The activity level of ATPase increased significantly on cold acclimation in both the cerebral and thoracic ganglionic pools (+52%; +71·5% respectively). Thoracic ganglia exhibited higher response. Similarly the activity levels of ATPase increased in the fore, mid and hind brain regions of the frog on cold acclimation +102%; +55%; +15% respectively). However, forebrain exhibited the highest response and hind brain the least (Table II).

The increase observed in the activity level of ATPase in the present study can be correlated to the higher level of metabolic activity of the organism, characteristic of the cold acclimated state[6].

A decrease in the resting potential with a lowering of ambient temperature has been reported for giant nerve fibers of earthworm and *Aplysia*[7,8]. Lagerspetz[2] suggested that such changes are based on the changes in ionic conductance and on the cation pump. In the light of above studies the present increase in ATPase in the nervous tissue of a crab and a poikilothermic vertebrate frog can be suggested to be indicative of higher neuronal activity in them to achieve thermal compensation.

However, the differences in magnitude of response in the different regions of the nervous system of the animals studied point out to the different functional organisations of these regions. A correlation in the dstribution of ATPase and AChE was observed in the different regions in the brain of frog (unpublished data) in the course of the present study. Nistratova[9] postulated such a relationship between AChE and ATPase while working with the nervous system of bivalves. In the light of such a study, the present co-relation between the two enzymes in the brain of frog points to a functional similarity between the two enzyme systems in achieving compensation during acclimation to low temperature.

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PRESENCE OF NON-PATHOGENIC BACTERIA IN THE GUT OF RICE YELLOW STEM BORER, *TRYPORYZA INCERTULAS* WLK. (LEPIDOPTERA : PYRALIDAE)

LEYDIG[7] made the first observation on the association of microorganisms with the insect gut. Subsequently a number of reports[1–10] appeared in literature about the association and possible role of the microorganisms in the insect gut. Trager[9] reported that symbiotic yeasts and bacteria are most prevalent in insects with relatively restricted or peculiar diets. The yellow stem borer of rice, *Tryporyza incertulas* is highly specific in its diet and feeds only on rice (*Oryza sativa*).

Healthy larva of *T. incertulas* were collected from the field and conditioned in the laboratory at 30–32° C on cut stem pieces of a high yielding rice cultivar, *Jaya for three days. The larvae were surface sterilised* with 0·1% $HgCl_2$. The entire gut was removed intact on sterilised wax plates under aseptic condition. The major components of the alimentary canal (*viz.*, stomodaeum, mesenteron and proctodaeum) and the cuticle were separated out and transferred separately to nutrient agar plates and incubated for 48 hrs at 30° C. In a second set of experiments, all the major components of the gut and the cuticle were oriented on the nutrient agar plate at a distance of 3 cm. Two sets of controls were maintained in every case: (i) plates *having unsterilised components, (ii) plates having* only nutrient agar for ascertaining the possibility of contamination, if any, due to surface microorganisms under unsterilised conditions. Healthy *T. incertulas* larvae were also inoculated with freshly grown bacteria which were reisolated after 48 hours, following the same procedure. Reisolation was made from both sterilised and unsterilised and treated and untreated larvae.

The study revealed that *T. incertulas* larvae harbour two bacteria, *viz.*, *Klebsiella pneumoniae* (Schroter) Trevisan and *Enterobacter aerogenes* (Kruse) Hormeche and Edwards in all the major components, *viz.*, stomodaeum, mesenteron and proctodaeum. These bacteria, could not be recovered from cuticle and in the controls.

Association of *K. pneumoniae* and *E. aerogenes* with the alimentary canal of *T. incertulas* is being

reported for the first time. Further studies on the exact role of these two bacteria in the digestive physiology of the pest is in progress.

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FACTOR ANALYSIS IN ONION (*ALLIUM CEPA* L.)

SEVERAL measurements are usually recorded in experiments involving crop plants. They can be broadly classified into morphological characters and yield components. The next step that is generally taken is to assess the treatment differences for each of these characters independently. Doing so, we are tending to ignore the interrelationship between these characters and also the fact that each one of the measurements does not attempt to measure the yielding ability or the vigour or a similar phenomenon associated with plant growth.

For the above reasons, one of the methods employed is to find an index, for each of the phenomena concerned with the plant, using the measurements observed by us. This is done by the method of factor analysis. Results of such work have been reported recently[2-4].

Measurements recorded in an experiment on onion to assess its seed yield was used for the purpose of arriving at the factors. The characters considered were X_1–number of flowering stalks, X_2–height of flowering stalks, X_3–diameter of umbel, X_4–1000 seed weight, and X_5–total seed yield.

The centroid method of analysis as given by Lawley and Maxwell[1] was used in arriving at the factors. The following two factors were obtained :—

Factor I– $\cdot 3506\ X_1 + \cdot 6142\ X_2 + \cdot 4502\ X_3 + \cdot 2685\ X_4 + \cdot 8316\ X_5$.

Factor II–$\cdot 7698\ X_1 + \cdot 2803\ X_2 + \cdot 7166\ X_3 + \cdot 4397\ X_4 + \cdot 2725\ X_5$.

The first factor had a variance of 1·47 (29% of the total) and the second factor a variance of 1·45 (29% of the total).

Both the above mentioned factors give positive loading to all the characteristics observed, and hence they are indices of vigour only. While the first factor gives higher loadings to the height of the flowering stalk and seed yield, the second factor gives more loading to the number of flowering stalks and the diameter of umbel. The first factor can thus be taken as indicative of the general vigour of the plant giving importance to both the plant size and its reproductive potential, while the second one can be taken as a measure of floriferousness of the plant. These two indices could be used in further comparison of treatments in onion data profitably when the vigour of the onion plant is to be compared.

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