

NOTES ON FISHES FROM WESTERN AUSTRALIA, No. 2.

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(Plates xxvii. – xxxi., and Fig. 20).

IN continuation of the arrangement with Mr. B. H. Woodward, Curator of the Western Australian Museum, the Trustees have received a second collection of fishes from Western Australia. All the specimens are to be identified with described species, but many of them have not been previously recorded from the west coast. Of others already known to inhabit the western waters, precise or additional localities are supplied.

The following species, not previously illustrated, are now figured:—

*Apogon rüppellii*, Günther.

*Hypoplectrodes armatus*, Castelnau.

*Pseudolabrus ruber*, Castelnau.

*Thalassoma aneitense*, Günther.

*Coris auricularis*, Cuvier and Valenciennes.

*Cichlops lineatus*, Castelnau.

VELASIA STENOSTOMUS, *Ogilby*.

Two lampreys of this species were taken in the Canning River (at the estuary of the Swan River) and off Pinjarrah respectively. Under the name *Geotria chilensis* it has been recorded from Swan River, but I publish these indisputable occurrences, as doubt has been cast on the West Australian habitat, as below:—  
“I have placed a note of interrogation against the West Australian distribution usually accorded to this species on the strength of the British Museum Catalogue, in which it is recorded from ‘Swan River’; though without doubt the West Australian river is the most widely known, the name itself is so little distinctive that I am inclined to believe that some stream, possibly in Tasmania, where it has now been proved beyond question to occur, is intended.”—*Ogilby*.<sup>1</sup>

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<sup>1</sup> *Ogilby*—Proc. Linn. Soc. N. S. W., xxi., 1896, p. 419.



HYPNARCE SUBNIGRA, *Duméril*.

*Hypnos subnigrum*, Dum., Rev. Zool., 1852, p. 279.

The name *Hypnos*, given by Duméril in 1852, is preoccupied in Lepidoptera, Hübner having used the form *Hypna* in 1816. I therefore propose *Hypnarce* for the genus.

*Locality*.—Rottneet Island.

GYMNOTHORAX RICHARDSONII, *Bleeker*.

*Muraena richardsonii*, Bleek., Nat. Tijds. Ned. Ind., iii., p. 296.

This species has been recognised from the Abrolhos, and I now record it from the mainland. The two examples received were taken at Fremantle.

OPHISURUS SERPENS, *Linnaeus*.

Though generally stated to be from Australia, this widely distributed species appears to have been definitely recorded for the Continent only from Port Jackson and Port Stephens on the east coast. We now have it from Pinjarrah and Australind, both south of Fremantle, on the west coast.

ATHERINA LACUNOSA, *Forster*.

Though recorded from South Australia, this widely distributed species does not appear to have been previously recognised from the west. The examples received are from Fremantle.

UPENEICHTHYS POROSUS, *Cuvier and Valenciennes*.

The known range of this species, common on the eastern and southern shores as far as Adelaide, is now extended to Western Australia. The examples received were taken at Mandurah in 1897. *U. vlamingii* was recorded from the west by Castlenau.

SCOMBER COLIAS, *Gmelin*.

The only character insisted upon for the separation of *S. colias*, Gmel., and *S. pneumatophorus*, De la Roche, is the number of spines in the first dorsal—seven for the former, and ten to twelve in the latter. It is now generally conceded that both are of the same species. In the Atlantic form, the posterior adipose eye-lid is described as crossing over the lower edge of the anterior lid; in ours, the anterior lid crosses the posterior one.

The examples from Western Australia, obtained at Fremantle, agree with *S. colias* in having but seven dorsal spines and with *S. pneumatophorus* in the constitution of the adipose eye-lids.

In recent descriptions, *S. colias* is stated to have nine dorsal spines.



POMATOMUS SALTATRIX, *Linnaeus*.

This species, represented in the collection by examples from Fremantle, has not been recorded on the west coast northward of the Swan River.

APOGON RÜPPELLII, *Günther*.

(Plate xxvii.)

*Apogon rüppellii*, Günth., Brit. Mus. Cat. Fish., i., 1859, p. 236;  
Ogilby, Proc. Linn. Soc. N.S.W., xxiv., 1899, p. 165.

The two examples forwarded were obtained at Mandurah in 1897. The larger one forms the subject of the accompanying illustration.

In the paper above mentioned, Ogilby redescribes the species, but the following discrepancies are to be noted. The passage "spine of the second dorsal as long as, or a little shorter, than that of the first," should read:—"as long as, or a little shorter, than the fifth of the first dorsal." Again, for "second anal spine about as long as the fifth dorsal," read:—"sixth dorsal." These corrections have been verified with the larger of Mr. Ogilby's specimens, kindly lent me for the purpose of completing the tail in the drawing, this member being defective in Mr. Woodward's examples.

ENOPLOSUS ARMATUS, *White*.

Known from Queensland and common in New South Wales and Victorian waters, this species has not been recorded westward of St. Vincent's Gulf, South Australia. Examples obtained there by means of a trawl were recorded by Castelnau. Specimens taken at Fremantle in 1899, enable me to extend its known distribution, and add it to the published fauna of Western Australia.

HYPOPLECTRODES ARMATUS, *Castelnau*.

(Fig. 20).

*Serranus armatus*, Cast., Res. Fish. Aust., 1875, p. 7.

In 1875, under the name *Serranus? armatus*, Castelnau described a fish from the Swan River, Perth; he queried the genus on account of its dentition.

When dealing with the species in his Catalogue, Boulenger<sup>2</sup> placed it as a member of the genus *Gilbertia*, but denoted uncertainty.

A fine fish, sent by Mr. Woodward, I am able to identify with Castelnau's species, and am glad to support the conclusions as to

<sup>2</sup> Boulenger—Brit. Mus. Cat. Fish., (2), i., 1895, p. 309.



its generic position. It proves to be rather an aberrant member of the genus *Hypoplectrodes* (*Gilbertia*), differing from its allies mainly by its stronger dentition, by having its scales more numerous and furnished with scalelets, and an emarginate instead of truncate or rounded caudal. It attains to much greater dimensions, and while the other three members of the genus are remarkable for their bold black markings, this species is singularly devoid of ornamentation. While these various characters may be insufficient whereon to found a genus, they may be expressed in the sub-generic term *Gilbertella*. For the better recognition of the species, I furnish the following description and figure:—

D. x. 20; A. iii. 8; V. i. 5; P. 15; C. 15; L. lat. 70;  
L. tr. 11 + 36.

Length of head 3·0, height of body 2·7, caudal 5·2 in the length of the head and body. Snout with incomplete scales, its length twice the diameter of the eye, the latter round, 6·0 in the length of the head, and slightly less than the interorbital space, which is flat; supraorbital edges not prominent.

The upper profile of the head is quite straight, and from the nape curves backwards to the first spine which marks the highest point of the body; it reaches the caudal peduncle by a low curve, the ventral profile is much flatter. The lower jaw is the longer, and bears a prominent chin. The cleft of the mouth is large, protractile, and sub-horizontal. Maxillary naked, without supplemental bone, it extends beyond the hinder edge of the eye, its posterior margin is much rounded, and its distal breadth equal to the diameter of the eye. Posterior nostril vertically oval, one-third the ocular diameter in front of the eye; the anterior nostril has a low skinny rim, it lies near to and below the former. The preopercle is finely serrated behind, has a weak flat spine at the angle, and two small antrose ones below it. The opercle has a large flat spine at the angle, another below it, and a third further removed above.

Gill rakers of medium length, about half that of the gill-fringes, seven free ones on the lower limb of the first arch, preceded by indications of others, and a single one on the hinder limb, with four spiny bosses above it.

*Teeth*.—In the jaws the teeth are villiform and all depressible, those on the inner side somewhat larger. The upper jaw bears a pair of large widely-spaced canines; a similar pair in the lower jaw but much closer together. At each side of the mandible is a series of three canines, all close together and larger than those in front. Vomer and palatines with villiform teeth, tongue smooth.



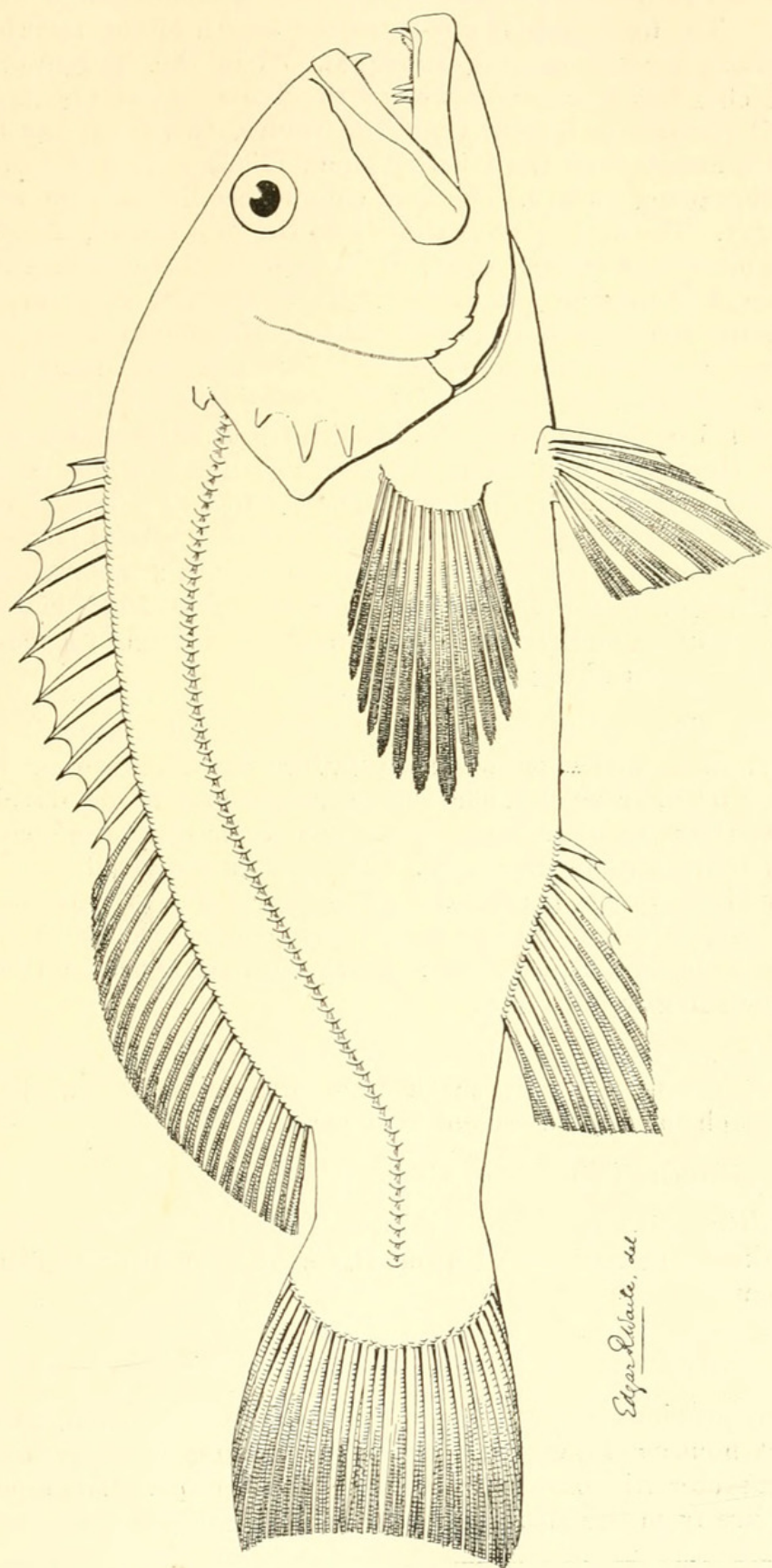


Fig. 20. *Hypoplectrodes armatus*, Castelnau. One-third natural size.



*Fins.*—The dorsal commences above the hinder edge of the opercle. The first spine is one-third the length of the fourth and fifth, which are the longest, subequal, 3·4 in the length of the head. The last spine is one-seventh shorter than the fourth. The soft portion is higher than the spines, the sixth ray being one-third longer than the fourth spine; it has a longer base, the proportion being 10 to 9. The anal commences beneath the second dorsal ray. The first spine is similar to the first dorsal, the second is very broad and strong, equal in length to the last dorsal, the third spine is weaker but longer. The rays are very long, the third being the longest and twice that of the fourth dorsal spine. The total length of the fin is half that of the soft dorsal. The pectoral is long, symmetrical, and rather pointed; the central rays are 1·3 in the length of the head, much dilated, and branched distally, the upper and lower rays less so. The fin has a broad base, nearly one-third its length. The ventral, situated below the pectoral, is shorter, being 1·6 in the length of the head; the spine is strong, equal to the fourth dorsal in length; the second ray forms the apex of the fin, which is pointed. The caudal is shorter than the ventral, and slightly emarginate, the depth of its peduncle 1·3 in the length of the fin.

*Scales.*—The scales on the body rather small, ciliate, but not spinose; each apparently bears at its base about seven scalelets, but they are in reality attached to a separate membrane, developed between the rows of scales. The scales of the head and chest are smaller than those on the body. The membrane of all the fins is scaly, at least for its basal half. The lateral line follows the arch of the back to below the last dorsal rays, thence passes along the middle of the caudal peduncle; the tubules are short, and for the most part simply bifurcate.

*Colours.*—After long immersion in spirits, the colour is a uniform yellow, the only mark now discernible is an elongate black patch in which the vent is situate.

Total length of specimen, 435 mm.

*Locality.*—Swan River, Western Australia, whence the type was taken. (Misprinted Suron River in the British Museum Catalogue).

COLPOGNATHUS DENTEX, *Cuvier and Valenciennes.*

In my previous paper<sup>3</sup> I stated that the specimens then examined were without markings; after prolonged soaking in water, however, the characteristic blue spots became discernable. Examples received are from the Abrolhos.

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<sup>3</sup> Waite—Rec. Aust. Mus., iii., 1900, p. 211.



THERAPON TRUTTACEUS, *Macleay*.

Specimens from the Lennard River, North-western Australia, do not appear to differ from those first described from the Endeavour River. The species was afterwards recognised by Zeitz from several streams in Central Australia.<sup>4</sup>

HELOTES SEXLINEATUS, *Cuvier and Valenciennes*.

The form from West Australia described by Jenyns as *Helotes octolineatus*<sup>5</sup> was regarded by Castelnau<sup>6</sup> as a variety of *H. sexlineatus*. The specimens before me, one from Mandurah and the other from Fremantle, support this view. The characters relied upon by Jenyns were seven anal rays instead of ten, eight body-lines in place of six; the soft dorsal and anal fins spotted, the nature of the striæ on the crown, and one or two other minor points. In our specimens there are eight longitudinal lines on the body, ten anal rays, no spots discernable on the fins, and the striæ on the crown as described in *H. octolineatus*, these specimens are therefore intermediate and show that the name must be sunk as a synonym.

PENTAPUS VITTA, *Cuvier and Valenciennes*.

*Locality*.—Mandurah.

GONIISTIUS VITTATUS, *Garrett*.

Examples from the Abrolhos islands in no way differ from those taken in Port Jackson and at Lord Howe Island; the species was first described from the Sandwich Islands.

PSEUDOLABRUS RUBER, *Castelnau*.

(Plate xxviii.)

*Labrichthys rubra*, Cast., Res. Fish. Aust., p. 37.

? *Labrichthys bleekeri*, McCoy, (*non* Cast.) Prod. Zool. Vict., Dec. xiv., pl. 134, 1887.

D. ix. 11; A. iii. 10; V. i. 5; P. 13; C. 12+2; L. lat. 26; L. tr. 3+8.

Length of head slightly less than the height of the body and 3.1 in the total length, caudal 4.7 in the same. The eye is one-sixth the length of the head, the interorbital space is rather flat and one-fourth more than the diameter of the eye, the length of the snout one-third more than the same. The upper profile of the head forms a low curve, the whole curve of the lower surface of the body is slightly more convex than that of the upper. The

<sup>4</sup> Zeitz—Rep. Horn Sci. Exped., ii., 1896, p. 176.

<sup>5</sup> Jenyns—Voy. Beagle, iii., 1842, p. 18.

<sup>6</sup> Castelnau—Res. Fish. Aust., 1875, p. 9.



jaws are equal, the cleft of the mouth does not reach the line of the eye. The nostrils are nearer to the eye than to the lips, the posterior is an oval aperture, the anterior lies in a skinny tube. The gill rakers are short and stout, ten on the lower limb of the first arch.

*Teeth.*—A pair of canines anteriorly in each jaw, the lower biting between the upper; the lateral teeth, of which there are eleven in the upper and nine in the lower jaw on each side, are conical, and regularly decrease in size from before, backwards. One or two canines at the posterior angle of the upper jaw on each side.

*Fins.*—The dorsal fin commences above the skinny margin of the operculum; the spinous portion is low, its longest spine, the ninth, being one-fourth the length of the head; the rays are subequal in length, one-half longer than the last spine. Beneath this the anal commences, its rays are similar to those of the dorsal and it terminates evenly with them. The ventral, placed beneath the pectoral, is very short; the longest ray, the second, 2.4 in the length of the head, the pectoral is one-half longer than the ventral is rather pointed above and rounded below. The caudal is subtruncate or slightly rounded, the height of its peduncle equal to half the length of the head.

*Scales.*—Head granular and crowded with pores, naked with the exception of a row of incomplete scales at the border of the postorbital and three rows of large scales on the posterior part of the opercle. The scales of the body are large, those on the chest much smaller, there are no scales at the bases of the fins, but a row runs up the proximal half of the caudal membrane between each ray. With the exception of a very slight curve anteriorly, the lateral line runs straight along twenty scales, it drops two scales and passes obliquely upwards along the side of the tail.

*Colours.*—In spirits reddish-brown, around the eye is a series of irregular radiating black marks, which below and behind enclose yellow areas. On the interopercular membrane these yellow marks tend to form large bars, wider than the interspaces and not bounded by black. The markings on the body are equally irregular. Five broad brown blotches may be traced on the back passing down the sides. The row of scales below the lateral line and other scattered scales possess opalescent blotches, and the lowest four or five rows of scales of the body are almost wholly of this colour, those on the chest being especially brilliant. Most of the scales of the head, back, and sides have one or more black dots. The dorsal and anal fins have each an indistinct dark band at the base, and each ray bears two or three white spots. The dorsal membrane also is darker in the region of the dark body marks; the pectoral and the ventral are without markings, but the caudal is somewhat mottled and carries white spots.



Length of specimen described 285 mm. Two examples taken at Houtmann's Abrolhos in 1894. The type specimen was from Swan River.

It is very probable that the fish figured by McCoy (*loc. cit.*) under the name *Labrichthys bleekeri*, Cast., is referable to this species.

We cannot well compare the descriptions of these two species of Castelnau, for while that of *P. bleekeri* is fairly comprehensive, that of *P. ruber* is little more than a colour description; the following points are however dealt with in both. In *P. bleekeri* the lateral line is formed of twenty-five long carinated lines which expand into rather numerous but short arbuscules; in *P. ruber* the scales of the lateral line are covered by very large arbuscules, formed of a fan-like series of concentric lines. In the colour pattern of the former species there is no trace of spots or bands on the body, in the latter four or five indistinct transverse bands sometimes occur.

On comparing the foregoing description with that of *P. bleekeri* by Castelnau, further differences are found which indicate that the two species are distinct. If, as I have surmised, McCoy's figure really represents *P. ruber*, Victoria must be added to the habitat of the species.

#### THALASSOMA LUNARE, *Linnaeus*.

Though unknown on the mainland of Australia, this species has been taken both at Norfolk and Lord Howe Islands off the east coast. It is now recorded from a similar situation on the west, the collection including two examples obtained at the Abrolhos Islands in 1894.

#### THALASSOMA ANEITENSE, *Günther*.

(Plate xxix.)

In a previous paper<sup>7</sup> I stated, on the authority of Günther, that this species has been recognised from North-eastern Australia. The locality for this habitat appears to be Cato Island in the Coral Sea, though the author quoted writes "north-east coast of Australia."<sup>8</sup>

On the east, the species is known from Cato Island, the New Hebrides (Aneiteum), Norfolk and Lord Howe Islands. We now have it from the west, the specimens being from the Abrolhos. The species is now figured for the first time.

D. viii. 13; A. iii. 10–11; V. i. 5; P. 15; C. 13+4; L. lat. 28;  
L. tr. 3+9.

Length of head (exclusive of opercular membrane) 3·4, height of body 2·9, caudal 4·0, in the length of the body. The eye is

<sup>7</sup> Waite—Rec. Aust. Mus., iii., 1900, p. 202.

<sup>8</sup> Günther—Brit. Mus. Cat. Fish., iv., 1862, p. 183.



5·8 in the length of the head ; the interorbital space is arched, equal to the length of the snout, or 3·2 in that of the head. The upper profile of the head forms an irregular low curve, somewhat tumid on the snout and nape. The ventral profile of the body is more convex than the dorsal one. The jaws are equal, very protractile, and the lips cover the prominent teeth. The cleft of the mouth reaches but half-way to the anterior margin of the eye. The posterior nostril is near the eye, a little below the level of its upper margin ; the anterior nostril is lower, and further removed from the eye.

*Teeth.*—All the teeth are conical and strong, the anterior pair in each jaw long, the lateral ones decrease in size backwards ; there are seven on each side in the upper and eleven in the lower jaw.

*Fins.*—The dorsal fin commences somewhat behind the angle of the operculum. The eighth spine is 3·9 in the length of the head ; the soft portion is also low, the posterior shorter than the anterior rays, the latter one-half longer than the longest spine. The anal is similar to the soft dorsal and commences beneath its second ray ; the first spine is minute, and its third equal to the sixth dorsal. The ventral is situated beneath the pectoral and its first ray is slightly produced ; its length is contained 1·3 times in that of the pectoral ; this latter fin has a falcate margin, its upper rays are contained 1·1 times in the length of the head and extend to the tenth scale of the lateral line. The caudal is equal to the pectoral in length, it is emarginate, and the outer rays produced ; the least height of its peduncle is slightly more than half the length of the head. The lateral line runs almost straight along nineteen scales, it passes downwards two scales and attains the caudal along the centre of the peduncle.

*Colours.*—Head and anterior part of the body purplish ; body olive, each scale with a vertical purple streak. Head with broad olive bars, narrowly margined with dark purple. One (sometimes indistinct) passes through the nostrils along the upper edge of the eye towards the lateral line ; a second, from behind the eye and down the angle of the operculum ; the third bar commences at the angle of the mouth, skirts the lower margin of the eye and passes backwards parallel to the second one ; the last bar forms a horse-shoe, the legs directed backwards, one on the sub- the other on the interoperculum ; a circle sometimes exists in the centre of the horse-shoe figure. On the throat a bar passes from the upper limb of the horse-shoe to the space between the pectoral and ventral fins ; a less distinct line may be traced from the above-mentioned third bar to the base of the pectoral. All these markings will be better understood by reference to the plate. Dorsal greenish, with a black spot between the second and third spines, and a broad purple band along its whole length, occupying the lower half of the fin, it is margined above and below



with a fine dark line. Anal similar in colour with a much narrower purple band situated on the basal fourth of the fin separated from the ground colour by a dark line. Pectoral greenish-yellow, with a black spot in the axil, and a broad oblique black band across its posterior portion; this band forms the margin of the fin above, but narrowing below leaves the hinder margin hyaline. Ventral colourless, except the first ray which darkens to the tip. Caudal with the outer rays somewhat darker than the median ones.

Length of specimen 250 mm.

CORIS AURICULARIS, *Cuvier and Valenciennes*.

(Plate xxx.)

*Julis auricularis*, Cuv. & Val., Hist. Nat. des Poiss., xiii., 1839, p. 489.

Of two specimens received, one was taken at Mandurah on the mainland, the other at the Abrolhos. Both have lost the colour and only the markings remain: the tints, in life, have been described by Richardson from a drawing by Lieut. Emery,<sup>9</sup> but as this does not appear to have been published, I have prepared the accompanying illustration, accurate in form, and showing such markings as are traceable on our spirit-faded examples.

SIPHONOGNATHUS ARGYROPHANES, *Richardson*.

The type specimen was obtained in King George's Sound. Macleay recorded examples from South Australia, and we now have the species from Fremantle, the first record from the west coast.

HARPOCHIRUS PUNCTATUS, *Gmelin*.

*Drepane punctata*, Cuv. & Val., Hist. Nat. des Poiss., vii., 1831, p. 132.

For Australia the species has been recorded from Cape York and also the north west coast, but without more precise habitat; the specimens forwarded were taken at Broome.

Although Cantor clearly pointed out that *Drepane*, Cuv. & Val., was preoccupied (in Lepidoptera)<sup>10</sup> later writers have still used it.

CHÆTODON STRIGATUS, *Cuvier and Valenciennes*.

The specimens received from Pinjarrah are identical with eastern examples. Although there can be no doubt that Castelnau's *Neochætodon vittatum*<sup>11</sup> is the same species, I cannot find the "bifid tooth on the palate" to which that writer refers. Later,<sup>12</sup> he identifies his genus and species from Port Jackson, and omits mention of the palatal tooth, relying on the operculum to distinguish his untenable species.

<sup>9</sup> Richardson—Ann. Mag. Nat. Hist., ii., 1843, p. 422.

<sup>10</sup> Cantor—Cat. Malay Fish, 1850, p. 161.

<sup>11</sup> Castelnau—Proc. Zool. Soc. Vict., ii., 1873, p. 130.

<sup>12</sup> Castelnau—Proc. Linn. Soc. N.S.W., iii., 1879, p. 375.



TOXOTES *sp. ?*

Two examples are in the collection, one from Mandurah, the other from the Abrolhos. As neither is in good condition and as the species are so closely allied as to render determination, in the absence of authentic specimens, very problematical, I have preferred to leave them unnamed. Of the five species described, two have been recorded from Australia, namely—*T. jaculator*, Pallas and *T. carpentariensis*, Castelnau.

MONACANTHUS PERONII, *Hollard*.

Two specimens taken at Fremantle add the species to the fauna of West Australia. Previously it was known only from Victoria, (Port Phillip and Warnambool) and South Australia, (Georgetown).

ARACANA LENTICULARIS, *Richardson*.

Of two examples forwarded, one was taken at the Abrolhos in 1894, the other at Mandurah in 1897. The species has not been previously identified from the western coasts.

AMBLYRHYNCHOTUS OBLONGUS, *Bloch*.

Originally recorded in Australian waters from King George's Sound, and afterwards on the east coast, this species is now recognised from the western shores, the locality being Shark's Bay.

SILLAGO BASSENSIS, *Cuvier and Valenciennes*.

*Sillago bassensis*, Cuv. & Val., Hist. Nat. des Poiss., iii., 1829, p. 412; Quoy. & Gaim., Voy. l'Astrolabe, Zool., 1835, p. 672, pl. i., fig. 2.

Most writers who have dealt with the Australian Sillagos have followed Günther in placing *S. bassensis* as identical with *S. maculata*, Quoy and Gaimard. Ogilby however demurs and writes: "it seems to us unadvisable to consider *S. bassensis* as a proved synonym of *S. maculata*."<sup>13</sup> From Western Australia we have received five examples, of these three are without doubt referable to *S. maculata*, the others are evidently to be identified with *S. bassensis*. The question remains, how may the two be distinguished?

The radial formula of *S. maculata* is:—D. xi., i. 19; A. ii., 19-20, the lateral line 72. Some authors count but one spine in the anal; the second one is covered with scales which give the appearance of joints, if however the scales are cleared away, I find an undivided spine always revealed; it is necessary to clean the spine with caustic soda and examine under a microscope.

<sup>13</sup> Ogilby—Edib. Fish. of N.S.W., 1893, p. 99.



In our examples of *S. bassensis* the fin formula is D. xi., i. 21; A. ii., 18; Lateral line 69. In the original description of the species the figures have been transposed in some way, so that they cannot be considered. The following proportions may be compared with those rendered by Ogilby<sup>14</sup> of *S. maculata*:—

Length of head 3·4, of caudal fin 6·3, height of body 4·7 in the total length. Diameter of eye 5·0 in the length of the head and 2·3 in that of the snout. Opercle with one sharp point. Ventral not filamentous 1·6 in the distance between its origin and the vent and half the length of the head.

The colours also supply distinguishing features:—in *S. maculata* the back is sandy-brown, and the sides have seven or eight dark blotches (said to be sometimes absent) a dark spot always present at the base of the pectoral. In *S. bassensis* the back is reddish-brown, there are no dark blotches on the body and no dark spot at the base of the pectoral.

In the work quoted, Ogilby states that "*S. bassensis*, if a good species, inhabits Tasmanian waters only." Western Port, the locality of the type specimen is in Victoria; the examples now received are from Mandurah and the Abrolhos.

In his generic description of *Sillago*, Day<sup>15</sup> writes:—"Lateral-line not continued on to the caudal fin." I have no Indian species by me for the verification of this: it is not true of Australian species, however, though Ogilby in copying Day's paragraph has overlooked it. It is doubtless a misprint in the original, as in our examples of *S. maculata*, which Day includes, the lateral line is continued quite to the end of the caudal; McCoy has noticed this in *S. ciliata*.<sup>16</sup>

#### SILLAGO MACULATA, Quoy and Gaimard.

*Sillago maculata*, Quoy & Gaim., Voy. Freyc. Zool., 1824, p. 261, pl. liii., fig. 2.

Having a wide range this species has been recorded from eastern and (?) northern Australia, and has been seen but once in Victoria. It is possibly common on the western coasts, we have examples from Fremantle.

#### CICHLIPS LINEATUS, Castelnau.

*Dampieria lineata*, Cast., Res. Fish. Aust., 1875, p. 30.

*Cichlops lineatus*, Macl., Proc. Linn. Soc. N.S.W., v., 1881, p. 571.

<sup>14</sup> Ogilby—*Loc. cit.*, p. 100.

<sup>15</sup> Day—*Fishes India*, 1878, p. 264, and *Fauna Brit. Ind.*, Fish., ii., 1889, p. 222.

<sup>16</sup> McCoy—*Prod. Zool. Vict.*, ii., Dec. xix., 1889, p. 299.



(Plate xxxi.)

B. vi.; D. ii., 25; A. iii., 14; V. i., 5; P. 18; C. 15 + 4; L. lat. 60 + 2i; L. tr. 4 + 17.

Length of head, to which the caudal fin is equal 3·2, height of body 3·0 in the total length (caudal excluded). The eye is rather small, 5·6 in the length of the head; the interorbital space is convex, one-fifth more than the eye diameter; the snout is longer than the eye, the proportion being as 5 to 3; exclusive of the maxilla it equals the eye in length. The upper profile of the head is flat with a marked tumidity on the snout, the dorsal curve is low, that of the ventral even less. The lower jaw is much the longer, the lips are very fleshy and a free flap of skin covers the maxillary and mandibular bones. The cleft of the mouth approaches the vertical, and the maxilla scarcely reaches the vertical line of the eye; its length is 2·5 in that of the head, it is strongly curved and almost reaches the lower profile. The nostrils are placed high on the snout, the distance between each pair being slightly less than the interorbital space, the anterior aperture is in a tube whose skinny margin is produced backward, the posterior one has a complete but simple margin. The opercles have skinny margins and are unarmed. The junction of the opercle with the subopercle is incomplete, a deep notch being thus formed on the posterior border. Gill rakers rather short and club-shaped, the head of each being set with short spines, there are nine on the lower limb of the first arch. Pseudobranchiæ present, a slit behind the fourth gill.

*Teeth.*—The teeth are in a single series in each jaw, but form a small patch in front, they are stout, conical, and smaller posteriorly. On each side of the patch in the upper jaw is a strong grooved canine, similar teeth exist in the lower jaw, but two or more pairs are developed, each canine being separated by some of the conical ones. A patch of small teeth is found on the vomer but none on the palatines, or the tongue. A number of fleshy villi occur about the anterior teeth.

*Fins.*—The dorsal fin commences slightly before the line of the opercle, the two spines are distinguishable as such only by their non-articulated character; the membrane is not incised and quite continuous with that of the rays. The fin arises low, the second spine being about the length of the eye diameter; a rapid rise takes place to the fourth ray which is nearly half the length of the head; the elevation is then slight until the posterior rays are reached, these are greatly elongated the twenty-second being the longest, 1·1 in the length of the head and extending to half the length of the caudal. The anal commences beneath the tenth dorsal ray and is similar to the dorsal, terminating slightly in advance of it, and its longest rays a fifth shorter. The ventrals are close together and placed beneath the base of the pectoral;



the spine is short and weak, the third ray is the longest, and produced, just reaching the vent; it is slightly longer than the pectoral, this latter has a rounded margin, a broad base, and a length contained 1.3 times in that of the head. The caudal is acuminate tapering from beyond the middle, the central rays being equal to the head in length; the pedicle is greatly compressed and its depth half the length of the fin.

*Scales.*—Top of the snout and lips naked: the scales on the head are smaller than those on the body, there are eleven rows on the cheek, the upper ones being formed of larger scales; the bases of all the fins (the ventrals excepted) are scaly. The lateral line arises above the opercle, passes upwards to below the fourth dorsal ray and follows the profile to below the twentieth ray, occupying sixty scales. It recommences in the line of axis of the body beneath the fifteenth ray, and is continued along twenty-one scales to the caudal.

*Colours.*—In spirits, the general hue is a rich brownish-yellow. A blue line encircles all but the anterior fourth of the eye, and six or more similar lines run obliquely forward and downward on the cheek, broken lines also exist on the opercle. Each scale of the body has a dark spot at the base with a blue centre, a series of lines, about sixteen in number is thus formed, anteriorly they are very faint and thus appear to commence suddenly some distance behind the opercle, the scales of the lateral line are not spotted, it therefore seems more than usually distinct. The dorsal fin is ornamented with eight or nine wavy brown longitudinal lines equal in width to the interspaces, a black spot occurs between the second spine and first ray. The anal has lines similar to, but much fainter than those of the dorsal. On the caudal, lines pass obliquely from the upper and lower edges to the centre and if these edges were respectively joined to the dorsal and anal, the lines on these fins would be continuous with those of the caudal; the pectoral and ventral are without markings.

Length of specimen 232 mm.

A smaller example, 160 mm. in length differs by having the profile of the head more even, an indication of immaturity.

Both specimens were obtained in 1897 at Mandurah south of Fremantle, and there can be little doubt that they are specifically identical with the fish described by Castelnau as *Dampiera lineata*. Macleay recognised the identity of the new genus with *Cichlops*. The only important differences between Castelnau's description and our specimens, are the nature of the dentition and the character of the ventral fin. The author of the species states that this fin is composed of seven rays, he has apparently not recognised the first as a spine, and counted the rays as six instead of five. Our fishes do not exhibit the pavement-like teeth described, though the description of the conical series and the strong canines



applies very well: I do not find teeth on the palatines as recorded by Castelnau. It is to be remarked that the type specimen was a dried skin, a circumstance which may well account for the discrepancies noticed. It was obtained at Dampier Archipelago in North-west Australia, and the species finds its nearest ally in *Cichlops melanotænia*, Bleeker,<sup>17</sup> an inhabitant of Macassar Strait.

I am unable to consult the original description of this species, and therefore refer to Günther's epitome<sup>18</sup> and Bleeker's figure.<sup>19</sup>

The profile of the head is not flattened as in *C. lineatus*, and the ventral fin has a much more posterior insertion. The membranes of the spines of the dorsal and anal fin are represented as different from that of the rays; in our specimens there is no such distinction. The markings of the fins are not the same, and the dark lines on the body in Bleeker's species are ten in number, while those of the Australian fish are sixteen. In *C. melanotænia* there are no blue marks illustrated on the opercle, and the central rays of the caudal are not produced as in *C. lineatus*.

It is not possible now to determine if the fins were edged with blue, as in *C. melanotænia*, but there are certainly blue marks on the opercle, a feature not illustrated by Bleeker.

In order that the two species may be the better compared, I have carefully figured the larger of the Mandurah examples. I have also supplied an independent description, Castelnau's 'Researches' having been published in a somewhat inaccessible work.<sup>20</sup>

#### BOLEOPHTHALMUS VIRIDIS, *Hamilton Buchanan*.

The collection contains three examples of a *Boleophthalmus*. Two were taken at Broome, on the north-west coast, and the third in the Lennard River, flowing into King Sound, somewhat further to the north. After comparison with descriptions of all known species, I cannot see any reason for separating them specifically from *B. viridis*. The largest example measures 122 mm. in length, and all have the vertical body marks mentioned as occurring in some specimens.

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<sup>17</sup> Bleeker—Celebes iii., p 765.

<sup>18</sup> Günther—Brit. Mus. Cat. Fish., ii., 1860, p. 259.

<sup>19</sup> Bleeker—Atlas Ichth., Pseudochrom, i., fig. 5.

<sup>20</sup> Philadelphia Centennial Exhibition, 1876, Official Record, Melbourne, 1875.





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