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THE COPULATORY ORGAN (PETASMA) OF SERGESTES

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BY

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WHILE working up the enormous material of Crustacea collected by the Danish research-steamer "Thor" during recent years in the Mediterranean and the adjacent parts of the Atlantic<sup>1</sup>), I observed in the autumn of 1912, that 2 specimens of the Mastigopus-stage of *Sergestes vigilax* had copulatory organs. This is, as far as I am aware, the only known occurrence of such organs in non-adult Decapoda, though it is evident that large organs with so complex a structure cannot suddenly appear in the adult stage, but that several moultings are necessary to give them their shape.

When I found these organs, I was not aware that they were known already, and searching in the Zoological Record I could not find information about them. Later on, for quite other reasons, I asked Dr. ANGELO SENNA in Florence to send me some papers on the Mediterranean Crustacea, and in one of these papers (Le esplorazioni abissali nel Mediterraneo del R. Piroscalo Washington nel 1881, II, Nota sui Crostacei Decapodi; Bolletino della Societa entomologica Italiana, Anno XXXIV, Trimestre IV, 1902 (1903), Pl. 11, fig. 8) I found a figure of the copulatory organ of the Mastigopus of the species in question. In the same paper (p. 292—93) SENNA has given figures of the organ of the adult, and now recently also Dr. OTTO PESTA in Vienna has given another figure (Zool. Anzeiger, vol. 42, No. 9, 29. Aug. 1913, p. 406).

My own investigations however have not therewith been rendered useless, my material being much larger than what has been at the disposal of the two authors mentioned; for I am able to give a complete series of the development.

#### 1. Petasma of the Mastigopus-stage (fig. 1—2).

Fig. 1 shows the petasma of a Mastigopus, 14 mm, "Thor" St. 206 (39° 32' N, 5° 15' E), 1000 m wire out; fig. 2: Mastigopus 17 mm, St. 22 (38° 50' N, 15° 18' E), 200 m wire out.

<sup>1</sup>) How immense this material is, may be seen from the circumstance, that e. g. of *Hyperiidea* alone about 3000 samples were brought home before 1913, several of which contain 6-8-10 species. The scientific results are under publication with the title: Report on the Danish Oceanographical Expeditions 1908—1910 to the Mediterranean and adjacent seas, published at the cost of the Carlsberg Fund under the superintendence of Johs. Schmidt, Ph. D. — Till now (Sept. 1913) 2 volumes have appeared.

SENNA's figure (l. c. Pl. 11 fig. 8) shows a lobate appendage, but gives no details; in the text he writes only (p. 295), "Nei maschi di 15 mm (in the explanation of the plates is by a misprint written *Mastigopus* ♀), il petasma è una breve lamina lobata (fig. 8)".

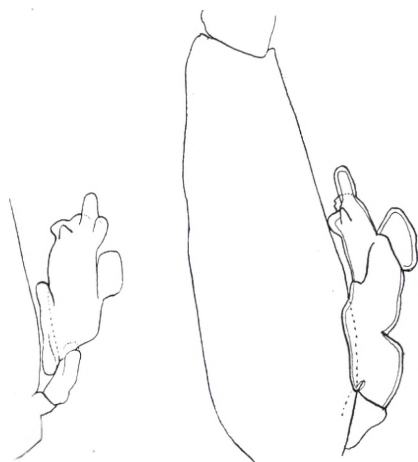


Fig. 1.

Fig. 2.

In both my specimens it is very easy to see, that already in the *Mastigopus*-stage the petasma consists of the same elements as in the adult. It is articulated to a little process in the pleopode. On the edge towards the pleopode it bears a small appendage, which becomes much larger in the adult; a little more distally, but turned towards the middle-line of the animal, another appendage is fixed, joined to the corresponding one in the petasma of the other side of the animal. Apically the petasma bears 4 buds. Distinct articulations I have not been able to see; but it is possible that the narrow stalk in the specimen from st. 206 (fig. 1) is articulated to the rest.

## 2. Petasma of the adult (fig. 3—6).

Fig. 3 shows the petasma of a young ♂, 16 mm, from st. 160 (35° 59' N, 28° 14' E),



Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

1000 m wire out; fig. 4: 31 mm, st. 66 (36° 16' N, 6° 52' W), 1200 m wire out; figs. 5—6: respectively 35 and 26 mm, both from st. 66 (see above), 600 m wire out.

My fig. 3 corresponds with the stage figured by PESTA (Zool. Anzeiger, vol. 42, No. 9, 29. Aug. 1913, p. 406, fig. 5). The appendage turned towards the pleopode is in the distal part of its edge of fixation provided with a little bud, later on (figs. 5—6) becoming a large process with a hook in the end. The proximal end of the petasma has a pair of lappets (figs. 5—6), and the appendage next to the middle-line has been folded (figs. 4—6), at the same time as the edge joining the corresponding part of the petasma in the other pleopode has been provided with small hooks, joining with those in the petasma of the other side, quite as in the maxillipedes of the Isopoda. The 4 buds in the apex of the petasma have grown longer; a pair of them or at least one (fig. 6) is provided with cleft spines. In one of the specimens (fig. 4) the petasma ends with 5 appendages, with a little one besides the 4 already mentioned.

SENNA's figs. (l. c. p. 292—93, figs. 4—5) correspond with my fig. 4, but he gives no description, only referring to his figures.

As may be seen the petasma varies very much with the age, and thus may not be used as a specific-character. The petasma does not seem to have roused the interest of carcinologists very much. The best description and figure, as far as I am aware, are given by S. J. SMITH in the "Blake"-Decapoda (Bull. Mus. Comp. Zool., Harvard College, vol. 10, No. 1, 1882, p. 99 (*Sergestes robustus*), Pl. 16 fig. 8); although he has described the organ in another species, the whole corresponds very well with my fig. 6.

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