

## Larval development of *Lecanogaster chrysea* Briggs, 1957

M.P. Olivar

Instituto de Ciencias del Mar, Paseo Nacional s/n, 08003 Barcelona, Spain

Received 18 February 1986; accepted 7 November 1986

The first description of the larval development of *Lecanogaster chrysea* Briggs, 1957 (Gobiesocidae) is presented. Adults of this species have been reported only off Ghana. The larvae described in this study were collected over the continental shelf off Namibia in the vicinity of the Cunene River mouth during a survey conducted in March – April 1981.

Die eerste beskrywing van die larwale ontwikkeling van *Lecanogaster chrysea* Briggs, 1957 (Gobiesocidae) word voorgelê. Volwassenes van dié spesies is tot dusver slegs langs die kus van Ghana gerapporteer. Die larwes wat in hierdie studie beskryf word, is oor die vastelandsplat langs die kus van Namibië in die omgewing van die Kuneneriviermond, gedurende 'n opname in Maart – April 1981, versamel.

In March 1981 larvae belonging to the family Gobiesocidae were collected on the continental shelf of northern Namibia, near the border with Angola. The eggs of members of the family Gobiesocidae are benthic, and the spawn is usually guarded by the males (Lythgoe & Lythgoe 1971). The larvae, in contrast, are pelagic. Members of this family are present all along the coast of the tropical and temperate Atlantic, Indian, and Pacific Oceans (Allen 1984).

Information furnished by Dr J.C. Briggs on the meristic characters of Gobiesociformes (Briggs, pers. comm., 1983, 1984) was used in the present study. On the basis of the available information, a discussion on the identification of this larvae as *Lecanogaster chrysea* is presented. The larval development of this species was formerly unknown.

### Material and Methods

The 24 larvae identified here as *L. chrysea* were obtained from plankton samples collected using a Bongo net with an opening diameter of 40 cm and a mesh size of 303  $\mu$ m. Oblique tows were carried out from 200 m, bottom depth permitting, to the surface.

The survey on which these larvae were collected took place in March – April 1981 (Benguela III) between the Cunene River and Walvis Bay (Figure 1).

Larvae were identified using the meristic characters of the 8 specimens that have the notochordal tip flexed (from 5,3 to 6,3 mm). Taylor's enzyme method of clearing and staining (Taylor 1967) was applied prior to effecting the vertebral count.

Larvae were measured using an ocular micrometer accurate to 0,01 mm. The following measurements were taken: total length (TL), the distance from the tip of the upper jaw to the end of the caudal fin; standard length (SL), the distance from the tip of the upper jaw to the end of the urostyle; preanal length (PA), the distance from the tip of the upper jaw to the end of the anus; and the eye diameter (ED).

The morphological and morphometric characters are enumerated, and the pigmentation code used in the description of the larvae is that given by Allen (1984).

### Description of *Lecanogaster chrysea* larvae

Figure 2 presents the larval series for this species from 3,9 to 6,33 mm; the morphometric characters are given in Table 1.

### Morphology and morphometry

As in other species of this family, the body of *Lecanogaster chrysea* larvae is cylindrical in shape with a slight lateral

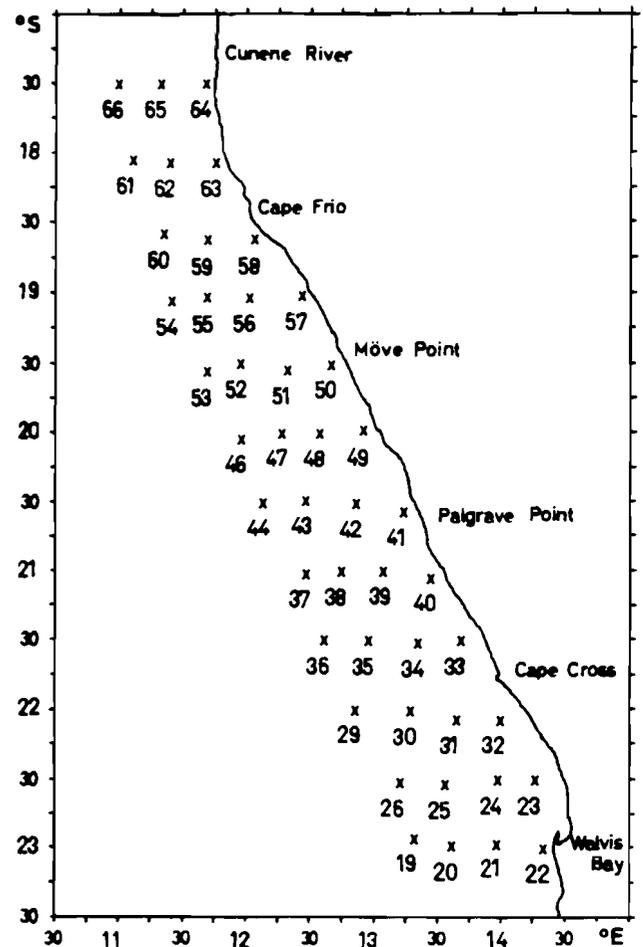


Figure 1 Stations occupied during the Benguela III survey in March/April 1981.

Table 1 Measurements (mm) of *Lecanogaster chrysea* larvae

SL	TL	PA	ED
3,00	2,96	1,92	0,25
3,50	3,60	2,33	0,29
4,00	4,26	2,76	0,33
4,50	4,94	3,19	0,38
5,00	5,64	3,64	0,42
5,50	6,36	4,10	0,46
6,00	7,10	4,58	0,50
6,50	7,86	5,06	0,54

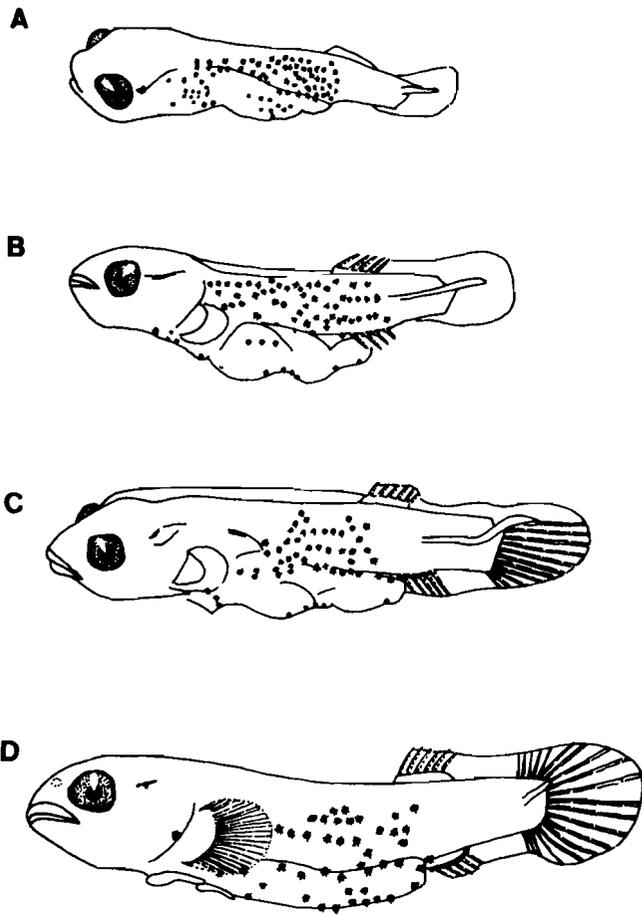


Figure 2 Larval series for *Lecanogaster chrysea*. (A) 3,9 mm. (B) 4,6 mm. (C) 5,4 mm. (D) 6,3 mm.

compression (Allen 1984). In smaller specimens the head is rounded, becoming more elongate in older larvae. In larvae longer than 4 mm, the lips are well developed.

The digestive tract is rather long and wide, taking up from 70 to 75% of the standard length.

The urostyle protrudes from the trunk in smaller larvae and is assimilated into the trunk as flexion progresses.

In larger larvae the pelvic fins are modified to form a double thoracic suction disc in which papillae are present. As the loss of the swimbladder presumably occurs during settlement (Allen 1984), and all the larvae described here have a swimbladder, it is not possible to give an indication of the size at which the sucking disc appears to be functional in this species.

The myomere count for the specimens between 3,2 and 4 mm is 24–25, for the specimens from 4 to 4,5 mm, 25–26, and for the larvae of more than 4,5 mm, 27–28.

#### Pigmentation

The body is rather heavily pigmented, particularly on the trunk, which is covered with numerous stellate melanophores. In the review of the Gobiesocidae larvae published by Allen (1984) it is pointed out that most gobiesocid larvae are also heavily pigmented.

The number and arrangement of the melanophores is species-specific and is a useful character for identifying Gobiesocidae larvae, and for this reason a code to indicate their number and distribution pattern over the parts of the body was proposed by Allen (1984). Figure 3 (redrawn after Allen 1984) is a diagram of the body of a larva in which the parts have been labelled to show the pigmentation code.

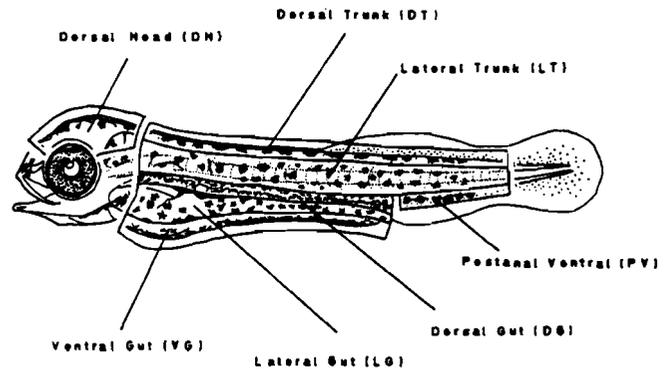


Figure 3 Regions which form the basis for coding patterns of melanophores (after Allen 1984).

The melanophores are more clearly distinguishable in larvae smaller than 5 mm than in larger specimens. The pigmentation code is as follows:

DH	DT	LT	PV	DG	VG	LG
0	0	19–50	4–7	8–15	5–8	3–6

#### Fin Development

Larvae of this species are characterized by early ossification of the fin rays and vertebrae. As previously mentioned, the pelvic fins are modified to form a thoracic suction disc. These fins become visible at a larval length of 5,3 mm. The meristic characters found in a 5,3 mm long larva using Taylor's enzyme method of clearing and staining (1967) were: 6 rays in the dorsal fin, 5 rays in the anal fin, 24 rays in the pectoral fin, 10 rays in the caudal fin, and 27 vertebrae plus the urostyle.

#### Notochordal flexion

Notochordal flexion occurs when larvae have attained from 5 to 6 mm standard length, which corresponds quite well to the range between 5 and 8 mm given by Allen (1984) for the rest of gobiesocid larvae.

#### Discussion

Of the species of this family present in the region (Briggs, pers. comm.), only *Apletodon pellegrini* Chabanaud and *Diplecogaster megalops* Briggs have the same number of fin rays as the specimens studied; they differ, however, in the number of vertebrae. The genus *Apletodon* has 29–32 vertebrae and the genus *Diplecogaster* has 30–32 (Briggs, pers. comm. 1984).

The species *Lecanogaster chrysea* described by Briggs (1957) off Ghana (specimens of 17; 17,5 and 20,8 mm) has meristic characters much like those of the larvae collected off Namibia (dorsal 5–6, anal 5, pectoral 21–23, caudal 10–12). The number of vertebrae given for this genus was 28. Because this count was obtained from a single specimen, Dr Briggs (pers. comm.) agrees that a count of 27 vertebrae for this genus is a distinct possibility.

According to all of these characteristics and to the occurrence of the species *L. chrysea* in the East Atlantic, it seems probable that the larvae described here belong to this species. However, bearing in mind the paucity of knowledge of the intertidal fauna of the tropical eastern Atlantic, it could also be possible that these larvae are those of an undescribed gobiesocid.

#### Distribution of *Lecanogaster chrysea* larvae

Larvae of this species were found at two stations near

the mouth of the Cunene River during the survey that took place in March – April 1981 (Stations 64 and 63 Figure 1). Bottom depth at these stations was 65 and 60 m, respectively.

This is the first time that the presence of *Lecanogaster chrysea* has been reported for the Namibian region.

#### Acknowledgements

The author wishes to thank Dr J.C. Briggs of the University of South Florida both for the information he provided and for his helpful suggestions. Thanks also go to Mr P. Rubiés for critically reviewing the manuscript and to Mr R. Sacks for the English translation.

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