

FIGS. 1-2. Amphistome cercariae of *pigmentata* type. Note the eye spots and stellate melanophores, $\times 75$.

In the course of a general survey of freshwater and amphibious gastropod hosts or vectors of Rayalaseema, one specimen of *Pila globosa*, collected from Kodur area, of Rajampet Taluk of Cuddapah District, began to emit pigmented cercariae which could easily be observed with the naked eye. Since the number emitted were few, the specimen was opened and tissues teased and washed in water. Quite a good number of cercariae could be obtained, this way, from the digestive gland. Through microscopic examinations, these have been identified as amphistome cercariae of the *pigmentata* type.³ The stellate melanophores and the eye spots with spherical lens-like bodies could easily be observed (Figs. 1 and 2). Although the occurrence of adult amphistome in the gut of this snail has previously been reported,⁴ there appears to be no previous report of amphistome cercariae from this particular snail. Thus it appears that, besides the usual host *Lymnea luteola* of these parts, *Pila globosa* under certain unknown circumstances can play host not only to echinostome cercariae as reported by Ganapathi and Hanumantha Rao but also to amphistome cercariae.

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THE REPRODUCTIVE CYCLE OF THREE DECAPOD CRUSTACEANS FROM THE SOUTH-WEST COAST OF INDIA

THE paucity of information on the reproduction of invertebrates of the west coast of India necessitated detailed investigation on the reproductive cycles of as many representative forms as possible. In crabs, the usual method employed to determine the breeding period had been plotting of the percentage of ovigerous females against time, which provided only an incomplete picture of the sequence of events that take place during the long and often drawn-out breeding season in the tropical waters. Therefore, it was instructive and advantageous to follow the gonad index method. The ratio between the gonad size and body weight bears a relation to gonad development and gonad maturity during different times of the year. This has already been reliably established in fishes,¹ molluscs and echinoderms² and crustaceans.^{3,4} In the present investigation the reproductive cycles of three species of decapod crustaceans, viz., *Uca annulipes* (Latreille), *Portunus pelagicus* (Linnaeus) and *Metapenaeus affinis* (Milne-Edwards), have been studied employing the gonad index method.

Fortnightly samples consisting of ten males and ten females of *Uca annulipes* were collected from the shores of Cochin Backwaters. Samples of *Portunus pelagicus* and *Metapenaeus affinis* were obtained from the trawlers operating off Cochin on the shelf region. The specimens were rendered free of moisture first by towelling and later with filter-paper. The individual weights were then determined. The gonads were carefully dissected out and weighed. The wet weight of the gonad was then divided by the wet weight of the body and this factor was multiplied by a hundred and the value was taken to represent the gonad index. The mean gonad index values for males as well as for females in each month for a period of three years from October 1963 were calculated and presented in the figure.

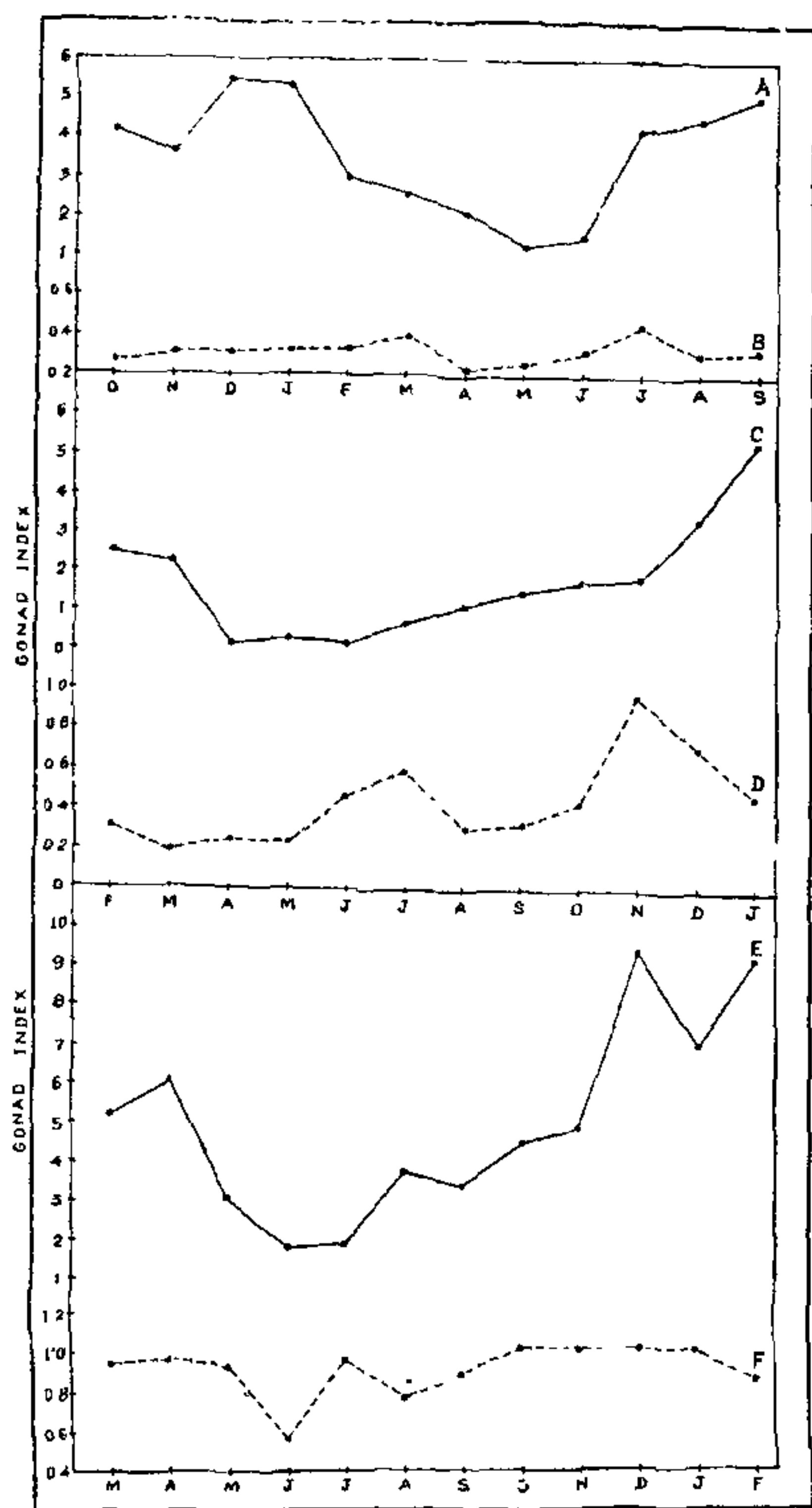


FIG. 1. The reproductive cycle of *Uca annulipes*, *Portunus pelagicus* and *Metapenaeus affinis*. A, Female *U. annulipes*; B, Male *U. annulipes*; C, Female *P. pelagicus*; D, Male *P. pelagicus*; E, Female *M. affinis*; F, Male *M. affinis*.

From Fig. 1, it will be seen that in the female *U. annulipes* the gonad index remains high during the months from July to February with a peak in December. *P. pelagicus* has a high gonad index for several months of the year from August to March with a definite peak during December-January. In this connection it may be noted that from the east coast of India, Rahaman⁴ reported that this species is a continuous breeder with three periods of maximal gonad indices, November, January and June with greater activity during November-January. In *M. affinis* high gonad index prevails from August to April with a major peak during December-February and a minor peak in April. The male and female reproductive cycles of these crustaceans are not concurrent. The peak of the reproductive cycle of males occurs slightly earlier in the breeding season than that of the females. In *U. annulipes* and *M. affinis*, the fluctuation of the gonad index of testis is not so conspicuous as that of the ovary. In males of all these three species, sperms and spermatophores have been noticed throughout the year. In all these species, the possibility of production of successive broods of eggs by an individual in a breeding season is indicated from the nature of the gonadal cycle.

In all these three crustaceans, the breeding season is not continuous all the year round but extends over several months of the year with distinct peak periods of gonadal activity. It may be noticed that the low saline conditions prevailing during the period of the south-west monsoon are apparently unsuitable for breeding. The medium and high saline conditions of the ambient water during the post-monsoon and pre-monsoon periods respectively, with abundant planktonic food^{5,6} for the larvae of these crustaceans, seem to be most favourable for breeding activity.

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