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STUDIES IN AUSTRALIAN FISHES.

No. 1.

By ALLAN R. McCULLOCH, Zoologist.

(Plates x.-xi.)

It is my intention to contribute under this heading a series of short papers dealing with material as it comes to hand.

The present article contains an account of some species of the genera *Clinus*, *Petraites* and *Cristiceps*. They are an extremely variable group, and it is only by an examination of large series that the limits of the many species can be determined. The Australian Museum Collection, together with that of the late Sir William Macleay, affords such material, and I take the opportunity of figuring the eight species available, as well as giving a short comparative description of each.

To Mr. George Masters, Curator of the Macleay Museum, my best thanks are due for enabling me to examine the specimens under his charge; also to Messrs. J. Gabriel, of Melbourne, and H. E. Finckh and Bassett Hull, Junr., of Sydney, for additional specimens.

The species dealt with, including synonyms, are as follows:—

- Cristiceps aurantiacus*, Cast.—Syn. *C. pictus*, Macl.
- „ *australis*, Cuv. & Val.—Syn. *C. macleayi*, Cast.;  
*C. howittii*, Cast.; *C. pallidus*, Macl.; *C. splendens*, Cast.
- „ *argyropleura*, Kner.
- Petraites heptacolus*, Ogilby.—Syn. *Cristiceps wilsoni*, Lucas.
- „ *roseus*, Günther.
- „ *fasciatus*, Macl.—Syn. *Clinus whiteleggi*, Ogilby.
- „ *phillipi*, Lucas.
- Clinus perspicillatus*, Cuv. & Val.—Syn. *Clinus despicillatus*, Rich.

CLINUS, Cuvier.

*Clinus*, Cuvier, Règne Anim., ii., 1817, p. 251 (*mustelaris*).

This genus was proposed for Blennies in which the anterior rays of the dorsal fin, while widely spaced from those following, are nevertheless connected with them by membrane.

CRISTICEPS, *Cuv. & Val.*

*Cristiceps*, Cuv. & Val., Hist. Nat. Poiss., xi., 1836, p. 402  
(*australis*).

This was erected to receive such species as had the first three rays entirely separated from those following. Beyond this there appears to be no other character to distinguish it from *Clinus*. It must be noted here, however, of the type, *C. australis*, that while many specimens have the membrane from the third ray ending a little way in front of the anterior spine of the second dorsal, in others it extends to, or even up its base.

PETRAITES, *Ogilby.*

*Petraites*, Ogilby, Proc. Linn. Soc. N. S. Wales, x., 1885, p. 226  
(*heptacolus*).

This is to accommodate the species "which oscillate between the two genera mentioned."

Apart from the general appearance, there are no definite characters by which any one of these may be separated from the others, for while such species as *Cristiceps aurantiacus* and *Clinus perspicillatus* are readily divisible into two genera, they are connected by an unbroken series of intermediate species. The same must be said of several other genera not found in Australia.

It is obvious that no good purpose can be subserved by uniting all these under the oldest name *Clinus*, and I therefore propose that the above three be provisionally restricted as follows:—

- |    |   |                    |
|----|---|--------------------|
| A. | First dorsal spine placed over or in front of the eye.<br>First and second dorsal fins entirely separated or connected by membrane..... | <i>Cristiceps.</i> |
| B. | First dorsal spine placed behind the eye.   |                    |
| C. | Third spine connected to the basal portion only of the first spine of the second dorsal.....  | <i>Petraites.</i>  |
| D. | Third spine connected to the middle or upper half of the first spine of the second dorsal.....  | <i>Clinus.</i>     |

Key to the species examined:—

*Cristiceps.*

- |    |  |                      |
|----|--|----------------------|
| A. | Anterior spine placed just before the front margin of the eye. Two dorsals separate.....                                       | <i>aurantiacus.</i>  |
| B. | Anterior spine over the front half of the eye. Two dorsals connected.....  | <i>argyropleura.</i> |
| C. | Anterior spine over the hinder portion of the eye. First dorsal either distinct from, or joined to the base of the second..... | <i>australis.</i>    |

*Petraites.*

## D. Body deep.

E. Dorsal spines of moderate length; the rays though spaced, not distinctly divided into two parts..... *roseus.*

EE. Dorsal spines short; the rays divided into two parts by a transparent interspace..... *heptacolus.*

## DD. Body slender.

F. Spines of first dorsal sub-equal..... *fasciatus.*

FF. Third spine of first dorsal much shorter than the first..... *phillipi.*

*Climis.*

G. First dorsal connected to the upper half of the anterior spine of the second; spines sub-equal... *perspicillatus.*

CRISTICEPS AURANTIACUS, *Castelnau.*

(Plate x., fig. 1.)

*Cristiceps aurantiacus*, Castelnau, Proc. Linn. Soc. N. S. Wales, iii., 1879, p. 386. Macleay, Cat. Austr. Fishes (Proc. Linn. Soc. N. S. Wales, vi., 1881), p. 22. Stead, Fish. Austr., 1906, frontispiece.

*Cristiceps pictus*, Macleay, *loc. cit.*, p. 25.

D. iii., xxviii.-xxx.; 4-5 + 2. A. ii.; 23-25. V. 3.

First dorsal spine placed just before the front margin of the eye. The two dorsals not connected by membrane. Generally the two posterior rays of the second dorsal are separated from the others by an interspace. Caudal peduncle very long and slender, the membrane from the posterior dorsal ray reaching half-way along its length. A branched tentacle on the snout, and another long simple one over the eye. Vertebrae 14 + 32.

This is a common species along the coast of New South Wales. An examination of the type of *C. pictus*, Macl., shows that it is identical with Castelnau's species.

## Specimens examined:—

(a) 1 Port Jackson, New South Wales.—Type *C. pictus*.

(b) 4 Port Jackson, New South Wales.

(c) 3 New South Wales Coast.

(d) 2 Lord Howe Island.

(e) 7 without locality.

CRISTICEPS ARGYROPLEURA, *Kner.*

(Plate x., fig. 2.)

*Cristiceps argyropleura*, Kner., Reise Novara, Zool. i., Fische, p. 199, pl. vii, fig. 4. Macleay, Cat. Austr. Fishes (Proc. Linn. Soc. N. S. Wales, vi., 1881), p. 25. Waite, Mem. Austr. Mus., iv., 1, 1899, p. 113, pl. xi., f. 3.

D. iii., xxvii.-xxix.; 5-7. A. ii.; 22-24. V. 3.

The first dorsal spine is placed over the anterior part of the eye, and the third spine is more or less completely connected with the base of the second dorsal by membrane. Dorsal rays equidistant. The caudal peduncle is long and slender, the membrane from the last dorsal ray reaching about half way along its length. A branched tentacle on the snout, and a long simple one over the eye. Snout short.

The five specimens of this species I have seen appear to differ from the original description only in having two rays less in the anal fin.

- (a) 1 Off Jibbon, New South Wales.—Thetis Expedition.
- (b) 2 Port Jackson, New South Wales.
- (c) 2 without locality.

CRISTICEPS AUSTRALIS, *Cuv. & Val.*

(Plate x., fig. 3.)

*Cristiceps australis*, Cuv. & Val., Hist. Nat. Poiss., xi., 1836, p. 402, pl. cccxxxvi. Günther, Cat. Fish. Brit. Mus., iii., 1861, p. 275. Macleay, Cat. Austr. Fishes (Proc. Linn. Soc. N. S. Wales, vi., 1881), p. 20. Waite, Rec. Austr. Mus., iii., 1900, p. 209; and *loc. cit.*, v., 1904, p. 224. Lucas, Proc. Roy. Soc. Vict., (n.s.), iii., 1891, p. 10, pl. iii., f. 3.

*Cristiceps macleayi*, Castelnau, Proc. Linn. Soc. N. S. Wales, iii., 1879, p. 385. Macleay, *loc. cit.*, p. 21.

*Cristiceps howittii*, Castelnau, Proc. Zool. Soc. Vict., ii., 1873, p. 48; and Proc. Linn. Soc. N. S. Wales, iii., 1879, p. 385. Macleay, *loc. cit.*, pp. 20, 21.

*Cristiceps pallidus*, Macleay, *loc. cit.*, p. 26.

? *Cristiceps splendens*, Castelnau, Proc. Zool. Soc. Vict., ii., 1873, p. 66. Macleay, *loc. cit.*, p. 22.

D. iii., xxvi.-xxix.; 6-8. A. ii.; 24-26. V. 3.

First dorsal spine situated rather behind the middle of the eye. The two dorsals either entirely separate, or the first just

connected to the base of the second by membrane. The dorsal rays equidistant. Caudal peduncle long and slender, the membrane from the last dorsal ray reaching from half to two-thirds along its length. A branched tentacle on the snout, and a long simple one over the eye. Snout sub-conical. Vertebrae 14 + 30.

This is the commonest species of the genus in New South Wales, and is taken in the sea-grass *Zostera*, by net fishermen. Its general colour is green, with darker bands and silvery markings.

Specimens examined:—

- (a) 11 Port Jackson, New South Wales.
- (b) 3 Port Phillip, Victoria.
- (c) 1 Western Port, Victoria.—Co-type *C. howittii*.
- (d) 4 Port Jackson, New South Wales.—Co-type *C. macleayi*.
- (e) 1 King George's Sound, Western Australia.—Type *C. pallidus*.
- (f) 1 King George's Sound, Western Australia.
- (g) 35 without locality.

In the Museum collection there is a specimen labelled "*Cristiceps splendens*, Cast., Adelaide," which agrees well with the description of that species in all but having the interorbital space much less than the vertical diameter of the eye. Other specimens from South Australia, and Fremantle, Western Australia, and one from Jervis Bay, New South Wales, have the fin formulæ as follows:—

D. iii., xxvi.-xxviii. 6-7. A. ii.; 22-24. V. 3.

Beyond the reduced number of rays in the anal fin, I am unable to find any differences between these and *C. australis*, C. and V.

- (a) 1 Adelaide, South Australia.
- (b) 3 South Australia.
- (c) 2 Fremantle, Western Australia.
- (d) 1 Jervis Bay, New South Wales.

#### PETRAITES ROSEUS, Günther.

(Plate x., fig. 4.)

*Cristiceps roseus*, Günther, Cat. Fish. Brit. Mus., iii., 1861, p. 274.  
Macleay, Cat. Austr. Fishes (Proc. Linn. Soc. N. S. Wales, vi., 1881), p. 19. Ogilby, Mem. Austr. Mus., ii., 1889, p. 63.

*Petraites roseus*, Waite, Rec. Austr. Mus., v., 3, 1904, pp. 181 and 224.

D. iii., xxv.; 3-5. A. ii., 18-20. V. 3.

First dorsal spine placed between the eye and the preopercular margin. The membrane from the third spine extends to, rarely up, the base of the first spine of the second dorsal. The dorsal rays are widely spaced, the second and third slightly more so than the others. Caudal peduncle short and broad, the dorsal membrane reaching to the base of the caudal rays. A branched tentacle on the snout and a broad fringed one over the eye. Body deep. Vertebrae 14 + 26.

All the fresh specimens I have seen were of a deep brown colour, with darker bands and silvery and transparent markings. Specimens long preserved in alcohol become yellowish with bright pink bands. Lives among weeds in pools along the New South Wales coast.

- (a) 4 Port Jackson, New South Wales.
- (b) 2 New South Wales coast.
- (c) 5 Lord Howe Island.
- (d) 2 without locality.

PETRAITES HEPTÆOLUS, *Ogilby*.

(Plate xi., fig. 1.)

*Petraites heptæolus*, Ogilby, Proc. Linn. Soc. N. S. Wales, x., 1885, p. 225.

*Cristiceps wilsoni*, Lucas, Proc. Roy. Soc. Viet., (n.s.), iii., 1891, p. 10, pl. iii., f. 1.

D. iii., xxv.-xxvii.; 1 + 2. A. ii.; 17-20. V. 3.

First dorsal spine placed over the preopercular margin. The membrane from the third spine extends rarely to, generally a little up the base of the anterior one of the second dorsal. The two posterior rays separated by an interspace from the first. Caudal peduncle short and broad, the dorsal membrane reaching to the caudal rays. A branched tentacle on the snout, and a broad fringed one over the eye. Body deep.

I have taken this species with *P. roseus* at Long Bay, to which it is nearest allied. It differs, however, by having much lower fins, the dorsal rays less numerous than is usual in that species, and the two last being separated from the first. Those of the anal are also generally distinct. There seems to me to be no doubt that *Cristiceps wilsoni*, Lucas, must be included under this heading, the only apparent difference lying in a greater range of variation in the number of spines and rays in the dorsal

and anal (D. iii, xxiv.-xxviii.; 1 + 2. A. ii.; 17-21) of the Victorian species, than in any I have seen from New South Wales.

- (a) 3 Long Bay, New South Wales.
- (b) 1 Port Jackson, New South Wales.—Type *P. heptaœolus*.
- (c) 1 Port Jackson, New South Wales.
- (d) 2 without locality.

PETRAITES FASCIATUS, *Macleay*.

(Plate xi., fig. 2.)

*Cristiceps fasciatus*, Macleay, Cat. Austr. Fishes (Proc. Linn. Soc. N. S. Wales, vi., 1881), p. 19.

*Clivus whiteleggii*, Ogilby, Proc. Linn. Soc. N. S. Wales, xix., 1894, p. 371.

D. iii, xxviii.-xxxii.; 1 + 1. A. ii.; 18-22. V. 2, rarely 3.

First dorsal spine placed above the hinder margin of the preopercle. The two dorsals connected by membrane. The last two rays are rather widely spaced. Caudal peduncle short and broad. A small branched tentacle on the snout, and a short, broad simple one over the eye. Rarely both are large and branched.

This is the common species living among sea-weeds in pools along the coast. In colour it may be anything from dark green without markings to pale green with darker bands and silvery or transparent markings. Specimens living in the pink coralline sea-weed common on the coast are of a bright pink variegated with brown, throughout which, however, the typical bands and silver spots are maintained.

Having examined Macleay's type of this species as well as Ogilby's *C. whiteleggii*, I am able to recognise the two as identical, although a comparison of the two descriptions would not lead to such a conclusion. Macleay's specimen is in very bad condition, but is sufficiently good to show all the important features. Ogilby's type is malformed, some of the rays of the various fins being distorted or absent. The above characters are therefore drawn up from a large series taken by myself at Long Bay, near Sydney.

- (a) 28 Long Bay, New South Wales.
- (b) 1 Jervis Bay, New South Wales.—Type *C. whiteleggii*.
- (c) 1 Port Jackson, New South Wales.—Type *C. fasciatus*.



PETRAITES PHILLIPI, *Lucas*.

(Plate xi, fig. 3.)

*Cristiceps phillipi*, Lucas, Proc. Roy. Soc. Vict., (n.s.), iii, p. 11, pl. iii, f. 2.

D. iii., xxx.-xxxii.; 2-3. A. ii.; 22-25. V. 2.

First dorsal spine placed over the margin of the preopercle. The membrane from the third extending on to the base of the first of the second dorsal. The rays are widely spaced, the last being joined to the base of the caudal. Caudal peduncle short and broad. Rostral and supraorbital tentacles very small and simple. Ventrals long and slender.

Five specimens are in the collection from Mr. J. Gabriel, who dredged them at Western Port, Victoria. They differ from the description only in the depth of the body, but this character varies according to the age and sex of the individual.

(a) 5 Western Port, Victoria.

CLINUS PERSPICILLATUS, *Cuv. & Val.*

(Plate xi, fig. 4.)

*Clinus perspicillatus*, Cuv. & Val., Hist. Nat. Poiss., xi, 1836, p. 372.

*Clinus despicillatus*, Richardson, Proc. Zool. Soc., 1839, p. 90, and Trans. Zool. Soc., iii, 1849, p. 128, pl. vi, fig. 2. Günther, Cat. Fish. Brit. Mus., iii, 1861, p. 271. Macleay, Cat. Austr. Fishes (Proc. Linn. Soc. N. S. Wales, vi, 1881), p. 14.

D. iii., xxxii.-xxxiv.; 3-5. A. ii., 24-26. V. 3.

First dorsal spine placed above the preopercular margin. The three anterior spines are sub-equal and joined to those following them by membrane. The dorsal rays are not spaced. Caudal peduncle short and broad, the dorsal membrane extending on to the base of the caudal. A slender branched tentacle on the snout and another large one over the eye.

It seems to me that Richardson's species is without doubt identical with *C. perspicillatus*, the distinguishing characters mentioned by him being of but little value, and dependent largely upon the method and condition of preservation.

(a) 2 Tasmania.

(b) 1 Western Port, Victoria.

(c) 8 Launceston, Tasmania.

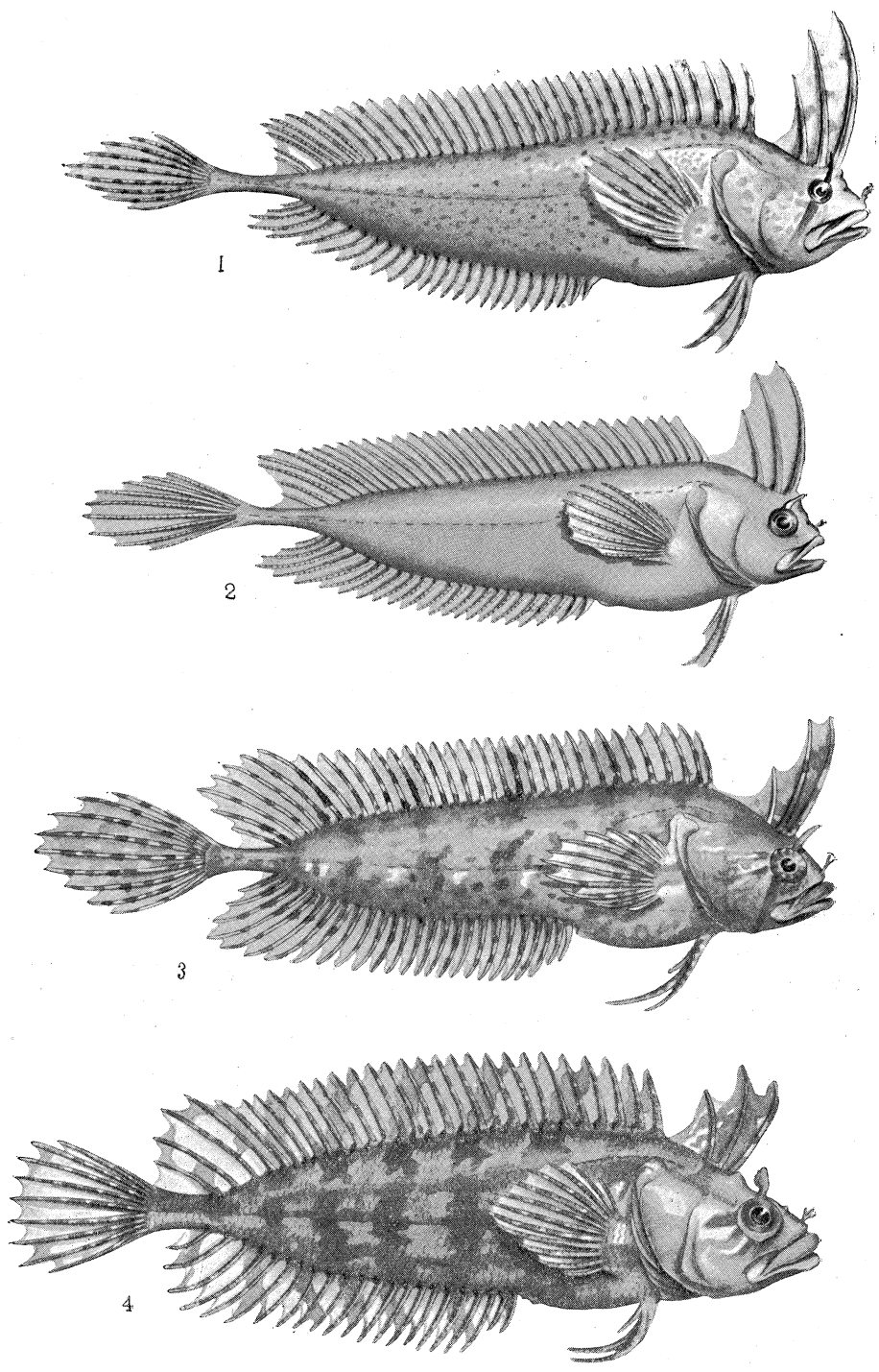
EXPLANATION OF PLATE X.

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AUSTRALIAN FISHES.

- Fig. 1. *Cristiceps aurantiacus*, Castelnau.  
,, 2. ,, *argyroleura*, Kner.  
,, 3. ,, *australis*, Cuvier and Valenciennes.  
,, 4. *Petraites roseus*, Günther.

All the figures are of the natural size.



A. R. McCULLOCH, del.,  
Austr. Mus.

EXPLANATION OF PLATE XI.

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AUSTRALIAN FISHES.

- Fig. 1. *Petraites heptaolus*, Ogilby.  
,, 2. ,, *fasciatus*, Macleay.  
,, 3. ,, *phillipi*, Lucas.  
,, 4. *Clinus perspicillatus*, Cuvier and Valenciennes.

All the figures are of the natural size.

