Bull. Inst. Oceanogr. & Fish. ARE, 14 (1) 1988: 175-180.

MORPHOLOGICAL VARIATIONS IN OOSTEGITES OF FOUR COMMON SPECIES FROM ALEXANDRIA MEDITERRANEAN WATERS

MANAL M. ATTA
Faculty of Science, Alexandria University, Oceanography Department.

ABSTRACT

The oostegites of the gammaridean Amphipods plays an important role in the protection of the eggs carried by the female. The morphological variation of four common Amphipod species from the intertidal rocky shore were described. The type, length, quantity of setae and average number of eggs carried in the female marsupium were examined.

The four species examined have different morphological shapes of oostegites, and wide plates provide more protection than few smooth irregularly distributed ones. Tightly closed numerous curl-tipped or long setae diminishes the chance for accidental egg loss.

INTRODUCTION

The morphological variations of oostegites of Gammaridean amphipods of Alexandria species have never been mentioned before. The oostegites are formed by four or five pairs of broad plates surrounded by setae which interlocked together to form a cradle enclosing the eggs. The oostegites are attached to the inner margin of coxae from 2 to 5 in the majority of species and in some to that of coxae 6 (Leite, Wakabara and Tararam, 1986). Information about the role of marsupium has increased. Moore (1981) and Sheeder (1977, 1983) refer accidental egg loss upon morphology and setae of broad plates. The return of youngs to the female marsupium was discussed by Crocker (1968) and Sheader and Chia (1970); Krishnan and Jon (1974). Borowsky (1980) and Sheader (1983) observed that even after hatching the young remains actively within the marsupium. Dexter (1971) discussed the formation of oostegites of **Neohaustorius schmitzi** and mentioned that they begin from stage 1 in females as small buds and are fully developed at females of stage 3.

The purpose of this study is to consider the morphological variation of Gammaridean oostegites, to compare those of different species concerning the results which are important for the biology and systematics of Amphipoda.

MATERIAL AND METHODS

The gammaridean females examined were collected from the intertidal rocky shore region along Alexandria beaches during 1987. The broad plates

of the ovigerous females were removed by releasing them from coxae 2 to 5, drawings were done by means of binocular microscope in order of arrangement of the broad plates on the female body, namely A, B, C and D representing from pereiopods 2 to 5, respectively.

RESULTS

The following gammaridean species were examined and drawn; **Cymadusa filosa, Jassa marmorata, Gammarus aequicauda** and **Ilyale prevosti.** They vary in type, length, quantity of setae, size and morphology of plates.

Concerning the type of setae when they are curl-tipped, setae may be long or short but they are always numerous (**Cymadusa filosa, Ilyale prevosti**) (Figs. 1 and 4). Smooth setae are medium in length or long but they are not so densely arranged as the curl-tipped setae (**Jassa marmorata, Gammarus aequicauda**) (Figs. 2 and 3).

The first three plates of **Ilylae prevosti** are nearly of the same size (Fig. 4 A,b,C) but the last one is smaller (Fig. 4 D). In **Cymadusa filosa** the first and fourth oostegites are smaller (Fig. 1 A,D) while in **Jassa marmorata** the last oostegite diminish sharply in size (Fig. 2 D) while in **Gammarus aequicauda** the first and third oostegites are the largest (Fig. 3 A,C).

The shape of broad plates of a single species may be similar or different from each other; the four pairs of one species may even be completely different (Leite, Wakabara and Tararam, 1986). The broad plates of **Cymadusa filosa** are rounded and enlarged in the distal portion (Fig. 1) while in **Ilyale prevosti** the first is pear-shaped and the second and third are rectangular while the last is nearly triangular. In **Jassa marmorata** (Fig. 2) the first is rounded and the others are pear-shaped. In **Gammarus aequicauda,** the first and third oostegites are elongated pear-shaped (Fig. 3 A and C) and the second and fourth are spatulated (Fig. 3 B and D).

Table (1) shows the type, quantity, length of setae and average number of eggs carried in female marsupium. According to Husson (1950) the size of oostegites follows that of the branchiae of which the largest play the most important role in respiration.

The type, length and number of setae might be related to the role of the broad plates for the protection of the eggs. Wide plates provide more protection than few smooth irregularly distributed ones. **Ilyale prevosti** (Fig. 4) have large curl-tipped broad plates and very short setae, which can close the marsupium tightly, this species has a jumping habit and need more security for the eggs as it lives in the intertidal zone and need protection to sustain the period of desiccation. According to Moore (1981) the flexibility of the oostegite, and interlacing of the setae are important factors for the protection of the eggs. For this reason, the increase of marsupium volume may be provided by the flexibility of the broad plates and the joining of the setae. The oostegites of **Cymadusa filosa** and **Ilyale prevosti** are approximately of the same size, providing a uniform distribution of the eggs in the marsupium, which is tightly closed by the numerous

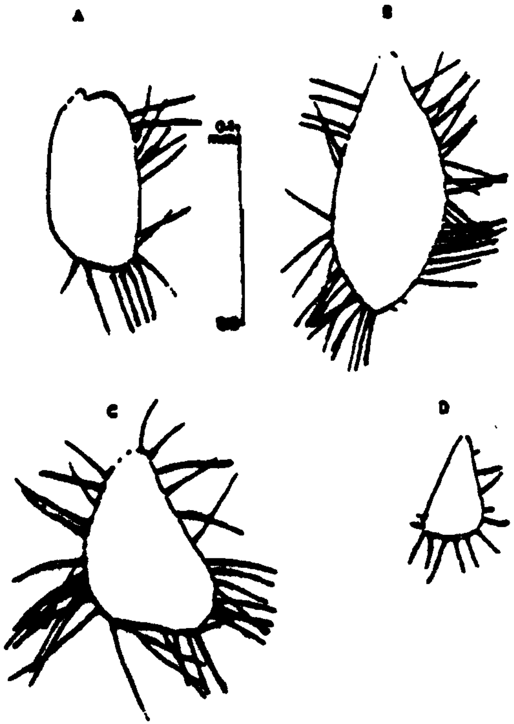

Fig. 2
Jassa marmorata Holmes, 1903 brood plates

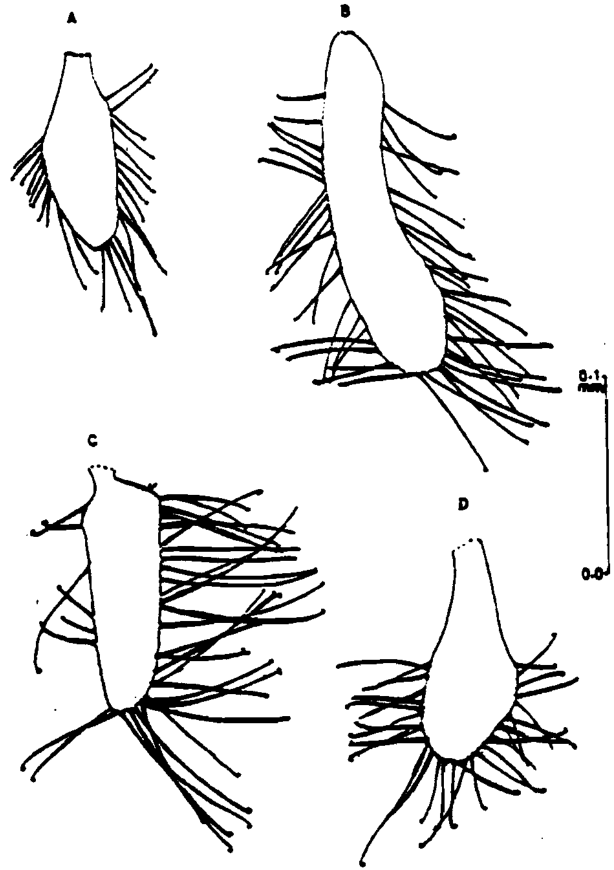

Fig. 1
Cymadusa filosa Savigny, 1816 brood plates

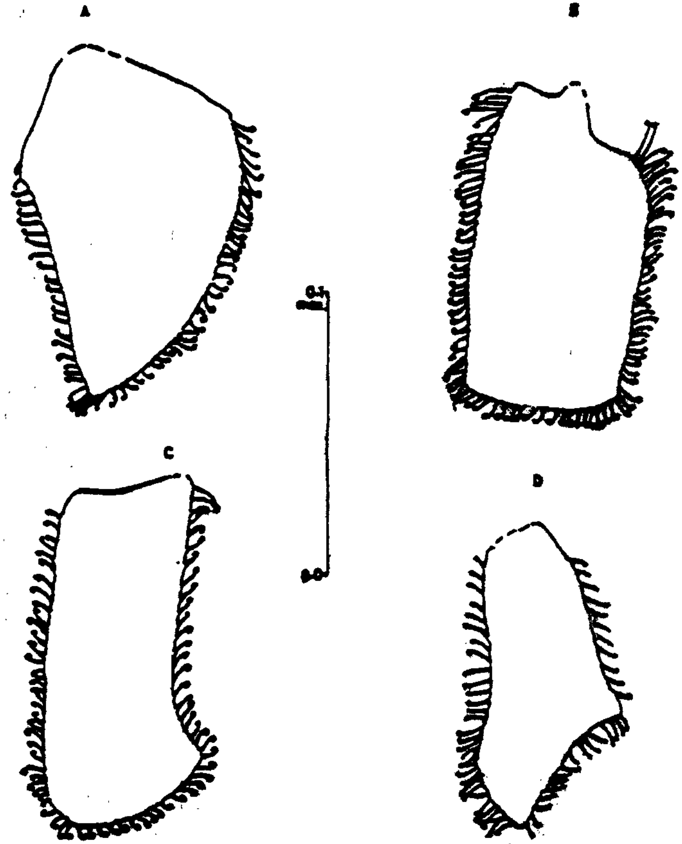

Fig. 4
Hyali prevosti M. Edward, 1816 brood plates

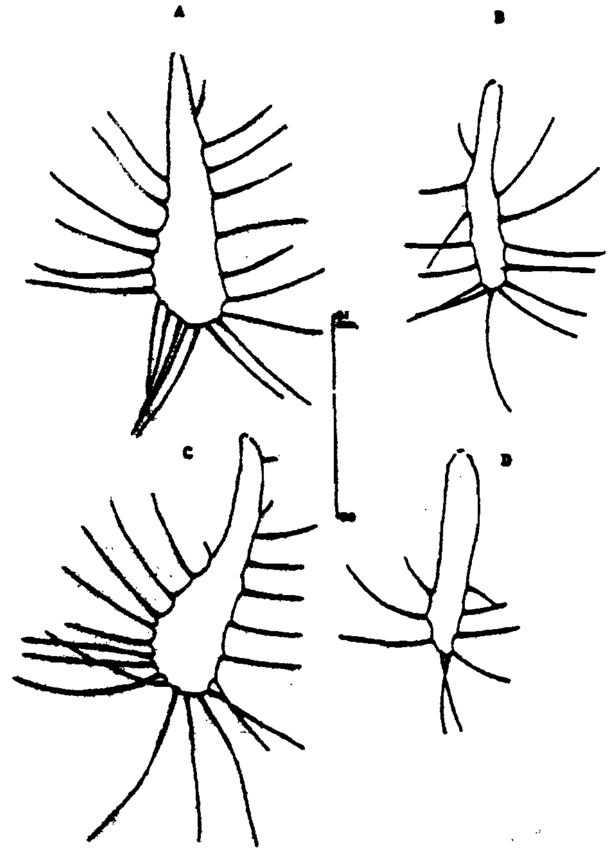

Fig. 3
Gammarus aequicauda Martynov; 1931 brood plates

Table (1)
Type, length and quantity of oostegites's setae and average number of egg carried in female marsupium of the four studied gammaridae.

Species	Type of Setae	Length of Setae	Quantity of Setae	Average Number of eggs / female marsupium
Cymadusa filosa Savigny, 1816	curl-tipped	long	many	22 - 45
Hyale prevosti M. Edward, 1830	curl-tipped	short	many	16 - 29
Jassa marmorata Holmes, 1903	smooth	medium	medium	20 - 36
Gammarus aequicauda Martynov, 1931	smooth	long	few	19 - 35

curl-tipped or long setae (Figs. 1,3 and 4), this diminishes the chance for accidental egg loss (Leite, 1981; Tararam and Wakabara, 1981; Wakabara et al, 1983). According to Moore (1981) species with a better sealed marsupium do not suffer egg loss.

In species which differ in size of oostegites such as Jassa marmorata (Fig. 2) and Gammarus aequicauda (Fig. 3), in both cases, there is a major concentration of the eggs near the larger oostegites.

From the above illustration, it was found that the four species studied present morphological conditions which allow a successful egg development in an unpredictable environment, like the intertidal zone.

REFERENCES

Borowsky, B., 1980. Factors that affect juvenile emergence in Gammarus palustris (Bousfield, 1969). Journ. Exp. Mar. Biol. Ecol., Vol. 42 (3): 213-223.

Crocker, R.A., 1968. Return of juveniles to the marsupium in the amphipod Neohaustorius schmitzi Bousfield. Crustaceana, Vol. 14: 216.

Dexter, D.M., 1971. Life history of the sandy-beach amphipod Neohaustorius schmitzi (Crustacea: Haustoriidae). Intern. Journ. on Life in Oceans and Costal Waters, Vol. 8 (3): 232-237.

Husson, R., 1950. Observations biologiques sur l'amphipode Niphargus virei Chev. (2e note). Bull. Soc. Zool. France, Vol. 75(5-6): 211-217.

Krishnan, L. and P.A. John, 1974. Observations on the breeding biology of Melita zeylandica stebbing, a brackish water amphipod. Hydrobiologia, Vol. 44 (4): 413-430.

Leite, F.P.P.; Y. Wakabara and A.S. Tararam, 1986. On the morphological variations in costegites of gammaridean species (Amphipoda). Crustaceana, Vol. 51 (1): 77-94.

Moore, P.G., 1981. The life histories of the amphipods Lembos websteri Bate and Corophium bonelli Milne Edwards in Kelp hold fast. Journ. Exp. Mar. Biol.

Ecol., Vol. 49(1): 1-50.

Sheader, M., 1977. Breeding and marsupial development in laboratory-maintained Parathemists garudichaudi. Jour. Mar. Biol. Assoc. U.K., Vol. 57: 943-954.

Sheader, M., 1983. The reproductive biology and ecology of Gammarus duebeni (Cruptacea-Amphipoda) in southern England. Journ. Mar. Biol. Assoc. U.K., Vol. 63: 517-540.

Sheader, M. and F.S. Chia, 1970. Development, fecundity and brooding behavior of the amphipod Marinogammarus obtusatus. Journ. mar. biol. Assoc. U.K., 50 (4): 1079-1099.

Tararam, A.S. and Y. Wakabara, 1981. The mobile fauna especially Gammaridea, of Sargassum cymosum. Mar. Ecol. Prog. Ser., Vol. 5: 157-163.

Wakabara, Y.; A.S. Tararam and A.M. Takeda, 1983. Comparative study of the Amphipod fauna living on Sargassum of two Itanhae'm shores, Brazil. Jour. Crustacean Biol., Vol. 3 (4): 602-607.