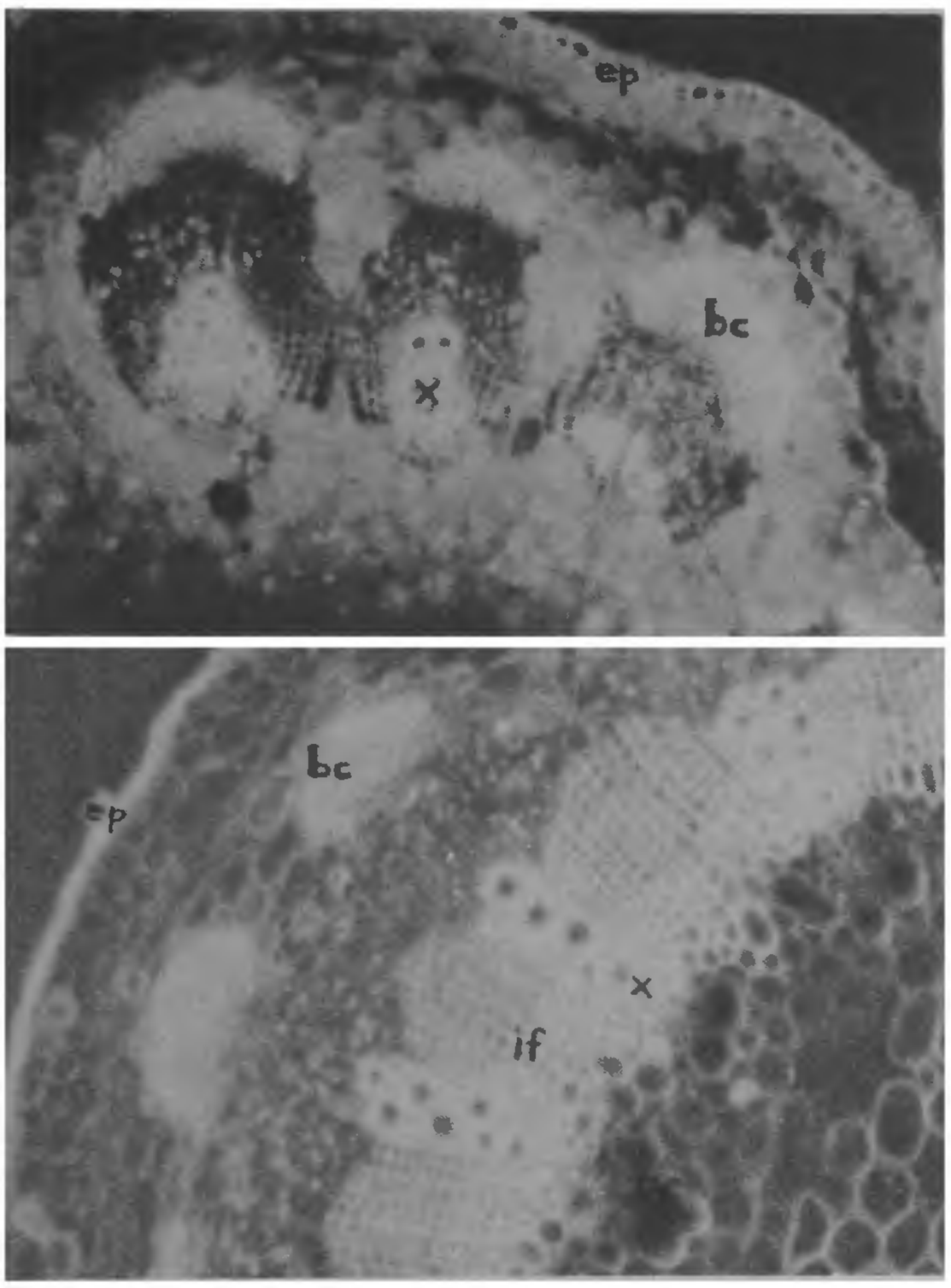

Figure 1. Cross-sections of groundnut pegs viewed under fluorescence microscope. bc—bundle cap; ep—epidermis; if—interxylary fibres; tc—tannin cells; x—xylem.

Univ., Junagadh for providing the cultivars of castor and mustard.

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ON THE RARE OCCURRENCE OF *MARGINELLA VENTRICOSA* G. FISHER 1807 NEOGASTROPOD FROM PORTO NOVO WATERS

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THE present communication deals with the occurrence of *Marginella ventricosa* G. Fischer 1807 in the neritic waters (Bay of Bengal) of Porto Novo. The marginells are a large family and found worldwide in warm and tropical seas[1]. The present species *M. ventricosa* is usually rare although it was reported from Indonesia and Malaya[1]. In the family Marginelledae, 6 genera and 13 species are recorded from Japanese[2] waters. The present sample is a new record from Porto Novo waters. This species was identified on the basis of Oliver[1]. Well known synonym to this species was *M. quinqueplicata*[1]. Another species *Marginella angustata* was recorded from Pamban area Krusadai island[3] and Porto Novo waters[4].

Specimens were collected from ten fathom lines on 18 December 1985. The salinity of deeper water was 36.0‰ and the temperature 20.2°C.

The shell is smooth, shiny, oval in shape with small spine or concealed spire (figure 1). Outer lip is thickened and recurved, runs round siphonal canal to join fasciole, ending posteriorly in callous area on spire. The moderately wide aperture, with four or more folds

Figure 1. Inner and outer view of the shell *Marginella ventricosa* G. Fisher 1807.

on the columellar region. The operculum is absent and foot is large with greyish-ash colour. Outer edge of lip is light brown, grey rim and serrated; and the inner lip is white.

The tentacles measured about 10 to 12.5 mm in length. They are situated on either side of the snout, long and pointed. The proboscis protrudes from below the tentacles, has mouth at the tip.

The present material measured 22.1 mm in height, 14.02 mm in width; 21.95 mm in aperture height and 3.94 mm in aperture width, indicating that shell height and aperture height is more or less equal. The present observations on this species agree well with that made by Oliver[1].

Only six animals were collected from Porto Novo waters. The associated molluscan species were *Babylonia spirata* L., *M. angustata* sowerby, *Tudicula spirillus* (Linne) and *Hemifuses pugilinus* (Born).

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VARIATIONS IN CARBOXYLIC ESTER HYDROLASE ACTIVITY IN *HELIOTHIS ARMIGERA* HÜBNER LARVAE

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AT global level, *Heliothis* complex is a major polyphagous agricultural pest and is reputed to cause heavy losses[1]. On Indian sub-continent *Heliothis armigera* Hübner is the dominant species, and is a serious pest of a number of crops including cotton and pulses (both pigeonpea, *Cajanus cajan* L., and chickpea, *Cicer arietinum* L.)[2]. It has been suggested that *H. armigera* populations occurring in different regions of the country may differ significantly in various biological parameters including response to pesticides[3]. Since, the presence of carboxylic ester hydrolase (CE; EC 3.1.1.1) from the fifth instar larvae of this species has already been reported[4], the present communication reports the titres of this enzyme and its response to various inhibitors in the populations of *H. armigera* collected from widely separated regions of the country on chickpea; the *Heliothis* populations were collected from Hyderabad (Andhra Pradesh), Pantnagar (Uttar Pradesh) and Hissar (Haryana). Our results show that both the titres as well as the response of the enzyme to various organophosphate and carbamate inhibitors differ significantly in the 3 populations studied. Further an interesting correlation between the titres of CE levels and I_{50} values (molar concentration of inhibitor to give 50 % inhibition of the enzyme activity) was seen in various *Heliothis* populations; higher the CE activity lower the I_{50} value for the inhibitors.

The CE activity was assayed in the homogenates of whole larvae spectrophotometrically[5] using *ortho*-nitrophenylacetate (NPA) as substrate[5]. The insects were homogenized in 0.1 *M*, pH 8.0, phosphate buffer at the rate of 10 mg larvae/ml buffer, using an all glass Potter-Elvehjem type homogenizer. The homogenate was centrifuged at 6500 g for 20 min and the supernatant used for enzyme assay. A typical assay for enzyme activity contained homogenate equivalent to 10 mg fresh weight of larvae, 300 μmol phosphate buffer and 3 μmol NPA in a total volume of 3 ml at 30°C ± 1°C. The rate of NPA hydrolyzed was estimated by following the increase in absorbance with time at 415 nm using an Uvikon 810 double beam spectrophotometer. The extinction coefficient of the *ortho*-nitrophenate ions produced was taken as 4.95×10^3, for estimating the amount of NPA hydrolyzed[6]. The larvae of *H. armigera* of approximately the same size and age were collected from field crops of chickpea only so as to avoid the effects of host plant on enzyme activity. A minimum of 15 observations replicated 5 times were taken. The CE activity was observed to be highest in the populations collected from Hyderabad followed by those from Pantnagar and least in the populations from Hissar (table 1).

The response of the CE to the inhibitors sumioxon (*O*, *O*-dimethyl, *O*-3 methyl, 4-nitrophenyl phosphate), carbaryl (N-methyl-l-naphthyl carbamate) and eserine showed that I_{50} was highest for the enzyme obtained from *Heliothis* larvae collected from Hissar followed