

## NOTES

### OBSERVATIONS ON THE BREEDING ACTIVITY OF CIRRIPED CRUSTACEANS *OCTOLASMIS TRIDENS* AND *O. WARWICKII*

#### ABSTRACT

Observations were made on the breeding activity of *Octolasmis tridens* and *O. warwickii* occurring in the Porto Novo waters for a period of one year. *O. tridens* exhibits continuous breeding activity almost throughout the monsoon months. Intensive breeding was observed during postmonsoon and summer months. The incidence of *O. warwickii* breeding activity was continuous in all the months except February. Breeding was intense in March. The results are discussed in detail.

A THOROUGH knowledge of the reproductive biology of barnacles becomes very important in the light of the formulation of suitable control measures. The *Octolasmis* species infest the gills and gill chambers of decapod crustaceans like *Scylla serrata*, *Portunus* sp., *Charybdis* sp., *Menippe* sp., *Palinurus* sp. and *Thenus orientalis*. However, one species namely *Octolasmis warwickii* occurs externally on the carapace and appendages of decapods and on sea snakes. The present study was undertaken because these pedunculate barnacles are important in another way also in that they mainly infest edible crabs and lobsters of export value. Moreover, the work on the breeding biology in Indian waters is also limited.

TABLE 1. Incidence of *Octolasmis tridens* (%) in relation to different stages of ovarian development for a period of one year

| Month       | Stages |      |      |      |      |
|-------------|--------|------|------|------|------|
|             | O      | A    | B    | C    | D    |
| June '78    | 3.4    | 3.5  | 58.6 | 10.0 | 24.5 |
| July ..     | —      | 4.0  | 24.0 | 20.0 | 52.0 |
| Aug. ..     | 7.0    | 37.1 | 41.8 | 2.0  | 12.1 |
| Sep. ..     | 26.5   | 28.7 | 23.8 | 6.4  | 14.6 |
| Oct. ..     | 4.0    | 12.0 | 60.0 | 8.0  | 16.0 |
| Nov. ..     | —      | —    | 8.0  | 32.0 | 60.0 |
| Dec. ..     | 53.3   | 46.7 | —    | —    | —    |
| Jan. '79 .. | 14.5   | 7.2  | 61.0 | 8.2  | 9.1  |
| Feb. ..     | 20.3   | 10.7 | 56.0 | 4.7  | 8.3  |
| Mar. ..     | 56.0   | 8.0  | —    | 8.0  | 28.0 |
| April ..    | —      | —    | —    | —    | —    |
| May ..      | —      | —    | —    | —    | —    |

Zann and Harker (1978) studied the reproductive biology of *O. warwickii* from Townsville in North Queensland. They reported the size, proportion and egg production of this species and compared with less specialised barnacles besides analysing its potential self-fertilisation and high fecundity. The larval development and metamorphosis of the pedunculate barnacle *O. mulleri* was examined in detail by W. H. Lang (1976). Karande (1974), Pillay and Nair (1972) and Antony Fernando (1978) are some of the pioneers to study the biology, reproduction and development of a variety of barnacles in India.

TABLE 2. Incidence of *O. warwickii* (%) in relation to different stages of ovarian development during December to March

| Month       | Stages |     |      |      |      |
|-------------|--------|-----|------|------|------|
|             | O      | A   | B    | C    | D    |
| Dec. '78 .. | 4.0    | —   | 72.0 | 8.0  | 16.0 |
| Jan. '79 .. | 10.4   | —   | 16.6 | 60.6 | 12.4 |
| Feb. ..     | 8.4    | 8.0 | 83.6 | —    | —    |
| Mar. ..     | —      | —   | 52.0 | —    | 48.0 |

#### Materials and methods

Different methods to determine breeding activity of barnacles were employed by several workers. While these methods are useful and reliable only in undisturbed waters, a suitable alternate method was experimented by assessing the conditions of the developing gonads qualitatively as well as quantitatively

for their stages of maturity. In the present study both the edible crabs and lobsters were collected and examined carefully for the presence of cirripeds. Based on the condition of ova, the different stages such as 'O' (spent), 'A' (Unfertilized egg), 'B' (Fertilized egg), 'C' (Fertilized egg with eye spot) and 'D' (Nauplius out of egg and inside the mantle cavity ready to be released) were fixed. Measurements of maximum length and breadth for stages 'A'-'C' and maximum length from the tip of the anterior region to the beginning of the posterior spine for stage 'D' were taken. This was done every month at regular intervals for a period of one year. The percentage occurrence of each stage during a particular month for a given species was calculated. The active breeding season was determined by presence of large percentage of matured gonads and the results were tabulated and graphically presented.

#### Results and discussion

In *Octolasmis tridens* the percentage of stage 'O' was higher during March (56.0%) followed by December (53.3%). The less percentages of 3.4, 7.0 and 4.0 were observed during June, August and October respectively. The stage 'A' percentages fluctuated from 3.5 (June) to 46.7 (December). The incidence of stage 'B' was more or less uniform in all the months excluding November where it is very low (8.0%). Less occurrence of stage 'C' was noticed with the highest only during November (32.0%). The maximum occurrence of stage 'D' was noticed during November (60.0%) and none during December. As a whole, this cirripeds exhibited a continuous breeding activity round the year except December. Intensive breeding

occurred during NE postmonsoon and summer months.

In *O. warwickii* specimens could be collected only for four months from December to March. The incidence of stage 'O' was comparatively less (maximum 10.4%) when compared to the larger continuous incidences of stage 'B' (16.0 to 83.6%) and stage 'D' (maximum 48.0%). The stages 'A' and 'C' are less represented. Breeding activity was observed in all the months except during February. The breeding of *O. warwickii* was higher and intense in March.

The intensively continuous breeding of *O. tridens* observed during late NE postmonsoon and summer months is related to the abundance of phytoplankton, which form food for these cirripeds, during this season and subsequently spawn their larvae. The non-breeding activity noticed during December correlates with the obvious fact that the hosts, being restricted to inhabit the muddy bottom of the sea, have to face the continuous flood during NE monsoon with cold, less saline waters coupled with silt. *O. warwickii* is the only species among *Octolasmis* infesting the externals of the hosts inhabiting 10-20 m of the Porto Novo waters. An year round observation on the breeding activity has not been possible for the fact, although the hosts were available these cirripeds have not been encountered on them except the period from December to March. Though the breeding activity was observed higher in March, it is not possible at present to conclude. A study on the causes of non-availability of adult *O. warwickii* on the hosts will definitely throw light on the distribution and breeding activity.

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