

REVISION OF THE BATRACHOIDIDÆ OF QUEENSLAND.

By J. Douglas Ogilby.

FAMILY BATRACHOIDIDÆ.

THE FROG-FISHES

Body robust, depressed or cylindrical anteriorly, thence tapering gradually to the tail, which is more or less strongly compressed. Scales, when present, small and cycloid. One or more lateral lines, the pores with or without cutaneous appendages. Head large, broad and depressed, the muciferous system strongly developed and tentaculated, those of the jaws and supraciliary region usually the longest. Mouth large or moderate, protractile. Dentition varying from a single series of obtusely conical teeth to narrow bands of small cardiform teeth. Opercle always, subopercle often armed with one or two strong spines. Two dorsal fins, the first short, with 2 to 4 spines, which are wholly concealed beneath the skin; soft dorsal long, with numerous branched rays, enveloped in loose folds of skin; anal fin similar but shorter: caudal fin usually free, rounded or cuneiform: pectoral short and broad, multiradiate, with muscular, vertical base; all the rays attached to the pterygials: ventral rather long, jugular, with a short, concealed spine and 2 or 3 rays. Gill-openings rather narrow, mostly restricted to the sides immediately in front of the pectoral fins; gill-membranes broadly united to the isthmus; branchiostegals six; no pseudobranchiæ; gills three, a slit behind the last; gill-rakers feeble, sometimes tubercular; pharyngeal bones separate, armed with acute cardiform teeth; air-bladder divided into two portions, which lie side by side, and are connected posteriorly by a slender tube. Stomach siphonal; no pyloric cæca. Posterior processes of the premaxillaries well developed, in contact with the inner angle of the frontal; suborbital

without bony stay; posttemporal small and undivided, ankylosed to the skull; tail diphyccercal. Vertebrae 27 to 43, the precaudal without distinct transverse processes. [Βάτραχος, a frog; εἶδος, resemblance].

The *Batrachoididæ* form a small but distinct family, related on the one hand to the *Blenniidæ* and on the other to the *Congrogadidæ*. They may be briefly described as—carnivorous ground-fishes of small or moderate size, inhabiting all intertropical and juxtatropical seas. Most of the species show a marked partiality for muddy ground, into which they burrow with great facility when danger threatens. They are for the most part litoral fishes, and even to some extent ascend tidal rivers, but many instances are on record of their capture at depths closely approaching the hundred-fathoms line. While not disdaining aught else, which chance may put in their way, their principal food consists of crustaceans and mollusks, the hard integuments of which their exceptional strength of jaw enables them to crush with ease. Like all other fishes in which the powers of locomotion are limited, they are compelled to resort to strategy in order to obtain in sufficient quantity even this comparatively slow-moving prey; they are, therefore, in the habit of burying themselves in the mud leaving only a part of the head exposed, and possibly using the oral and supraciliary tentacles as lures for the unwary, much in the same manner as the angler-fishes (*Antennariidæ*) employ the rostral tentacle. When living on ground into which they are unable to burrow weeds serve the same purpose of concealment, and in either case the normal pattern of their coloration blends so thoroughly with their surroundings that detection is extremely difficult so long as they remain motionless. A very curious habit is mentioned by Gilbert—than whom no more acute and trustworthy observer ever lived—when writing of one of our common Queensland species (*Coryzichthys diemensis*). He states that it—“is an inhabitant of the mud at the head of the harbor of Port Essington, where it may be frequently seen creeping over the surface after the tide has left. It is very difficult to capture, for on the slightest appearance of danger it plunges down instantaneously” (*Richardson, Ann. & Mag. Nat. Hist.*, xi, 1843, p. 352). Though the flesh is firm, white, and to all appearance tempting to the palate, these fishes are rejected as food by all except the very poorest classes; it is probable that their rather repulsive appearance may be to a large extent responsible for this repugnance; personally I have had no opportunity of testing their quality, but I am not aware of any practical reason why they should not be excellent eating. The ova of the frog-fishes are large, round, and few in number; they are probably attached either singly or in bunches to weeds or stones at the bottom,

but on this point no definite information is at present available. I have had the opportunity on three occasions of examining females in which the ova were fully matured, and improved the occasion by ascertaining the number and dimensions of the eggs; these are contained in a pair of oval sacs formed of delicate and transparent but strong tough and elastic tissue. In my first specimen (*a*), a *Batrachomæus minor*, caught in May, length 186 millim., the left ovary carried 62 eggs measuring from 3.5 to 5 millim. each; in (*b*), a *Coryzichthys diemensis* of 146 millim. in length, the right ovary contained 45 eggs with a size of from 4.5 to 5 millim. apiece; while the numbers in both ovaries of (*c*)—same species, length 160 millim. was $35 + 39 = 74$, measuring from 5.5 to 6.5 millim.; unfortunately no record of the date of capture is available in these two latter cases. In all three the enveloping skin was intact, proving that the full complement of ova were still *in situ*. The voracity of these fishes may be conceived from the fact that a specimen of *Batrachomæus minor* in my possession had swallowed an octopus of so large a size that two of the arms were protruding fully an inch from its mouth, nevertheless this did not deter it from taking a prawn bait, and thereby paying the penalty of its gluttony. Thirty-five valid species distributed among ten genera are recognized in this review; of these no less than seven genera and twenty-one species are confined to American waters,* and it is a remarkable fact that the number of soft dorsal and anal rays and of vertebræ found in the New World forms invariably exceeds those which obtain in the Old World fishes. Three of the American genera—*Thalassophryne*, *Dæctor*, and *Thalassothia* are of special interest. In the seven species which represent them the opercular and dorsal spines are perforated by a canal, having a basal and subterminal aperture, such as is the case among the viperine snakes; opposite the basal aperture of each spine lies a venom sac so arranged that the slightest pressure on the tip causes the poison to spurt forth into the wound inflicted thereby. Although the results of the poison are frequently severe I am not aware of any accident so received terminating fatally. The frog-fishes are chiefly taken by hook and line, fish-trap, or seine net.

* The sole exception to this general rule occurs in the case of the West African *Batrachus liberiensis* Steindachner. Though I am unacquainted with the description of this species I would have placed it unhesitatingly in my proposed genus *Halobatrachus* (*vide Key infra*), if it were not for the following remark of Dr. Günther (*Zool. Rec., iv, 1867, Pisc. p. 164*).—" *Batrachus pacifici* appears to occur also in the Atlantic, as it has been described from a West African example as a new species *B. liberiensis* by Dr. Steindachner." On this account I am forced to include the species in the American genus *Batrachoides*, characterised among other things by the absence of an axillary pore.

KEY TO THE GENERA OF THE BATRACHOIDIDÆ.

- a. Spines solid, without poison-sacs.
- b. Body covered with small cycloid scales; vertebræ 12 + 17 = 29.
- c. Three dorsal spines.
- d. Dorsal rays 25 to 29; anal 21 to 26; no axillary pore... i. *Batrachoides*.*
- dd. Dorsal rays 17 to 21; anal 14 to 17; an axillary pore... ii. *Halobatrachus*.†
- bb. Body scaleless.
- e. Dorsal spines three; no canine teeth.
- f. An axillary pore; teeth uniserial, strong and conical.
- g. Dorsal rays 26 to 28; anal 22 to 24; vertebræ 12 + 22 = 34.
iii. *Opsanus*.
- gg. Dorsal rays 18 to 22; anal 15 to 18; vertebræ 9 + 18 = 27 or
12 + 17 = 29 iv. *BATRACHOMÆUS*.
- ff. No axillary pore.
- h. Dorsal rays 28 to 30; anal 22 to 24; teeth short and very blunt;
vertebræ? v. *Marcgravia*.
- hh. Dorsal rays 19 to 22; anal 15 to 18; teeth in narrow bands, acute
and cardiform; vertebræ 10 + 17 = 27 vi. *CORYZICHTHYS*.
- cc. Dorsal spines two; canine teeth present on the vomer; vertebræ
12 + 31 = 43 vii. *Porichthys*.
- aa. Spines hollow, each connected with a poison-sac.
- i. Dorsal spines two.
- j. Dorsal and anal fins free from the caudal viii. *Thalassophryne*.
- jj. Dorsal and anal fins fully united to the caudal ix. *Dæctor*.
- ii. Dorsal spines four x. *Thalassothia*.

The new genus *Halobatrachus* is here proposed to accommodate *Batrachus didactylus* and its allies from the Eastern Atlantic, and bears the same relationship to *Batrachoides* as *Opsanus* does to *Marcgravia* and *Batrachomæus* to *Coryzichthys*.

I. *BATRACHOMÆUS* gen. nov.

? *Pseudobatrachus* Castelnau, Res. Fish. Austr., 1875, p. 24 (*striatus*). No description.

Body depressed anteriorly, without scales. Three inconspicuous lateral lines, the pores without cutaneous appendages. Mouth with wide horizontal cleft, the lower jaw projecting; maxillary extending to below the hinder border of the eye. Jaws with a single series of conical teeth, those of the mandible much the stronger; usually a few smaller teeth at the symphysis in front of the functional series: vomerine and palatine teeth strong, arranged in a continuous band, the former sometimes biserial. Eyes of moderate size, superolateral. Opercle with two strong spines; subopercle normally with two

* The italicized genera are exotic.

† ἅλς, gen. ἅλός, sea; βᾶτραχος, a frog.

spines, the lower much the longer, the upper short and divergent, often absent. Gill-opening moderate, embracing the base of the pectoral fin; gill-rakers tubercular; pharyngeal teeth unequal in size, acute and cardiform. Dorsal fins with iii, 18 to 22 rays, the middle spinous ray the longest: anal fin similar to but shorter than the soft dorsal, with 15 to 18 rays: caudal fin free, rounded or cuneiform. Axillary pore present. Frontal ridges strongly developed; transverse ridge linear; occipital ridge feeble; basis cranii evenly rounded. Vertebræ $9 + 18 = 27^*$ (*βάτραχος*, a frog; *ὄμοιος*, like).

Coasts of India, Malaysia, Australia, and Southern New Guinea, entering tidal rivers. Voracious fishes of small or moderate size, living at the bottom, and partial to muddy localities where the water is more or less obscured. Species three.†

Key to the Australian Species.

- a. Dorsal rays 19 or 20, anal rays 16; no frontonasal tentacle; supraciliary tentacles small; axillary pore large.
- b. Diameter of eye more than interorbital width, which is $6\frac{2}{3}$ in the head; vomerine teeth uniserial; one subopercular spine 1. MINOR.
- bb. Diameter of eye less than interorbital width, which is $5\frac{1}{3}$ in the head; vomerine teeth biserial; two subopercular spines 2. CÆCUS.
- aa. Dorsal rays 21 or 22, anal rays 18; a frontonasal tentacle; supraciliary tentacles large; axillary pore minute.
- c. Diameter of eye rather less than interorbital width, which is $6\frac{1}{3}$ in the head; vomerine teeth uniserial; two subopercular spines 3. BROADBENTII.

1. BATRACHOMÆUS MINOR.

? *Batrachus dubius* Richardson, Zool. Erebus & Terror, Fish. 1845, p. 16, pl. x: Port Jackson—Günther, B.M. Catal. Fish., iii, 1861, p. 169.—Macleay, Proc. Linn. Soc. N. S. Wales, v, 1880, p. 572. Not *Lophius dubius* White, 1790.

Batrachus dubius Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales, i, 1877, p. 335: Sue Island, Torres Straits—Macleay, *ibid.*, viii, 1884, p. 267. Not *Lophius dubius* White, 1790.

? *Batrachus trispinosus* Kner, Reise Novara, i, 1865, Fisch. p. 189: Port Jackson. Not Günther, 1861.

? *Pseudobatrachus striatus* Castelnau, Res. Fish. Austr., 1875, p. 24: Cape York.

LESSER FROG-FISH.

D. iii, 19 or 20; A. 16; Vert. $9 + 18 = 27$. Width of head equal to or rather more than its length, which is 2.75 to 3.00 in that of

* According to Günther *Batrachus trispinosus* has $12 + 17$ vertebræ (v. B.M. Catal. Fish., iii, p. 169).

† *Batrachus trispinosus* differs so much in the dentition of the jaws and in the number of the vertebræ ($12 + 17$, *vide* Günther, B.M. Catal. Fish., iii, p. 169), that I am uncertain as to whether it should rightly be referred to this genus.

the body. Diameter of eye 1.25 in the length of the snout and considerably more than the interorbital width, which is 6.65 in the head. Premaxillary and mandibular teeth biserial anteriorly, a few of the front ones in the former somewhat enlarged; vomerine teeth uniserial. A single subopercular spine. Oral tentacles moderate, those of the distal end of the maxillary the largest; no frontonasal tentacle; two short supraciliary tentacles; axillary pore large. Posterior dorsal and anal rays extending beyond the base of the caudal; caudal and pectoral fins rounded, the former 5.00, the latter 6.20 in the body; outer ventral ray 4.0 longer than the pectoral and 1.65 in the head. Above dark brown, blotched and marbled with lighter, below dull white; lower portion of tail with obscure whitish spots. Fins brown, the dorsal with two or three inconspicuous oblique whitish bars; anal with similar bars and the free tips of many of the rays white; caudal and pectorals with more or less pronounced indications of lighter transverse bars; outer ventral ray dull white, basally spotted with brown, inner brown. One example differs as follows—Above purple, largely blotched with lavender, below white the chin faintly dotted brown; lower half of the sides with numerous bluish spots. Dorsal and caudal fins like the back; anal lighter, tipped with purple; pectorals lavender, with obscure rows of lighter spots; outer ventral ray dull white, inner violet. (*minor*, lesser).

Type in the collection of the Amateur Fishermen's Association of Queensland; Cat. no. 348. Coll. & Pres. by Mr. J. T. Jameson.

Total length 188 millimeters.

A littoral and estuarine species from the East Coast of Australia (Cape York, Moreton Bay, ? Port Jackson), Sue Island, Torres Straits, and British New Guinea (Port Moresby).

This frog-fish is not uncommon in the lower reaches of the Brisbane River and the muddy foreshores of Moreton Bay. The five specimens which I have examined, measuring from 125 to 188 millim., all differ from the *Batrachus dubius* of authors in the shortness of the tentacles and the narrowness of the interorbital region, which is considerably less than the diameter of the eye. *B. dubius* (White) having apparently villiform teeth can not belong to *Batrachomœus*, and since his description and figure are worthless it would be better to drop the name altogether. As Castelnau's description is equally faulty—he does not mention the presence or absence of an axillary pore—his name is valueless, since it is impossible to say to what species he refers. I have, therefore, been obliged to give the small northern form a new name.

2. BATRACHOMÆUS CÆCUS.

Thalassophryne cæca de Vis, Proc. Linn. Soc. N. S. Wales, ix, 1884, p. 546 : Coast of Queensland.

GREATER FROG-FISH.

D. 19 or 20; A. 15 or 16; Vert $9 + 18 = 27$. Width of head rather more than its length, which is 3.00 of that of the body. Diameter of eye 1.50 of the length of the snout and much less than the interorbital width, which is 5.35 in the head. Premaxillary teeth biserial anteriorly; vomerine teeth biserial, obtusely conical, the posterior row the larger. Two subopercular spines, the upper small and divergent. Oral tentacles moderate and fringed, largest posteriorly; no frontonasal tentacle; one or two small supraciliary tentacles; axillary pore large. Posterior dorsal and anal rays not extending beyond the base of the caudal: caudal fin rounded, pectoral obtusely cuneiform, the former 5.50, the latter 6.60 in the body: outer ventral ray .35 longer than the pectoral, and 1.60 in the head. Above dark brown blotched with lighter, below pale brown blotched with bluish white; branchiostegal region mottled brown and white: dorsal, anal, caudal, and pectoral fins brown with lighter spots and bars; outer ventral ray dull white, the inner violaceous. (*cæcus*, blind).

Type in the Queensland State Museum, Brisbane.*

Total length 300 millimeters.

East Coast of Queensland. (Moreton Bay and Cardwell). This is a deep water form, usually taken by hook on the offshore snapper banks.

3. BATRACHOMÆUS BROADBENTI sp. nov.

BROADBENT'S FROG-FISH.

D. iii, 21 or 22; A. 18. Width of head equal to its length, which is 2.75 to 3.00 in that of the body. Diameter of eye 1.50 of the length of the snout and a little less than the interorbital width, which is 6.35 in the head. Premaxillary teeth biserial, mandibular teeth triserial, anteriorly; vomerine teeth uniserial, acute and conical. Two subopercular spines, the upper small and divergent. Oral tentacles rather long and fringed; a frontonasal tentacle; three supraciliary tentacles, the posterior the longest, 1.50 of the diameter of the eye; axillary pore minute. Posterior dorsal and anal rays extending well beyond the base of the caudal: caudal fin cuneiform, pectoral rounded, the former 4.75, the latter 6.00 in the body: outer ventral ray .20 longer than the pectoral and 1.75 in the head. Above

* The type being a wretchedly mounted and distorted specimen, the description is taken from a very fine example in the A.F.A.Q. Museum, Brisbane, presented by Mr. J. Dowd: Cat. no. 170.

dark brown marbled with lighter, which on the tail may take the form of irregular transverse bands; below reddish brown, the under surface of the head penciled and dotted with pearl gray: dorsal and anal fins pale brown, with a marginal and some oblique bands darker brown; caudal and pectorals similar with dark brown transverse bars; ventrals pearl gray, tipped and barred with brown. [Named for Mr. Kendall Broadbent, the noted Australian and New Guinea explorer and collector].

Type in the Queensland State Museum, Brisbane.

Total length 255 millimeters.

East Coast of Queensland (Cardwell and Bundaberg). Described from two specimens collected respectively by Mr. Kendall Broadbent and Dr. T. H. May.

II. CORYZICHTHYS gen. nov.

Body cylindrical anteriorly, without scales. Three well-marked lateral lines, each of the pores with a cutaneous appendage. Mouth with moderate horizontal cleft, the jaws equal; maxillary extending to below the middle of the eye. Jaws, vomer, and palatines with narrow bands of small, cardiform teeth. Eyes rather large, superolateral. Opercle with two spines; subopercle with two spines, the lower much the shorter, divergent, often absent. Gill-opening narrow, embracing the upper half of the pectoral fin only; gill-rakers few, short, acute, and conical; pharyngeal teeth unequal in size, acute, and cardiform. Dorsal fins with iii, 19 to 22 rays, the middle spinous ray the longest: anal fin similar to but shorter than the dorsal, with 15 to 18 rays: caudal fin free and rounded. No axillary pore. Interorbital region deeply concave, the frontal ridges feeble; transverse ridge crescentic; occiput and basis cranii strongly ridged. Vertebrae $10 + 17 = 27$. [*κόρυζα*, slime or mucus; *ἰχθὺς*, a fish].

Small voracious fishes from the shores of India, Malaysia, Australia, and New Guinea. The weaker dentition of the species belonging to this genus suggests that their food may principally be chosen from worms, sand-fleas, and similar soft organisms, while the more brilliant coloration which is often observable in individual specimens shows that they are not averse to living on coral reefs.*

* While this paper was passing through the Press the Queensland Museum received from Mr. E. J. Banfield a beautiful example from Dunk Island, in which the richness of the various shades of brown, purple, and lilac is greatly accentuated, and which has in addition a brilliantly golden spot on each side of the head almost entirely covering the cheek and preopercle, and three similar blotches on each side of the back.

4. CORYZICHTHYS DIEMENSIS.

- ? *Lophius dubius* White, Voy. N. S. Wales, 1790, p. 265, c. fig. : Port Jackson, N.S.W.
- Batrachoides diemensis* Le Sueur, Journ. Acad. Nat. Sci. Phila., iii, 1823, p. 402 :
- Batrachus dussumieri* Cuvier & Valenciennes, Hist. Nat. Poiss., xii, 1837, p. 474, pl. cccxvii: Malabar Coast—Günther, B. M. Catal. Fish., iii, 1861, p. 169—Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales, i, 1877, p. 335—Klunzinger, Sitzb. Akad. Wien, lxxx, i, 1879, p. 386—Macleay, Proc. Linn. Soc. N. S. Wales, v, 1880, p. 573.
- Batrachus quadrispinis* Cuvier & Valenciennes, *ibid.*, p. 487 : Seas of India.
- Batrachus diemensis* Richardson, Ann. & Mag. Nat. Hist., xi, 1843, p. 352. & Zool. Erebus & Terror, Fish. 1845, p. 17, pl. viii, figg. 1 & 2—Bleeker, Nat. Tijds. Ned. Ind., iii, 1852, p. 168—Günther, *ibid.*, p. 170—Macleay, *ibid.*, ii, 1878, p. 355 & v, 1880, p. 573.
- Batrachus mülleri* Klunzinger, *ibid.*, p. 387 : Port Darwin, N. T.—Macleay, *ibid.*, ix, 1884, p. 29.
- Batrachus grunniens* Macleay, *ibid.*, vii, 1882, p. 360. Not *Cottus grunniens*, var. B, Linnæus, 1758.
- Porichthys queenslandicæ* de Vis, Proc. Linn. Soc. N. S. Wales, vii, 1882, p. 370 : Coast of Queensland.*

BANDED FROG-FISH.

D. 19 to 21 ; A. 16 or 17 ; Vert. 10 + 17 = 27. Width of head rather less than its length, which is 2·75 to 3·00 in that of the body. Diameter of eye ·20 more than the length of the snout and 3·75 in that of the head. Interorbital width 2·25 in the diameter of the eye and 8·25 in the head. Premaxillary teeth anteriorly in four, posteriorly in two series, those of the inner row the longest and strongly hooked ; vomerine teeth in many irregular series ; palatine teeth similar to the vomerine, but often with two or three much enlarged, isolated teeth on the inner edge of the bone at some distance from the outer band, which is biserial posteriorly ; mandibular teeth pluriserial anteriorly, where the bone expands to form a rounded process directed forwards, behind which the band gradually narrows to a double row, the hinder teeth of which are much enlarged, erect, and compressed. Two opercular spines, the upper much the longer ; one or two subopercular spines, the lower, when present, short. † Tentacles variable in length, the variance not dependent on age and sex ; those surrounding the jaws usually rather short and simple,

* The types of Mr. de Vis' proposed species are unfortunately missing, but I have no hesitation in referring it to this fish.

† Of twelve Queensland specimens examined the lower subopercular spine was absent in four ; in one of these, however, the position of the base of the spine is plainly discernible below the surface, though not reaching the edge of the subopercular bone. There is absolutely no other difference between the three-spined *dussumieri* and the four-spined *diemensis*.

with the exception of a pair on the distal half of the maxillary, which are long and fringed; a series of mixed tentacles—simple or fringed, the latter the longer—around the edges of the opercular bones; three well developed supraciliary tentacles, which are usually bifid or trifid; a similar but smaller frontonasal tentacle; occiput with five regular longitudinal series of rather small tentacles; lateral line pores each with a small, usually bifid tentacle, forming three series on the body, the two lower of which are sometimes aborted.* Caudal and pectoral fins rounded, the former 4.35, the latter 5.35 in the total length: outer ventral ray .25 longer than the pectoral and 1.25 of the length of the head. Coloration varying from violet to purplish black above and from pearl-gray to lilac below; tail usually with four broad, more or less connected lighter cross-bands, which are continued on the dorsal and anal fins, where they are inclined respectively forwards and backwards; sometimes the upper half of these bands is scarlet or orange, as also are the spinous dorsal and the cheeks; the bands are usually plentifully sprinkled with darker spots and dots; caudal fin lilac, with more or less conspicuous lighter transverse bars; pectorals and ventrals violaceous gray, with broad basal and median purple bands, or uniform purple. (*diemensis*, belonging to Van Diemen's Land, whence Le Sueur believed that his specimen came; it has not, however, been found there since).

Total length 220 millimeters.

From South-Western India (fide Valenciennes) to Eastern Australia and South-Eastern New Guinea. The Australasian records are as follows:—Timor (Bleeker); Houtmans Abrolhos, W.A., and Port Essington, N.T. (Richardson); Port Darwin, N.T. (Macleay & Klunzinger); Thursday Island, T.S. (Weber); Darnley Island and Cape Grenville, Q. (Alleyne & Macleay); Port Denison, Q. (Klunzinger); Port Moresby, N.G. (Macleay); ? Port Jackson,

* I have examined a specimen from Cardwell, length 166 millim., in which all the tentacles except the supraciliary were very short, and I consider Klunzinger's *Batrachus mülleri* to be merely an exaggerated example of this variety, in which for some reason the tentacles have not arrived at their full development. In an exceptionally fine six-inches specimen from Moreton Bay the upper lateral line commences behind the supraciliary tentacles, and passing immediately above the edge of the opercle, curves upwards over the pectoral, and running close to the base of the soft dorsal, terminates at the upper fourth of the base of the caudal: the middle line separates from the upper above the base of the pectoral, and curving downwards behind that fin runs along the middle of the side until just in front of the caudal fin where it bends upwards and reunites with the upper line; its pores are much fewer and more distant than those of the other lines, but the filaments are longer: the third line originates above the base of the ventral, curves slightly upwards beyond the tip of that fin, and passing close along the base of the anal finally terminates below the end of that fin.

N.S.W. (White & ? Steindachner); and ? Tasmania (Le Sueur). To these may be added the following Queensland localities—Somerset, Dunk Island, Cardwell, Gladstone, and Moreton Bay.

The Banded Frog-Fish is found everywhere along the coast of Queensland, but its southern limit is at present undefined. The Chevert expedition found it to be distributed "generally throughout Torres Straits," while the fact that at Port Moresby it has received the native name "Nohu" proves that it must be well known to the aboriginal population. Further eastward we learn from Gilbert that it is common at Port Essington, and as it is by no means scarce in Moreton Bay, we may safely consider it to be the most abundant and widely distributed species on our shores.

List of the Species of Batrachoididæ.

i. **BATRACHOIDES** Lacépède, Hist. Nat. Poiss., iii, 1802, p. 306 (*tau* = *surinamensis*).

1. *boulengeri* Gilbert & Starks, Mem. Calif. Acad. Sci., iv, 1904, p. 182: Pacific Coast of Central America.
2. *goldmani* Evermann & Goldsborough, Bull. U.S. Fish. Comm., xxi, 1902, p. 159: Tabasco, Mex.
3. *pacifici* Günther, B.M. Catal. Fish., iii, 1861, p. 173: Pacific Coast of Panama.
4. *surinamensis* Bloch & Schneider, Syst. Ichth., 1801, p. 43: Surinam.

ii. **HALOBATRACHUS** Ogilby, v. supra. Type, *Batrachus didactylus* Schneider.

5. *congicus* Reichenow, Mon. Akad. Berlin, 1877, p. 622: Chinchoxo, W. Africa.
6. *didactylus* Bloch & Schneider, *ibid.*, p. 42: Mediterranean.
7. *liberiensis* Steindachner, Sitzb. Akad. Wien, lvi, 1867, p. 525: Liberia, W. Africa.

iii. **OPSANUS** Rafinesque, Amer. Month. Mag., 1817, p. 203 (*cerapalus* = *tau*).

8. *argentinus* Berg, An. Mus. Buenos Aires, v, 1897, p. 300: Mouth of the Rio de la Plata.
9. *pardus* Goode & Bean, Proc. U.S. Nat. Mus., ii, 1879, p. 336: Pensacola, Fla.
10. *tau* Linnæus, Syst. Nat., ed. 12, 1766, p. 439: Carolina.

iv. **BATRACHOMÆUS** Ogilby, ut supra.

11. **BROADBENTI** Ogilby, ut supra.
 12. **CÆCUS** de Vis, Proc. Linn. Soc. N. S. Wales, ix, 1884, p. 546 :
 Cardwell, Q. East Coast of Queensland.
 13. **MINOR** Ogilby, ut supra.
 14. *trispinosus* Günther, *ibid.*, p. 169 : Indian Seas.

v. **MARCGRAVIA** Jordan, Proc. U. S. Nat. Mus., ix, 1886,
p. 546 (*cryptocentra*).

15. *cryptocentra* Cuvier & Valenciennes, Hist. Nat. Poiss., xii, 1837,
p. 485 : Bahia, Braz.

vi. **CORYZICHTHYS** Ogilby, ut supra.

16. *diemensis* Le Sueur, Journ. Acad. Nat. Sci. Phila., iii, 1823, p.
402 : Tasmania. From South-Western India to Eastern
Australia and South-Eastern New Guinea.
17. *gangene* Buchanan, Fish. Ganges, 1822, pp. 34 & 365 : Ganges.
18. *reticulata* Steindachner, Sitzb. Akad. Wien, lx, 1870, p. 564 :
Singapore.

vii. **PORICHTHYS** Girard, Proc. Acad. Nat. Sci. Phila., 1854,
p. 141 (*notatus*).

19. *greenei* Gilbert & Starks, *ibid.*, p. 184 :
20. *margaritatus* Richardson, Zool. Sulphur, Fish. 1845, p. 67 :
Pacific Coast of Central America.
21. *notatus* Girard, *ibid.* ; San Francisco.
22. *porosissimus* Cuvier & Valenciennes, Hist. Nat. Poiss., xii, 1837,
p. 501 : Surinam.
23. *porosus* Cuvier & Valenciennes, *ibid.*, p. 506 : Coast of Chile.

viii. **DÆCTOR** Jordan & Evermann, Fish. N. & Mid. Amer.,
pt. iii, 1898, p. 2325 (*dowi*).

24. *dowi* Jordan & Gilbert, Proc. U. S. Nat. Mus., x, 1887, p. 388 :
Punta Arenas, S. Chile.

ix. **THALASSOPHRYNE** Günther, *ibid.*, p. 174 (*maculosa*).

25. *amazonica* Steindachner, *ibid.*, lxxiv, 1876, p. 161 : Rio Amazons.
 26. *maculosa* Günther, *ibid.*, p. 175 : Puerto Cabello.
 27. *nattereri* Steindachner, *ibid.*, : Rio Amazons.
 28. *punctata* Steindachner, *ibid.*, p. 160 : Rio Negros.
 29. *reticulata* Günther, Proc. Zool. Soc., 1864, p. 150 : Pacific Coast of Panama.

x. **THALASSOTHIA** Berg, An. Mus. Buenos Aires, iv, 1895, p. 67 (*montevidensis*).

30. *montevidensis* Berg, An. Mus. La Plata, ii, 1893, p. 6 : Montevideo, Ur.

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31. *apiatus* (*Batrachus*) Cuvier & Valenciennes, *ibid.*, p. 477 : Cape Seas.
 32. *biaculeatus* (*Batrachus*) Steindachner, Verh. zool.-bot. Ges. Wien, 1867, p. 516 : Cape of Good Hope.
 33. *cirrhusus* (*Batrachus*) Klunzinger, Verh. zool.-bot. Ges. Wien, 1871, p. 500 : Red Sea.
 34. *elminensis* (*Batrachus*) Bleeker Soc. Holl. Sci. Harlem, 1864, p. 98 : Guinea Coast.
 35. *gronovii* (*Batrachus*) Cuvier & Valenciennes, *ibid.*, p. 482 : Brazil.
 36. *güntheri* (*Batrachus*) Bleeker, *ibid.*
 37. *marmoratus* (*Batrachus*) Steindachner, *ibid.*, 1866, p. 482 : ?
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