

SOME NEW AND LITTLE-KNOWN FISHES FROM SOUTH AUSTRALIA.

By

ALLAN R. McCULLOCH, ZOOLOGIST AUSTRALIAN MUSEUM, (1)

AND

EDGAR R. WAITE, F.L.S., DIRECTOR SOUTH AUSTRALIAN MUSEUM.

Plates ii-vii; Text figs. 26-31.

THIS paper is the result of an examination of some fishes preserved in the South Australian Museum, and marked "Old Collection," but specimens in the Australian Museum have also been used for comparison. Many of the fishes were unnamed, and the names attached to some of the others were found to be incorrect. A few species recently collected by one of us from rock pools at Kangaroo Island are also included.

Family SYNGNATHIDAE.

SYNGNATHUS CURTIROSTRIS Castelnau.

Syngnathus curtirostris Castelnau, Proc. Zool. Soc. Vict., i, 1872, p. 243, and ii, 1873, p. 79. Macleay, Proc. Linn. Soc. N.S. Wales, vi, 1881, p. 290. Johnston, Proc. Roy. Soc. Tasm., 1890 (1891), p. 37. Zietz, Trans. Roy. Soc. S. Aust., xxxii, 1908, p. 298. Duncker, Faun. Südwest-Austr., ii, 1909, p. 244.

Plate v, fig. 1.

D.21-24: P.8-9: V.3: C.10: Annuli 18+43: Subdorsal annuli 0-1, 4-4½. Male pouch covering 16 caudal rings.

Head 3 in the trunk, and 12·1 in the total length: snout 2·7 in the head, and 1·1 in the postorbital portion: eye 1·8 in the snout, and 5 in the head: caudal almost twice as long as the rest of the body.

Snout short and broad, with a median keel before the eyes: interorbital space slightly concave, convex on the median line: head with reticulating raised lines, and radiating series of raised lines on the operculum; no median opercular keel: occipital and nuchal ridges rudimentary; body and tail rings with sharp angles, but no spines. Body scarcely deeper than wide, the depth equal to the length of the snout.

(1) By permission of the Trustees of the Australian Museum.

Fins. Dorsal a little variable in position, commencing either on the posterior body-ring, or wholly situate on the tail: median ridge terminating above the vent and well separated from the lower caudal edge which is continuous with that of the trunk; dorsal edge of the trunk terminating below the hinder part of the dorsal fin, that of the tail curving downward to above the end of the median lateral ridge: ventral surface a little wider than that of the dorsal: caudal fin rounded, longer than the eye, but shorter than the snout.

Colour-markings. The markings vary in intensity in different specimens, but are similarly arranged in all. An adult male is brown, with slightly darker cross-bars on the back: light oval spots encircle the lateral ridge on each body ring, and also the junctions of the rings: large dark spots are present on the lower half of each segment of the trunk. Head with a broad cross-band on the occiput and another between the eyes; tail and egg-pouch variegated with brown reticulating lines; lower surfaces with irregular brown bars radiating from the eye, and enclosing white interspaces.

Described from two males and two females, 125-164 mm. long, the largest of which is figured.

Loc. Kangaroo Island, South Australia. Coll. Waite, 1917.

ICHTHYOCAMPUS CRISTATUS sp. nov.

Fig. 26.

D.26: P.12: C.8: annuli 19-40: subdorsal annuli 1, 5.

Head 3.6 in its distance from the vent, and 13.3 in the total length: trunk 1.8 in the tail: snout 3.4 in the head, much shorter than the postorbital portion of the head: eye 1.3 in the snout, and 4.7 in the head: pectoral about as long as the eye: caudal a little shorter than the snout.

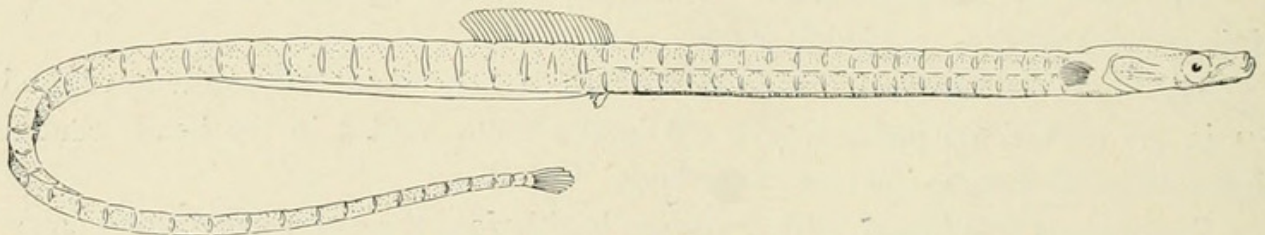


Fig. 26. *Ichthyocampus cristatus*.

Head and body uniformly granular: snout with an elevated, obtuse crest, which expands posteriorly to join the orbits: interorbital space flat, with a very low median ridge which is subcontinuous with an indefinite nuchal ridge: occiput and nape slightly elevated: low ridges extend backward on each side of the head from the orbits: opercles with a low, median ridge, and granular radiating striae.

Body as deep as broad, its angles well defined; back slightly concave: upper and lower angles continuous with those of the tail; lateral ridge extending on to the two anterior tail rings, and deflected downwards on the second; a low ventral ridge: ovisac covering thirteen tail rings: a minute anal fin present.

Described from a single specimen, 207 mm. long, preserved in the South Australian Museum: it is completely bleached after long preservation. The ovisac is filled with well-developed young.

The short-crested snout separates this species from all other Australian representatives of *Ichthyocampus* except *I. tryoni* Ogilby: it differs from that species in having more numerous dorsal rays and annuli, the head covered with granules instead of reticulating ridges, and in having the nuchal and occipital crests scarcely developed.

Loc. Spencer Gulf, South Australia.

Family ATHERINIDAE.

TAENIOMEMBRAS TAMARENSIS Johnston.

Atherina tamarensis Johnston, Proc. Roy. Soc. Tasm., 1882 (1883), p. 122, and 1890 (1891), p. 34.

Atherina tasmaniensis Macleay, Proc. Linn. Soc. N.S. Wales, ix, 1884, p. 443,—misprint for *tamarensis*.

Atherinichthys cephalotes Zietz, Trans. Roy. Soc. S. Aust. xxxiii, 1909, p. 264 (not *A. cephalotes* Castelnau).

D.vi-viii; i, 11: A.i, 12-13: P.13: V.i, 5: C.17: Sc. lat. 44-45; Sc. tr. 2+7.

Proportions of a specimen 98 mm. long: depth 6.5 in the length to the hypural; head 4.4 in the same: eye 2.7 in the head: interorbital space 1.2 in the eye, greater than the length of the snout, which is 1.5 in the eye: depth of the caudal peduncle equal to the length of the snout: third dorsal spine slightly longer than the eye.

Body moderately elongate, about three-fourths as wide as deep. Head flat above, with the usual pores and muciferous canals: jaws equal, the maxillary almost reaching the anterior ocular margin or extending slightly beyond it: a single row of large scales on the cheek; operculum, suboperculum and interoperculum also scaly: a narrow band of minute teeth on the anterior half of each jaw; a patch of microscopic teeth on the middle of the vomer, which is difficult to detect in any but dried or shrivelled specimens; a patch of minute teeth on the base of the tongue: gill-rakers slender, the longest equal to about one-third the length of the eye.

Body covered with large cycloid scales extending forward to the nape and to behind the eyes; there are 44-45 on the silver lateral band from behind the base of the pectoral to the hypural, and nine in a transverse series, including the median dorsal and ventral rows.

Fins. Origin of the dorsal well behind that of the ventrals, and much nearer the snout than the hypural; second and third spines longest: the interspace between the anterior spines of the dorsals is greater than the distance between the last dorsal ray and the hypural, and is half or more than half the distance between the snout and the first dorsal spine: anal originating well in advance of the second dorsal, and terminating before the vertical of its posterior ray; the length of its base is about 1.3 in its distance from the hypural; anterior anal rays longer than those of the dorsal, the margin of the fin somewhat incised: upper pectoral rays longest, not quite reaching the vertical of the ventral: ventrals reaching rather less than half their distance from the anal; the vent is placed between or slightly behind their tips.

Colours. Whitish in alcohol, with a broad silver lateral band along the fourth row of scales: upper portion of the head and back densely dotted with greenish-black dots, which also border the scales above the lateral band, and occasionally some of those below it: fins nearly transparent, sparingly dotted with black.

Described from several specimens 68-98 mm. long, selected from a large series secured together in a net. They agree with others in the Australian Museum collection which were received from the Tasmanian Museum in 1884 as *Atherina tamarensis*, and differ only from Johnston's brief description of that species in having an extra ray or two in the anal fin.

This species is allied to *T. microstoma* Günther, but differs in having smaller teeth, more numerous scales between the pectoral and the hypural, and rather longer and more numerous gill-rakers; the maxillary also usually attains the ocular margin in *T. tamarensis*, but falls short of it in the former species. *T. tamarensis* is perhaps synonymous with *Atherina hepsætoides* Richardson, described from Port Arthur, Tasmania; the description of that species, however, differs from the characters of our specimens in having nine dorsal spines and fifteen pectoral rays.

We have examined the specimen identified by Zietz as *A. cephalotes* from Thistle Island, Spencer Gulf, and find it is identical with those described above: it differs from *A. cephalotes* in having more numerous dorsal rays.

Locs. Cornelian Bay, Hobart, Tasmania; coll. C. Hedley, April 1917. Thistle Island, Spencer Gulf, South Australia.

CRATEROCEPHALUS EYRESII Steindachner.

Atherinichthys eyresii Steindachner, Sitzb. Akad. Wiss. Wien, lxxxviii, i, 1884, p. 1075.

Atherina interioris Zietz, Trans. Roy. Soc. S. Aust., xxxiii, 1909, p. 264 (*nom. nud.*).

Fig. 27.

Br.vi: D.v-vi; i, 6-7: A.i, 6-8: P.12-13: V.i, 5: C.17: L.lat.31-33: l.tr.13-14.

Proportions of a specimen 54 mm. long: head 3.3, depth of body 4.6 in the length of the hypural joint: eye 3.4: interorbital space 3.2 in the head: third dorsal spine 2.6, second dorsal ray almost half the length of the head.

Snout obtusely pointed, almost as long as the eye: interorbital space flat, wider than the eye; length of the eye less than the depth of the caudal peduncle: maxillary slender posteriorly, not reaching the vertical of the orbital margin; mandible closing within the projecting premaxillaries: cheeks with a single row of large scales; opercles covered with large and irregular scales: preopercular angle rounded, opercles unarmed: each jaw with a single row of small curved teeth, which are somewhat spaced; palate and tongue toothless: gill-rakers short and thick, about eleven on the lower limb of the first arch.

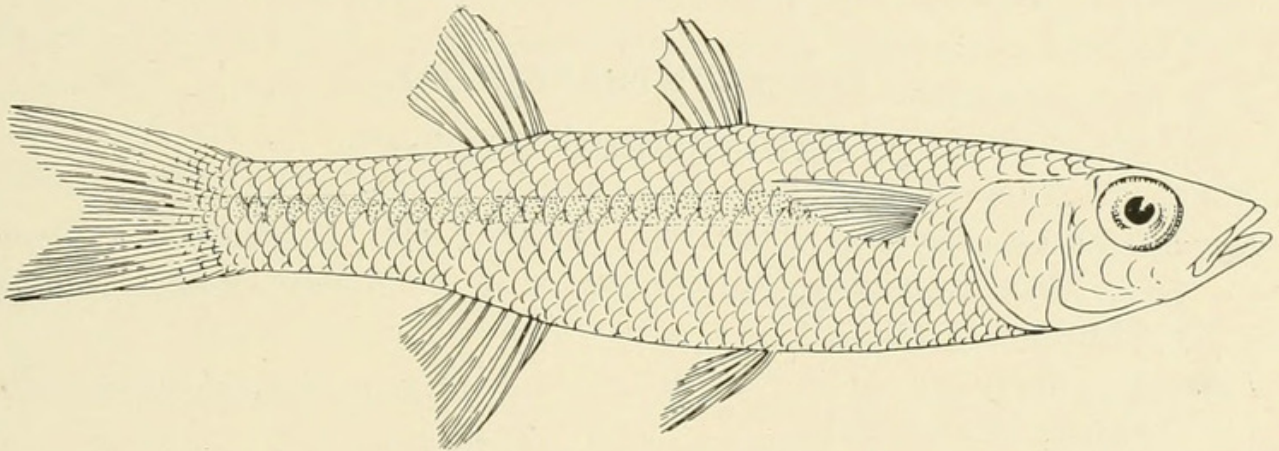


Fig. 27. *Craterocephalus eyresii*.

Scales. Body covered with cycloid scales of moderate size, which are conspicuously concentrically striated, and have radiating ridges on their basal portions: they are slightly larger posteriorly than anteriorly, and are largest on the silver lateral band; those of the median row on the back before the dorsal fin are larger than the others on each side of them: the scales cover the base of the caudal fin, extend forward to between the eyes, and become much enlarged on the top of the head: there are 13-14 rows between the back and belly before the second dorsal and anal fins, and 31-33 on the lateral band from behind the pectoral fin to the hypural.

Fins. Origin of first dorsal about midway between the snout and the hypural, and behind the insertion of the ventrals; second and third spines longest: origin of second dorsal behind that of the anal; its anterior rays are longest, but shorter than those of the anal: ventrals almost or quite reaching the vent: upper pectoral rays reaching slightly beyond the vertical of the ventral spine.

Colour-markings. Bleached after long immersion in alcohol, but with numerous minute dots on the back, which border the scales laterally: a silvery lateral band covering a single row of scales extends from behind the pectoral to the base of the tail: fins with dark dots.

Described from several specimens selected from a series, 40-54 mm. long; the figure represents the largest example. They differ somewhat in their proportions from Steindachner's description of *A. eyresii*, but having been obtained at Strangways Springs, in the vicinity of Lake Eyre, they are almost certainly that species.

Two specimens bearing Zietz's label "*Atherina interioris*, Strangways and Coward Springs," are identical with those described above.

This species is closely allied to *C. fluviatilis* McCulloch, but differs in having smaller scales, there being 13-14 in a transverse series instead of only 6-10.

Loc. Strangways Springs, southern Central Australia.

Family CENTRARCHIDAE.

NANNOPERCA Günther.

Nannoperca Günther, Proc. Zool. Soc., 1861, p. 116 (*australis*); Klunzinger, Sitzb. Akad. Wiss. Wien, lxxx, i, 1879, p. 429. Macleay, Proc. Linn. Soc. N.S. Wales, v, 1881, p. 342.

Paradules Klunzinger, Arch. Naturg. xxxviii, i, 1872, p. 20 (*obscurus*). Not *Paradules* Bleeker, 1863.

Microperca Castelnau, Proc. Zool. Soc. Vict. i, 1872, p. 48 (*yarrae*). Macleay, Proc. Linn. Soc. N.S. Wales, v, 1881, p. 308. (Not *Microperca* Putnam, 1863.)

Edelia Castelnau, Proc. Zool. Soc. Vict. ii, 1873, p. 123 (*vittata*). Macleay, Proc. Linn. Soc. N.S. Wales, v, 1881, p. 340. Ogilby, Proc. Linn. Soc. N.S. Wales, xxiv, 1899, p. 175. Regan, Ann. Mag. Nat. Hist. (7), xviii, 1906, p. 452. McCulloch, Rec. W. Aust. Mus. i, 1912, p. 85.

Body oblong, compressed: scales large, ciliated: lateral line more or less incomplete, usually interrupted, the anterior portion parallel to the back, the posterior extending along the middle of the caudal peduncle; its tubes simple and irregularly spaced, and crossing the whole length of the exposed portion of the

scales: mouth small, protractile: bands of villiform teeth on the jaws; a large patch on the vomer, and some on the anterior part of each palatine; tongue smooth: preorbital entire or denticulate, the other bones smooth; operculum with two flat spines; suborbitals ligamentous: cheeks, opercles, nape and interorbital space scaly, snout and lower jaw naked; mucigerous canals and pores are present on the mandible, preopercular margin, snout, upper surface of the head, and above the opercles: nostrils large and widely separate: gill-membranes narrowly united, partly free from the isthmus; pseudobranchiae well developed, gill-rakers moderate, few in number; v-vi branchiostegals. Dorsal fins connected at the base, the spinous portion longer than the soft; D.vi-ix; i, 8-10; A.iii, 6-8: ventral, with a strong spine, inserted behind the pectoral; caudal rounded. Premaxillary processes not reaching the frontals; supraoccipital crest not extending on the upper surface of the cranium; no parietal crests. Vertebrae 28 (12-13+15-16).

Affinities. According to Regan, this genus is allied to *Kuhlia*, in the family Centrarchidae.

Distribution. Southern and Western Australia, and Tasmania.

Synonymy. A careful comparison of the genotypes, *N. australis*, *P. obscurus*, *M. yarrae*, and *E. vittata*, shows them to be very closely allied, and evidently congeneric. Günther's original definition of *Nannoperca* included some important errors which have caused some confusion: he observed no lateral line, whereas his figure shows a very distinct canal, which, however, is quite different from what is actually found in the genus: the entirety or serrature of the pre-orbital bone in *N. australis* and *N. vittata* affords a generic distinction according to Regan, but a somewhat intermediate form is found in *N. obscura*; he also found the interorbital area naked in *Nannoperca* and scaly in *Edelia*, but we find the scales similarly disposed in all our examples of both genera.

KEY TO THE SPECIES OF NANNOPERCA.

- a. Preorbital rounded, entire ... Subgenus *Nannoperca*
 - b. Third anal spine not longer than the second:
 - maxillary reaching to below the orbital margin: vi-vii, rarely viii spines in the first dorsal ... *australis* and *tasmaniae*
- aa. Preorbital angular, serrated ... Subgenus *Edelia*
 - c. Third anal spine longer than the second:
 - maxillary reaching to below the orbital margin: viii-ix spines in the first dorsal ... *obscura*
 - cc. Third anal spine not longer than the second:
 - maxillary not reaching the orbit: vii-viii spines in the first dorsal ... *vittata*

NANNOPERCA AUSTRALIS Günther.

Pigmy Perch.

Nannoperca australis Günther, Proc. Zool. Soc., 1861, p. 116, pl. xix, fig. 2 (not good). Macleay, Proc. Linn. Soc. N.S. Wales, v, 1881, p. 342. Ogilby, Cat. Fish. N.S. Wales, 1886, p. 14. Waite, Mem. N.S. Wales Nat. Club, 2, 1904, p. 29.

?*Nannoperca riverinae* Macleay, Proc. Linn. Soc. N.S. Wales, v, 1881, p. 342, and ix, 1884, p. 10. Ogilby, *loc. cit.* Waite, *loc. cit.*

Paradules lectus Klunzinger, Arch. Naturg. xxxviii, i, 1872, p. 21, and (*emend. laetus*) Sitzb. Akad. Wiss. Wien, lxxx, i, 1879, pp. 349, 430.

Plate ii, fig. 1.

Synonymy. The identity of *Paradules laetus* and *Nannoperca australis* was recognized by Klunzinger, notwithstanding several striking discrepancies between the descriptions of the two. Macleay later regarded his *N. riverinae* as synonymous with *P. laetus*, although according to his scale-counts their identity would seem improbable: since, however, the type of his species is not now to be found, his opinion must be accepted.

Locs. Murray River. The specimen figured is 65 mm. long, and was taken near Narrandera, on the Murrumbidgee River, New South Wales.

Family POMACENTRIDAE.**GLYPHISODON VICTORIAE** Günther.

Glyphidodon victoriae Günther, Ann. Mag. Nat. Hist. (3), xi, 1863, p. 115. Castelnau, Proc. Zool. Soc. Vict., i, 1872, p. 146. Klunzinger, Sitzb. Akad. Wiss. Wien, lxxx, i, 1879, p. 398. Macleay, Proc. Linn. Soc. N.S. Wales, vi, 1881, p. 68. Kent, Proc. Roy. Soc. Tasm., 1886 (1887), pp. 123, 124. Lucas, Proc. Roy. Soc. Vict. (2), ii, 1890, p. 32. Johnston, Proc. Roy. Soc. Tasm., 1890 (1891), p. 34.

Heliastes lividus Klunzinger, Arch. Naturg., xxxviii, i, 1872, p. 36.

Plate ii, fig. 2.

D.xiii, 17: A.ii, 15: P.20: V.i, 5: C.15: L.lat.20: Sc.29.

Depth 1.76 in the length to the hypural joint; head 3.03 in the same: eye 4.1 and depth of caudal peduncle 1.8 in the head.

Body elevated, compressed, the dorsal and ventral profiles evenly arched: interorbital space convex, about twice as wide as the eye: snout longer than the eye, the nostril placed in about the middle of its length: greatest breadth of the preorbital about three-fourths the width of the eye: maxillary reaching to below

the anterior portion of the eye, the mouth a little oblique: teeth in a single series in each jaw; they are thick and slightly curved, and laterally compressed towards their bases: operculum with a broad flat spine.

Entire head, with the exception of the snout and lower jaw, covered with scales; these are largest on the operculum, and the basal portions of many are covered by membrane beset with minute pores; they extend forward to between the anterior portions of the eyes. Body scales largest on the sides, becoming much smaller on the caudal peduncle: they cover the basal portions of all the fins except the ventrals, and extend up between the rays of the vertical fins: lateral line a little curved, terminating below the anterior portion of the soft dorsal, and covering twenty scales; there are twenty-nine rows of scales between the origin of the lateral line and the hypural joint.

Fins. Origin of the dorsal above the end of the operculum; the spinous part is rounded; fifth spine longest, about twice as long as the eye: soft dorsal angular, the sixth ray the longest: pectorals as long as the head, the fourth upper ray longest and not reaching quite so far backward as the ventrals, which scarcely attain the vent: caudal forked.

Colour-markings. Bleached after long preservation in spirits, and showing only some pearly markings on the throat and preopercular border; one is on the chin, and a second crosses the throat from behind the angles of the mouth.

Described and figured from a somewhat imperfect specimen in the old collection of the South Australian Museum; it is 176 mm. long from the snout to the hypural joint.

Loc. St. Vincent Gulf, South Australia. The species has been recorded from Victoria, Tasmania, and King George Sound.

Family LABRIDAE.

PSEUDOLABRUS AURANTIACUS Castelnau.

Cheilinus aurantiacus Castelnau, Proc. Zool. Soc. Vict. i, 1872, p. 245, and ii, 1873, p. 71. Macleay, Proc. Linn. Soc. N.S. Wales, vi, 1881, p. 92.

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

Pseudolabrus elegans Gill, Proc. U.S. Nat. Mus. xiv, 1892, p. 403. McCulloch, Rec. Aust. Mus. ix, 3, 1913, p. 376.

A specimen 119 mm. long, in the old collection of the South Australian Museum, is labelled as *Cheilinus aurantiacus* Castelnau. It agrees with the description of that species in all structural details, and in such colour-markings as remain. It is also identical with *P. elegans* Steindachner, and as Castelnau's

description of the colour-marking agrees with that of the larger specimen figured by Steindachner, we regard the two as synonymous.

This species is remarkable in the genus *Pseudolabrus* in having rounded pectoral fins, thereby approaching *Pictilabrus*; but it has free pencils to the dorsal spines, which feature is characteristic of the first-named genus.

Loc. St. Vincent Gulf, South Australia.

Family CALLIONYMIDAE.

CALLIONYMUS CALAUROPOMUS Richardson.

?*Callionymus calauropomus* Richardson, Ichth. Erebus & Terror, 1844, p. 10, pl. vii, fig. 4-5. Günther, Cat. Fish. Brit. Mus. iii, 1861, p. 147.

Callionymus calauropomus Castelnau, Proc. Zool. Soc. Vict. ii, 1873, p. 49, and Res. Fish. Aust. (Vict. Offic. Rec. Philad. Exhib.), 1875, p. 21. Klunzinger, Arch. Naturg. xxxviii, i, 1872, p. 31, and Sitzb. Akad. Wiss. Wien. lxxx, i, 1879, p. 386. McCoy, Prodr. Zool. Vict. dec. xx, 1890, pl. excii. Lucas, Proc. Roy. Soc. Vict. (2), ii, 1890, p. 29.

A large example, 167 mm. long excluding the tail, agrees with McCoy's description and figures, but differs slightly from the specimen described by Richardson. The bands of teeth in the jaws are broad anteriorly and become very narrow laterally, but they are not reduced to a single row as described in the typical example.

Richardson quoted Western Australia as the origin of his specimen (*loc. cit.*, p. iv), but Günther rendered it as North-Western Australia.

Loc. South Australia.

Family GOBIIDAE.

RHINOGOBIUS LATERALIS Macleay.

Gobius lateralis Macleay, Proc. Linn. Soc. N.S. Wales, v, 1881, p. 602.

Plate ii, fig. 3.

D.v; 10: A.9: P.17: V.i, 5: C.13. Twenty-eight rows of scales between the upper base of the pectoral and the hypural joint, and nine between the anterior dorsal and anal rays.

Depth 5.3 in the length to the hypural joint; head 3.4 in the same: eye 3.1 in the head, a little longer than the snout, which is 4.2 in the head: interorbital width 5.5 in the eye: depth of caudal peduncle 3.1 in the head; middle caudal rays 0.1

longer than the head: breadth between the bases of the pectoral fins equal to the depth.

Head naked, with indistinct rows of mucigerous pores on the snout, cheeks and operculum, along the preopercular margin and each ramus of the mandible; some large open pores on the snout, occiput, and margin of the preoperculum: eyes superolateral, separated by a narrow interorbital space: snout obtusely pointed, its upper profile oblique; anterior nostril in a short tube, the posterior a simple opening near the eye: maxillary reaching back to below the anterior third of the eye; jaws of equal length: a band of small teeth in each jaw, becoming narrower laterally, the outer teeth enlarged, spaced and curved; palate toothless: tongue truncate anteriorly, only its tip free: gill-openings very wide, separated by a space about as wide as the eye; exposed edge of pectoral arch smooth, without papillae.

Body rather elongate, compressed, covered with large angular ctenoid scales, which extend forward on the neck to above the operculum, leaving the occiput naked; they also cover the breast and the base of the pectoral: genital papilla large.

Fins. First dorsal commencing well behind the base of the pectoral; the first spine is filamentous, and reaches beyond the base of the second ray; the second, third and fourth are subequal in length, and shorter than the anterior rays: second dorsal increasing in height to the ninth ray, which overlaps the caudal base: anal opposite the second dorsal, and of similar form: pectoral rounded, without free rays above, the middle rays reaching the vertical of the first dorsal ray: ventrals large, inserted a little behind the pectorals, completely united, and reaching the first anal ray: caudal obtusely pointed.

Colour-markings. Pale greenish in alcohol, mottled with olive brown; six large dark blotches on the sides, one below the spinous dorsal, two below the soft portion, and three on the caudal peduncle, the two last being close together and near the caudal base: two broad dark bars on the side of the snout, one crossing from the eye to the middle of the upper lip, and the other to behind the angle of the mouth; a dark iridescent blotch behind the preopercular margin: cheek and operculum with light pearly vermiculating lines, and some subvertical light streaks are present on the side of the abdomen, becoming broken up into dots on the side of the tail: first dorsal closely dotted with black, the margin white; the dots combine to form a black spot between the two anterior spines, and there are reticulating lighter lines basally: second dorsal with numerous rows of angular grey spots: caudal with transverse rows of grey spots, its lower portion dusky: anal dark grey, pectorals and ventrals light grey, the latter with a blackish margin.

Described and figured from a specimen 78 mm. long. It agrees in all details with the three cotypes of the species with which we have compared it, except in having only five instead of six dorsal spines, which is an individual peculiarity.

Variation. A number of specimens from South Australia exhibit some variation in the relative lengths of the spines and rays of the dorsal and anal fins, which are shorter in younger examples, the rays not reaching the base of the caudal: the pearly lines on the head and body are often wanting in preserved specimens.

Loc. Noarlunga, South Australia; figured specimen. Semaphore, South Australia. St. Vincent Gulf, South Australia. Queenscliff, Victoria.

MUGILOGOBIUS GALWAYI sp. nov.

Blue-spot Goby.

Plate iii, fig. 1.

D.vi; i, 8: A.i, 8: P.15: V.i, 5: C.15: 31 rows of scales between the upper base of the pectoral and the hypural joint, and 10 between the anterior dorsal and anal rays.

Depth 5.3 in the length to the hypural joint; head 3.6 in the same: eye slightly shorter than the snout, 4.4 in the head; interorbital space 2.1 in the eye: depth of caudal peduncle 2.0 in the head; breadth between the bases of the pectorals 1.1 in the depth: second dorsal spine 1.9, seventh dorsal ray 1.7, posterior anal ray 1.9 in the head; median caudal rays as long as the head.

Cheeks naked; some rather indistinct large scales on the operculum: rows of open pores extend around the eye, preopercular margin and mandible; indistinct series of upraised rows of mucigerous pores are present on the cheek and operculum: eyes of moderate size, separated by a slightly concave interorbital space, which is about half as wide as the eye: snout tumid, anterior nostril in a short tube near the upper lip, the posterior a simple opening; maxillary reaching to below the middle of the eye, the lower jaw closing within the upper: teeth villiform, in a band in each jaw, which becomes narrow laterally; the outer teeth somewhat larger than the others; no canines; palate toothless: tongue thick, rounded anteriorly, and largely adnate to the floor of the mouth: gill-openings separated by a space which is about one and one-half times as wide as the eye: exposed edge of pectoral arch entire, without papillae.

Body covered with large ctenoid scales, which extend forward to the eyes above, but are somewhat rudimentary on the breast and base of the pectoral; they are a little larger posteriorly than elsewhere: genital papilla elongate, and well developed.

Fins. First dorsal commencing a little before the middle of the pectoral; its margin rounded and second spine longest: rays of soft dorsal increasing very slightly in height backwards: anal almost opposite the second dorsal, and of similar form: pectoral rounded, without free rays, and reaching to below the middle of the interspace between the dorsal fins: ventrals inserted slightly behind the pectorals, and not quite reaching the vent; they are completely united, and have a deep basal membrane: caudal large and rounded.

Colour-markings. Yellowish in alcohol, closely speckled with olive brown; some larger blotches of irregular form are present on the sides, and saddle-like darker markings cross on the back: first dorsal with about four oblique, irregular, dark bands, the outer one forming the margin of the fin, and iridescent blue in life; a bright blue blotch about the middle of the fin: second dorsal with about four rows of subcuneiform dark spots on its basal half; a broad, dark, horizontal stripe on the outer half, which is separated from the narrow blackish margin by a white band; anal dusky, with a blue margin; pectoral and ventral lighter, the latter with dark bars between the rays; caudal with about ten rows of broad, dark spots on its upper half, the lower portion dusky.

Described and figured from a specimen 67 mm. long: two others of about the same size are quite similar, while a number of smaller examples show that the colour-pattern is constant, and developed at an early age.

This species is distinguished from all other Australian gobies known to us by the scaly operculum. It is congeneric with *Mugilogobius (Vaimosa) fontinalis* Jordan and Seale, with paratypes of which we have compared it.

Loc. Patawalunga, near Adelaide, South Australia; holotype. Noarlunga, South Australia; Freshwater lake, Robe, South Australia.

We have pleasure in associating with this pretty species the name of His Excellency Sir Henry Lionel Galway, K.C.M.G., D.S.O., Governor of South Australia, an ardent angler and patron of the South Australian Fish Protection and Anglers' Association.

Family BLENNIIDAE.

HELCOGRAMMA gen. nov.

This genus is closely allied to *Tripterygion* Risso, but differs in the structure of its lateral line: this runs downwards from the shoulder to the middle of the side instead of extending backward parallel with the back, and there is no secondary series of incised scales posteriorly.

Type. *H. decurrens* sp. nov.

Tripterygion medium Günther is a second species of this genus.

HELCOGRAMMA DECURRENS sp. nov.

Plate iii, fig. 2.

Br.vi: D.iii; xiii; 11: A.22: P.9+7: V.2: C.13: L.lat. 19+19.

Depth 4.5 in the length to the hypural; head 3.2 in the same: eye not quite so long as its distance from the end of the snout, 3.5 in the head: interorbital space 3.5 in the eye: first dorsal spine highest, 1.9 in the head; fourth spine of second dorsal 2.2, median pectoral rays 1.1 in the head.

Head large, naked, with double rows of pores beneath the eye, around the preoperculum and on the mandible: anterior nostril with a tentacle, the posterior a simple opening close to the upper orbital border: a small ocular tentacle: lips large and thick, projecting anteriorly; maxilla reaching to below the middle of the eye; mandible a little shorter than the upper jaw: a broad band of villiform teeth in each jaw which becomes very narrow posteriorly, the outer ones somewhat enlarged; a large patch covers the vomer, and smaller patches are present on the anterior part of each palatine: opercular lobe pointed, incised above.

An upraised nuchal ridge extends downward and backward on each side before the dorsal: scales ctenoid, commencing at the shoulder and increasing slightly in size backward: breast and abdomen naked to behind the origin of the anal: lateral line running downward from the shoulder to the middle of the body, and formed of nineteen simple tubes on enlarged scales, which terminate below the end of the second dorsal; no secondary series of incised scales: the scales above the lateral line are rather irregular, and an extra row is intercalated between each of the lateral line series so that there are about 38 or 60 rows along the body, according to the direction in which they are counted.

Fins. First dorsal spine inserted just behind the vertical of the preoperculum; it is much higher than the following, which decrease backward; membrane of the third spine just touching the base of the anterior spine of the second dorsal: margin of the second dorsal slightly arched, the fourth spine longest but shorter than the anterior spine; membrane of the last spine not reaching the anterior ray: soft dorsal damaged, apparently formed of simple rays: anal rays simple, curved, and increasing slightly in length backward; the last is well behind the termination of the dorsal: pectoral pointed, reaching to below the posterior third of the second dorsal; the lower rays are thickened and simple with their membrane incised, the upper rays bifurcate: ventral rays inserted slightly in advance of the vertical of the anterior dorsal spine, free for more than half their length, the inner the longer: caudal subtruncate.

Colour-markings. Brown in alcohol, with the lower half of the head and the pectoral base blackish. Some symmetrical light spots are present on the sides, and the lower part of the trunk is black speckled: dorsal fins with dark

speckles which form irregular, oblique bars: anal closely speckled, the marginal portion darker.

Described and figured from a single, somewhat damaged specimen, 57 mm. long. It is allied to *H. medium* Günther (2), but differs in the form and composition of its fins.

Loc. St. Vincent Gulf, South Australia.

TRIANECTES gen. nov.

Body rather short and deep, covered with large ctenoid scales which extend over the breast and abdomen: two lateral lines, the first formed of simple tubes and parallel with the back, the second of incised scales along the middle of the tail: head large, rounded, and naked, with numerous pores: eye large: mouth large, the maxillary exposed, jaws subequal: upper angle of operculum forming a flat spine, not rounded: teeth moderate, in a band in each jaw, the lower the larger; a single curved row on the vomer, palatines toothless. Three dorsal fins, the two anterior spinous: pectoral with bifid rays in its upper half and simple ones below: ventrals jugular, with two simple rays.

Type. *T. bucephalus*, sp. nov.

This genus differs from *Tripterygion* not only in the very different form of the head, but also in lacking palatine teeth; the upper angle of the operculum also is spine-like, not rounded, and scales cover the breast and abdomen. It is near *Notoclinus* Gill (3), but has the upper pectoral rays divided and more numerous than in that genus.

TRIANECTES BUCEPHALUS sp. nov.

Plate iii, fig. 3.

Br.vi; D.iii; xiv; 12: A.21: P.15: V.2: C.13: L.lat.28+?; L.tr.2+10?.

Depth 4·7 in the length to the hypural joint; head 3·1 in the same: eye slightly longer than the snout, 3·6 in the head; interorbital space 2·2 in the eye: first dorsal spine a little longer than the eye, shorter than the fifth spine of the second dorsal, which is 2·4 in the head: anterior rays longer than the spines, 2·0 and median pectoral rays 1·2 in the head.

Head large, naked, with double rows of pores around the eye, preopercular margin, and on the mandible; snout and nape also porous: anterior nostril with a tentacle, the posterior a simple opening near the upper orbital margin; a broad ocular tentacle: lips thick, projecting anteriorly: maxilla reaching beyond the

(2) Waite, Rec. Cant. Mus. ii, 1913, p. 5, pl. ii.

(3) *Id. ib.*, p. 9, pl. iv.

vertical of the hinder margin of the pupil, expanded posteriorly: upper jaw with a band of villiform teeth anteriorly, which becomes narrow laterally, and an outer row of larger subcardiform teeth; mandibular teeth larger, the inner ones strongest, and arranged in 3 or 4 rows anteriorly, becoming uniserial laterally; a single arched row of teeth on the vomer, the outer of which are the largest; palatines toothless: opercular lobe pointed, a little incised above.

Neck with a well-defined series of upraised pores separating the head from the back: scales large, ctenoid, commencing on the neck; breast and abdomen covered with weak cycloid scales: lateral line extending backward parallel with the back to below the hinder portion of the third dorsal; a second series of incised scales along the middle of the tail (these scales are mostly wanting in the holotype): about 35 rows of scales between the shoulder and the hypural joint.

Dorsal composed almost entirely of spines, anal with two spines and numerous rays: both fins united with the caudal: pectorals present, united with the first of the second dorsal: spines of the second dorsal subequal, increasing slightly in length to the fifth, thence decreasing backward: dorsal rays simple, highest anteriorly: anal rays increasing slightly in length backward: pectoral pointed, the upper rays bifurcate, the eight lower ones simple; the middle rays reach to below the tenth spine of the second dorsal: ventrals inserted a little behind the vertical of the hinder orbital margin, the inner ray longest and largely united with the outer by membrane: caudal rounded, the inner rays bifurcate.

Colour-markings. Pink, after long preservation, with four brown cross-bars descending on to the sides, where they expand and connect with one another: first dorsal blackish with a light submarginal band: second dorsal dusky with oblique bars corresponding to the body marking: soft dorsal lighter, obliquely barred: pectorals, anal and caudal with narrow cross-bars.

Described and figured from a specimen 67 mm. long, which has lost some of its scales, but is otherwise fairly well preserved.

Loc. Spencer Gulf, South Australia. Dredged by Dr. J. C. Verco.

OPHICLINUS Castelnau.

Ophiclinus Castelnau, Proc. Zool. Soc. Vict., i, 1872, p. 246 (*antarcticus* Cast.).

Ophioclinus Castelnau, *Loc. cit.*, ii, 1873, p. 69. Waite, Rec. Aust. Mus., vi, 3, 1906, p. 209.

?*Neogunellus* Castelnau, Res. Fish. Aust. (Vict. Offic. Rec. Philad. Exhib.), 1875, p. 27 (*sulcatus* Cast.).

Body elongate, compressed, covered with small scales: lateral line present quite anteriorly or wholly wanting: head long, scaleless, with open pores: anterior nostril tubular: eye in the anterior portion of the head: preopercular

margin subcutaneous, operculum unarmed, its lobe with a cleft: gill-membranes forming a free fold across the isthmus: large teeth, forming bands on the jaws, and similar teeth on the vomer; palatines toothless.

Dorsal composed almost entirely of spines, anal with two spines and numerous rays; both fins united with the caudal: pectorals present, united with the opercular lobe by membrane: ventrals jugular, with a hidden spine and two rays: viviparous.

This definition is based on nine specimens herein ascribed to four species. According to Castelnau, the genotype, *O. antarcticus*, has palatine teeth, but this is probably an error.

Synonymy. In assuming *Neogunellus* to be synonymous with *Ophiclinus*, we rely principally upon the evidence afforded by a specimen in the Australian Museum which is believed to be *N. sulcatus* (see notes under that species): Castelnau's description of *N. sulcatus* is partly unintelligible, and is contradictory in several details, so that we feel justified in disregarding some of the statements which conflict with our conclusions.

KEY TO THE SPECIES OF *OPHICLINUS*.

- a. Pectoral longer than the eye; lateral line present anteriorly.
 - b. Vomerine teeth tubercular, forming a triangular patch.
 - c. Dorsal lviii-lix, I. ?*sulcatus*
 - cc. Dorsal liv, I. *aethiops*
 - bb. Vomerine teeth pointed, forming an angular row or series.
 - d. Dorsal commencing above the end of the operculum,
 - with more than fifty spines *gabrieli*
 - dd. Dorsal commencing before the end of the operculum,
 - with less than fifty spines *gracilis*
- aa. Pectoral shorter than the eye; lateral line obsolete; dorsal commencing well behind the head.
 - e. Dorsal with xli-xliv spines *varius*
 - ee. Dorsal with lii spines *pardalis*

?*OPHICLINUS SULCATUS* Castelnau.

?*Ophiclinus antarcticus* Castelnau, Proc. Zool. Soc. Vict., i, 1872, p. 246, and ii, 1873, p. 69.

?*Neogunellus sulcatus* Castelnau, Res. Fish. Austr. (Vict. Offic. Rec. Philad. Exhib.), 1875, p. 27.

Fig. 28.

Br.v; D.lviii-lix, 1: A.ii, 40-41: P.10: V.i, 2: C.13.

Head about 5 in the length to the hypural joint: depth 1.6, eye 5.2 in the head: snout 2.2 in the eye, greater than the interorbital width, which is half as wide as the eye: pectoral 3.0, inner ventral ray 1.7, last dorsal spine 3.8 in the head.

Elongate, compressed. Head moderately flat above, snout obtuse: lower jaw slightly longer than the upper: anterior nostril in a tube behind the lip: rows of pores surround the eye, nuchal and occipital regions, the margin of the preoperculum, mandible and snout; maxillary reaching to behind the pupil: blunt teeth in several rows in front of the premaxillaries, becoming uniserial laterally: mandibular teeth larger, and extending farther back than those of the upper jaw: a large rounded patch of tubercular teeth on the vomer; palate edentulous.

Body covered with small, loosely imbedded scales, commencing on the nape, and covering the thorax and base of the pectoral: lateral line represented by a short canal anteriorly, which is little longer than the eye: head naked.

Fins. Dorsal beginning above the end of the operculum; the spines increase in length backwards, and the last ray is connected with the caudal by membrane: origin of anal nearer the snout than the hypural joint by a space equal to the length of the head: anal rays increasing in length backward, the last connected with the caudal: ventrals inserted below the middle of the operculum, the inner ray the longer: pectorals almost twice as long as the eye, connected with the opercular lobe by membrane: caudal obtusely pointed.

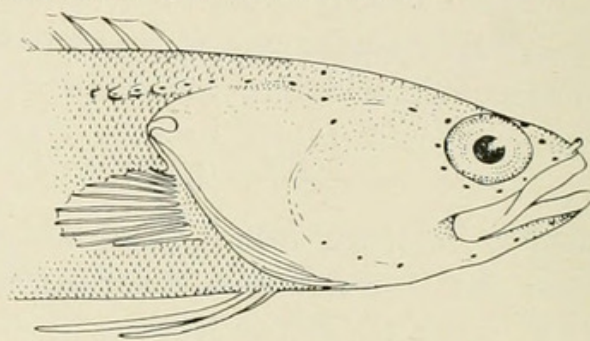


Fig. 28. Head of *O. sulcatus*.

Colour. Light brown in alcohol, the head variegated with darker markings: back with about ten greyish blotches: vertical fins variegated with darker markings.

Described from two specimens 89 and 117 mm. long. The figure represents the head of the larger example.

Identification. The larger of these specimens is part of the old collection of the Australian Museum, and bears a parchment label, "*Neogunellus sulcatus* Cast., Adelaide." The handwriting is clearly identical with that accompanying other specimens which are known to have been received in exchange from Castelnau, and was probably written by himself. This specimen differs from his description of *N. sulcatus* in having fewer spines and rays in the dorsal and anal fins; in having the anal formed principally of rays instead of spines; also in some proportional details. But the description is clearly inaccurate in parts, since the ventrals are stated to be 5-rayed in one part of his generic definition and 2-rayed

in another, while he described the anal as beginning behind the snout. We therefore rely rather upon the evidence of the label than his description for the identification of the specimen as *N. sulcatus*.

If this identification be correct, it is probable that *Neogunellus sulcatus* is synonymous with *Ophiclinus antarcticus*, since our specimens agree fairly well with the description of that species.

Loc. Port Adelaide and St. Vincent Gulf, South Australia.

OPHICLINUS AETHIOPS sp. nov.

Fig. 29.

D.liv, 1: A.ii, 36: P.10: V.2: C.13.

Head 5.5 in the length to the hypural joint: depth at origin of anal 1.3, eye 4.2 in the head: snout 1.6 in the eye, greater than the interorbital width, which is 2.5 in the eye: pectoral 2.6, inner ventral ray 1.7, and last dorsal spine 3.1 in the head.

Form, structure and dentition similar to those of *O. sulcatus* as described by us.

Colour-markings. Dark brown in alcohol, the sides and lower surfaces speckled with black dots; about ten blackish blotches on the back below the

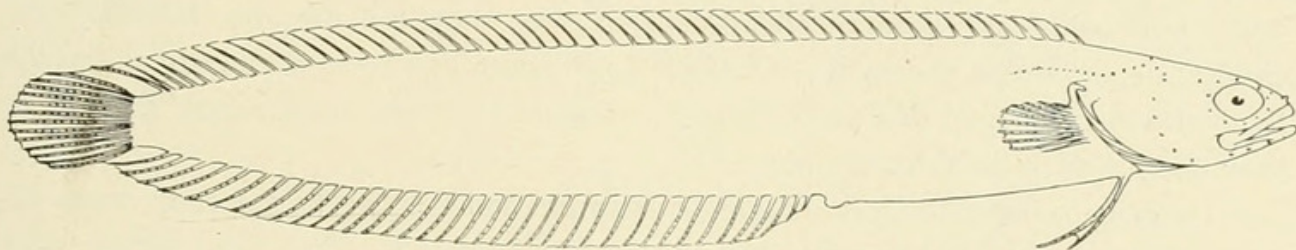


Fig. 29. *O. aethiops*.

dorsal fin: short dark lines radiate backward from the eye; head with conspicuous blackish dots: dorsal and anal fins with alternate light and dark vertical bands, the former being the narrower; pectorals, ventrals and caudal irregularly spotted.

Described and figured from a specimen 85 mm. long. A second slightly smaller example differs only in lacking the black dots on the head, body and fins.

This species is very similar to *O. sulcatus*, but differs in having fewer spines and rays in the dorsal and anal fins.

Loc. Kangaroo Island. Coll. Waite, 1917.

OPHICLINUS VARIUS sp. nov.

Fig. 30.

D.xli-xliv, 1: A.ii, 26-28: P.7-8: V.2: C.13.

Proportions of a specimen 45.5 mm. long: head 5.1 in the length to the hypural joint: depth at origin of anal 6.8, eye 4.0 in the head: snout 1.6 in the

eye, greater than the interorbital space, which is 2.6 in the eye: pectoral 1.3 in the eye: inner ventral ray 2.0, last dorsal spine 4.0 in the head.

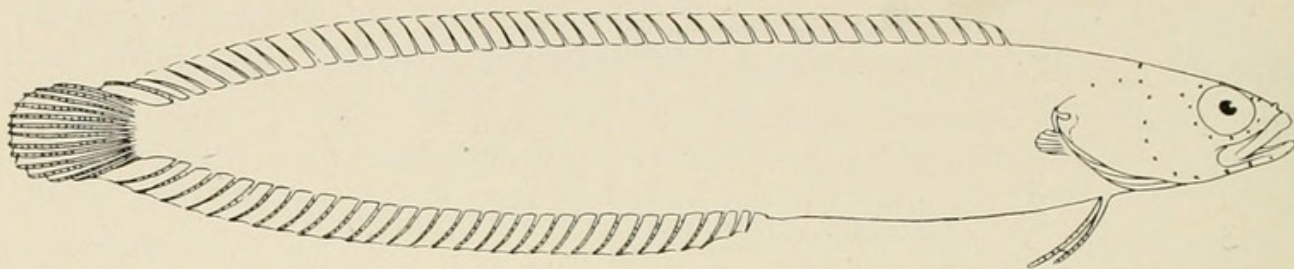


Fig. 30. *O. varius*.

Form and structure of the head and body similar to *O. pardalis*; the dentition of the two species is also similar, except that vomerine teeth form an angular row on the vomer instead of a broad patch as in *O. pardalis*.

Abdomen naked, the scales otherwise distributed as in *O. pardalis*: the form of the fins also is similar, but in *O. varius* the origin of the anal is not much nearer the snout than the base of the caudal.

Colour-markings. Light green or yellowish, with irregular dark lines and dots on the body, most prominent along the middle of the anterior half of the body, and below the base of the dorsal fin, but they are variable and may be absent: head darker, speckled with black dots; some light and dark bars radiating from the eye: vertical fins more or less variegated with light and dark markings, the ventrals with blackish annuli.

Described from four specimens 42-46 mm. long. The figure represents an example 45.2 mm. long, which is selected as the holotype. Two are females, and contain well-developed young, the eyes of which are visible through the abdominal walls; one specimen, on being dissected, was found to have twenty-three young curled up within the left oviduct, and about the same number in the right one; these were of somewhat different sizes, the largest being 7.5 mm. long.

This species is very similar to *O. pardalis*, differing principally in having fewer dorsal and anal spines.

Loc. Kangaroo Island. Coll. Waite, 1917.

OPHICLINUS PARDALIS sp. nov.

Plate iv, fig. 2.

D.lii, 1: A.ii, 39: P.6: V.i, 2: C.13.

Head 5.7 in the length to the hypural: depth 1.4, eye 5.0 in the head: snout equal to the interorbital space, 1.6 in the eye: inner ventral ray 1.7, last dorsal spine 3.5, last anal ray 2.7 in the head: pectoral 1.4 in the eye.

Elongate, compressed. Head about as deep as broad at the preoperculum, flattened above, and tapering to the pointed snout: lower jaw projecting beyond the upper: anterior nostril in a tube behind the lip: rows of pores surround the eye, nuchal and occipital regions, the margin of the preoperculum, mandible and snout: eye separated by the flat interorbital space, and situated in the anterior portion of the head: lips broad; maxillary reaching to below the hinder margin of the pupil, and expanded and rounded posteriorly: preopercular margin hidden: operculum without spines, the posterior lobe with a deep cleft: gill-membranes free from the isthmus: teeth proportionately large, forming broad bands in each jaw anteriorly, becoming uniserial laterally; they are obtusely conical, the outer rows slightly larger than the others: a broad patch of similar teeth on the vomer: tongue and palatines toothless.

Body covered with small scales, which are loosely imbedded and scarcely imbricate; their free edge appears to be slightly ciliated: they commence on the nape, and are very small on the sides of the abdomen: head scaleless.

Fins. Dorsal fin beginning well behind the end of the operculum; its spines increase in length backwards, and the single ray is connected with the caudal by membrane: origin of the anal almost twice as far from the tip of the caudal as from that of the snout; its rays are simple and increase in length backwards, the last united with the caudal: ventrals inserted beneath the middle of the operculum; the spine is completely hidden in the skin, and each ray is divisible basally, the inner the longer: pectoral minute, with rudimentary simple rays, and connected by a fold of skin with the upper lobe of the operculum: caudal obtusely pointed.

Colours. Light brown in spirits, with numerous lighter spots together with dark brown spots and longitudinal markings. Head reticulated with dark brown dots and lines radiating from the eye: two blackish streaks extend backwards, which are separated by a white interspace, the upper forming a large black blotch on the operculum: dorsal fin variegated with lighter and darker markings of irregular form, which are also present on the anal and caudal.

Described and figured from a single specimen, 80 mm. long, preserved in the South Australian Museum.

Loc. Streaky Bay, Great Australian Bight.

PERONEDYS Steindachner.

Peronedys Steindachner, Sitzb. Akad. Wiss. Wien, lxxxviii, 1884, p. 1083 (*P. anguillaris*, Steindachner).

Eucentronotus Ogilby, Proc. Linn. Soc. N.S. Wales, xxiii, 1898, p. 294 (*E. zietzi* Ogilby).

Body elongate and compressed, the head depressed. Scales minute, deeply imbedded, non-imbricate, and present on the caudal portion only; lateral line short. Head naked, with series of large open pores. Snout short, rounded; mandible projecting: mouth a little oblique, with thick lips; maxilla expanded distally, and largely exposed: no tentacles or barbels; anterior nostrils tubular: eyes supero-lateral: teeth small, conical, in several rows anteriorly in each jaw, uniserial laterally; vomerine teeth present, palatines toothless: gill-openings wide, the membranes united across the isthmus: pseudobranchiae present, gill-rakers rudimentary; six branchiostegals. A single dorsal fin composed almost entirely of spines, and confluent with the caudal: anal composed principally of simple rays, and united with the caudal: ventrals minute, jugular: pectorals vestigial, the rudimentary rays enclosed in a membrane which is united with the operculum.

PERONEDYS ANGUILLARIS Steindachner.

Peronedys anguillaris Steindachner, Sitzb. Akad. Wiss. Wien, lxxxviii, 1884, p. 1083.

Eucentronotus zietzi Ogilby, Proc. Linn. Soc. N.S. Wales, xxiii, 1898, p. 294.

Plate v, fig. 2.

Br.vi: D.lxxxi, 3: A.ii, 57: V.2: C.13.

Head and body 2.5 in the total length; head 7.6 in the same, and 2.07 in its distance from the vent: depth at the vent 14.2 in the total length, and 1.8 in the head: eye as long as its distance from the mandibular symphysis, 5.5 in the head: interocular space much narrower than the eye, 8.6 in the head: caudal 2.1 in the head.

Head depressed, with the gill-covers expanded, naked, with rows of open pores on the snout, occiput, round the eyes, preopercular margins, and on each side of the mandible; others extend along the groove above the opercles to the lateral line, and a series crosses the neck at its junction with the head: eye supero-lateral, situated in the anterior portion of the head, and separated from the maxilla by a narrow suborbital space; interorbital space concave: snout broadly rounded, its upper profile slightly convex; mandible projecting well beyond the premaxillaries: mouth a little oblique, with thick fleshy lips; maxilla expanded posteriorly, and almost reaching to below the hinder orbital border: anterior nostrils tubular, and projecting beyond the upper lip. About three rows of small conical teeth in front of each premaxillary, the outer only of which extends on to the side of the jaw: three or four rows of subequal conical teeth in the anterior part of the mandible; they become uniserial and larger laterally, and extend further back than those of the premaxillary: some spaced conical teeth on the vomer, most of which are arranged in a single curved series; palatines naked:

gill-membranes forming a free fold across the isthmus; gill-rakers represented by one or two minute tubercles on the first gill-arch.

Body very elongate, compressed, and wholly naked as far as the vent; thence minute non-imbricate and cycloid scales appear on the median line and gradually spread until they cover the posterior portion. Lateral line consisting of a short series of tubes on the humeral region: a groove extends along the middle of the body from the shoulder to near the tail, and less distinct ones occur near the bases of the dorsal and anal fins. Vent with two small papillae.

Fins. Dorsal low, commencing a short distance behind the head, the spines increasing in length backwards; the three simple rays are longer than the posterior spine, and united with the caudal: the anal commences just behind the vent, and its rays increase in length backwards; the last is united with the caudal: ventral jugular, shorter than the eye, the membrane apparently enclosing a single ray, which is divided to its base: no true pectoral, but a membrane enclosing rudimentary rays is present, and is connected with the opercular lobe: caudal obtusely pointed.

Colour-markings. Whitish in alcohol, with a sharply defined blackish-brown band extending from the snout to the tail, which covers the top of the head, back, dorsal fin, and upper portion of the caudal: another band, which is light anteriorly but becomes darker backwards, extends from the vent to the tip of the caudal, and covers the lower part of the body and the greater part of the anal: six more or less definite grey stripes extend backwards from the head, the upper of which are mostly distinct: sides of the head with three or four oblique, dark-edged stripes extending along each side of the head, and others are present on its upper surface.

Described and figured from a specimen 100 mm. long.

Identity. This specimen differs from Steindachner's description in several details. It has lxxxi spines and 3 rays in the dorsal, instead of lxxv, 5, and ii, 57 instead of ii, 52 in the anal, and apparently an additional ray in each ventral. The proportions of the eye and the snout are slightly different, and the vomer bears conical teeth instead of being smooth. In all other characters, however, it appears so similar to *P. anguillaris* that we believe it to be correctly identified with that species.

Synonymy. *Eucentronotus zietzi* Ogilby, is apparently synonymous with Steindachner's species: Ogilby counted lxxvii-lxxix, 4, and i, 57-59 spines and rays in the dorsal and anal fins, respectively, which numbers are intermediate between our count and that of Steindachner. He further found only four branchiostegals instead of six, and 2 instead of 3-4 rows of teeth anteriorly. His specimens had three ventral rays, ours appears to have two, while Steindachner

counted only one. Most of these differences are probably due to variation exhibited by the several specimens examined, while others are perhaps attributable to errors arising from the difficulty of accurately observing such small characters.

Loc. Kangaroo Island. *Coll.* Waite, 1917.

LEPIDOBLENNIUS Steindachner.

LEPIDOBLENNIUS MARMORATUS Macleay.

Lepidoblennius marmoratus (Macleay) McCulloch and McNeill, *Rec. Austr. Mus.*, xii, 1918, p. 24.

Plate v, fig. 3.

Five specimens, 107-126 mm. long, do not differ from the cotypes of the species, with which they have been compared. The largest example is figured.

Loc. Kangaroo Island. *Coll.* Waite, 1917.

Family BROTLIDAE.

DERMATOPSIS Ogilby.

Dermatopsis Ogilby, *Proc. Linn. Soc. N.S. Wales*, xxi, 1896, p. 138 (*D. macrodon* Ogilby).

Body rather elongate, compressed; partly covered with non-imbricate, small scales, which are approximate posteriorly but spaced anteriorly: lateral line represented by minute raised tubules. Head naked, with large open pores on the opercles, mandible, and suborbital regions; snout rounded, with large openings and foliaceous lobes; no barbels: mouth slightly oblique, the jaws subequal; maxilla expanded, with an obtuse spine on its lower margin: a band of villiform teeth on the premaxillaries, and some larger ones near the symphysis; mandible with a band of villiform teeth anteriorly, and an inner series of large spaced teeth: an angular series of pointed teeth on the vomer, the exterior of which are enlarged; a triangular patch of pointed teeth on each palatine: tongue pointed, free at the tip: gill-openings broad, lateral, the membranes united with the isthmus; seven branchiostegals: no pseudobranchiae; gill-rakers reduced to minute spinous tubercles: eyes small: opercles covered by a continuous skin, the operculum with a strong spine, which pierces the membrane. Dorsal and anal fins with branched rays, and distinct from the caudal; pectoral well developed: ventrals close together behind the isthmus, each with a single ray. Viviparous.

Ogilby mentioned a spinous tubercle in front of the dorsal fin, regarding it as an anterior dorsal: dissection proves this to be merely the end of a neural spine, pressing against the skin owing to the shrivelled condition of the specimen. The isthmus is also described as wide, whereas it is narrow.

Affinities. *Dermatopsis* is allied to *Dinematichthys* Bleeker, but differs in its squamation, the head being wholly naked, and the anterior body-scales widely spaced.

DERMATOPSIS MULTIRADIATUS sp. nov.

Plate v, fig. 4.

D.102-104: A.62-65: P.19-20: V.1: C.15.

Depth 7.04 in the length to the hypural joint; head 5.4 in the same: eye 2 in the snout, and 1.6 in the interorbital space: this is slightly less than the snout, which is 4.5 in the head: breadth between pectoral bases 1.4 in the depth: posterior dorsal rays higher than those of the anal, 2.2 in the head: pectorals and ventrals of equal length, 1.8 in the head.

Head naked, compressed, the snout obtuse: eye distinct, covered with membrane: nostrils are large openings in broad tubes: snout with convoluted dermal lobes surrounding large pores above the upper lip; lower lip fringed, several large openings below the mandibular symphysis. A series of spaced open pores extends from the preopercular angle on to the side of the mandible; a minute tubular pore on the nape behind the eyes, and another at the shoulder: maxilla extending backward far behind the eye; its greatest breadth is less than the length behind the marginal spine: opercular spine well developed: a narrow band of villiform teeth in each premaxillary, those near the symphysis slightly enlarged, and some larger depressible ones behind them: a narrow villiform band in the maxilla, and an inner series of enlarged spaced teeth extending backwards: an angular series of pointed teeth on the vomer, the outermost enlarged: palatines with three rows of similar teeth, the inner series being largest: tongue obtusely pointed, the tip free: isthmus narrow, the gill-membranes sometimes forming a narrow fold across it.

Body covered with minute cycloid scales, which are juxtaposed posteriorly, but spaced anteriorly; they commence behind the pectoral fin on the middle of the sides, and gradually expand backward towards the dorsal and anal surfaces. Lateral line very indistinct, and consisting of minute tubules arising from a linear canal; this curves upwards from the shoulder and descends to the middle of the side some distance behind the pectoral fin. Male urinogenital aperture large, with three horny claspers, two being directed outward at right-angles from their bases, and the median one backward; the latter bears a procurved spine at its tip.

Fins. Dorsal commencing over the middle of the pectorals, and increasing gradually in height backward; the last rays united with the extreme base of the caudal by membrane: anal similar to the dorsal, its origin behind the middle of the total length: pectoral broadly rounded, and reaching less than one-third of

its distance from the vent: ventrals filiform, inserted a little behind the vertical of the preopercular margin: caudal rounded.

Colours. In alcohol greyish-brown on the back, lighter on the sides, and white below. Fins lighter than the body.

Described from two males and two females, 76-83 mm. long, the largest of which is figured and selected as the holotype.

A female 77 mm. long contained three perfectly-formed embryos, each 28 mm. in length, which occupied the greater portion of the abdominal cavity. Two faced forward and one backward, and their tails were curved round at about two-thirds of their length in each case: they showed distinct pigmentation along the back: similarly large embryos of an allied form, *Lucifuga subterranea* Poey, are illustrated by Jordan (4).

Affinities. This species is very similar in its major structures to *Dermatopsis macrodon* Ogilby, but differs in having a much larger number of dorsal and anal rays. The maxilla is broader posteriorly, and the dentition weaker than in that species.

Loc. Kangaroo Island. Coll. Waite, 1917.

Family SCORPAENIDAE.

NEOSEBASTES PANTICA sp. nov.

Plate iv, fig. 1.

D.xii, i, 8: A.iii, 5: V.i, 5: P.20-21: C.15: L.lat.37: Sc.62.

Head 2.6 in the length to the hypural joint, height 2.5 in the same: eye 3.05 in the head: snout 1.6, interorbital space 2.5 in the eye: third dorsal spine 1.2, anterior dorsal ray 1.8, third anal spine 1.6, anterior anal rays 1.5 in the head.

Cephalic spines. A large nasal spine above the anterior nostril: a small antero-superior orbital spine: four over the posterior portion of the orbit increasing in size backward: one small posterior spine and several spinules: a large nuchal spine extending obliquely backward on each side, and a smaller one on the suprascapular: a large spine above the suspension of the preoperculum, which may be bilobed: preorbital with two strong marginal spines, and two on its upper surface: suborbital stay with three or four spines: a long preopercular spine, with another surmounting its base: inferior preopercular margin quadrispinate: two opercular spines, one near the upper angle, and one projecting backward: no median opercular spine.

Head covered with rough scales, leaving only the snout, interorbital groove, nuchal groove, and mandible naked: interorbital space deeply concave, with two bony ridges diverging backward: some rough scales separate this area from the

(4) Jordan, Guide to the Study of Fishes ii, 1905, p. 524, fig. 479.

nuchal groove, which is rather deep, and extends outward and backward to above the preoperculum: nostrils close together, the anterior with raised margins and a tentacle: maxillary reaching back nearly to below the middle of the eye; its upper surface covered with rough scales, its hinder margin obliquely truncate: mandible projecting beyond the upper jaw, it has three large pores on each ramus, and one at each side of the symphysis: bands of villiform teeth in the jaws, the upper of which are broader than the lower; a v-shaped patch on the vomer, and an elongate band on each palatine.

Back elevated anteriorly. Body covered with moderately large, ctenoid scales, which do not extend on to the fins; they are smaller on the base of the pectoral and thorax than elsewhere: there are sixty-two rows below the lateral line between its origin and the hypural joint, eight being in advance of the end of the operculum; only thirty-seven are pierced by the lateral line, which is curved only quite anteriorly, and then runs almost straight to the base of the caudal: about nine scales between the base of the fifth dorsal spine and the lateral line.

Fins. Dorsal commencing above the base of the preopercular spine; third spine longest, the following decreasing evenly to the tenth, the eleventh and twelfth being abruptly shorter; the thirteenth is about half as long as the first ray: margin of the soft dorsal rounded: all the spines of the fins are grooved: anal commencing below the anterior dorsal rays, and terminating behind the posterior rays; second spine very strong, more than three-fourths as long as the first ray; margin of the soft portion rounded: pectoral reaching the vertical of the vent; the rounded margin is broken by the fourteenth to sixteenth rays, which project a little beyond the others; the lower rays are thickened and more or less branched: ventrals reaching a little beyond the vent: caudal rounded.

Colour-markings. Much bleached after long preservation, but with well-defined, reddish-brown areas on the body; one forms a saddle below the fifth to eighth dorsal spines, and extends to below the lateral line; other markings occur below the tenth to eleventh spines, the anterior, and the posterior dorsal rays: the membrane between the third to eighth dorsal spines is largely black: the second dorsal has a broad dark band near its margin, and there is also a basal spot: pectoral, caudal, and ventral fins each with a broad dark band on their distal halves, the two former with light margins.

Described and figured from a specimen 188 mm. long. It is allied to *N. panda* Richardson, but differs in having the lateral line much less arched anteriorly, in lacking a spine on the centre of the operculum, and in having much shorter pectoral fins, which are not evenly rounded.

Loc. Spencer Gulf, South Australia.

Family GOBIESOCIDAE.

DIPLOCREPIS COSTATUS Ogilby.

Diplocrepis costatus Ogilby, Proc. Linn. Soc. N.S. Wales x., 1885, p. 270.

Waite, Rec. Austr. Mus. v, 1904, p. 179, pl. xxiv, fig. 1.

Several specimens from St. Vincent Gulf and Spencer Gulf, South Australia, do not differ from the types in the Australian Museum, with which they have been compared.

The number of fin-rays varies considerably in this species: in nine specimens obtained near Sydney we find D.7-10: A.6-8: C.11-13: V.4: P. about 22.

Family ANTENNARIIDAE.

This family is represented in southern Australian waters by several aberrant species, which appear to differ from the typical *Antennarius* sufficiently, in their dermal armature and fin-structures, to demand the erection of new genera for their reception. Their principal characters are tabulated in the following key to the Australian genera of the subfamily Antennariinae:

- a. Gill-openings pore-like, anal opposite the end of the dorsal.
- b. Dorsal and anal separated from the caudal, the peduncle free.
- c. Skin granular or bristly.
- d. Second spine enveloped in skin.
 - e. First spine smooth, rod-like; 11-13 rays *Antennarius*
 - ee. First spine bristly, thick; 15 rays ... *Echinophryne*
 - dd. Second spine free, bristly like the first; 13-14 rays ... *Trichophryne*
- cc. Skin smooth, with cutaneous appendages.
 - f. First spine long, placed on the snout ... *Rhycherus*
 - ff. First spine short, placed on the base of the second ... *Pterophryne*
- bb. Dorsal and anal united with the caudal peduncle and bases of the rays.
 - g. Skin smooth or spiculate; first spine smooth, rod-like *Histiophryne*
- aa. Gill-openings tubular: anal behind the dorsal ... *Tathicarpus*

ECHINOPHRYNE gen. nov.

An Antennariid with fifteen dorsal rays, and the skin thickly beset with large, upstanding, bifurcate spinules: depressible, cardiform teeth are arranged in several rows in the anterior portion of each jaw, which become uniserial laterally; similar teeth in several rows form an oblique group on each side of the vomer; anterior portion of palatines with smaller teeth, which are also present

on each side of the tongue: eye small: mouth oblique, maxillary naked posteriorly: first dorsal spine thick and spiny, terminated by a minute fleshy process: second and third spines well developed and covered with skin: soft dorsal high and long, with fifteen rays: anal opposite the end of the dorsal, with eight to ten rays: pseudobranchium large and mobile, with the pore-like gill-opening placed below the middle of its length.

Enlarged spines on each side of pores define a mucigerous system on the head and body: these commence before the eye, and extend backward to above the shoulder; thence they curve downward to a point above the origin of the anal, and disappear on the lower portion of the tail; another row extends from the mandibular symphysis, and running backward, bifurcates, one branch extending around the preopercular border, and the other towards the pseudobranchium.

Type. *E. crassispina* sp. nov.

This genus differs from *Antennarius* in having fifteen instead of twelve dorsal rays, and its anterior spine is thick and spiny instead of tentacular: the spinate skin distinguishes it from *Histiophryne* Gill.

ECHINOPHRYNE CRASSISPINA sp. nov.

Plate vi, fig. 2.

D.i, i, i, 15: A.8-10: P.10-11: V.5: C.9.

Depth 1.7 in the length to the hypural joint; head, to end of operculum, 2.6-2.9 in the same: eye 1.2-1.5 in the snout: first dorsal spine 7 in the head.

Body deep, compressed, the back elevated. Head deeper than long: mouth oblique, maxillary reaching to below the posterior margin of the eye: eye small, rounded: nostrils superolateral, the anterior with a low skinny margin: skin everywhere covered with upstanding prickles, which are usually bifurcate spines, but are sometimes trifurcate; they are of unequal size, larger prickles being evenly distributed among the surrounding smaller ones. The mucigerous system of pores is defined by rows of large bifurcate spines placed on each side of the openings; enlarged spines form three groups on the upper portion of the maxillary, and a few are present on the cheek.

First dorsal spine comparatively thick and covered with spines; it is about as long as the distance between the tip of the snout and the hinder border of the eye, and only its extreme tip is fleshy: second and third spines well developed, the second a little longer than the first, the third much larger: the rays of all the fins except the caudal are simple: median rays of the soft dorsal slightly longer than the others, the last separated by a wide space from the caudal: anal short, rounded, and well separated from the caudal: pectoral, ventral and caudal rounded, the latter with bifurcate rays.

Colour-markings. A white patch is present on the interorbital space between the bases of the second and third spines, and a larger one below the anterior dorsal rays; two more are below the middle of the dorsal, and a smaller one on the caudal peduncle, and one above the pectoral base: some darker markings surround the lighter areas, and there is a brownish, submarginal band on the soft dorsal.

Described from three specimens 37-46 mm. long: the largest is figured, and is selected as the holotype; it is preserved in the South Australian Museum.

Loc. Spencer Gulf, South Australia; holotype. Western Port, Victoria; paratypes.

TRICHOPHRYNE gen. nov.

Skin closely covered with long, spiniform bristles, which are mostly bifurcate: teeth large, cardiform, and depressible, arranged in about two rows in each jaw anteriorly; two groups of vomerine teeth, palatine and lingual teeth also present. Dorsal spines separate, the first and second free and spinate, the third enveloped in skin: soft dorsal with 13-14 rays, anal opposite the end of the dorsal with 8-9 rays; caudal peduncle free: gill-opening a simple pore below the middle of the pseudobranchium: mucigerous system consisting of series of simple pores opening between two small spines, their course defined by arborescent tentacles placed upon the adjacent bristles; a series extends from behind the nostrils to the shoulder, and forms a lateral line on the body curving downward to above the anterior anal rays, and thence along the lower portion of the caudal peduncle; others extend backward from each side of the mandibular symphysis, and follow the curves of the opercular borders, while some are present on the cheek and above the maxillary.

Type. *Antennarius mitchellii* Morton.

This genus is closely allied to *Antennarius*, but differs in having the second spine as free as the first, and both covered with bristles: the development of the dermal bristles is also greater than is usual in *Antennarius*.

TRICHOPHRYNE MITCHELLII Morton.

Antennarius mitchellii Morton, Proc. Roy. Soc. Tasm. 1896 (1897), p. 98.

Plate vi, fig. 1.

D.i, i, i, 13-14: A.8-9: P.10-11: V.5: C.9.

Depth 1.8-2.0 in the length to the hypural joint; head 3.0-3.5 in the same: eye shorter than the snout, which is 4.0-4.4 in the head: first dorsal spine slightly shorter than the second, and 1.5-1.6 in the head.

Body moderately deep and thick, the back elevated anteriorly. Mouth sub-vertical, the maxillary reaching backward to below the eye and hidden in a fold of skin: eye small, round, and projecting above the cheek, which is deeply hollowed beneath it: teeth long, cardiform, and depressible; they are arranged in two series on the anterior part of the premaxillaries, but become uniserial laterally, the inner ones much the larger; mandibular teeth much larger, biserial, becoming uniserial posteriorly; two rows of similar teeth on each side of the vomer and on the palatines; somewhat smaller teeth on the tongue and pharyngeals.

Skin thickly covered with long, upstanding, bifurcate, spiniform bristles; they are enveloped in membrane in well-preserved specimens, only their points projecting: they extend on to the rays of all the fins, but are replaced by soft tentacles on the distal portions of the caudal and anal.

Fins. First dorsal spine slender, covered by bifurcate bristles, which form a cluster at its tip, together with some dermal tentacles: second spine similar to the first, but with larger bristles: third spine enveloped in thick skin and connected with the back by membrane: soft dorsal formed of simple rays, the tips of which project beyond the membrane; the median ones are the highest: anal opposite the end of, and terminating behind, the soft dorsal; the median rays are highest, and equal to those of the dorsal: pectorals and ventrals rounded, with thick simple rays which are bristly on their upper surfaces: caudal rounded, with bifurcate rays.

Colour-markings. Whitish, with dark brown and blackish markings; the most striking are two oblique spots between the bases of the anterior dorsal rays and the pectoral, another below the middle of the soft dorsal, and one at the base of the posterior dorsal ray: a quadrangular line encloses a white area on the cheek: a doubly-curved line crosses the nape, and numerous spots and oblique bars are present on the sides: soft dorsal with an inframarginal row of grey blotches, and some darker ones towards its base.

Described from two specimens 80 and 109 mm. long, the smaller of which is well preserved, but the larger is a beach-dried example: the figure is unfortunately based on the latter, but correctly illustrates the characters of the species.

In identifying them as *A. mitchellii* Morton, we rely less upon the description of that species than upon notes, and a sketch made by one of us from the type, which is preserved in the Tasmanian Museum. The great length of the bristles and the character of the first and second dorsal spines readily distinguish it from any other Australian species.

Loc. The larger specimen was found by one of us on Brighton beach, South Australia: the smaller was obtained by the Federal trawler "Endeavour," off Wilson's Promontory, Victoria.

RHYCHERUS Ogilby.

Rhycherus Ogilby, Proc. Roy. Soc. Qld., xx, 1907, p. 17. McCulloch, Mem. Qld. Mus., v, 1916, p. 68.

Skin without spines, but more or less thickly covered with fleshy tubercles and tentacles or cutaneous appendages, which also extend on to the fins: teeth rather large, cardiform, and depressible; they are arranged in several rows anteriorly, and become biserial laterally in each jaw; they form two groups on the vomer: palatine and lingual teeth also present: nostrils in a raised protuberance: dorsal spines separate, the first with a slender, naked rod; second and third largely free, mobile, and covered with skin and numerous tentacles: soft dorsal high, with about thirteen rays; anal opposite the end of the dorsal, with about eight rays; posterior dorsal and anal rays well separated from the caudal, leaving the peduncle free: gill-opening a simple pore below the middle of the pseudo-brachium: mucigerous system not evident, hidden by the dermal tentacles.

Type. *R. wildii* Ogilby (*R. filamentosus* Castelnau).

RHYCHERUS FILAMENTOSUS Castelnau.

Chironectes filamentosus Castelnau, Proc. Zool. Soc. Vict., i, 1872, p. 244, and ii, 1873, p. 65.

Antennarius filamentosus Macleay, Proc. Linn. Soc. N.S. Wales, v, 1881, p. 579.

Chironectes bifurcatus McCoy, Prodr. Zool. Vict., Dec. xiii, 1886, pl. cxxiii.

Lucas, Proc. Roy. Soc. Vict. (2) ii, 1890, p. 27.

Rhycherus bifurcatus Ogilby, Proc. Roy. Soc. Qld., xx, 1907, p. 19.

Rhycherus wildii Ogilby, *Loc. cit.*, p. 18.

Rhycherus filamentosus McCulloch, Mem. Qld. Mus., v, 1916, p. 68.

Plate vi, fig. 3, and text figure 31.

Description of two specimens 127 and 162 mm. long.

D.i, i, i, 13: A.8: P.11: V.5: C.9.

Depth 1.4-1.7 in the length to the hypural joint; head 2.7-2.8 in the same: bulge of the eye equal to the length of the snout, which is 4.6-4.8 in the head: first and third spines subequal in length, and about as long as the highest rays: second spine shorter than, or as long as, the others: median anal rays not so high as those of the dorsal: caudal fin equal to or slightly longer than the head.

Body deep and rather thick, the back elevated anteriorly; head deeper than long: mouth subvertical; maxillary expanded posteriorly, and reaching backward to below the hinder portion of the eye: eye small, rounded, and projecting; cheek deeply hollowed below it: nostrils superolateral, and opening into a raised protuberance: skin quite unarmed, but thickly covered with rounded, fleshy tubercles, from which arise cylindrical tentacles of varying lengths, and which are more or

less branched; these are very evident in a well-preserved example, but are shrunk and largely lost in old spirit specimens: mucigerous system hidden by the dermal structures.

Teeth rather large, cardiform and depressible: they are arranged in two or three rows on the anterior part of the premaxillaries, behind which is a short series of larger teeth on each side; they become smaller backwards and biserial: mandibular teeth in three or four rows anteriorly, and narrowing to a single row posteriorly: two widely separated groups of vomerine teeth, and a small patch on each palatine; some smaller teeth on each side of the tongue.

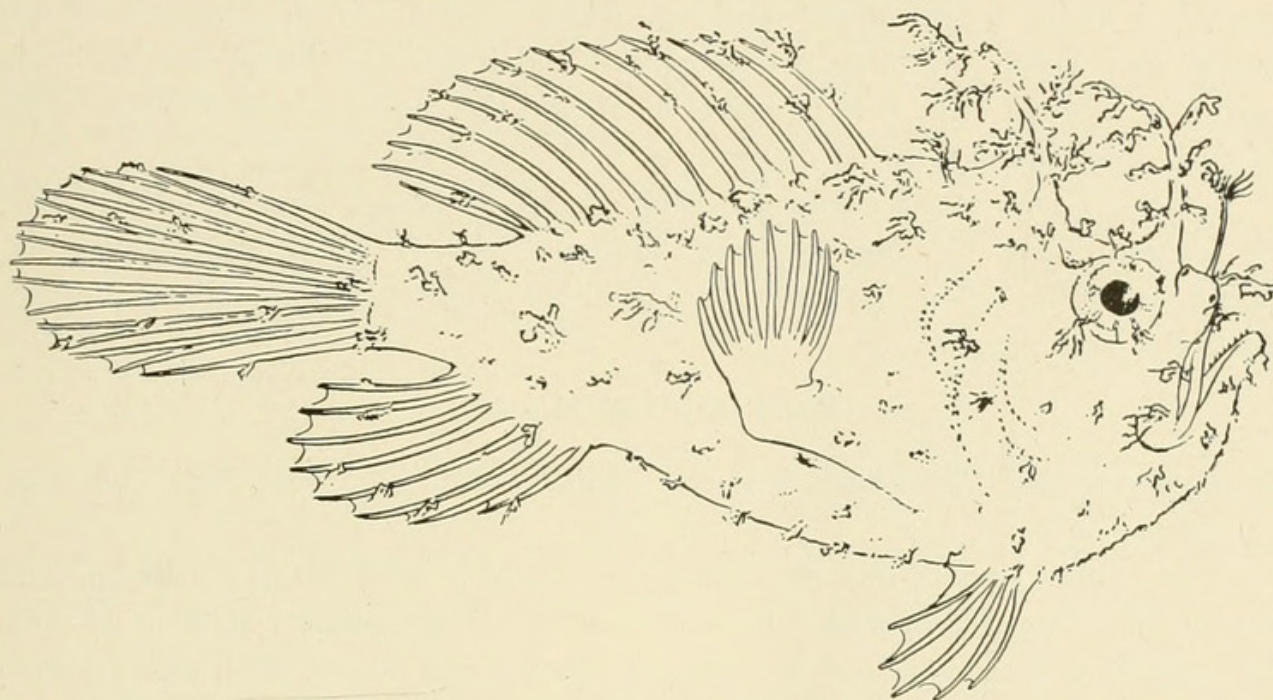


Fig. 31. *Rhycherus filamentosus*.

Fins. First dorsal spine a slender, naked rod, terminated by two fleshy tentacles with a petiolate flap at their base, which covers a group of minute tentacles: second and third spines thickly covered with branching tentacles, and terminated by a bunch of tubercles (the second spine is longer than the first and ends in a knob and not as in the specimen figured, which is damaged): soft dorsal high, its rays mostly simple, but subdivided posteriorly; they bear rounded tubercles along their length, and the anterior ones are provided with branched tentacles: anal opposite the end of, and terminating somewhat behind, the soft dorsal; its median rays are longest, and some are weakly divided: caudal rounded, its rays mostly bifurcate: pectorals and ventrals rounded, with thick, simple rays.

Colour-markings. Back blackish, with three broad bars descending on to the white of the sides; the first covers the post-orbital portion of the head, the second extends to behind the pectorals, and the third is below the end of the dorsal: some scattered dark markings are also present on the sides, while striking

white markings occur on the nape, behind the eye, and on the cheek: dorsal and caudal with dark pencillings between the rays.

Young (figure 31). A small example 41 mm. long, differs in being much more elongate, its depth being 2.07 in the length to the hypural joint: the caudal fin is distinctly longer than in the adults, and the eye is larger: the first spine is much shorter than the second, and is terminated by a bunch of tentacles of various sizes: its cutaneous appendages are less numerous than in larger examples, which, however, may be due to its imperfect preservation.

Colour variation. Another specimen, 113 mm. long, differs from the adults described above in its colour-marking, which consists of an almost uniform lighter and darker marbling over the head and body: the dorsal and anal fins each bear a broad, dark inframarginal band, and the caudal has about three rows of dark, inter-radial spots on its distal half.

Locs. Kingscote, Kangaroo Island (Adult specimen, figured). Wallaroo, St. Vincent Gulf (Young specimen, figured). Corny Point and Palmerston, South Australia. This species is also recorded from the Swan River, Western Australia, and Victoria.

HISTIOPHRYNE Gill.

Histiophryne Gill, Proc. Acad. Nat. Sci. Philad., 1863, p. 90; and Proc. U.S. Nat. Mus. i, 1879, p. 222.

Skin either smooth or with microscopic spicules: teeth large, cardiform, and depressible; they are arranged in several rows on the anterior portion of each jaw, and form two groups on the vomer; palatine and lingual teeth also present: dorsal spines separate, the first with a slender, naked rod; second and third spines enveloped in thick skin, and either well-developed or merely tubercular: soft dorsal high and long, with 14-15 rays, the last almost or quite united with the tail by membrane: anal opposite the end of the dorsal, with 8-9 rays, the last more or less united to the caudal base: gill-opening a small pore below the middle of the pseudobranchium: mucigerous system defined by minute pores with skinny tentacles on each side of them; they form a lateral line which is arched from the shoulder to above the anal fin, and is lost on the lower portion of the tail; others are arranged in regular series on the head.

Type. *Chironectes bougainvilli* Cuv. and Val.

HISTIOPHRYNE BOUGAINVILLI Cuv. and Val.

Chironectes bougainvilli Cuvier and Valenciennes, Hist. Nat. Poiss. xii, 1837, p. 431.

Antennarius bougainvillii Günther, Brit. Mus. Cat. Fish. iii, 1861, p. 199.

Histiophryne bougainvillii Gill, Proc. Acad. Nat. Sci. Philad., 1863, p. 90, and Proc. U.S. Nat. Mus. i, 1879, p. 222.

Plate vii, fig. 1.

D.i, i, i, 15: A.8: P.8: V.5: C.9.

Depth 1.5 in the length to the hypural joint; head 2.5 in the same: eye equal to the length of the snout, 5.1 in the head: first dorsal spine slightly longer than the eye.

Body short, deep, and thick: back elevated anteriorly, the head much deeper than long: mouth very oblique, the gape extending to below the anterior portion of the eye; maxillary hidden in a skinny fold: eye small, round: nostrils supero-lateral, the anterior with a low skinny margin: skin smooth, without spinules (see notes under variation), except on the dorsal spines: mucigerous system defined by small pores with skinny lobes on each side of them; they commence on the snout and curve over the eye to the shoulder, where they form the lateral line which curves downward to above the anterior part of the anal, and is lost on the lower portion of the tail; another series extends backward from the mandibular symphysis around the preopercular margin; about four pores are present above the upper lip, and others cross the cheek and the nape.

Teeth large, cardiform, and depressible: they are arranged in two rows on the anterior part of the upper jaw, the inner ones being much larger than the others: mandibular teeth larger, biserial: a patch of large teeth on each side of the vomer, smaller ones on the anterior part of each palatine, and others on each side of the tongue.

Fins. First dorsal spine free, short and slender, with spinules at its base, and a fleshy knob at its tip: second and third spines scarcely projecting, tubercular, and covered with spinules; a thick membrane connects the third with the soft dorsal: the latter is formed of simple rays which increase slightly in length to about the twelfth; the last ray is united by membrane to the basal third of the upper caudal ray: anal opposite the end of the soft dorsal, its last ray united with the basal portion of the lower caudal ray: pectorals, ventrals and caudal rounded, the last with bifurcate rays.

Colourless after long preservation in alcohol.

Described from a specimen 41 mm. long, which is without *data*: it is well preserved, and appears to agree with the description of *H. bougainvilli*, which was also from an unknown locality.

Variation. Two other specimens in the South Australian Museum are apparently identical with this species, though they differ greatly in appearance owing to their indifferent state of preservation: one is greatly compressed and shrunk, and the skin is beset with microscopic spinules; the anal and pectorals each have nine rays: the other specimen is very robust but distorted, and its skin

is closely covered with minute spicules; it is uniformly speckled with small brown dots, which extend on to the fins.

Loc. Both specimens were taken in St. Vincent Gulf, South Australia.

HISTIOPHRYNE SCORTEA sp. nov.

Plate vii, fig. 2.

D.i, i, i, 15: A.8: P.11: V.5: C.9.

Depth 1.9 in the length to the hypural joint; head, to end of operculum, 3.2 in the same: eye 1.6 in the snout: first dorsal spine 3.0 in the head.

Body rather longer than is usual in the family, and compressed: back elevated anteriorly, head deeper than long: mouth oblique, the gape extending to below the hinder portion of the eye; maxillary hidden by a skinny fold when the mouth is closed: eye small, round: nostrils supero-lateral, the anterior with a low skinny margin: skin leathery, without spines but closely covered with minute dermal tubercles: mucigerous system defined by small pores with skinny lobes on each side of them: they commence on the snout and curve over the eye to the shoulder, where they form the lateral line which curves downward to above the anterior portion of the anal and is lost on the lower portion of the tail; another series extends backward from each side of the mandibular symphysis, and branching, sends one series around the preopercular border and the other around that of the operculum: about four pores are present above the upper lip, and some are distributed on the cheeks.

Upper jaw with two rows of depressible, cardiform teeth anteriorly, which become uniserial on the sides; teeth of the lower jaw similar but much larger: a patch of teeth on each side of the vomer and on the palatines, and a few teeth on each side of the tongue: gill-opening a simple pore below the middle of the pseudobranchium.

Fins. First dorsal spine tentacular; a slender rod with a fleshy tip; it is placed just before the base of the second: second spine enveloped in thick, fleshy skin, and free; its base is in advance of the eye: third spine similar to the second, but smaller and largely united with the back: soft dorsal formed of simple rays, the median of which are the longest; the last is joined to the base of the upper caudal ray by membrane: anal opposite the end of the soft dorsal, its last ray almost united with the caudal base: pectorals, ventrals and caudal rounded, the last with bifurcate rays.

Colour-markings. Dark brown in alcohol, with the fins darker. A white quadrangular patch on the nape behind the second dorsal spine, and an angular white bar from the anterior dorsal rays to the shoulder; a large white spot below the middle of the soft dorsal, another in the axilla, and a minute one on the caudal peduncle.

Described and figured from a specimen 62 mm. long, which is selected as the holotype: a second (paratype) of about the same size differs only in having its white markings less definite though similarly disposed: a third example, only 28 mm. long, is similarly coloured, with the addition of some white markings below the eye and around the mouth; the second and third dorsal spines are more slender, and freer from the back: all differ greatly in general form from *H. bougainvilli*, not only in being much longer but also in having the second and third dorsal spines better developed, and the dorsal and anal fins almost free from the caudal.

Loc. Stansbury, St. Vincent Gulf, South Australia.

HISTIOPHRYNE SCORTEA, var. INCONSTANS, var. nov.

Twenty-one specimens, 26-64 mm. long, appear to be structurally similar to the three described above, but differ greatly in their colour and markings: all are light-coloured with more or less abundant whitish, irregular markings and blackish spots; darker marblings may or may not be present. The extent and disposition of their markings are exceedingly variable, and are differently arranged on the two sides of any one individual: the first dorsal spine may have a bunch of short tentacles at its tip in addition to the fleshy knob, and the second dorsal has sometimes only fourteen rays: they are evidently only colour variations of *H. scortea*, which may be recognized under the varietal name *inconstans*.

Loc. St. Vincent Gulf; Kingscote, Kangaroo Island, South Australia.

Family BRACHIONICHTHYIDAE.

SYMPTERICHTHYS Gill.

Sympterichthys Gill, Proc. U.S. Nat. Mus. i, 1879, p. 221-222.

Skin without spines, but covered with dermal tubercles: teeth small, cardiform, depressible, arranged in several series in each jaw anteriorly; palate and tongue toothless: first dorsal spine a slender, naked rod, terminated by a bunch of foliaceous appendages; it is quite free from the second and third, which are united by membrane and form a cristiform fin: second dorsal long, with 13-16 rays: anal opposite the end of the soft dorsal, with 6-9 rays; posterior rays of the dorsal and anal united by membrane with the caudal peduncle: gill-opening a small tubular pore above the posterior angle of the pseudobranchium: mucigerous system defined by rows of paired tubercles; a series commences above the eye and curves backward to the shoulder, and thence along the side of the body above the median line; another series extends backward from each side of the mandibular symphysis towards the pseudobranchium; others are present above the maxillary, and on the cheek and operculum.

Type. *Lophius laevis* Lacépède.

In distinguishing this genus from *Brachionichthys*, Gill relied upon the partial connection of the three dorsal spines and the soft portion by membrane, as described by Cuvier in his *Chironectes unipennis* (5). This character, however, was not noted by Lacépède in his original definition and figure of the same specimen (6), and we therefore consider it requires verification: if it is found that a membrane is really present between the fins of *S. unipennis* (*S. laevis*), the above definition will not apply to *Symptericichthys*.

SYMPTERICHTHYS VERRUCOSUS sp. nov.

Plate vii, fig. 3.

D. i, ii, 13-14: A.6: P.7-8: V.4: C.9.

Depth 2.2-2.5 in the length to the hypural joint: head 3.0 in the same: eye subequal to the length of the snout, which is 3.6 in the head: first dorsal spine 1.4-1.5, the second almost equal to the length of the head.

Body comparatively long and compressed, the back elevated anteriorly: mouth oblique, the maxillary reaching back to behind the vertical of the pupil; it is narrow posteriorly and hidden in a fold of skin: eye of moderate size, round: nostrils superolateral, opening on each side of a low protruberance: skin smooth in one specimen, raised into low tubercles in the other, which extend on to the fins: teeth small, depressible, almost villiform, forming a band of three or four rows anteriorly in each jaw which becomes narrow laterally; palate and tongue toothless, but covered with upstanding dermal papillae which resemble teeth.

Fins. First dorsal spine wholly free, terminated by a bunch of foliaceous appendages: second spine arising above the nostrils, and enveloped in a thick membrane, which also encloses the third and extends backward to the nape: soft dorsal formed of simple rays enclosed in a thick membrane; each ray readily splits into two along its median longitudinal line in both specimens: anal rays increasing in length to the penultimate; the membrane from the posterior dorsal and anal rays united with the peduncle almost or quite to the vertical of the hypural joint: caudal rounded, its inner rays bifurcate. Pectorals and ventrals rounded, formed of thick, simple rays.

Colour-markings. Brownish in alcohol, with lighter and darker areas: a large whitish blotch above the gill-opening, and another below the anterior dorsal rays: indefinite brown markings on the head below the eye, on the anterior portion of the back, and covering the abdomen: first dorsal with a dark basal spot, and a larger one on its upper third: an oblique dark marking covers the

(5) Cuvier, Mem. Mus. Hist. Nat., iii., 1817, p. 435, pl. xviii, fig. 3.

(6) Lacépède, Ann. Mus. Hist. Nat., iv, 1804, pp. 202, 210, pl. lv, fig. 4.

base of the tail, the posterior dorsal rays, and all the anal fin: distal portions of the caudal and pectoral fins blackish.

Described from two specimens 41 and 45 mm. long, the larger of which is figured and selected as the holotype. The reduced number of dorsal rays distinguishes this species from its allies.

Loc. St. Vincent Gulf, South Australia.

Explanation of Plates ii-vii.

Plate ii.

- Fig. 1. *Nannoperca australis* Günther. A specimen 65 mm. long, from near Narrandera, New South Wales.
Fig. 2. *Glyphisodon victoriae* Günther. A specimen 176 mm. long, from St. Vincent Gulf, South Australia.
Fig. 3. *Rhinogobius lateralis* Macleay. A specimen 78 mm. long, from Noarlunga, South Australia.

Plate iii.

- Fig. 1. *Mugilogobius galwayi* sp. nov. Holotype, 67 mm. long, from Patawaulunga, near Adelaide, South Australia.
Fig. 2. *Helcogramma decurrens* sp. nov. Holotype, 57 mm. long, from St. Vincent Gulf, South Australia.
Fig. 3. *Trianectes bucephalus* sp. nov. Holotype, 67 mm. long, from Spencer Gulf, South Australia.

Plate iv.

- Fig. 1. *Neosebastes pantica* sp. nov. Holotype 188 mm. long, from Spencer Gulf, South Australia.
Fig. 2. *Ophiclinus pardalis* sp. nov. Holotype 80 mm. long, from Streaky Bay, Great Australian Bight.

Plate v.

- Fig. 1. *Syngnathus curvirostris* Castelnau. A specimen 164 mm. long.
Fig. 2. *Peronedys anguillaris* Steindachner. A specimen 100 mm. long.
Fig. 3. *Lepidoblennius marmoratus* Macleay. A specimen 126 mm. long.
Fig. 4. *Dermatopsis multiradiatus* sp. nov. A specimen 83 mm. long.
All from Kangaroo Island, South Australia.

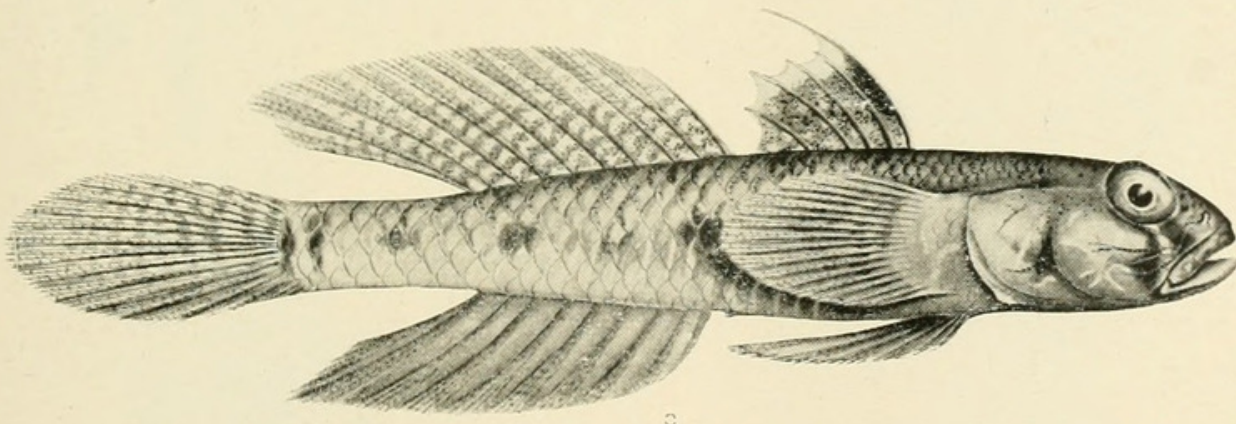
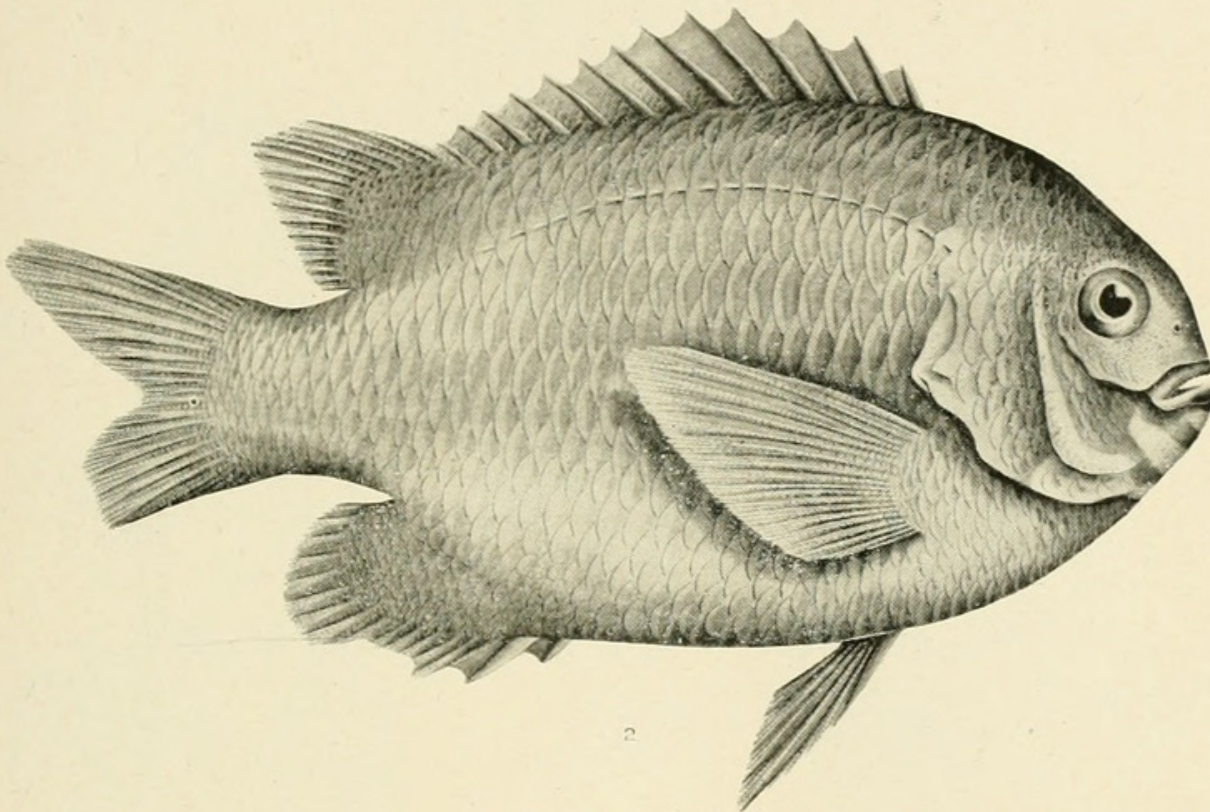
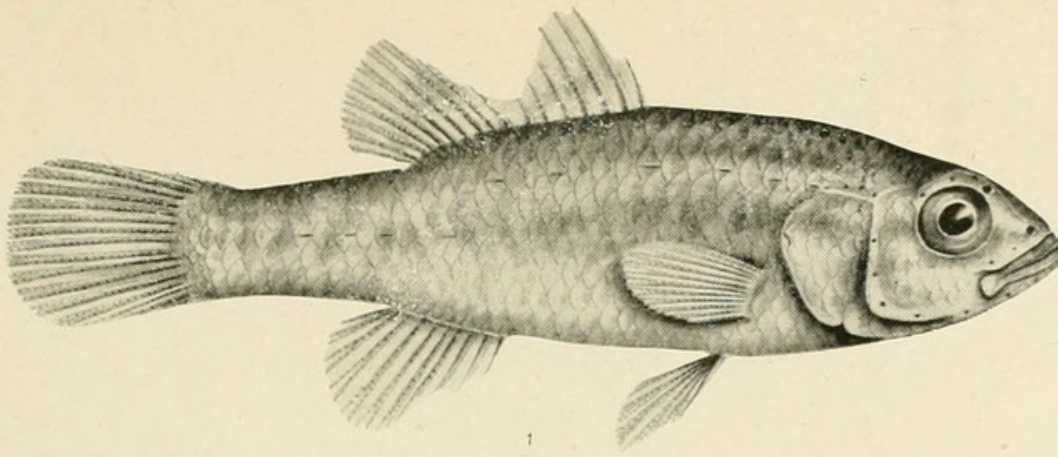
Plate vi.

- Fig. 1. *Trichophryne mitchelli* Morton. A specimen 109 mm. long, from Brighton Beach, South Australia.

- Fig. 2. *Echinophryne crassispina* sp. nov. Holotype 46 mm. long, from Spencer Gulf, South Australia.
- Fig. 3. *Rhycherus filamentosus* Castelnau. A specimen 162 mm. long, from Kingscote, Kangaroo Island, South Australia.

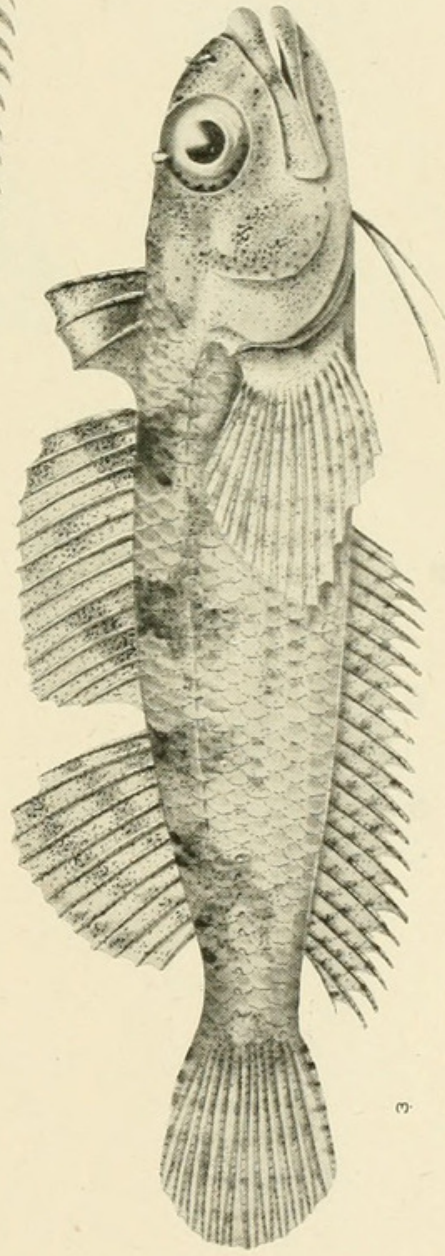
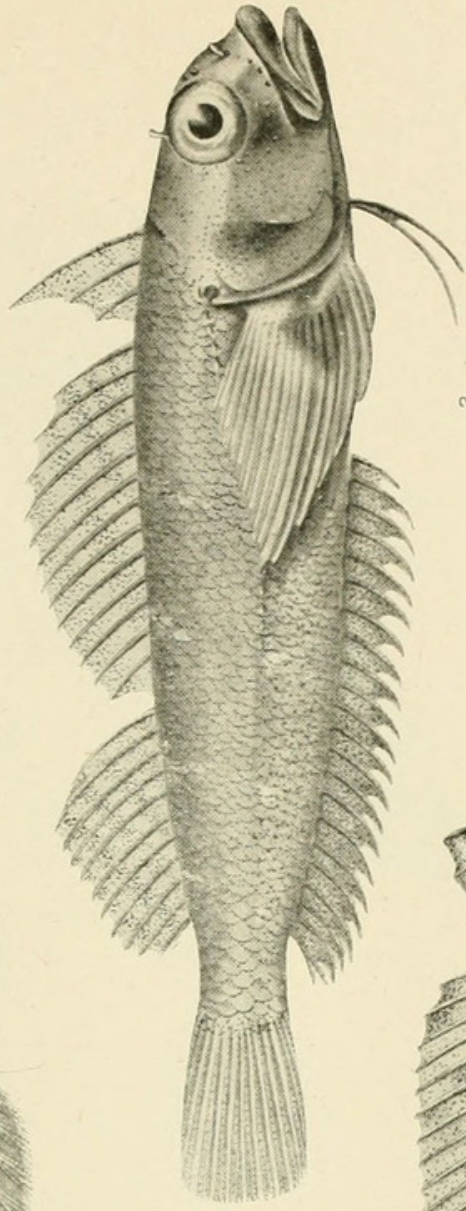
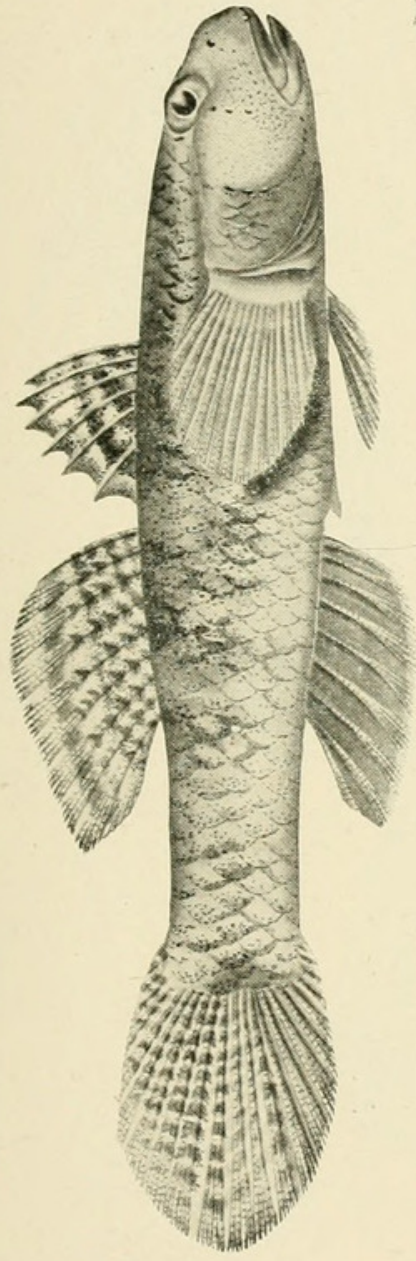
Plate vii.

- Fig. 1. *Histiophryne bougainvilli* Cuvier and Valenciennes. A specimen 41 mm. long, from an unknown locality.
- Fig. 2. *Histiophryne scortea* sp. nov. Holotype 62 mm. long, from Stansbury, St. Vincent Gulf, South Australia.
- Fig. 3. *Sympterichthys verrucosus* sp. nov. Holotype 45 mm. long, from St. Vincent Gulf, South Australia.



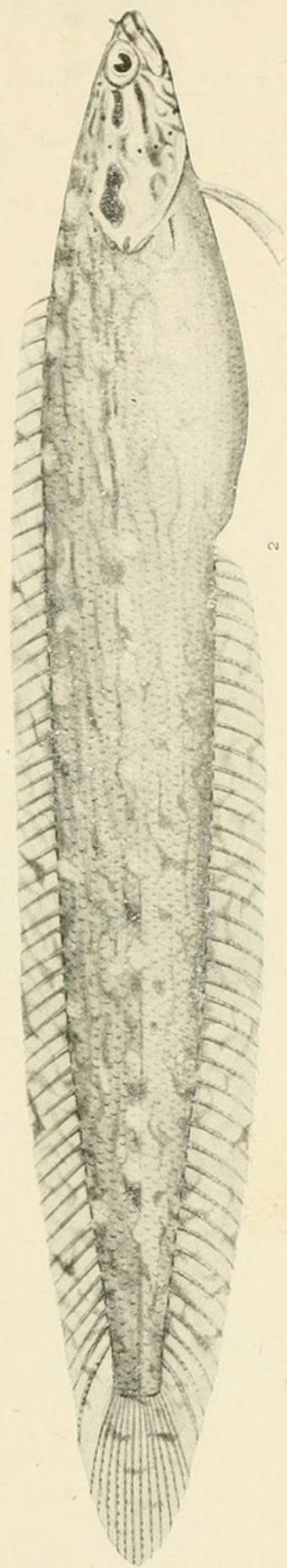
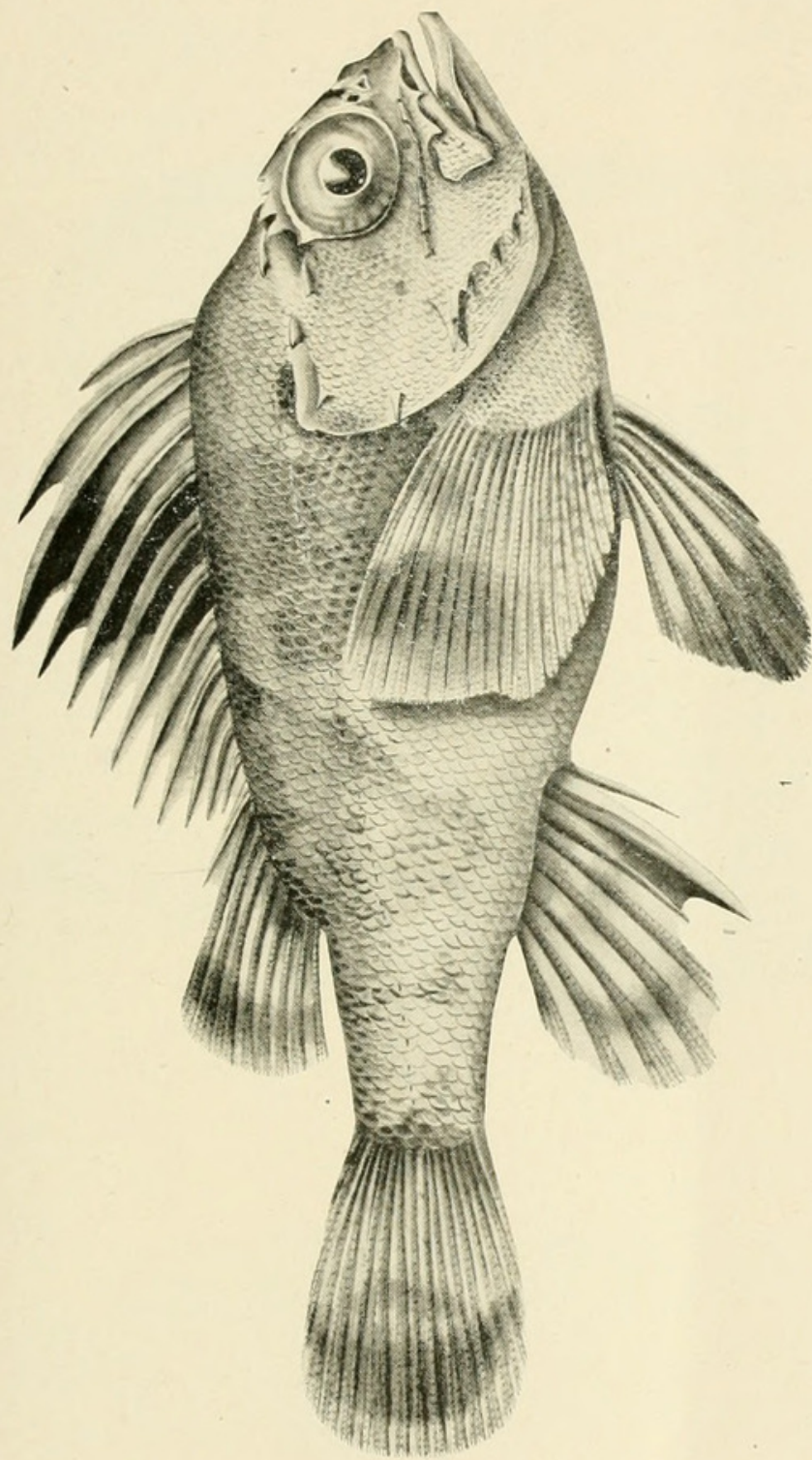
Phyllis Clarke, *del.*

S. AUSTRALIAN FISHES.



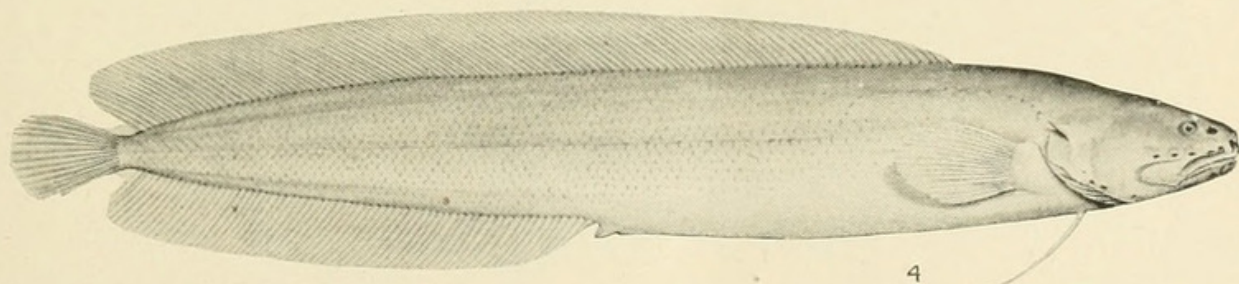
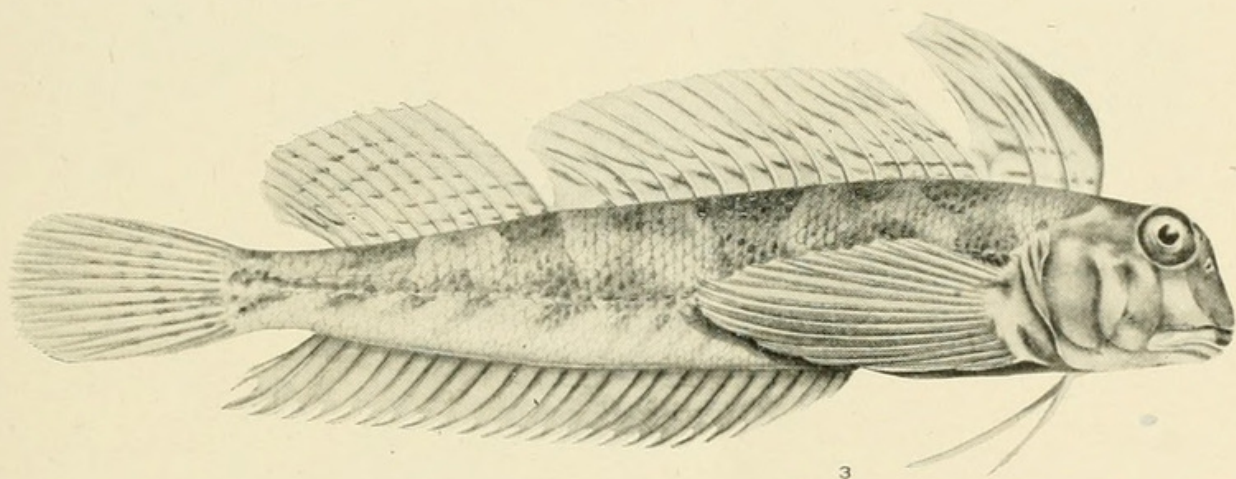
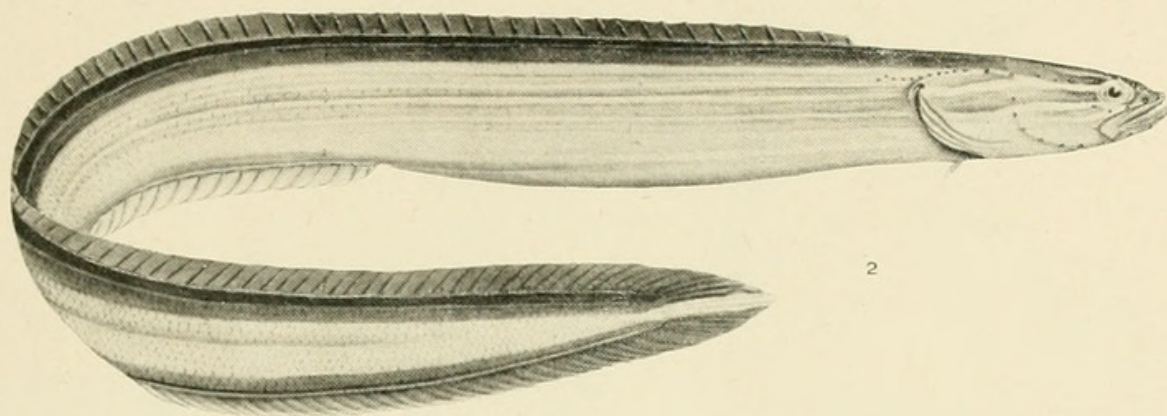
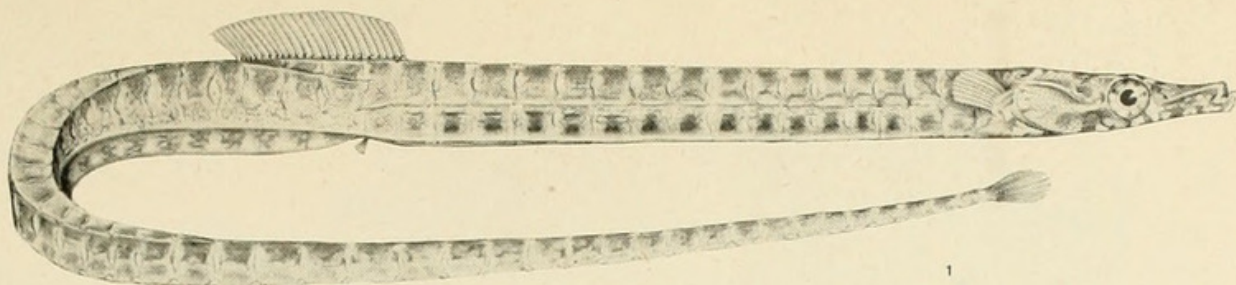
Phyllis Clarke, *del.*

S. AUSTRALIAN FISHES.



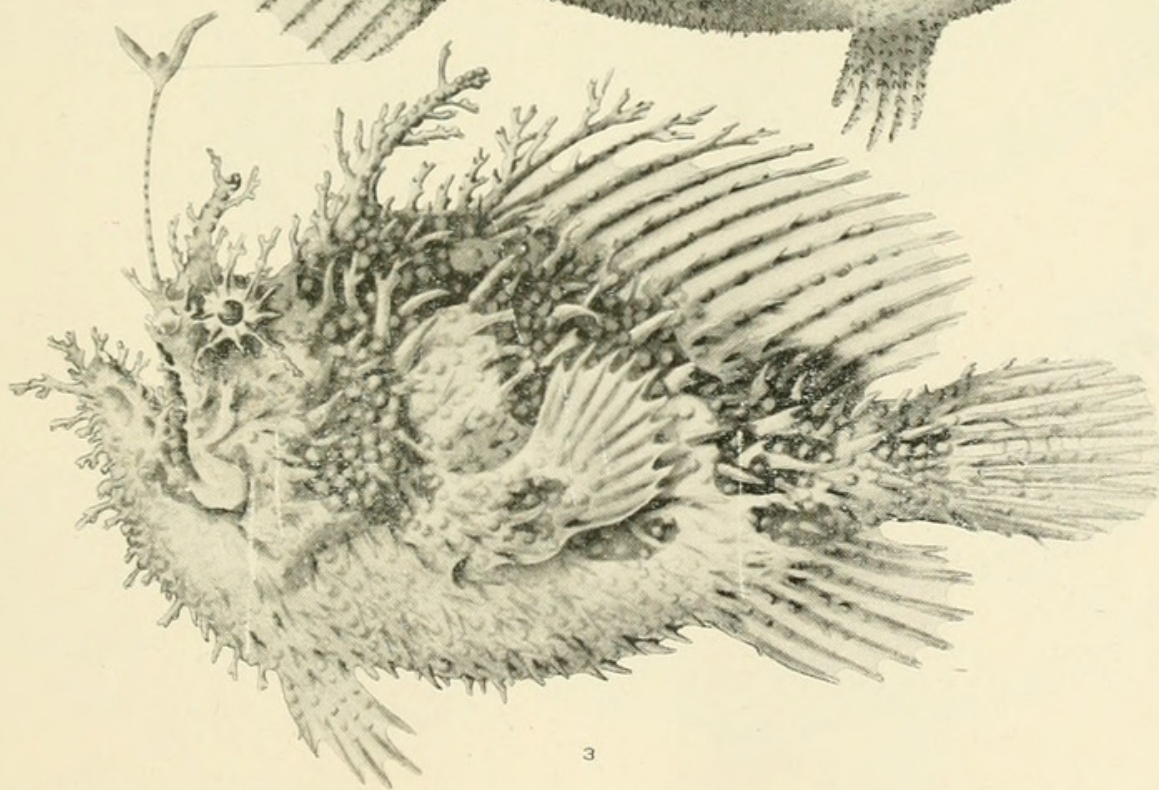
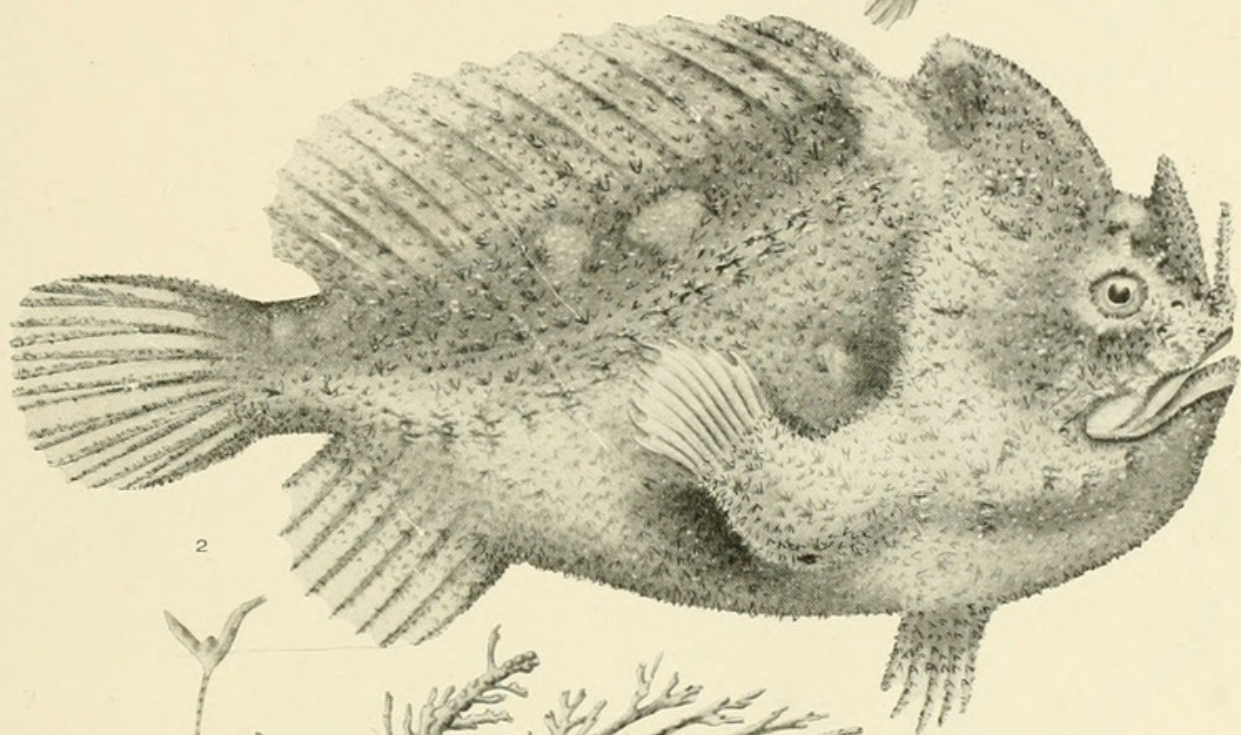
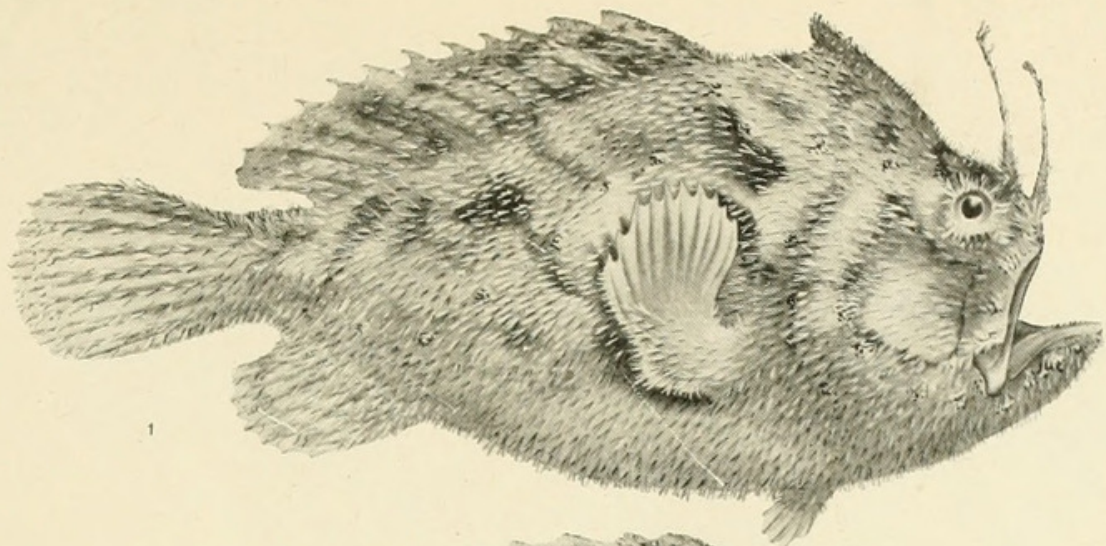
Phyllis Clarke and A. R. McCulloch, *del.*

S. AUSTRALIAN FISHES.



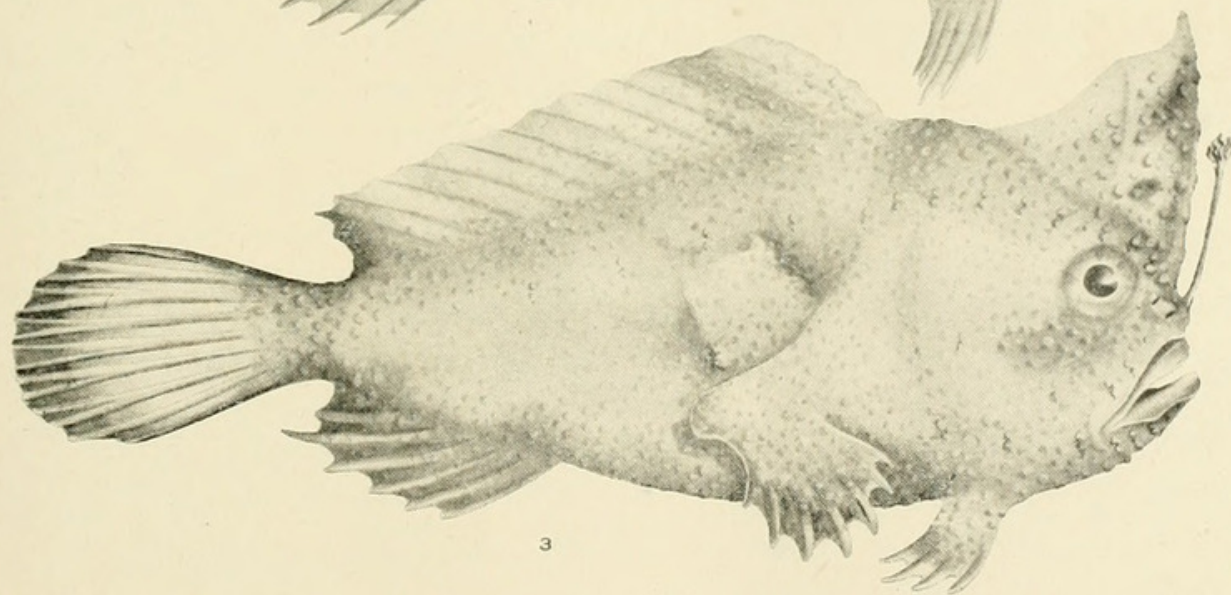
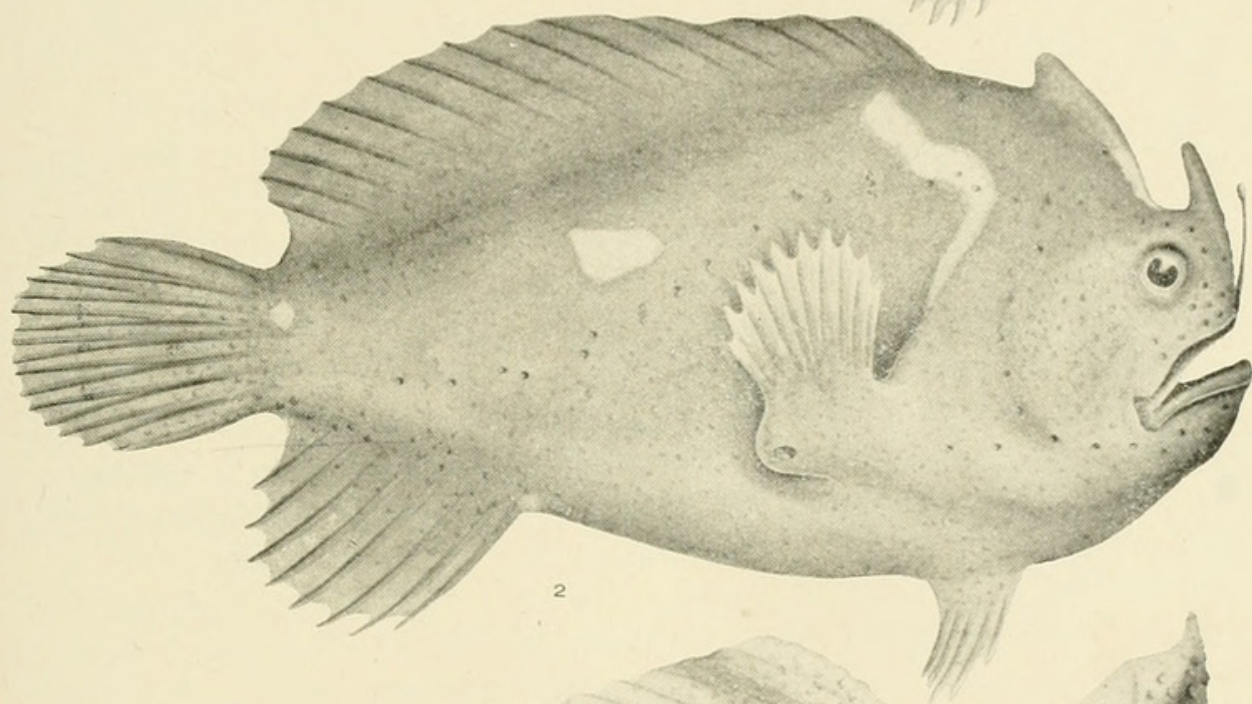
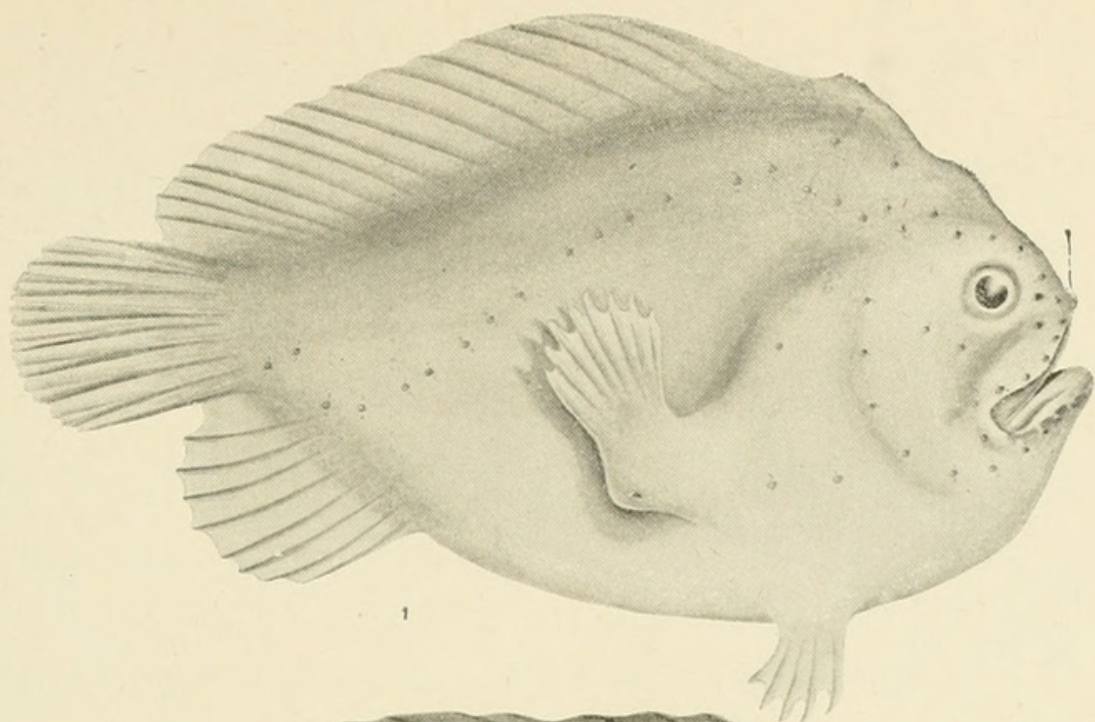
Phyllis Clarke and A. R. McCulloch, *del.*

S. AUSTRALIAN FISHES.



Phyllis Clarke, del.

S. AUSTRALIAN FISHES.



Phyllis Clarke, *del.*

S. AUSTRALIAN FISHES.



McCulloch, Allan R. and Waite, Edgar R. 1918. "Some new and little known fishes from South Australia." *Records of the South Australian Museum* 1, 39–78.

View This Item Online: <https://www.biodiversitylibrary.org/item/92797>

Permalink: <https://www.biodiversitylibrary.org/partpdf/91933>

Holding Institution

Smithsonian Libraries and Archives

Sponsored by

Smithsonian

Copyright & Reuse

Copyright Status: Public domain. The BHL considers that this work is no longer under copyright protection.

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.