

## Notes on the Young of *Blennius galerita*, L.

(MONTAGU'S BLENNY).

By

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No description of the young of this species seems to exist, with the exception of that given by Emery (1) of some examples from Naples.

The specimens here described were captured at Newquay, on the north coast of Cornwall, in September, 1898, and have been preserved in formol. They were caught in sandy pools surrounding or surrounded by rocks in the shelter of which they seemed to be fond of lying. When disturbed they darted with considerable rapidity from place to place, and in doing so were seemingly assisted by the large pectoral fins which were carried nearly at right angles to the body by the fish when at rest.

They exhibit the large pectoral fins typical of the young of many British species of *Blennius*, but in other respects generally resemble the adult in form. Although these specimens exhibit a remarkable amount of individual variation and show a considerable lack of uniformity in growth and development, the presence of the interorbital "helmet," taken in conjunction with their comparatively small size and radial formula, seems to be diagnostic from a length of 15·5 mm. (including caudal fin) upwards.

A brief description of the Cornish specimens follows.

Length.	Length with middle caudal rays.	Depth of body.	Length of head.	Length of pectoral.	Pectoral compared with length of body.	Averages.
13	15·5	—	3	4·5	·35	} ·352
13	15·5	2·75	3	4·75	·37	
13·25	15·75	—	3	4·5	·34	
13·5	16	—	3	4·5	·33	
13·5	16	2·75	3	5	·37	
14·25	17	2·75	3·25	4·75	·33	} ·33
14·5	17·25	3	3	5	·34	
14·75	17·5	3	3·5	5	·34	
14·75	17·5	3	3·5	4·75	·31	
15·5	18·75	3·5	3·5	5	·32	
17·5	21	4	3·5	5	·29	·29

*Fin-rays.* D. xiii. 15-16; A. 18-20.

*Pigmentation.* At 13 to 13.5 mm. (15.5 to 16 mm. including the middle caudal rays) the caudal peduncle is still quite or almost devoid of pigment. The pectoral fin is more or less thickly covered with a variable number of black chromatophores, and there are a few others at the base of the caudal fin and in a roughly horizontal band on the anal fin.

There is a varying amount of diffuse brown pigment, more especially (*a*) on the upper part and front of the head, (*b*) in a band running from the eye to the upper jaw, (*c*) on the operculum and base of the pectorals, and (*d*) on the body. In the latter situation it is most noticeable (i.) in four more or less faint V-shaped markings on each side of the dorsum, the first below the origin of the dorsal fin and the third below its lowest point, and (ii.) in more or less indefinite patches below and alternating with these.

A considerable number of dark brown chromatophores (very probably black chromatophores seen through the diffuse brown pigment) are scattered along the dorsum on each side, along the base of the anal fin, and, less freely, on the trunk; in some cases similar chromatophores may be detected among the diffuse pigment (*a*), (*b*), and (*c*), already mentioned.

At 14.25 to 14.75 mm. (17 to 17.5 mm. with the middle caudal rays) the caudal peduncle is still almost devoid of pigment. A few of the black chromatophores at the base of the caudal fin remain, while those on the pectorals vary much in number, being in some cases many and closely set and in others few and scattered.

The diffuse brown pigment is more marked and more generally distributed, beginning to appear on the dorsal and anal fins and the lower part of the pectorals. There are six V or U-shaped dorsal markings, the last of which is still faint and is situated below the posterior end of the dorsal fin, and alternating with and below these are  $\blacktriangle$  or  $\text{H}$ -shaped markings on the body. The dark brown chromatophores are much less noticeable and more restricted in distribution.

At 15.5 mm. (18.75 mm. with middle caudal rays) the large black chromatophores on the pectoral fin are no longer visible, the body is generally covered with diffuse brown pigment, which extends on to the dorsal, anal, and lower part of the pectoral fins, the dark chromatophores have almost disappeared, and the body markings are much as in the last stage, with the addition of traces of a seventh dorsal band on the caudal peduncle.

At 17.5 mm. (21 mm. with middle caudal rays) the pigmentation remains practically the same, but is more intense.

The *pectoral* fins grow comparatively shorter with age, though subject to considerable individual variation; both these points appear sufficiently in the table.

The *narial tentacles* are plainly visible in all examples from 13 mm. up.

The *interorbital "helmet"* increases with age, but may attain a very different growth in two individuals of the same size. It consists of a single leaf-like and broadish tentacle followed by several smaller ones; these latter seem to vary much in the period at which they appear—though present in one specimen of 15.5 mm. they have not yet appeared in another of 17.25 mm.

A comparison with the figures given by Emery (1) of young forms attributed to this species from Naples shows that (in addition to the individual variations above alluded to) there is a very great difference in the development of Atlantic and Mediterranean specimens; a Neapolitan example of 15 mm. (including caudal) shows no trace of the interorbital "helmet" and has far longer pectorals than any of the Cornish specimens, while a Neapolitan example of 23 mm. (including caudal) still retains most of the black pigment on the pectorals, which it is obvious must undergo their comparative reduction in size at a much later period of growth than in the case of the Cornish specimens. The differences in pigmentation and general form do not appear, when allowance has been made for the different methods of preservation, to be very great.

Apparently in *B. galerita*, as in *B. pholis* (3 and 5) and *B. ocellaris* (2 and 3), the size and dark pigmentation of the pectoral fins increase until a certain stage of growth is reached (possibly the stage at which the young fish first begins to assume the habits of the adult), when this increase is checked and the fins gradually assume the form and colouration found in the adult.

The true significance of the "long-finned" phase of *Blennius* is by no means certain. It has been suggested that it is of an ancestral nature, but if so it is curious that *Anarrhichas* does not appear to pass through such a phase. The groups of *Acanthopterygii* in which the pectorals are most markedly developed are the Trigloids and Scopænoids, forms which are closely allied to one another, but do not appear to be in any way related to the blennies.

If, on the other hand, the large size and dark pigmentation of the pectorals are regarded as a purely transitory and adaptive character, the "long-finned" blenny may be compared with the pelagic stages of certain gadoids (e.g. *Molva* and *Onos*), in which the ventral fins are enormously prolonged and deeply pigmented. It is not much use speculating upon the origin and utility of such a stage, but the observation on *Dactylopterus* mentioned by Holt (4) certainly suggests the possibility that

the possession of large and darkly pigmented accessory organs may easily divert the attacks of enemies from a defenceless but almost transparent larval fish during the pelagic stage of its existence, and this theory is to a certain extent borne out by the fact that the decrease in size and loss of pigment would appear in *BleNNIUS* to coincide to some extent with the adoption of the habits and colours of the adult.

## REFERENCES.

1. Emery.—*Atti dei Lincei*, ser. 3, xiv. p. 187 (1883).
2. Garstang.—*M. B. A. Journal*, vi. p. 70 (1900).
3. Holt.—*M. B. A. Journal*, v. p. 107 (1898), and *Ann. Mus. Marseille*, v. p. 5 (1899).
4. Holt.—*P. Z. S.*, 1898, p. 314.
5. McIntosh and Masterman.—*British Marine Food Fishes*, p. 206 (1897).