

FICHES D'IDENTIFICATION DU ZOOPLANCTON

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CALLIONYMIDAE OF THE NORTHEASTERN NORTH ATLANTIC

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Fig. 1. The right preopercular spines (A) of *C. reticulatus* of 5, 6.5, 7.1, 8, 9.2, 10, 10.5, 11.4 mm, (B) of *C. maculatus* of 5.5, 6.5, 7.3, 8, 9, 9.8, 10.5, 11.8 mm, (C) of *C. lyra* of 4.3, 5, 6.3, 6.9, 8, 9, 11.2, 12.5 mm total length.

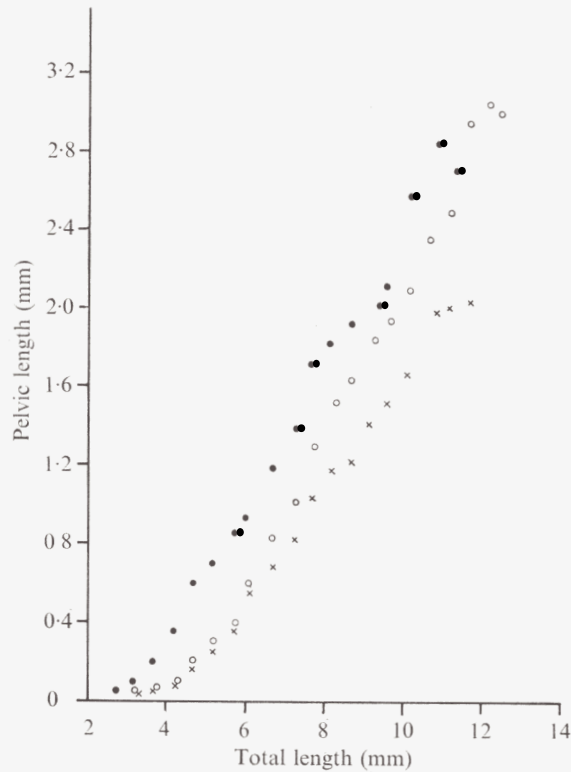


Fig. 2. The relation of pelvic length to total length. ● *C. reticulatus*, ○ *C. lyra*, × *C. maculatus*.

Introduction

Three species of *Callionymus* occur in the eastern North Atlantic: *C. lyra* Linnaeus, 1758; *C. maculatus* Rafinesque-Schmaltz, 1810; *C. reticulatus* Valenciennes, 1837. The postlarvae of *C. lyra* and *C. maculatus* are well known. The postlarvae of *C. reticulatus* have recently been identified by Russell and Demir (1971) and described by Demir (1972). The main characteristics used in identification of the postlarvae of the three *Callionymus* species are given below based on the preserved material collected from the Plymouth district. The data given here refer only to postlarvae and the lengths quoted are total length.

Criteria used in identifying *Callionymus* postlarvae

The following characteristics are the principal ones used in identification:

1. The number, size and shape of the preopercular spines (generally useful at length above 4–5 mm).
2. The number of fin rays in the second dorsal fin (generally useful above 5.6–6.5 mm).
3. The length of the pelvic fins (useful in all postlarval stages over 3 mm but being more helpful above 6–7 mm).
4. The melanophore concentrations: a, on the pelvic fins; b, on the branchiostegal region of the operculum; c, on the surface of the body cavity; d, on the postanal region of the body (useful in all postlarval stages over 3 mm).

Diagnoses of species

C. lyra Linnaeus, 1758:

1. In fully developed postlarvae the preoperculum ends posteriorly in four spines three of which are directed backward and the fourth in basal and forward-pointing. The development of the preopercular spines begins in early postlarval stages. Postlarvae larger than 3.8–4.5 mm and 4.8–5.5 mm have single and double backward-pointing spines respectively. The basal spine is formed above 6.5–7.3 mm, and the third of the backward-pointing spines above 11.5–12 mm when the metamorphosis has already started. The preopercular spines of this species are stronger than in the postlarvae of *C. maculatus* and *C. reticulatus* at comparable sizes (see Fig. 1).
2. The fully developed second dorsal fin has usually 9, rarely 8 or 10 soft rays.
3. The pelvics are longer than those of *C. maculatus*, but shorter than those of *C. reticulatus* at comparable sizes. The relation of pelvic length to total length is illustrated in Fig. 2.
- 4a. The pelvics are generally free of melanophores, but very rarely several melanophores can be seen on the pelvics of the best preserved specimens at 5–7 mm.
- 4b. In the branchiostegal region the pigmentation is heavier than that of *C. reticulatus*, but lighter than that of *C. maculatus* at comparable sizes.
- 4c. Starting from early postlarval stages melanophores are scattered on the whole surface of the body cavity, although they are fewer in number dorsolaterally at 3–4 mm.
- 4d. At the postanal region of the body, between the dorsal and lateral and the ventral and lateral rows of melanophores, there are always some scattered melanophores which increase proportionally with the size of postlarvae (see Figs. 3–7).

C. maculatus Rafinesque-Schmaltz, 1810:

1. When fully developed, the number and direction of the preopercular spines are similar to those of *C. lyra*, but the preopercular spines of this species are thinner and begin to develop later than in *C. lyra*. The first and second backward-pointing spines and the basal spine are formed at 4.7–5.5 mm, 7–7.5 mm, 9.5–10 mm respectively. From the formation of the basal spine until about 11.5–12 mm, when the third backward-pointing spine is formed, the basal spine is situated farther from the two previously formed backward-pointing spines than in *C. lyra* (see Fig. 1).
2. The fully developed second dorsal fin has usually 9, rarely 8 or 10 soft rays.
3. The pelvics are shorter than those of *C. lyra* and *C. reticulatus* at comparable sizes (Fig. 2).
- 4a. Melanophores develop on the whole surface of the pelvic fins, arranged along the rays, starting from their formation up to a total length of 11–11.5 mm. In more advanced stages, however, melanophores tend to collect at about the middle of pelvics in more heavy concentrations than in *C. reticulatus*.
- 4b. The pigmentation on the branchiostegal region of *C. maculatus* is heavier than in the other two *Callionymus* species at the same developmental stages.
- 4c, d. The pigmentation on the surface of the body cavity and postanal region is similar to that of *C. lyra*, but generally it is heavier at the ventral side of the body (Figs. 3–7).

C. reticulatus Valenciennes, 1837:

1. In the fully developed postlarvae the preoperculum has only three backward-pointing spines. According to Chang (1951) and Wheeler (1969) in adult specimens the basal spine develops rarely as a rudimentary structure, but no basal forward-pointing spine is found in the postlarvae. The first and second preopercular spines develop at 4.7–5.5 mm and 7–7.5 mm, i.e. similar to those of *C. maculatus*, and their size and shape are also similar to those of *C. maculatus* until about 9.5–10 mm. However, since at 9.5–10 mm the basal spine, and at 11.5–12 mm the third back-



ward-pointing spine of *C. maculatus*, and at 10.3–10.8 mm, the third backward-pointing spine of *C. reticulatus* are formed, at postlarvae larger than 9.5–10 mm the preopercular spines of these two species are rather different from each other (see Fig. 1).

2. The fully developed second dorsal fin has usually 10, rarely 9, soft rays.

3. *C. reticulatus* has the longest pelvics comparing the postlarvae of the other two species of *Callionymus* at comparable sizes (Fig. 2).

4a. The pelvics are free of melanophores until about 9–10 mm. At this size several melanophores are formed at about the middle of each pelvic, being more lightly concentrated than in *C. maculatus*.

4b. In the branchiostegal region, the pigmentation is lightest in this species.

4c. In the early postlarvae and until about 4–4.5 mm, the melanophores on the body cavity are found only in the dorsal, ventral and ventro-lateral regions thus differing from the other two species. In more advanced stages melanophores, although some are formed on lateral and dorso-lateral regions of the body cavity, are always less numerous than in *C. lyra* and *C. maculatus* at comparable sizes.

4d. The postanal melanophores are also less numerous in this species. The scattered melanophores between the dorsal and lateral and the ventral and lateral rows of melanophores, which are found in the postlarvae of the other two species starting from the early stages, are very few or not found at all in sizes smaller than 5.5–6 mm; in more advanced stages they are fewer in number than in *C. lyra* and *C. maculatus* at comparable sizes (see Figs 3–7).

DISTRIBUTION

For distribution see Figure 8.

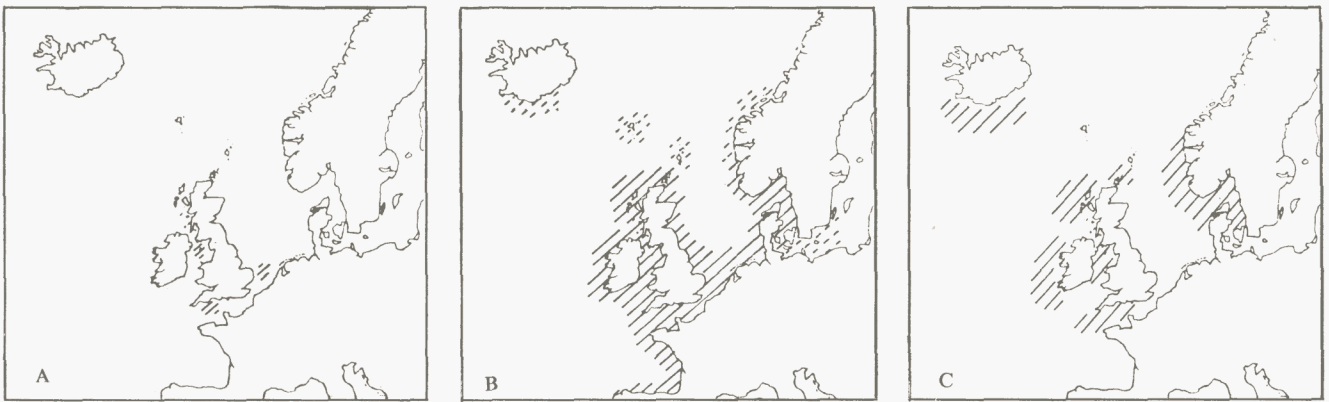


Fig. 8. The distribution (A) of *C. reticulatus*, (B) of *C. lyra*, (C) of *C. maculatus* in the eastern North Atlantic (from Wheeler).

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Fig. 3. The postlarva (a) of *C. reticulatus* of 3.3 mm, (b) of *C. lyra* of 3.6 mm, (c) of *C. maculatus* of 3.3 mm total length.

Fig. 4. The postlarva (a) of *C. reticulatus* of 4.7 mm, (b) of *C. lyra* of 4.9 mm, (c) of *C. maculatus* of 4.7 mm total length.

Fig. 5. The postlarva (a) of *C. reticulatus* of 6.6 mm, (b) of *C. lyra* of 6.5 mm, (c) of *C. maculatus* of 6.6 mm total length (side view).

Fig. 6. The postlarva (a) of *C. reticulatus* of 6.6 mm, (b) of *C. lyra* of 6.5 mm, (c) of *C. maculatus* of 6.6 mm total length (ventral view).

Fig. 7. The postlarva (a) of *C. reticulatus* of 10.1 mm, (b) of *C. lyra* of 10.2 mm, (c) of *C. maculatus* of 10 mm total length (dorsal view).