

Reproductive patterns of *Pasiphaea sivado* in the Ligurian Sea

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Pasiphaea sivado occupies a key position in the food chains of the Ligurian Sea, where it forms part of the diets of pelagic and benthic predators in a vertical space of at least 700 m. Details of its distribution are given by FRANQUEVILLE (1971) and SARDOU and ETIENNE (1988) and of its trophic role by ORSI RELINI and RELINI 1989. Preliminary observations have been carried out on the reproduction with the aim of assessing its life cycle in the Ligurian Sea.

About 2000 specimens were obtained by means of 52 hours of pelagic trawling (Isaacs Kidd Midwater Trawl 15 feet; R/V Minerva, C.N.R.; cruises in August 1987, July 1988, August 1989, December 1989, February 1990) mainly in the bathymetric ranges 300-400 and 600-700 m. About 1000 additional specimens were fished by commercial otter trawls on fishing grounds at 500-700 m depth off Ventimiglia, where glass shrimps represent a by-catch of *Aristeus antennatus*.

The shrimps were isolated, sexed and measured in terms of carapace length by calipers. Females were identified from 10-mm c.l. upwards by looking for the ovary under or through the thin and transparent carapace wall. The smallest males with an easily distinguishable appendix masculina were 10 mm c.l. The specimens under these sizes were classified as juveniles. The largest size was 22 mm c.l. for both sexes.

In the females the following reproductive patterns were recorded a) with ovarian eggs in advanced maturation; b) with embryos; c) with egg remnants represented by fixing stalks on pleopods. The "reproducing females" are the sum of a+b+c. The embryos were classified in the following stages:

- 1) unsegmented egg i.e. whose tracks of segmentation are not visible under the stereo-microscope.
- 2) embryonic tissues extended to a third part of the egg contour line.
- 3) embryonic tissues which cover half (or a little more) of the egg contour; eye pigments appearing as a very small spot.
- 4) embryonic tissues about 3/4 of egg volume; eyes and limbs evident.
- 5) reserves consumed except the oil droplet; egg envelope easily broken.

Sex ratio and minimum reproductive size

In pelagic catches the sex ratio is in favour of females (overall ratio 1.5:1), with negligible differences between the upper and the lower sampled levels. In demersal catches we have observed both sex ratio in favour of females and instances of sex-ratio near to 1:1. The minimum reproductive size for the female was established as the minimum carapace length when bearing embryos. This size was 15 mm in summer 1987; 16 mm in summer 1988 and 1989 and 14 mm in December 1989.

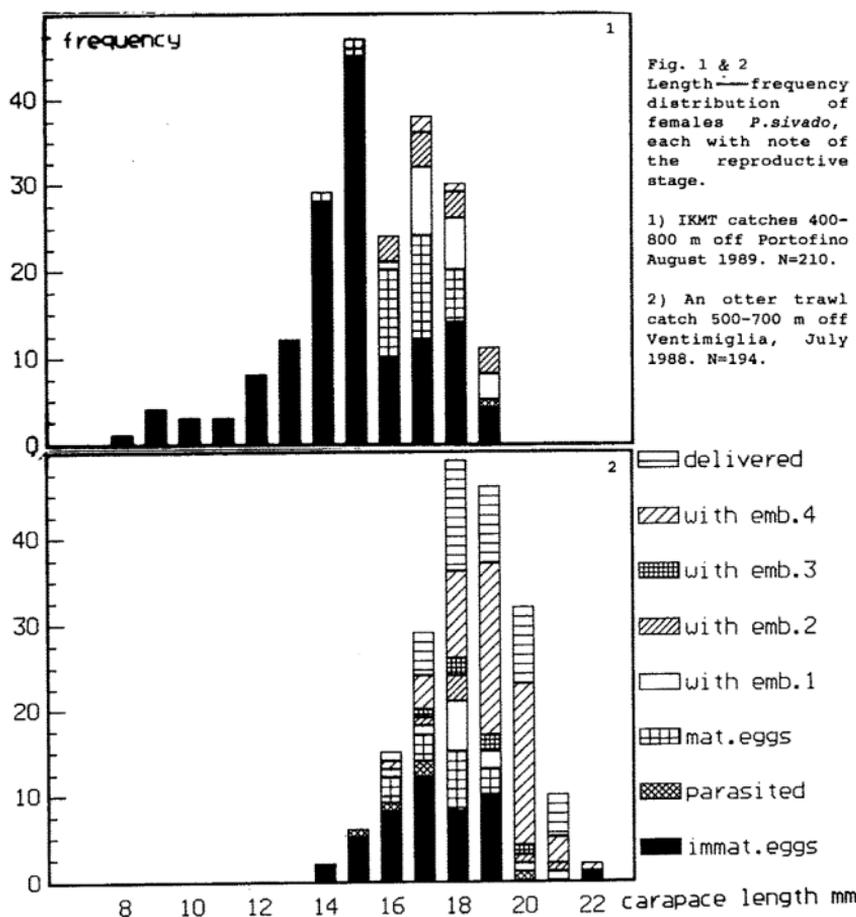
Reproductive stages

The reproductive structure of the female population was studied in pelagic (fig. 1) and demersal catches (fig. 2). Both included females with ovarian eggs in early and advanced maturation and bearing embryos of the stages 1-4. However recently delivered females are present only near the bottom (fig. 2). Supposing that after hatching eggs the female moults and mates - as is common in many Decapods - it is probable that the partners meet and copulate in this bottom environment.

During the winter we observed the same series of reproductive stages as in the summer. Moreover only in the winter samples were recorded some females with embryos of stage 5, i.e. hatching.

Presence of parasites

In the period of this study we observed increasing examples of the presence of a parasite of the genus *Amalocystis* (Protozoa, Ellobiopsidae) in both sexes of *P. sivado* (total incidence in the examined material 4.3%). Females affected by parasites were never seen reproducing.

Références

- FRANQUEVILLE C., 1971 - *Tethys*, 3: 11-55.
 ORSI RELINI L. and RELINI G., 1990 - in 'Trophic Relationship in the Marine Environment. Proc. 24th Europ. Mar. Biol. Symp.: 334-346.
 SARDOU J. and ETIENNE M., 1988 - *Rapp. Comm. int. Mer Médit.*, 31, 2.