

On the Post-larvæ of the Wrasses occurring near Plymouth.

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With Figures 1-9 in the Text.

Six species of Wrasses occur in the adult stage in the neighbourhood of Plymouth (Clark 3, p. 217), namely, *Labrus bergylta* Asc., *Labrus mixtus* (L.), *Ctenolabrus rupestris* (L.), *Crenilabrus melops* (L.), *Centrolabrus exoletus* L., and *Julis julis* (L.). The post-larval forms of four of these species have been described by the following authors:—

<i>Labrus bergylta</i>	Le Danois	(4, p. 155).
<i>Labrus mixtus</i>	Allen	(1, p. 223).
<i>Ctenolabrus rupestris</i>	Ehrenbaum	(5, p. 7).
<i>Julis julis</i>	Fage	(6, p. 50).

It is the purpose of the present publication to add descriptions of the post-larvæ of the two remaining species, *Crenilabrus melops*, and *Centrolabrus exoletus*, and to suggest a key for the practical identification of the post-larvæ of the six species, based on the distinct and easily recognisable characters of the pigmentation schemes.

In his report for the year 1914 (1, p. 222), Dr. Allen pointed out that the most numerous of the forms occurring at Plymouth is the one in which the body and the greater part of the tail is covered with many black stellate chromatophores, which, however, cease more or less abruptly behind the anal fin, leaving the hinder end of the tail unpigmented. The post-larvæ of this form were recorded in 1913 (Clark, 2) and in 1914 (Allen, 1) as *Labrus bergylta*, and in 1919 (Clark, 3) under the general heading, "labrid types." Subsequently, however, living post-larvæ of this type have been reared in aquaria until the adult characters could be definitely observed, and it has been found the type actually represents three species, namely, *Labrus bergylta*, *Crenilabrus melops*, and *Centrolabrus exoletus*. A renewed study of the post-larvæ showed that they

could be separated into three groups, each exhibiting characteristic features in their scheme of pigmentation, and ultimately it was found possible to assign the individuals of each group definitely to a particular species.

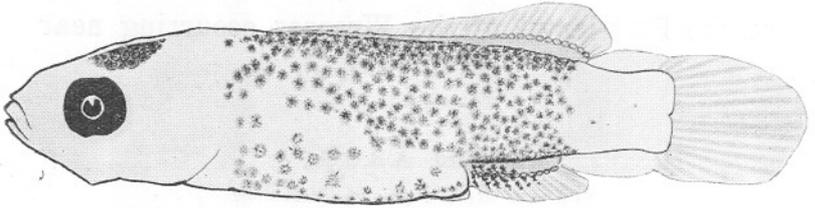


FIG. 1.—*Labrus bergylla*. 8.7 mm. Y.F.T. 1920.

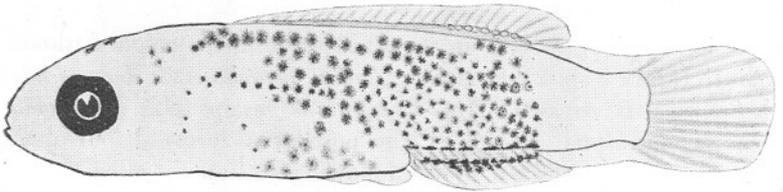


FIG. 2.—*Crenilabrus melops*. 8.6 mm. Y.F.T. 1920.

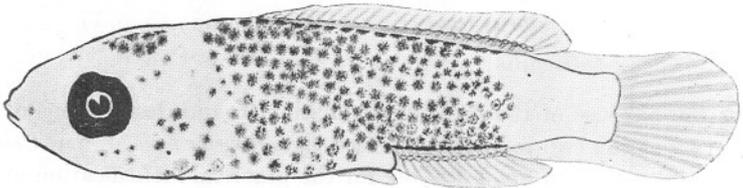


FIG. 3.—*Centrolabrus exoletus*. 8.5 mm. Y.F.T. 1920.

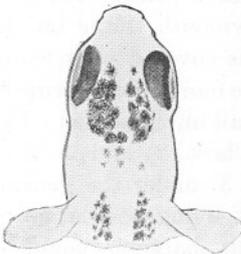


FIG. 4.
Labrus bergylla.
8.7 mm.

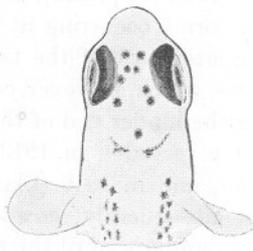


FIG. 5.
Crenilabrus melops.
8.6 mm.

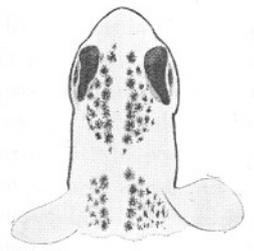


FIG. 6.
Centrolabrus exoletus.
8.5 mm.

PIGMENTATION ON THE HEAD.

POST-LARVÆ OF FIRST GROUP.

These agreed satisfactorily with the descriptions given by Le Danois (4) for *Labrus bergylta*, and it will suffice to note that they are characterised by the presence of two crescent-shaped areas of black stellate chromatophores, disposed longitudinally one on either side of the middle line on the top of the head; and by the restriction of the black pigment on the anal fin to the anterior portion on the interradial membrane (see Figs. 1 and 4).

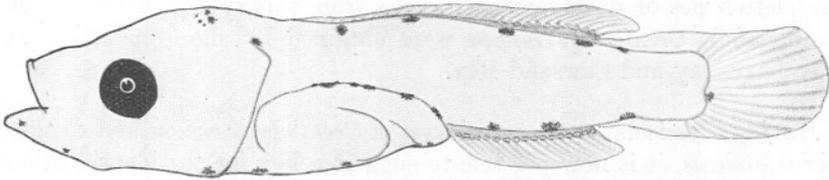


FIG. 7.—*Labrus mixtus*. 9.0 mm. Y.F.T. 1914.

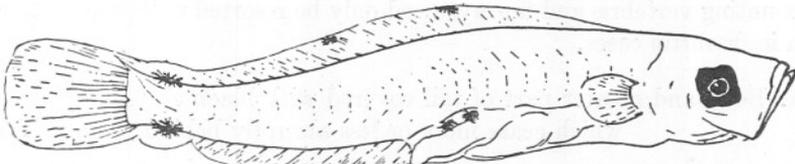


FIG. 8.—*Julis julis*. 8.5 mm. (After Fage, 6, p. 53, Fig. 40.)

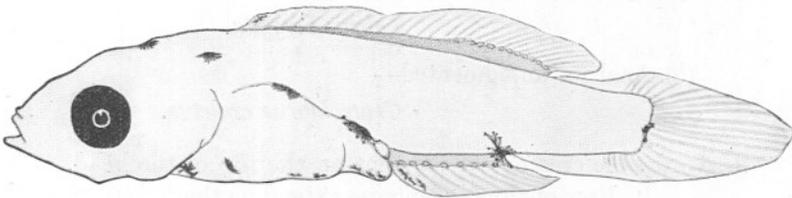


FIG. 9.—*Ctenolabrus rupestris*. 8.5 mm. Y.F.T. 1919.

POST-LARVÆ OF SECOND GROUP.

These possess the two crescent-shaped pigment areas referred to in the case of *Labrus bergylta*, but unlike the latter, the anal fin is devoid of pigment (see Figs. 3 and 6). The body pigment generally is dense, and fairly well marked on the abdominal region. On August 26th, 1920, a living post-larva of this type was transferred to an aquarium, where it eventually acquired the characters of a young adult *Centrolabrus exoletus*.

POST-LARVÆ OF THIRD GROUP.

The individuals of this group do not present the two crescent-shaped areas on the head, having instead a few scattered chromatophores, and, on the anal fin, a row of black chromatophores extends along its full length at the base of the fin-rays. The body pigment is more regularly arranged, and appears to be only sparsely represented on the abdominal region (see Figs. 2 and 5). Holt's drawing of a post-larva which he records as *Ctenolabrus rupestris* (7, Plate V, Fig. 49) indicates very effectively the appearance of the post-larva of this group. During August, 1920, a complete series of developmental stages from this type to recognisable young adult *Crenilabrus melops* were obtained by shore collecting at Wembury Bay and Cawsand Bay.

Having thus isolated the post-larvæ of *Crenilabrus melops* and *Centrolabrus exoletus*, it is now possible to suggest a key for the identification of the six species, which may prove useful for the more rapid sorting out of a large collection of specimens, so that the somewhat laborious process of counting vertebræ and fin-rays need only be resorted to as a confirmation in doubtful cases.

A. Body and greater part of tail covered with black chromatophores, which cease more or less abruptly behind the anal fin.

1. Double crescent or pigment on the top of the head.

(a) Pigment on the anal fin restricted to the anterior portion on the interradiial membrane—

Labrus bergylta.

(b) Anal fin unpigmented—

Centrolabrus exoletus.

2. No double crescent of pigment on the top of the head.

Row of chromatophores extending the full length of the anal fin, at the base of the fin-rays—

Crenilabrus melops.

B. The chromatophores on the body and tail limited in number and characteristically situated.

1. A series of chromatophores along the dorsal and ventral edges of the body, typically five along the base of the dorsal fin, and three along the ventral post-anal portion of the body—

Labrus mixtus (see Fig. 7).

2. A single conspicuous and much-branched chromatophore on the ventral edge of the body post-anally. Pigment entirely absent from the dorsal edge beneath the dorsal fin, or reduced to a single chromatophore immediately above the ventral chromatophore.

(a) A chromatophore on each of the 5th and 13th interradial spaces of the dorsal fin—

Julis julis (see Fig. 8).

(b) The 5th and 13th interradial spaces of the dorsal fin unpigmented—

Ctenolabrus rupestris (see Fig. 9).

The Plymouth collection of post-larval Wrasses does not include any examples of *Julis julis*, but the other species are well represented. It will be seen from the accompanying table (p. 698) showing the relative frequency of the post-larvæ taken during the years from 1913 onwards, that *Labrus bergylla* and *Labrus mixtus* occur considerably earlier in the year than the others, indicating an earlier spawning period.

MONTH.	LABRUS BERGYLTA.			LABRUS MIXTUS.			CTENOLABRUS RUPESTRIS.			CENTROLABRUS EXOLETUS.			CRENILABRUS MELOPS.		
	No. of hauls in which Labrids occur. 1913-21	No. of hauls in which species occurs.	Per-centage	No. of hauls in which Labrids occur. 1914-20	No. of hauls in which species occurs.	Per-centage	No. of hauls in which Labrids occur. 1913-20	No. of hauls in which species occurs.	Per-centage	No. of hauls in which Labrids occur. 1913-20	No. of hauls in which species occurs.	Per-centage	No. of hauls in which Labrids occur. 1913-20	No. of hauls in which species occurs.	Per-centage
April	2	2	100.0	—	—	—	—	—	—	—	—	—	—	—	—
May	12	10	83.3	7	3	42.9	7	—	—	7	—	—	7	—	—
June	27	15	55.6	17	8	47.1	27	7	25.9	27	—	—	27	2	7.4
July	95	19	20.0	64	16	25.0	81	33	40.7	81	38	46.9	81	56	69.2
August	40	—	—	23	—	—	33	11	33.3	33	15	45.5	33	19	57.6
September	1913-20 3	—	—	2	—	—	3	1	33.3	3	Broken. 1? doubtful.	33.3?	3	1	33.3

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