

20. THE SPIDER *LYCOSA CARMICHAELI* GRAVELEY AS A PREDATOR OF SMALL FROGS

During my field trips in connection with studies on Amphibian Fauna of Dehra Dun District, I have observed on several occasions the interesting case of predation of small frogs, *Microhyla ornata* Dum. & Bibr., and juvenile *Rana cyanophlyctis* Schn. by the spider *Lycosa carmichaeli* Graveley. Spiders have not so far been recorded as predators of amphibians rather the reverse.

Both the frogs and the spider are common around stony banks of rivers, road side ditches and pools. The spider is fairly large and is quite capable of hunting small frogs. *Rana cyanophlyctis* Schn. when mature starts eating its previous predator, but *Microhyla ornata* Dum. & Bibr. adults have not so far been observed feeding on the spider.

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NORTHERN REGIONAL STATION,
ZOOLOGICAL SURVEY OF INDIA,
13 SUBHASH ROAD,
DEHRA DUN,
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R. K. BHATNAGAR
Assistant Zoologist

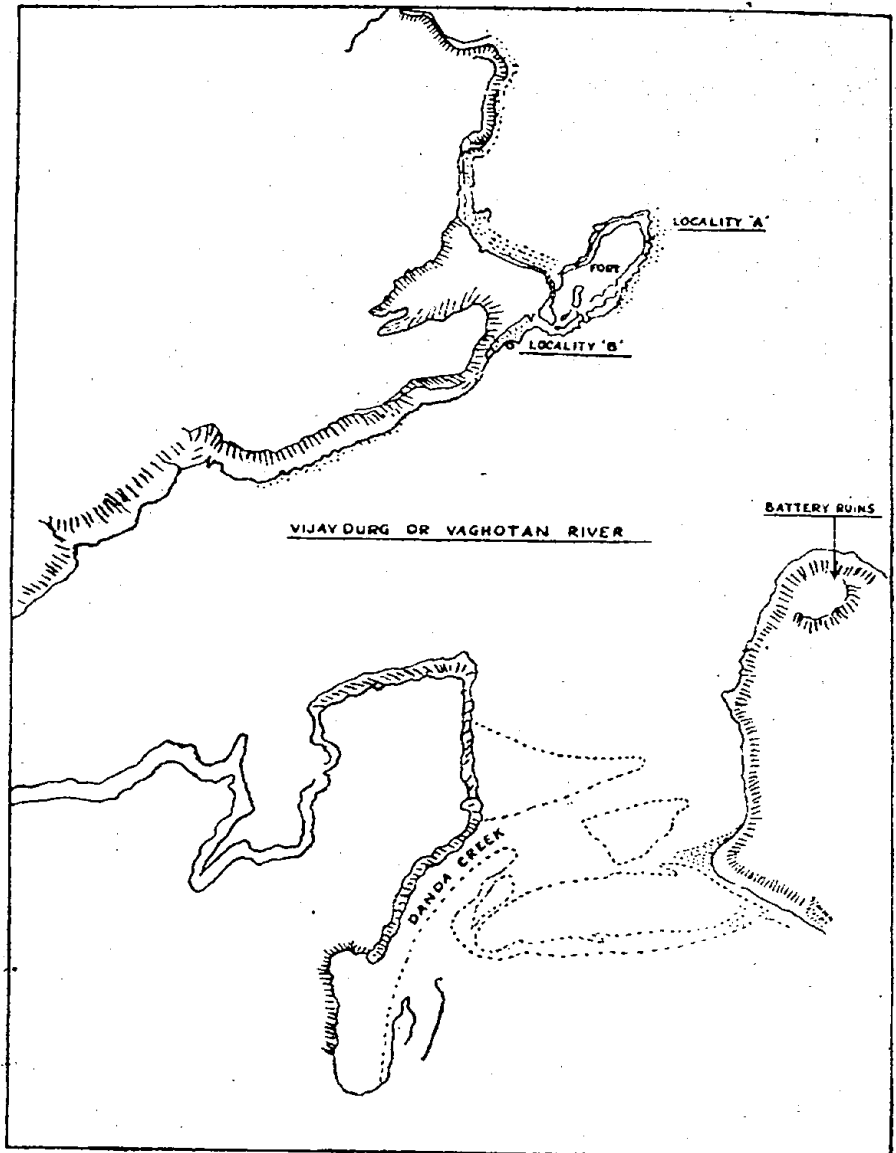
21. DIAMETRICALLY OPPOSITE RESULT OF HUMAN ACTIVITY ON BARNACLE POPULATIONS

(With a text-figure)

There are quite a few instances in environmental research studies, of barnacle populations in intertidal region being affected due to human activity or pollution (Mileikovsky 1968; Naylor 1965; Persoone & de Pauw 1968; Rzhepishevsky 1963; and Smyth 1968). This note communicates one more instance of similar type. The peculiarity of this record, however, is that the ecological factor altered as a result of dredging activity, has different, almost diametrically opposite, effect on two populations of sessile balanomorphs.

During the survey of the west coast of India (Maharashtra region) made in the period 1962-1965, Station Vijaydurg (16° 34'N., 73° 20.5'E.) could be visited on two occasions. During the first survey in 1962, locality 'A' (Fig. 1) had populations of *Chthamalus malayensis* Pilsbry

and *Balanus tintinnabulum* L. whereas locality 'B' had a population of moderate-sized *B. amphitrite* Darwin forms.



In 1963, as a part of the port development project of the Government, work was initiated to construct a landing jetty at locality 'B' and to dredge the bottom between localities 'A' and 'B'. The dredged material was being deposited in the area that was lying opposite to locality 'A'. As a result, at least apparently, of this double activity the balanid fauna of both these localities presented an altogether different picture when they were visited again in 1964. The locality which had fairly good population of large shelled *B. tintinnabulum*

was completely devoid of it. There were only a few empty shells. Similarly, the population of *Ch. malayensis* had shifted position from sea-facing to land-facing surfaces of the rocks. The density of the population had also become poor.

As compared to this, the piers of the landing jetty that was under construction had abundant population of *B. amphitrite* with the basal diameter of their shells admeasuring more than 15 mm. (average diameter at other localities being 6-10 mm.).

The probable explanation that can be offered, to explain this phenomenon under the situation when all physico-chemical factors except the suspended matter in the water, are apparently unchanged, is that it must have resulted due to dredging of the harbour and subsequent abrupt increase in the suspended matter in water. Locality 'A', that falls under the category of highly-exposed, so far as wave-action is concerned, must have had the maximum effect, especially the shearing effect of waves. As a result, entire population of *B. tintinnabulum* must have been eradicated and displacement of *Ch. malayensis* population must have taken place.

Paradoxically, as it may appear, the population of *B. amphitrite* situated at site 'B' that falls under the category of sheltered locality due to its disposition, had this ecological change to its advantage. The increased amount of suspended matter has provided abundant food material for these forms without any harmful effect of wave action, unlike those of locality 'A'. The resultant effect was the abundance of *B. amphitrite* forms with large-sized shells.

This explanation, though tentative, appears to be the only plausible one, that can explain the variation in the abundance of barnacle populations. It will certainly be interesting to pursue similar faunistic studies and the variation in their populations. It should prove helpful in better understanding of the population dynamics of the respective biotic region and the ecology of near-shore waters as a whole.

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NATIONAL INSTITUTE OF OCEANOGRAPHY,
PANJIM,
GOA,

ARUN B. WAGH

KIRTI COLLEGE,
BOMBAY-28,

D. V. BAL

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22. STUDIES ON THE LARVAE OF DECAPODA
BRACHYURA I. *XENOPHTHALMUS GARTHII*
SANKARANKUTTY

(With two text-figures)

INTRODUCTION

The Indo-Pacific region is known for its faunistic richness and a recent assessment by Serene (1968) has put the total number of species of Brachyura at 2500, of which, according to him, more than 1000, may be found within the Indo-Malayan region. However, the larval stages of a great majority of these have not been studied and with the available information, one may not be able to proceed very far in the identification of brachyuran larvae from plankton samples. This was very evident when I made a preliminary examination of the brachyuran larvae from the International Indian Ocean Expedition which contains a large number of zoeae and megalopae collected from different parts of the Indian Ocean. As has already been advocated by Provenzano (1967), only a long term rearing programme of larvae from known parents, as is currently being pursued in the laboratories of the United States, can assist in the identification of larvae from the plankton samples. It was with this objective that the present work was initiated and further studies along similar lines is contemplated as and when ovigerous specimens become available. This paper describes the first zoeal stage of *Xenopthalmus garthii* Sankarankutty obtained through laboratory rearing. For the first time, the description of the first zoeal stage of an interesting and rare genus, *Xenopthalmus* White, is given here.

* Not referred in original.