. 45.

*Pseudolabrus laticlavius*, Waite, Mem. Nat. Club N. S. Wales, 1904, p. 39, and Rec. Cantb. Mus., i., 1907, p. 22; *Id.*, Stead, Ed. Fish. N. S. Wales, 1908, p. 84.

*Pictilabrus laticlavius*, Gill, Proc. U.S. Nat. Mus., xiv., 1892, p. 403; *Id.*, Hutton, Index Faun. N. Zeal., 1904, p. 48.

Cheek scales in one row above, and two, rarely one or three rows below. Body green with two broad longitudinal purple bands, the upper following the lateral line and joining the lower on its downward curve; often a third band is present on the lower surface of the body and tail. A triangular dark blotch descends from the second bar above the origin of the anal, and there may be two other indefinite ones behind it. Both bands and spots vary in degree of development and may be almost absent. Scales of lower parts with blue lines. Dorsal, anal and caudal fins each with a broad submarginal dark band spotted with blue. A large anterior dorsal spot.

*Hab.*—South and South-eastern Australia, from Port Jackson to Tasmania and King George Sound. I have examined four specimens from near Sydney, eight from Victoria, one from Tasmania, and one from South Australia.

## Genus AUSTROLABRUS, *Steindachner.*

*Austrolabrus*, Steindachner, Sitzb. Akad. Wiss. Wien, lxxxviii., i., 1883 (1884), p. 1102; *Id.*, Gill. Proc. U.S. Nat. Mus., xiv., 1892, p. 404 (*Labrichthys maculatus*, Macleay).

Steindachner relied upon the large scales covering the dorsal, anal and caudal fins to separate *maculatus* from the other species of *Pseudolabrus*; this character is, however, shared by *P. guntheri* and *P. luculentus*, which appear to me to be true Pseudolabri, while *P. bostockii* is intermediate between the species with scaly fins and those without. One may, perhaps, use the absence of free pencils projecting from the spines of the dorsal and anal fins as a distinguishing character, but it must be noted that in Steindachner's figures of *A. maculatus* they are shown as present in the female though not in the male. They are wanting in the only two I have examined, in which the fins are formed exactly as shown on Plate v. of Steindachner's paper. If this character is not reliable I can find no other to separate *Austrolabrus* from *Pseudolabrus*. The shape of the pectorals and the scaly fins distinguishes it from *Pictilabrus*, and the latter character and the different fin formula from *Eupetrichthys*; Steindachner describes and figures twelve rays in the dorsal fin but in my two specimens the last ray, though widely branched from the base, must be counted as a single split ray.

### AUSTROLABRUS MACULATUS, *Macleay.*

(Plate xvi.).

*Labrichthys maculata*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 89.

*Labrichthys* (*Austrolabrus*) *maculata*, Steindachner, Sitzb. Akad. Wiss. Wien, lxxxviii. i., 1883 (1884), p. 1100, pl. v., and pl. vi., fig. 1.

*Austrolabrus maculatus*, Gill, Proc. U. S. Nat. Mus., xiv., 1892, p. 404.

Cheek scales in one or two rows above and three or four below. Upper pectoral rays longest. Basal halves of dorsal and anal fins covered with large scales, the membrane not produced beyond the spines as free pencils (see above). Caudal rounded. Tubes of lateral line ramose. Greenish, most of the scales of the upper half with large black spots, which are smaller below and on the head; on the caudal peduncle they may unite to form a large blotch. Dorsal, anal and caudal usually with fine dusky wavy lines.

*Hab.*—King George Sound and St. Vincent Gulf, West and South Australia. I have examined the type which is 103 mm. long and a second larger example 140 mm. long which is figured. It was collected for the Trustees by Mr. Abjornssen at Albany.

### PSEUDOLABRUS GUNTHERI, *Bleeker*.

(Pl. xvii.).

*Pseudolabrus guntheri*, Bleeker, Versl. Akad. Amsterdam, xiv., 1862, p. 130; *Id.*, Waite, Rec. Austr. Mus., vi., 1905, p. 70.

*Labrichthys guntheri*, Günther, Brit. Mus. Cat. Fish., iv., 1862, p. 507; *Id.*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 82; *Id.*, de Vis, Proc. Linn. Soc. N. S. Wales, ix., 1885, p. 879.

*Pseudolabrus luculentus* vel *richardsonii*, Steindachner, Sitzb., Akad. Wiss. Wien, lvi. i., 1867, p. 330.

*Labrichthys dorsalis*, Macleay, *Loc. cit.*, vi., 1881, p. 87.

,, *melanura*, Macleay, *Loc. cit.*, vi., 1881, p. 89.

,, *dux*, de Vis, *Loc. cit.*, viii., 1883, p. 287; *Id.*, Macleay, *Loc. cit.*, ix., 1884, p. 47.

,, *cruentatus*, de Vis, *Loc. cit.*, ix., 1885, p. 879.

,, *sexlineatus*, de Vis, *Loc. cit.*, ix., 1885, p. 880.

? ,, *rex*, de Vis, *Loc. cit.*, ix., 1885, p. 880.

? ,, *maculatus*, de Vis, *Loc. cit.*, ix., 1885, p. 881 (*non* *L. maculatus*, Macleay).

D. ix., 11; A. iii., 10; P. 12; V. i., 5; C. 13-14; L. lat. 26-27; L. tr. 3-4 -|- 9.

Height 3-3$\frac{1}{4}$ in the length to the hypural and equal to or a little more than the length of the head including the opercular flap. Eye 2 in the snout in adults and 6 in the head, much larger in the young. Breadth of caudle peduncle 1$\frac{8}{10}$ in the head.

Body moderately elongate, compressed, covered with rather large scales which extend on to the bases of the dorsal, anal and caudal fins. Cheeks with 4-5 rows of scales below the eye and 2 behind it; operculum covered with large irregular scales, head otherwise naked. Preorbital much broader than the eye, almost equal to the interorbital space. A pair of strong, widely separated canines in front of the upper jaw, and two pairs in the lower; sides with a single series of smaller canine-like teeth which decrease in size backwards, and a second inner series anteriorly. Posterior canine present or absent. Nostrils close together, near the supero-anterior angle of the eye; the anterior tubular, posterior rounded. Lateral line slightly arched anteriorly, then following the curve of the back to the end of the dorsal, where it bends down to the middle of the caudal peduncle.

Dorsal fin commencing above the hinder half of the operculum; the spines increasing in length backwards, the last about three in the head, and each topped by a prolongation of the membrane. Soft portion of the fin angular behind, the anterior rays a little longer than the posterior, about 2$\frac{1}{3}$ in the head. Anal similar to, and terminating almost evenly with the dorsal. Pectoral 1$\frac{1}{2}$ in the head, the upper rays longest, the margin rounded. Ventrals pointed, either the first or second rays the longest and reaching almost to the vent or some distance short of that point. Caudal truncate, the outer rays either rounded off or slightly produced.

*Colour.*—Adult specimens greenish or reddish, with or without about six indistinct darker cross-bands. Seven broad bars extend across the head and on to the anterior half of the body which are arranged as follows: two from the occiput to above the lateral line; one from the snout passing through the eye to below the lateral line, and a short one between it and the pectoral fin; two from the angle of the mouth, the upper one passing through the eye, and the lower across the angle of the preoperculum; an intermediate one from the preoperculum to the base of the pectoral. Two similar bars connect the eyes across the interorbital space. A large black spot is present

between the second and third dorsal spines; remainder of the fin with indefinite lighter and darker bands and a whitish edge. Anal marked similarly to the dorsal. Caudal with the central portion dusky and two more or less distinct blotches at the base. A black spot or bar at the base of the pectoral. When fresh, the colouration consists largely of scarlet bars on a rich green ground colour.

Young specimens have the same markings as adults but the vertical bars on the body are much more pronounced, and there are four to six pairs of dark brown spots between the back and the lateral line, and one on the caudal peduncle. These are sometimes persistent in the full-grown fish.

Having examined all de Vis' specimens, with the exception of *P. rex* and *P. maculatus*, which are lost, I am certain they all belong to one species; though they have lost all traces of colour, they still retain more or less of their markings which are similar to those described above. The descriptions of *P. rex* and *P. maculatus* indicate that they also are identical with the others; this view is strengthened by the fact that they were obtained with his *P. cruentatus*.

The only difference between the type specimens of *P. dorsalis* and *P. melanurus* is that in the latter the markings on the head are darker than the ground-colour, whereas they are whitish in the former. There is no room for doubt however that this is merely the result of indifferent preservation, *P. dorsalis* being little more than a skin from which the interior parts have decayed.

Steindachner described a Port Jackson specimen as *P. luculentus*, Richardson, but thinking that it might prove distinct from that species, he proposed the alternative name *richardsonii* for it. The description agrees well with my specimens of *P. guntheri*.

*Hab.*—This species is apparently rare in New South Wales but is common in Queensland. The Australian Museum collection includes five adults and twenty-six young specimens ranging from 33-180 mm. in length, from the following localities:—Moreton Bay, and Masthead Island off Port Curtis, Queensland; Lord Howe Island; Cape Solander, Botany Bay. All the specimens described by de Vis were taken in Moreton

Bay, with the exception of *P. sexlineatus*, which came from the "Barrier Reef." *P. dorsalis* and *P. melanurus*, Macleay, were described from Port Jackson. The type specimen of *P. guntheri* was simply said to have come from Australia, but the species has been recognised under that name by de Vis from Moreton Bay, and by Waite from Fremantle, Western Australia. The specimen figured was caught at Cape Solander by Mr. J. H. Wright, who presented it to the Trustees.

PSEUDOLABRUS LUCULENTUS, *Richardson*.

*Labrus* vel *Tautoga luculentus*, Richardson, Zool. Erebus and Terror, Fishes, 1848, p. 130.

*Labrichthys luculenta*, Günther, Brit. Mus. Cat. Fish., iv. 1862, p. 116; *Id.*, Castelnau, Proc. Linn. Soc. N. S. Wales, iii., 1879, p. 354; *Id.*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 82; *Id.*, Ogilby, Cat. Fish., N. S. Wales, 1886, p. 45, and Mem. Austr. Mus., ii., 1889. p. 67.

*Pseudolabrus luculentus*, Waite, Rec., Austr. Mus., v., p. 29, pl. iv., fig. 1, and Mem. N. S. Wales Nat. Club, 1904, p. 38, and Trans. N. Z. Inst., xlii., 1910, p. 378.

Cheek scales in about five rows. Bases of the dorsal and anal fins scaly. Caudal truncate or slighty rounded. Upper rays of pectoral longest, the margin of the fin rounded. Greenish, the scales with brownish centres. Two or three narrow brown bands extend from the snout through the eye to the back of the head, of which the upper ones are less distinct than the lower, or all may be absent. Throat and lower part of head sometimes with many brown spots. A broad black bar across the base of the pectorals. Three large black blotches beneath the soft dorsal, in front of each of which is a similar white blotch; both light and dark blotches may be wanting. A dark spot is sometimes present on the anterior part of the dorsal fin, which in life is also tipped with scarlet. The soft dorsal is pale orange on the upper half, with narrow, irregular, blue lines through it; lower portion green. Anal green with three bands of pale orange. Caudal, pectorals, and ventrals greenish.

*Hab.*—This species is known from Norfolk and Lord Howe Islands the Kermadec Islands, Port Jackson and Western Australia. There are forty-one specimens, 47-185 mm. long, in the Australian Museum from Lord Howe Island, and one from Cape Solander, Botany Bay, which was presented by Mr. J. H. Wright.

PSEUDOLABRUS CONVEXUS, *Castelnau.*

*Labrichthys convexus*, Castelnau, Res. Fish, Austr. (Vict. Offic. Rec. Philad. Exhib.), 1875, p. 38 ; *Id.*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 86.

*Pseudolabrus convexus*, Gill, Proc. U.S. Nat. Mus., xiv., 1892, p. 402.

Cheeks with four series of very large scales. Purplish, lighter below. Length less than seven inches without the tail. The original and only known specimen of this species was almost as imperfect as its description.

*Hab.*—Swan River, Western Australia.

PSEUDOLABRUS MILES, Bloch and Schneider.

*Labrus miles*, Bloch and Schneider, Syst. Ichth., 1801, p. 264, and *L. coccineus* Forster (M.S.).

*Labrus psittaculus*, Richardson, Proc. Zool. Soc., 1840, p. 26 ; Trans. Zool. Soc., iii., 1849, p. 141, and Zool. Erebus and Terror, Fishes, 1848, p. 129, pl. liv., figs 7-10.

*Labrichthys psittaculus*, Günther, Brit. Mus. Cat. Fish., iv., 1862, p. 114 ; *Id.*, Hutton, Cat. Fish. N.Z., 1872, p. 43, and Trans. N.Z. Inst., v., 1873, p. 165, pl. x., fig. 69, and *Loc. cit.*, ix., 1877, p. 354 ; *Id.*, Castelnau, Proc. Zool. Soc. Vict., ii., 1873, p. 52 ; *Id.*, Macleay, Proc. Linn. Soc. N. S.Wales, vi., 1881, p. 79 ; *Id.*, Johnston, Proc. Roy. Soc. Tasm., 1882 (1883), p. 124, and *Loc. cit.*, 1890 (1891), p. 35 ; *Id.*, Lucas, Proc. Roy. Soc. Vict. (2), ii., 1890, p. 32.

*Labrichthys rubicunda*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 89.

*Labrichthys mortoni*, Johnston, Proc. Roy. Soc. Tasm., 1884 (1885), p. 256.

*Pseudolabrus miles*, Gill, Mem. Nat. Acad. Sci. Washington, vi., 1893, pp. 98, 117.

*Pseudolabrus coccineus*, Waite, Rec. Cantb. Mus., i., 1907, p. 22.

*Pseudolabrus psittaculus*, McCulloch, Zool. Res. Endeavour, i., 1911, p. 77, fig. 19.

Cheeks with four rows of scales extending forward to below the eyes. Bases of dorsal and anal fins not scaly. Upper pectoral rays longest. Caudal truncate with the lobes more or less produced. Colour pink with a yellow spot in the centre of each scale on the sides. A black spot on the back at the bases of the last dorsal rays may be present or absent, and may be followed by a second less distinct one on the caudal peduncle. Rows of lighter spots are present on the dorsal and anal fins, which also have lighter margins.

*Hab.*—This species is recorded from Tasmania, Victoria and New Zealand. I have examined eleven specimens from Tasmania and Bass Strait down to 60 fathoms, and three from Hobson's Bay and Westernport, Victoria ; also four from the Great Australian Bight, west of the meridian of Eucla, 70-120 fathoms (Coll. F. I. S. "Endeavour.")

PSEUDOLABRUS INSCRIPTUS, *Richardson.*

*Labrus* vel *Tautoga inscriptus*, Richardson, Zool. Erebus and Terror, Fishes, 1848, p. 134, pl. lvi., fig. 1-2.

*Labrichthys inscripta*, Günther, Brit. Mus. Cat. Fish., iv., 1862, p. 115 ; *Id.*, Macleay, Proc. Linn. Soc. N. S.Wales, vi., 1881, p. 80; *Id.*, Ogilby, Mem. Austr. Mus., ii., 1889, p. 66.

*Pseudolabrus inscriptus*, Waite, Rec. Austr. Mus., v., 1904, p. 212, and Trans. N. Z. Inst., xlii., 1910, pp. 378 and 381.

Cheek scales in about five rows. Bases of dorsal and anal fins not scaly. Caudal more or less rounded. Upper pectoral rays longest, the margin rounded. Dark green or brownish, the scales with more or less distinct script-like markings which are often wanting in preserved specimens ; the scales sometimes bear rows of dark spots. Cheek and operculum with small darker spots and lines. A blackish bar across the base of the pectorals. The membrane between the anterior dorsal spines darker. Young light green, with striking olive green or brown mottlings.

*Hab.*—This species is recorded from Norfolk and Lord Howe Islands and the Kermadec Islands. There are thirty-there specimens from the two first-named localities in the Australian Museum, ranging from 40 to 405 mm. in length.

## PSEUDOLABRUS FUCICOLA, *Richardson.*

(Plate xviii.).

*Labrus fucicola*, Richardson, Proc. Zool. Soc., 1840, p. 26; Trans. Zool. Soc., iii., 1849, p. 137, and Zool. Erebus and Terror, 1848, p. 127, pl. liv., figs. 1-2.

*Labrichthys fucicola*, Günther, Brit. Mus. Cat. Fish., iv., 1862, p. 112 footnote; *Id.*, Hutton, Trans. N.Z. Inst, v., 1873, p. 265; *Id.*, Macleay, Proc. Linn. Soc. N.S.Wales, vi., 1881, p. 87; *Id.*, Johnston, Proc. Roy. Soc. Tasm. 1882 (1883). p. 124.

*Labrichthys bothryocosmus*, Hutton, Cat. Fish. N. Zealand, 1872, pl. vii., fig. 68 (non *P. bothryocosmus*, Richardson, *fide* Hutton).

*Pseudolabrus fucicola*, Gill, Mem. Nat. Acad. Sci. Washington, vi., 1893, p. 116.

*Pseudolabrus fuscicola*, Waite, Rec. Cantb. Mus., i., 1907, p. 22

A single specimen of this species is in a collection received from the National Museum, Melbourne. It is smaller than Richardson's specimen, being only eleven-and-a-half inches long, and has a more pointed head which is characteristic of the younger fish. The pectoral fin, also, is somewhat pointed above instead of being rounded, but otherwise it agrees very well with Richardson's figure.

The life-colours have been described by both Hutton and Johnston as purple with some irregular yellow spots on the back and humeral region. This specimen has become greenish in spirits with only traces of purple on the head and fins, but the yellow markings are still traceable, as is a dark bar across the base of the pectoral fin, and some others on the cheeks and operculum. There are five rows of scales on the cheeks, the bases of the dorsal and anal fins are not scaly, and the caudal fin is slightly rounded.

*Hab.*—The specimen was obtained off the east coast of Flinders Island, Bass Strait. The species is known from New Zealand and Tasmania, and possibly the southern coasts of Australia.

PSEUDOLABRUS CELIDOTUS, Forster.

*Labrus celidotus*, Forster in Bloch and Schneider, Syst. Ichth., 1801, p. 133, and Descr. Anim., Ed. Licht., 1844, p. 133; *Id.*, Richardson, Zool. Erebus and Terror, Fishes, 1848, p. 53, pl. xxxi., figs. 1-5.

*Labrus pœciloplcura*, Cuvier and Valenciennes, Hist, Nat. Poiss., xiii., 1839, p. 95.

*Julis* ? *notatus*, Richardson, Ann. Mag. Nat. Hist., xi., 1843, p. 425 (*Sparus notatus*, Solander, M.S.).

*Labrus bothryocosmus*, Richardson, Zool. Erebus and Terror, Fishes, 1848, p. 53, pl. xxxi., figs. 6-10.

*Labrichthys celidota*, Günther, Brit. Mus. Cat. Fish., iv., 1862, p. 113; *Id.*, Hutton, Cat. Fish. N. Z., 1872, p. 42; *Id.*, Macleay, Proc. Linn. Soc. N.S. Wales, vi., 1881, p. 78; *Id.*, Ogilby, Cat. Fish. N. S. Wales, 1886, p. 44.

*Labrichthys bothryocosmus*, Günther, Brit. Mus. Cat. Fish. iv., 1862, p. 114; *Id.*, Hutton, Cat. Fish. N.Z., 1872, p. 43. and Tr. N. Z. Inst., v., 1873, p. 265, pl. x., fig. 68; *Id.*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 79; *Id.*, Johnston, Proc. Roy. Soc. Tasm., 1882 (1883), p. 123, and 1890 (1891), p. 35.

*Pseudolabrus celidotus*, Gill, Mem. Nat. Acad. Sci., Washington, vi., 1893, pp. 98, 117; *Id.*, Waite, Mem. N. S. Wales Nat, Club, 1904, p. 38, and Rec. Cantb. Mus., i., 1911, p. 224.

Cheek scales in about five rows. Bases of the dorsal and anal fins not scaly. Caudal truncate or slightly rounded. Upper pectoral rays longest, the margin rounded. Light green or reddish olive, with some smaller spots on the upper half of the body; some specimens with a large black blotch on the lateral line. Some dark postorbital markings present or absent. Sometimes there is a dusky longitudinal band on the dorsal and anal fins. Pectoral with or without a dark basal band.

According to Waite, *P. celidotus* and *P. bothryocosmus* are merely colour varieties of one species. I have only examined one of his New Zealand specimens, 320 mm. long, which has the colour marking of the typical *celidotus*; there is no dark bar across the base of the pectoral, but Mr. Waite informs me that this may be present or absent. He also tells me the young are marked with ill-defined bands.

*Hab.*—This species is common in New Zealand and Tasmania, and is also recorded from South Australia and Botany Bay, New South Wales. The specimen referred to by Günther from Port Essington, North Australia, is doubtless some other species.

PSEUDOLABRUS BOSTOCKII, *Castelnau.*

*Labrichthys tetrica*, Günther, Brit. Mus. Cat. Fish., iv., 1862, p. 116 (part.); *Id.*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 81 (copied from Günther).

*Labrichthys bostockii*, Castelnau, Proc. Zool. Soc. Vict., ii., 1873, p. 137; *Id.*, Macleay, *Loc. cit.*, p. 85.

*Labrichthys biserialis*, Klunzinger, Sitzb. Akad. Wiss. Wien. lxxx. i., 1879, p. 402.

*Pseudolabrus bostockii*, Gill, Proc. U.S. Nat. Mus., xiv., 1892, p. 402; *Id.*, McCulloch, Rec. W. Austr. Mus., i., 1912, p. 91, pl. xi., fig. 1.

*Pseudolabrus biserialis*, Gill, *Loc. cit.*, p. 402.

*Pseudolabrus tetricus*, Waite, Rec. Austr. Mus., vi., 1905, p. 70 (*nec* Richardson).

Cheek scales in two rows. Bases of dorsal and anal fins scaly. Upper pectoral rays much the longest. Caudal truncate, the tips usually a little produced. Red or green, each scale with a large central darker spot; a yellow band from above the pectoral base to the middle of the caudal peduncle. Dorsal black basally, then orange and margined with a dark violet line. Anal red, margined with violet and with or without a darker median band. Caudal orange with dark edges. Pectorals and ventrals pink, the former with a black basal band.

*Hab.*—South-western Australia. I have examined one from near Albany, Another from Mandurah, and four from Fremantle. Length, 160-200 mm.

PSEUDOLABRUS ELEGANS, *Steindachner.*

*Labrichthys elegans*, Steindachner, Sitzb. Akad. Wiss. Wien, lxxxviii. i., 1883 (1884), p. 1102, pl. vi., figs. 2-3.

*Pseudolabrus elegans*, Gill, Proc. U. S. Nat. Mus., xiv., 1892, p. 403.

Cheek scales large, in one row behind the eye and two below, extending well forward on to the anterior portions of the cheeks. Bases of dorsal and anal fins not scaly. Caudal more or less rounded. Colour marking different in the two sexes. Male with a series of dark blotches in a row above the lateral line; sides of head spotted with brown. Dorsal and anal fins each with two broad dark bands, one at the outer border of the fins and the other near their bases. Hinder, upper and lower borders of caudal dark violet, as are the outer halves of the ventrals.

Female with dark cross bands on the body, head with brown spots. Dorsal with large dark spots near the bases of the rays and one on the anal. Outer half of ventrals greyish violet.

*Hab.*—St. Vincent Gulf, South Australia (Steindachner). I have not seen any specimens of this species.

PSEUDOLABRUS TETRICUS, Richardson.

(Pl. xix.).

*Labrus tetricus*, Richardson, Proc. Zool. Soc., 1840, p. 25, and Trans. Zool. Soc., iii., 1849, p. 136.

*Labrus* vel *Tautoga tetricus*, Richardson, Zool. Erebus and Terror, Fishes, 1848, p. 126, pl. lv., figs. 1-4.

*Labrichthys ephippium*, Gunther, Ann. Mag. Nat. Hist., xi. (3) 1863, p. 116; *Id.*, Macleay, Proc. Linn. Soc. N.S. Wales, vi. 1881, p. 84 (*non Labrus ephippium*, Cuv. and Val.)

*Labrichthys tetrica*, Klunzinger, Arch. fur Naturg., xxxviii. i., 1872, p. 37 (with vars. *tigripinnis* and *fuscipinnis*); *Id.*, Klunzinger, Sitzb. Akad. Wiss. Wien., lxxx. i., 1879, p. 401, (with var. *ocellata*); *Id.*, Johnston, Proc. Roy. Soc. Tasm., 1882 (1883), p. 124, and 1890 (1891), p. 35.

*Labrichthys vestita*, Castelnau, Proc. Zool. Soc. Vict., i., 1872, p. 151.

*Labrichthys cyanogenys*, Ramsay and Ogilby, Proc. Linn. Soc. N. S. Wales (2), ii., 1887, p. 242; *Id.*, McCulloch, Zool. Res. Endeavour, i., 1911, p. 76, pl. xiii.

[Not *Labrichthys tetrica*, Günther, Brit. Mus. Cat. Fish., iv., 1862, p. 116; *Id.*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 81; *Id.*, Waite, Rec. Austr. Mus., vi., 1905, p. 70 (=*Pseudolabrus bostockii*, Castelnau.)].

? *Labrichthys cuvieri*, Castelnau, *L. bleekeri*, Castelnau, and *L. richardsonii*, Castelnau (see below).

A well graduated series of twenty-six specimens, 180-420 mm. long, shows that the colour-markings of this species vary remarkably, the variations apparently depending on both age and sex.

In small examples, 180-200 mm. long (Pl. xix,) there is a dark brown cross-bar, with rather indefinite edges, extending from the spinous dorsal to behind the pectoral; two or three darker patches occur below the soft dorsal, and one or two oblique bands are present on the hinder part of the body. Some brown bands radiate from the eye, while the lower parts of the head bear several large light spots. Scales of the ventral surface more or less silvery. Pectoral and ventral fins bright yellow, the former with a dark basal bar; the other fins are also yellowish with rows of more or less numerous darker spots. This form corresponds to the var. *tigripinnis*, Klunzinger.

In a later stage, 240-370 mm. long, the posterior body-markings become indefinite or are lost, leaving only the anterior band. The vertical fins are still spotted as in the first form (the spots are sometimes almost wanting), but the soft dorsal and anal show signs of darkening as in the next form.

In the largest specimens, up to 420 mm. long, two broad darker bands cross the body, which are separated by a lighter one. The chin and throat are dark blue. The anterior dorsal, ventral and pectoral fins are yellow, the pectoral with a striking blackish base. The soft dorsal and anal fins are very dark, the former with two light oblique bands through it. The caudal is dark basally, yellowish posteriorly. I have recently figured this form as *P. cyanogenys*, Ramsay and Ogilby; it also appears to correspond to the variety *fuscipinnis*, Klunzinger and the larger specimen described by Castelnau as *P. vestita*.

In all the specimens I have examined there is one row of cheek scales above, and usually three, rarely two or four below. The caudal is slightly rounded or truncate. The upper pectoral rays are longest and sometimes produced beyond the rounded margin in old specimens. The bases of the dorsal and anal fins are not scaly.

*Hab.*—*P. tetricus* is common in Tasmania and Victoria, and extends northwards to about Port Jackson, but is rather rare in New South Wales.

PSEUDOLABRUS CUVIERI, *Castelnau*.

*Labrichthys cuvieri*, Castelnau, Proc. Zool. Soc. Vict., ii., 1873, p. 53; *Id.*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 84; *Id.*, Johnston, Proc. Roy. Soc. Tasm., 1881 (1882), p. 124, and 1890 (1891), p. 35; *Id.*, Lucas, Proc. Roy. Soc. Vict. (2), ii., 1890, p. 33.

*Pseudolabrus cuvieri*, Gill, Proc. U.S. Nat. Mus., xiv., 1892, p. 402.

Cheek scales in two series. Dorsal and anal fins not scaly Body greenish or purple with two broad red or crimson transverse bands, the second covering nearly the posterior half of the body. Pectorals orange. Spinous dorsal orange, the soft dorsal almost black. Caudal olive (Castelnau).

As already suggested[7] I have little doubt that this species is identical with *P. cyanogenys* which is the adult form of *P. tetricus*. It was not known to Johnston when he included it in his catalogue of the Fishes of Tasmania.

*Hab.*—Hobart, Tasmania, and Phillip Island, Bass Strait.

PSEUDOLABRUS RICHARDSONI, *Castelnau*.

*Labrichthys richardsoni*, Castelnau, Proc. Zool. Soc. Vict., i., 1872, p. 150; *Id.*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 83; *Id.*, Lucas, Proc. Roy. Soc. Vict. (2), ii., 1890, p. 33 (non *P. richardsonii*, Steindachner, = *P. guntheri*, Bleeker.)

*Pseudolabrus richardsoni*, Gill, Proc. U.S. Nat. Mus., xiv., 1892, p. 403

Very much like *P. bleekeri*. Cheek scales in three rows. Bases of dorsal and anal fins not scaly. Bluish-green with a dark spot on the end of the operculum. One to three broad dark transverse bands on the body, the first covering the space between the third or fourth dorsal spine and the first ray; the others are further back, but may be absent. Fins either bluish-green with a few dark spots between the dorsal spines, or yellow with purple spots (Castelnau).

[7] McCulloch—"Endeavour" Zool. Results, i., 1911, p. 76.

The types were obtained in the Melbourne markets. Length 14 inches.

This appears to me to be almost certainly a form of *P. tetricus*.

PSEUDOLABRUS BLEEKERI, *Castelnau*.

*Labrichthys bleekeri*, Castelnau, Proc. Zool. Soc. Vict., i., 1872, p. 148; *Id.*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 83; *Id.*, McCoy, Prodr. Zool. Vict., xiv., 1887, pl. cxxxiv.; *Id.*, Lucas, Proc. Roy. Soc. Vict. (2), ii., 1890, p. 33.

*Pseudolabrus bleekeri*, Gill, Proc. U.S. Nat. Mus., xiv., 1892, p. 402.

Cheek scales in two series. Dorsal fin not scaly. Green above, dark blue below, the scales bordered with carmine; no trace of spots or bands. A broad black band from the eye to the end of the operculum. Cheek with small white spots, throat purple spotted with white. Vertical fins green, spotted with purple or carmine; caudal orange with carmine spots; pectorals yellow; ventrals pink (Castelnau).

I have examined the specimen which is the original of McCoy's figure, and though it has lost almost all traces of colour-marking I have no doubt it is the same as what I have figured as the young *P. tetricus* (Pl. xix.). McCoy describes and figures colour bands which are differently arranged to what I can see in his specimen, and which according to Castelnau should not be present in *P. bleekeri*. The anal fin also is drawn too far forward. Waite suggested that the figure represented *P. ruber*, Castelnau, but it is at once distinguished from that species by having three instead of only one row of cheek scales. According to Castelnau, *P. bleekeri* has two rows, which is what I have found in some specimens of *P. tetricus*. I think that *P. bleekeri* will prove to be identical with the young of *P. tetricus*.

*Types*.—Obtained in the Melbourne fish markets. Length ten to twelve inches.

## PSEUDOLABRUS GYMNOGENIS, *Günther.*

(Plate xx.)

*Labrichthys gymnogenis*, Günther, Brit. Mus. Cat. Fish., iv., 1862, pp. 117, 507, and Ann. Mag. Nat. Hist. (3), xx., 1867, p. 66: *Id.*, Castelnau, Proc. Linn. Soc. N.S. Wales, iii., 1879, p. 389; *Id.*, Klunzinger, Sitzb. Akad. Wiss. Wien, lxxx. i., 1879, p. 403; *Id.*, Macleay, Proc. Linn. Soc., N.S., Wales, vi., 1881, p. 82; *Id.*, Ogilby, Cat. Fish. N.S. Wales, 1886, p. 45.

*Pseudolabrus gymnogenis*, Gill, Proc. U.S. Nat. Mus., xiv., 1892, p. 401; *Id.*, Ogilby, Ed. Fish. N.S. Wales, 1893, p. 139; *Id.*, Waite, Mem. Nat. Club, N.S. Wales, 1904, p. 38; *Id.*, Ogilby, Proc. Roy. Soc. Q'land, xxi., 1908, p. 25; *Id.*, Stead, Ed. Fish. N.S. Wales, 1908, p. 84, pl. liii.

*Labrichthys parila*, Castelnau, Proc. Linn. Soc. N.S. Wales, iii., 1879, p. 389; *Id.*, Macleay, *Loc. cit.*, vi., 1881, p. 81 (part); *Id.*, Ogilby, Cat. Fish. N.S. Wales, 1886, p. 45 (part); *Id.*, Waite, Mem. N.S. Wales Nat. Club, 1904, p. 38 (not *P. parilus*, Richardson).

*Labrichthys nigromarginatus*, Macleay, Proc. Linn. Soc. N.S. Wales, iii., 1878, p. 35, pl. iii., fig. 3 and vi., 1881, p. 87; *Id.*, Castelnau, Proc. Linn. Soc. N.S. Wales, iii., 1879, p. 354; *Id.*, Ogilby, Cat. Fish. N.S. Wales, 1886, p. 45.

*Pseudolabrus nigromarginatus*, Gill, Proc. U.S. Nat. Mus., xiv., 1892, p. 402; *Id.*, Ogilby, Ed. Fish. N.S. Wales, 1893, p. 140; *Id.*, Waite, Rec. Austr. Mus, v., 1903, p. 29, and Mem. Nat. Club N.S. Wales, 1904, p. 38; *Id.*, Ogilby, Proc. Roy. Soc. Q'land, xxi., 1908, p. 25; *Id.*, Stead, Ed. Fish. N.S. Wales, 1908, p. 84.

Stead (Ed. Fish. N.S. Wales) has expressed the opinion that *P. nigromarginatus* is merely the male form of *P. gymnogenis* which attains a larger size than the female. In support of this it must be noted that the distribution of the two is the same and that both are obtained from the same localities, which are usually in the vicinity of rocky reefs, etc. The more robust form of *P. nigromarginatus* as compared with *P. gymnogenis* is only what is found in all large specimens of *Pseudolabrus*, while the colour differences between the two are not more striking than what I have found between young and old examples of *P.*

*tetricus*. Günther (Ann. Mag. Nat. Hist.) regarded large specimens from Port Jackson which had the characteristic marking of *nigromarginatus* as merely colour varieties of *gymnogenis*. Finally, as small specimens of the *nigromarginatus* form are unknown, and as the essential structural details of the two are similar, I regard them as identical.

The following are the principal characters of the two forms :—

*P. gymnogenis*. Cheek scales in a single series. Body scales extending on to the extreme bases of the dorsal and anal fins. Caudal truncate, very slightly rounded in small specimens, the lobes sometimes a little produced in older ones. Greenish or reddish, with more or less distinct large white spots on the scales, which are sometimes wanting. Usually some brownish spots and lines radiate from the eye. Pectoral with a dark basal bar. Dorsal and anal usually with a median dark band, and spotted, a violet submarginal band ; the membrane between the anterior dorsal spines darker. Caudal with dark upper and lower margins.

The specimen recorded from China by Steindachner [8] is not this species according to Klunzinger. I have already [9] given my reasons for considering the specimen recorded by Castelnau from Port Jackson as *Labrichthys parila* to be not that species but *P. gymnogenis*.

*Specimens examined*.—Five from near Sydney, and one from Lord Howe Island. The largest is 250 mm. long.

*Hab*.—Botany Bay, New South Wales, northwards to Mooloolah, near Moreton Bay, Queensland ; Lord Howe Island ; King George Sound (Klunzinger).

*P. nigromarginatus*.—Cheek scales in a single series. Bases of the dorsal and anal not scaly. Caudal truncate, the angles somewhat produced. Purple or purplish green, yellowish posteriorly ; a broad crimson band between the soft dorsal and anal fins. Dorsal and anal yellow or crimson with narrow purple margins. Median rays of ventrals blackish. Pectoral yellow with a purple blotch posteriorly, and a dark basal band. Caudal orange with dark upper and lower margins.

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[8] Steindachner—Sitzb. Akad. Wiss. Wien, lvi., 1867, p. 342.

[9] McCulloch—Rec. W. Austr. Mus., i., 1912, p. 91.

*Specimens examined.*—Four from near Sydney, two from Moreton Bay and one from Lord Howe Island. Length 277-300 mm.

*Hab.*—Botany Bay, northwards to Caloundra near Moreton Bay; Lord Howe Island.

PSEUDOLABRUS PARILUS, *Richardson.*

*Tautoga parila*, Richardson, Proc. Zool. Soc., 1850, p. 70, and Ann. Mag. Nat. Hist. (2), vii., 1851, p. 286.

*Labrichthys parila*, Günther, Brit. Mus. Cat. Fish., iv., 1862, p. 117; *Id.*, Castelnau, Proc. Zool. Soc. Vict., ii., 1873, p. 137; *Id.*, Macleay, Proc. Linn. Soc. N.S. Wales, vi., 1881, p. 81.

*Pseudolabrus parilus*, Gill, Proc. U.S. Nat. Mus., xiv., 1892 p. 401; *Id.*, McCulloch, Rec. W. Austr. Mus., i., 1912, p 90, pl. xii.

*Labrichthys rubra*, Castelnau, Res. Fish. Austr. (Vict. Offic. Rec. Philad. Exhib.), 1875, p. 37; *Id.*, Klunzinger, Sitzb. Akad. Wiss. Wien. lxxx. i., 1879, p. 403; *Id.*, Macleay Proc. Linn. Soc. N.S. Wales, vi., 1881, p. 86.

*Pseudolabrus ruber*, Gill, Proc. U.S. Nat. Mus., xiv., 1892, p. 402; *Id.*, Waite, Rec. Austr. Mus., iv., 1902, p. 185, pl. xxviii.

I have already suggested the identity of *P. parilus* and *P. ruber* and having since examined another specimen which has almost as much the markings of *ruber* as of *parila*, I have now no hesitation in uniting them.

Cheek scales in one or two rows, usually in one above and two below. Bases of dorsal and anal fins not scaly. Upper pectoral rays longest. Caudal more or less rounded.

*P. parilus* form.—Greenish, spotted with brown, the spots tending to form five more or less distinct cross bands. Brown lines radiating from the eye. With or without broad darker markings enclosing lighter interspaces on the lower parts of the head. Dorsal and anal with light and dark spots, the latter being most distinct above the body bands; a large anterior dorsal spot.

*Specimens examined.*—Two specimens from Fremantle and one from Doubtful Island Bay. Length 200-225 mm.

*Hab.*—Doubtful Island Bay, King George Sound and Fremantle, Western Australia. In the "Records of the Western Australian Museum" I have given my reasons for supposing Castelnau's record of this species from Port Jackson to be incorrect.

*P. ruber* form.—Reddish-brown in spirits with five broad brown blotches descending from the back; numerous small dark spots on the head and body. A series of irregular dark marks radiating from the eye. Cheeks and throat with broad silvery patches enclosed by brown bands. Scales of lower surface of body with large silver spots. Dorsal and anal with light or dark spots, or both; the membrane darker in the region of the dark body marks.

*Specimens examined*—One from South Australia; two from Houtman Abrolhos, and one from Fremantle; two from Western Australia including a specimen received from Count Castelnau by the National Museum, Melbourne.

*Hab.*—South and Western Australia.

PSEUDOLABRUS PUNCTULATUS, *Günther.*

*Labrichthys punctulata*, Günther, Brit. Mus. Cat. Fish,, iv., 1862, p. 118; *Id.*, Castelnau, Proc. Zool. Soc. Vict., ii., 1873, p. 138; *Id.*, Macleay, Proc. Linn. Soc. N.S. Wales, vi., 1881, p. 82.

*Pseudolabrus punctulatus*, Gill, Proc. U. S. Nat. Mus., xiv., 1892, p. 401; *Id.*, Waite, Rec. Austr. Mus., vi., 1905, p. 69, pl. xiii.

*Labrichthys edelensis*, Castelnau, Proc. Zool. Soc. Vict., ii., 1873, p. 137; *Id.*, Macleay, Proc. Linn. Soc. N. S. Wales, vi., 1881, p. 85; *Id.*, Gill, Proc. U. S. Nat. Mus., xiv., 1892, p. 403.

Cheek scales in one or two rows, usually in one above and two below. Bases of dorsal and anal fins not scaly. Upper pectoral rays longest. Caudal rounded. Body dark above the lateral line, light below; an irregular, dark longitudinal band on the lower half which is connected with the upper dark part

by indefinite dark cross-bars. Entire body closely dotted with small blue ocelli. Throat and lower parts of head with dark bars enclosing light areas. Soft dorsal and anal each with three broad dark marks separated by lighter interspaces; margins of the fins lighter. Greater portion of caudal dark, margin lighter. Pectorals light coloured with a blackish basal band.

*Specimens examined.*—One from Houtman Abrolhos and one from Albany; two from South Australia; one from Queenscliff, Victoria. Length 285-385 mm.

*Hab.*—Western Australia, South Australia and Victoria.

PSEUDOLABRUS UNICOLOR, Castelnau.

*Labrichthys unicolor*, Castelnau, Res. Fish. Austr. (Vict. Offic. Rec. Philad, Exhib.), 1875, p. 37; *Id.*, Macleay, Proc. Linn. Soc. N.S. Wales, vi., 1881, p. 85.

*Pseudolabrus* unicolor, Gill, Proc. U.S. Nat. Mus., xiv., 1892, p. 403.

Cheeks without scales. Colour of a dark brown rubyish tint, length eight inches.

*Hab.*—Western Australia. This species has not been recognised since it was first described.

HALICHŒRES TRIMACULATUS, *Quoy and Gaimard.*

*Julis trimaculata* Quoy and Gaimard, Voy. Astrolabe, iii., 1835, p. 705, Atl. pl. xx., fig. 2.

*Guntheria trimaculata*, Bleeker, Atlas Ichth., i., 1862, p. 138, pl. xxxii., fig. 1.

*Halichœres trimaculatus* Jordan and Seale, Bull. U. S. Fish. Bur., xxv., 1906, p. 301, pl. xlvii., fig. 1.

*Labrichthys nudigena*, de Vis, Proc. Linn. Soc. N.S. Wales, ix., 1885, p. 881.

The type specimen of *L. nudigena* is dried and much shrivelled, but still shows sufficient characters to leave no doubt as to its identity with *Halichœres trimaculatus*. The only item in the

short description requiring emendment is the statement "scales of the cheeks in one infraorbital series." These "scales" are merely small quadrangular spaces enclosed by series of pores descending from the eye, and are shown in Quoy and Gaimard's figure.

*L. nudigena* was described from the Barrier Reef, Queensland. As *Platyglossus trimaculatus*, Kner has recorded it from Sydney, but, as Ogilby has pointed out, this is almost certainly incorrect. Specimens are in the Australian Museum from Murray Island, Torres Strait (Coll. Hedley & McCulloch); Green Island, off Cairns (Coll. Hedley); Hood Bay, New Guinea (Coll. Goldie), and Samoa (Coll. Jordan).

## Family PTEROPSARIDÆ.

### Genus PARAPERCIS, *Bleeker.*

*Parapercis*, Bleeker, Nat. Tyd. Dierk., iv., 1872, p. 127 (*P. cylindrica*, Bloch.).

*Chilias*, Ogilby, Proc. Roy. Soc. Q'land, xxiii., 1910, p. 40 (*C. strictiveps*, de Vis).

Having compared a specimen of *Chilias strictiveps*, de Vis, received from Mr. J. D. Ogilby, with another of *Parapercis cylindrica*, Bloch, I fail to find any generic differences between them. Ogilby has described the head of *C. strictiveps* as depressed, but it is normally of the subconical form of *Parapercis*, although in my specimen the gill-covers and membranes are expanded laterally as often happens in fishes killed in formalin. He also states that the lower jaw is without villiform teeth, whereas there is really a broad band near the symphysis behind the canines. These, and all the other characters relied upon to distinguish *Chilias* are exactly as in *Parapercis*.

*P. strictiveps* is closely allied to *P. hexophthalma*, Cuv. and Val., of which I have a specimen from Murray Island, Torres Strait, but differs in having a much longer lower jaw, narrower interorbital, and smaller eye, as well as in its colour-marking.

## Family GOBIIDÆ.

### EVIOTA VIRIDIS, *Waite.*

*Allogobius viridis* Waite, Rec. Austr. Mus., v., 1904, p. 177, pl. xxiii., fig. 3.

*Eviota zonura*, Jordan and Seale, Bull. U.S. Fish. Bur., xxv., 1905 (1906), p. 386, fig. 75.

I have compared co-types of *E. zonura* with the types of *Allogobius viridis* and find them identical. I have no doubt also, that some other members of this genus figured by Jordan and Seale are merely variations of the one species.

This species is common all along the Great Barrier Reef and I have collected it at Murray Island, Torres Strait; on the Cairns Reef, off Cooktown; and at Masthead Island, off Port Curtis. It has not been previously recorded from Australia.

## Family SCORPÆNIDÆ.

### SEBASTOPSIS SCABER, *Ramsay* and *Ogilby*.

(Plate xiii., fig. 2).

*Sebastes scaber*, Ramsay and Ogilby, Proc. Linn. Soc. N. S. Wales, x., 1886, p. 577.

*Scorpæna scabra*, Ogilby, Mem. Austr. Mus., ii., 1889, p. 60.

[Not *Sebastopsis scabra*, Jordan and Seale, Bull. U. S. Fish, Bur., xxv., 1906, p. 374, fig. 71.]

D. xii., i/8-10; A. iii/5-6; P. 17-18; V. i./5; C. 13-15.

Height of body $2\frac{3}{4}$ to $3\frac{1}{4}$, length of head $2\frac{3}{7}$-$2\frac{1}{2}$ in the length to the hypural. Eye $2\frac{3}{4}$-3 in the head. Snout $\frac{2}{3}$-$\frac{3}{4}$ in the eye.

Head with large spines and rough scales, only the snout naked. Orbital margin with three spines above, followed by a single postocular one on either side; between the last are usually two small spines directed outwards. There are two occipital spines on either side, the anterior of which arise behind the level of the postocular spines. Two infraorbital ridges terminating in spines posteriorly. A strong spine above and between the nostrils. A series of bony ridges from in front of the eye to the preoperculum, armed with a spine below the eye and another near the preopercular margin; the latter bears a double spine on the same line and two others below it. Operculum with two spines. The pterotic, post-temporal, suprascapular and clavicle bones each bear a spine. The margin of the preorbital is very sinuous but not spiniferous. Anterior nostril with a large tentacle, while others may be

present on some of the larger head spines. Maxillary large, reaching backwards to below the hinder third, or almost to the hinder margin of the eye. Teeth minute, in a band on each jaw and on the vomer; palatines toothless.

Most of the scales strongly ctenoid, only those of the chest cycloid. The lateral line is almost straight; there are twenty-four pores along its length, each ending in a minute spine, and about forty-four rows of scales. The scales extend on to the bases of the soft dorsal, anal, pectoral and caudal fins.

The sixth and seventh dorsal spines are the longest, as long as or shorter than the eye; the rays are higher than the spines, the median ones longest. Second anal spine very long and strong, as long as the rays which are much longer than those of the dorsal. Pectoral reaching to above the anal spines, the lower nine or ten simple and thickened. Ventrals inserted in advance of the pectorals, not reaching backwards to the vent. Caudal rounded.

*Colour.*—Reddish or pink, with brown markings on the head and upper half of the body. Fins spotted with carmine in fresh examples, colourless in preserved specimens.

Described from fourteen examples, including the types, 35-79 mm. long from the snout to the hypural. They were obtained near Sydney and Newcastle, New South Wales, and Lord Howe Island.

### Sebastopsis guamensis, *Quoy and Gaimard.*

*Scorpæna guamensis*, Günther, Journ. Mus. Godeffroy, ii., 1873-5, p. 74, pl. lvi., fig. 13.

*Sebastopsis guamensis*, Jordan and Seale, Bull. U. S. Fish. Bur., xxv., 1906, p. 374.

? *Sebastopsis scabra*, Jordan and Seale, *Loc. cit.*, fig. 71 (nec *S. scaber*, Ramsay and Ogilby).

The fish figured by Jordon and Seale as *S. scabra* is not that species, though very closely allied to it. Those authors considered it differed from *S. guamensis* in having a longer anal spine, but a series of thirty-five specimens, including fourteen

from Samoa and identified by them as both *S. guamensis* and *S. scabra*, seems to me to agree very well with Günther's figure of the former species.

They differ from *S. scaber* in the arrangement of the spines on top of the head and in colouration. In all of my series, including specimens 30-115 mm. long, the infraorbital ridges do not terminate in sharp spines, the occipital spines arise on the same level as, or in front of the end of the postocular spines, and there is only rarely one or two small spines between the latter. The general colour is brown with striking darker bars and spots on the head, body and fins, and there is a more or less distinct black spot on the operculum.

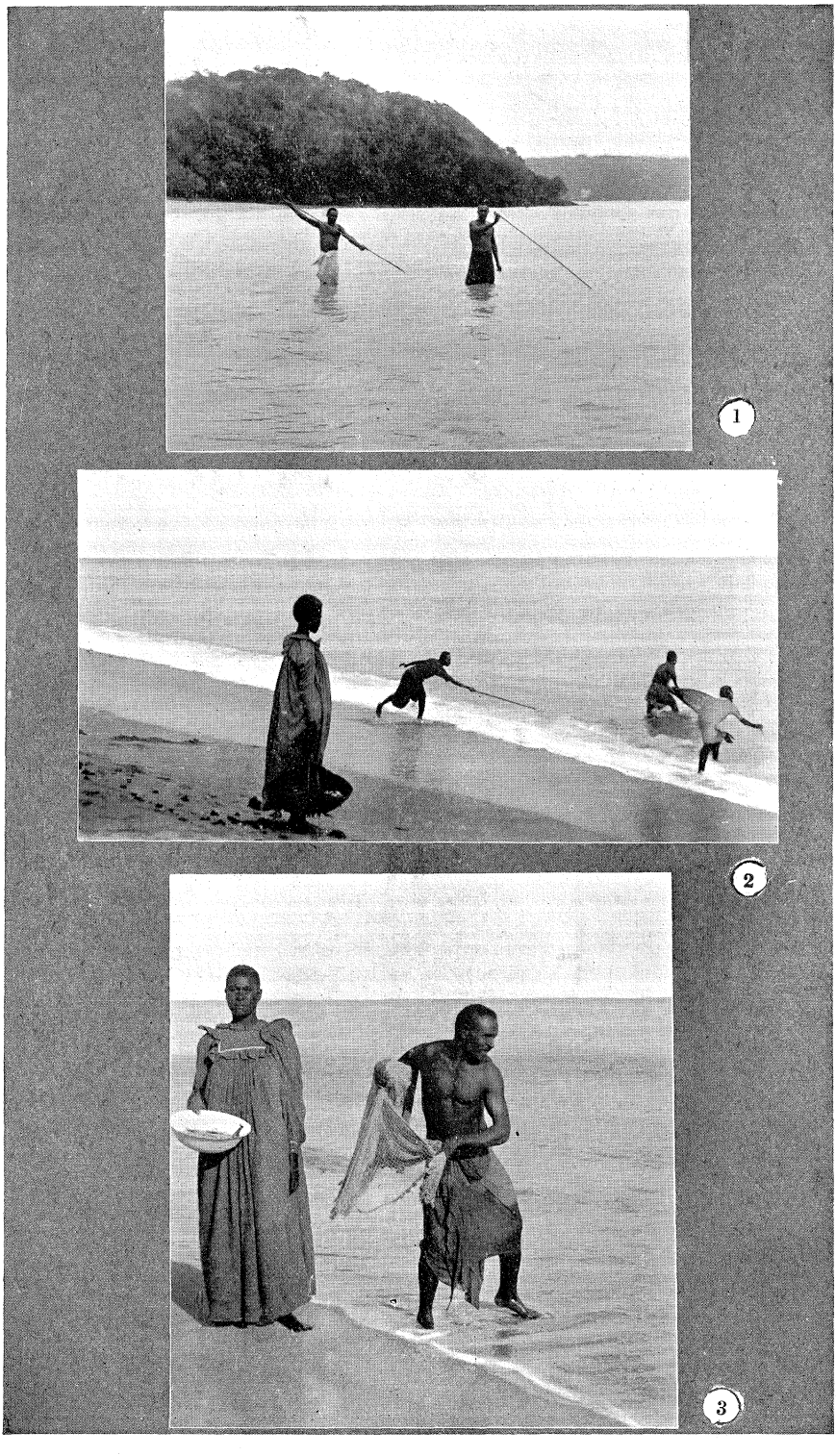
The specimens examined were obtained at the following localities:—Samoa, New Hebrides, Lord Howe Island, Tongatabu, Bogainville Island, Duke of York Island, and Murray Island, Torres Strait.

## EXPLANATION OF PLATE XII.

FIG. 1. Natives spearing fish. Albany Passage, Cape York.

FIG. 2. "Werir" fishing. Murray Island, Torres Strait.

FIG. 3. Fishing with a cast-net. Murray Island, Torres Strait.

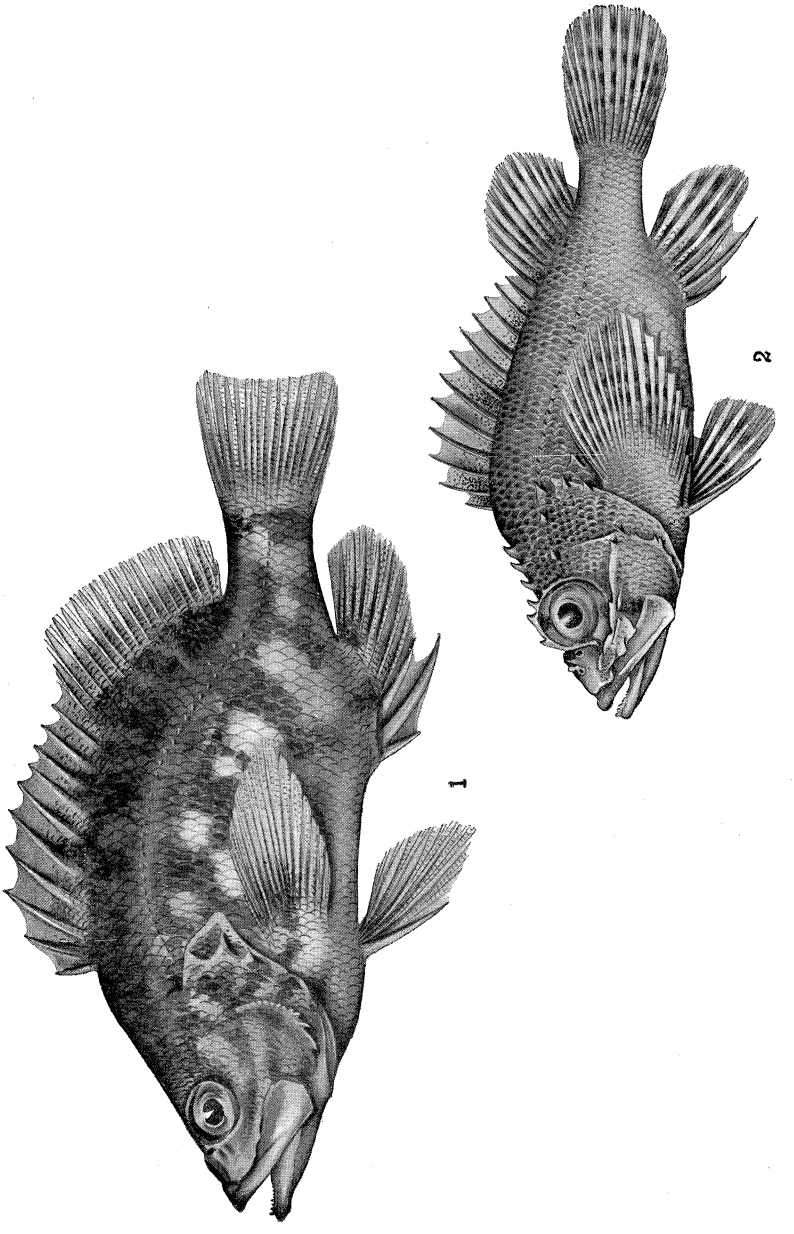



A. R. McCULLOCH, photo,
Austr. Mus.

## EXPLANATION OF PLATE XIII.

FIG. 1. *Hypoplectrodes jamesoni*, Ogilby.

FIG. 2. *Sebastopsis scaber*, Ramsay and Ogilby.

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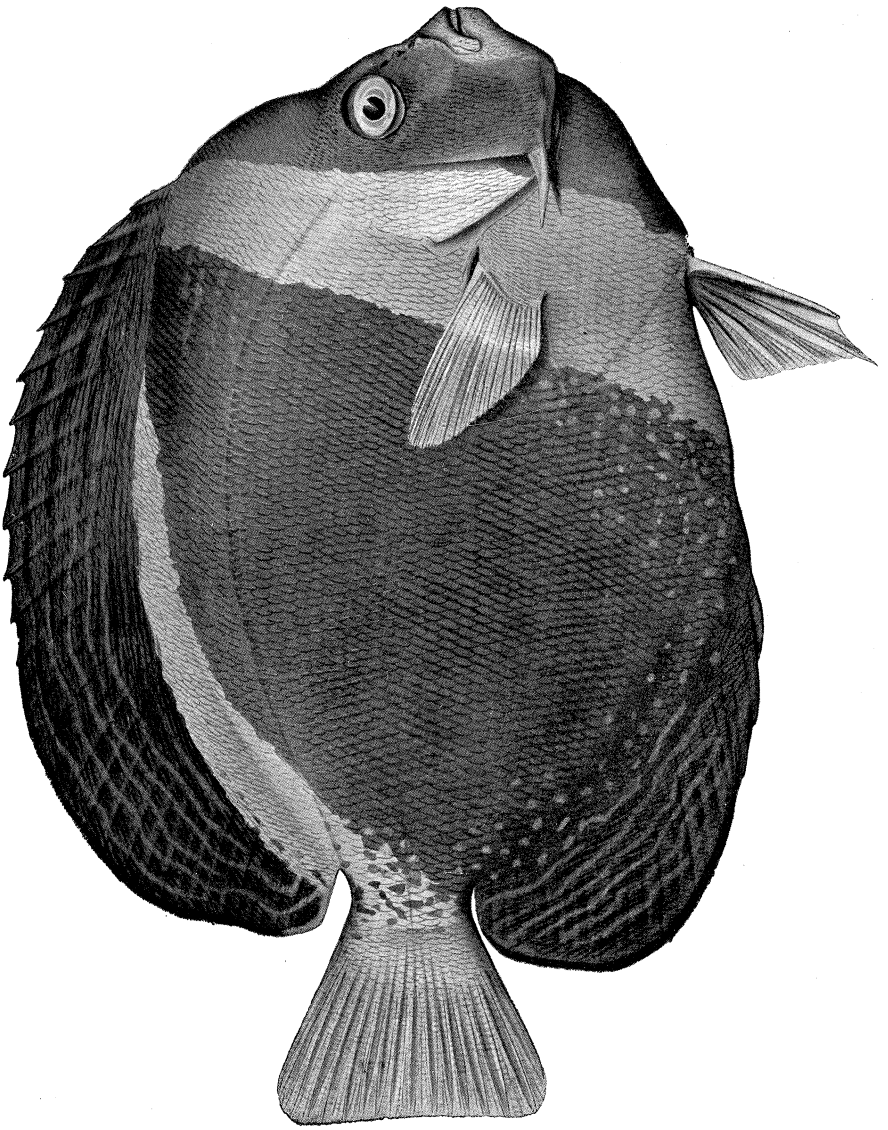
Austr. Mus.

## EXPLANATION OF PLATE XIV.

*Holacanthus duboulayi*, Günther.



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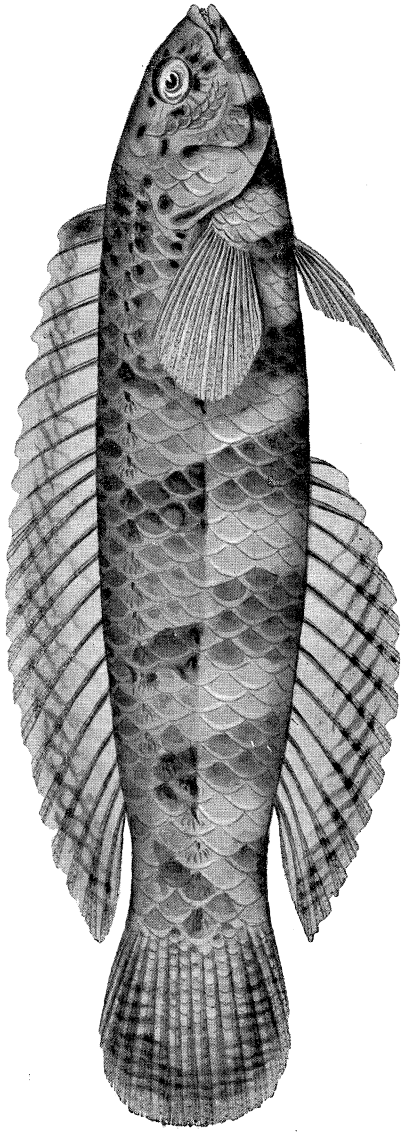
## EXPLANATION OF PLATE XV.

*Eupetrichthys angustipes*, Ramsay and Ogilby.



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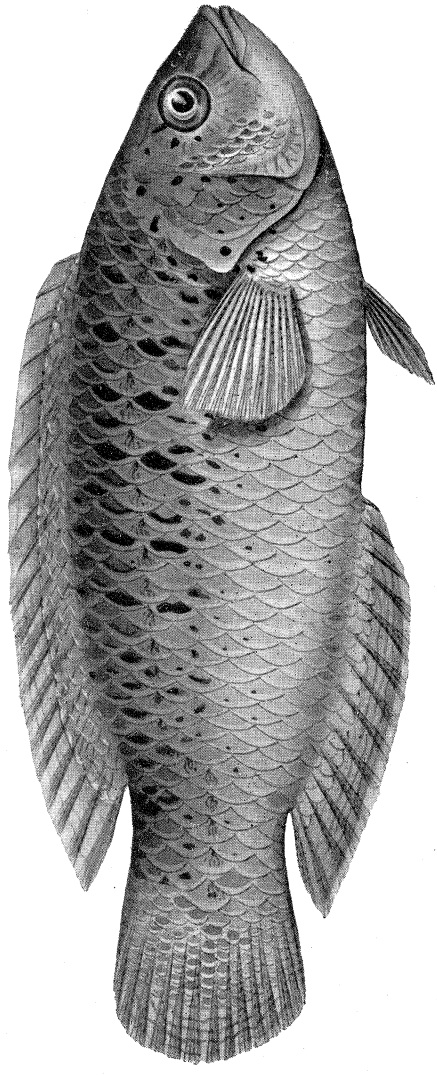
## EXPLANATION OF PLATE XVI.

*Austrolabrus maculatus*, Macleay.



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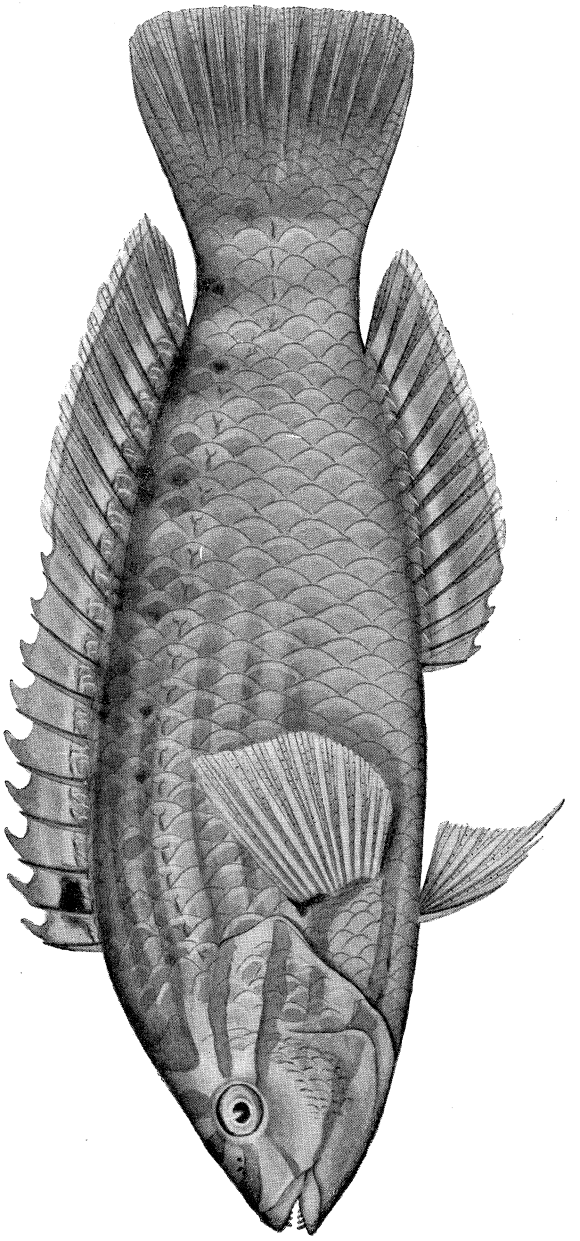
## EXPLANATION OF PLATE XVII

*Pseudolabrus guntheri*, Bleeker.



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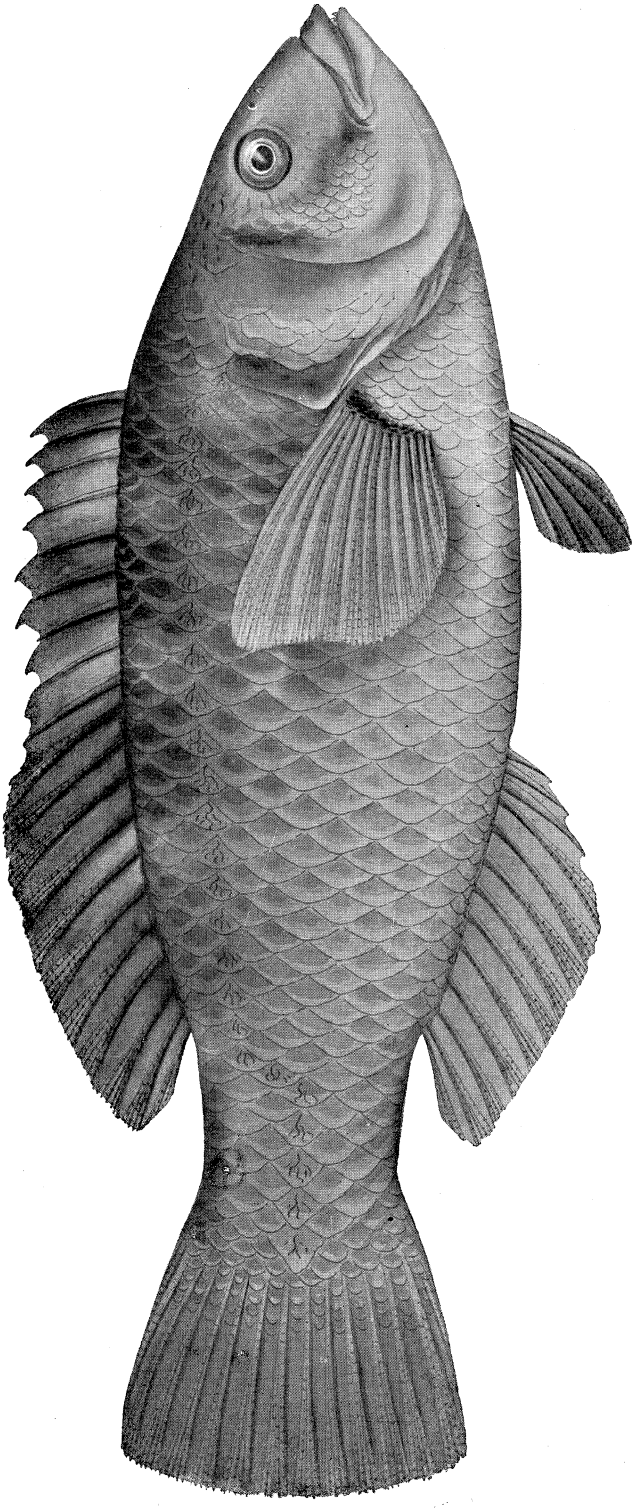
## EXPLANATION OF PLATE XVIII.

*Pseudolabrus fucicola*, Richardson.



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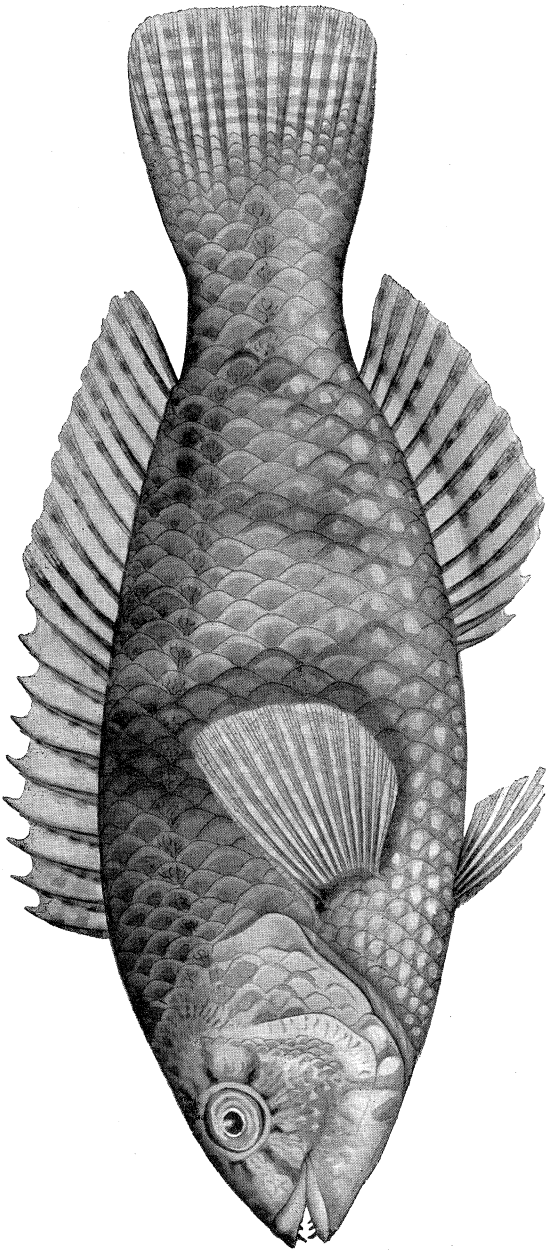
## EXPLANATION OF PLATE XIX.

*Pseudolabrus tetricus*, Richardson.



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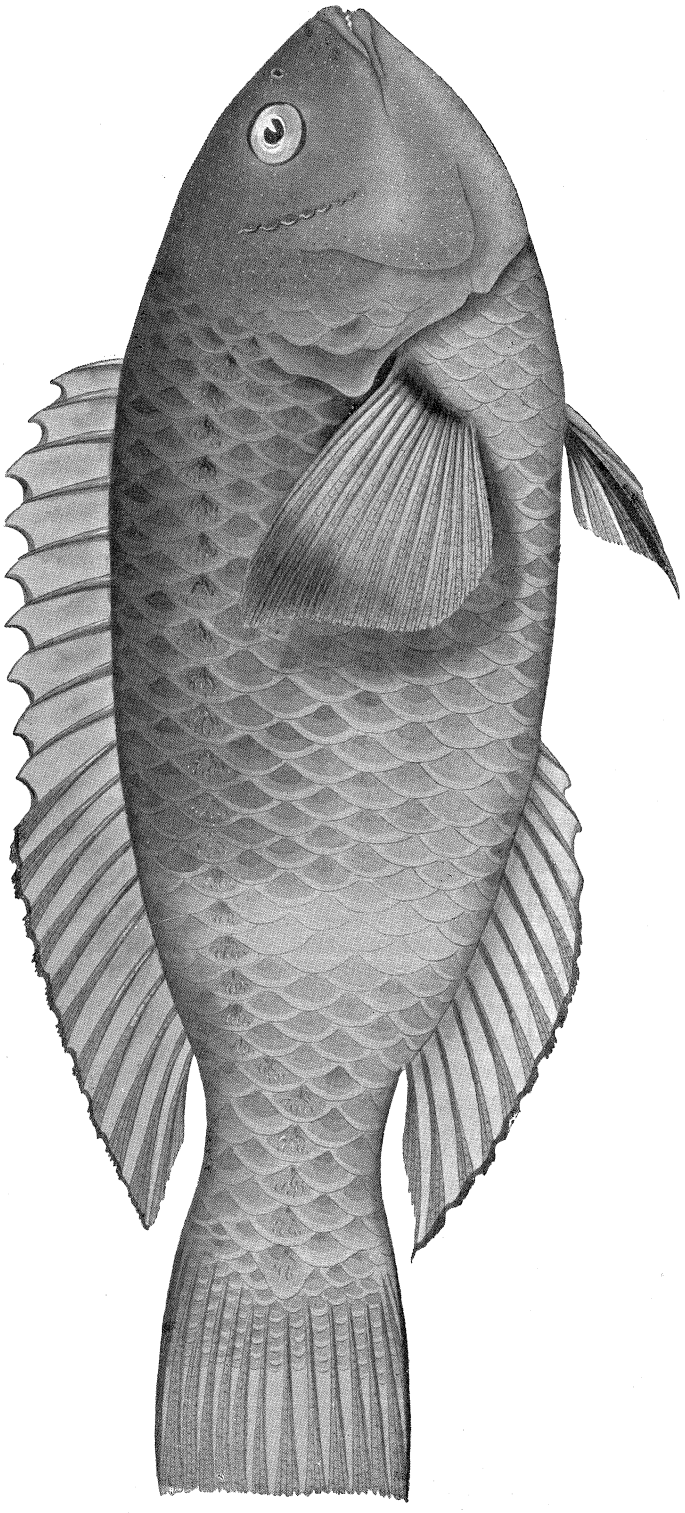
## EXPLANATION OF PLATE XX.

*Pseudolabrus gymnogenis*, Günther.



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