

## PART III

### NOTES, ABSTRACTS AND NEWS

#### NOTES:

#### DISTRIBUTION OF 5'-NUCLEOTIDASE ACTIVITY IN THE TISSUES OF A FRESHWATER TELEOST, *OPHICEPHALUS STRIATUS* BLOCH

Until recently, information on fish enzymes has been rather limited and certain groups still remain much less explored. In earlier communications from this laboratory the presence of an enzyme, 5'-nucleotidase (5'-ribonucleotide phosphohydrolase, E. C. 3. 1.3.5), capable of catalyzing the dephosphorylation of a number of ribonucleotide monophosphate, has been reported in the tissues of several freshwater teleosts (Jafri *et al.*, 1970; Asghar *et al.* 1972). Previously this enzyme was reported in the snake venom, seminal plasma and other animal tissues (Gulland and Jackson, 1938; Heppel and Hilmoe, 1951; Ahmad and Reis, 1958; Asghar and Devi, 1972). In a view to providing more information on the subject, and to determine interspecific differences, if any, in the enzyme activity the present authors thought it to be specially interesting to determine the distributional pattern of 5'-nucleotidase activity in the tissues of another teleostean species, *Ophicephalus striatus* Bloch., a fish of great economic importance. Since 5'-nucleotidase is known to be associated with the control of the concentration cycle of AMP which has a bearing on the rigor, freshness and flavour quality of the fish, studies on this enzyme would be interesting from the standpoint of dietitians and fish processing industries.

Adult and live specimens of *O. striatus*, measuring 35-40 cm. were obtained from the local fish market. These were killed by decapitation, dissected and their tissues quickly removed. A 10% homogenate of each tissue was prepared, centrifuged for 10 minutes at 1,200 X g and the supernatant used for enzyme assay. Method of enzyme estimation was the same as described earlier (Jafri *et al.*, 1970). No significant differences were found between the enzyme activity of male and female fish and, therefore, the two sexes were not analysed separately. The values for the enzyme activity given in Table I are the mean of triplicate determinations of tissues from fishes of approximately the same length.

As would be evident from the data summarised in Table I, all the organs of this species showed marked activity of 5'-nucleotidase. The highest activity was noted in the cardiac tissue. The values were also fairly high in kidney, spleen and brain tissues while relatively low values were observed in liver tissue. Muscle showed the lowest activity for this enzyme.

A comparison of the values obtained for *O. striatus* with those of *O. punctatus* and *H. fossilis* described earlier (Jafri

TABLE I  
5'-nucleotidase activity in the tissues  
of *O. striatus* Bloch.

Tissue	Enzyme Activity ( $\mu$ moles of Pi released/hr./mg.protein)
Heart	5.851 $\pm$ 0.0735
Kidney	4.048 $\pm$ 0.0591
Spleen	2.760 $\pm$ 0.0610
Brain	2.255 $\pm$ 0.0647
Liver	1.187 $\pm$ 0.0089
Muscle	0.633 $\pm$ 0.0392

Values are mean  $\pm$  SE

*et al.*, 1970; Asghar *et al.*, 1972) reveals a close similarity in the pattern of the distribution of 5'-nucleotidase among different tissues of the three species, though the level of enzyme activity differed markedly from one species to another. In *O. striatus*, for example, the level of 5'-nucleotidase activity in all the tissues was much higher than in *O. punctatus*, a closely related species, pointing thus to the existence of a significant inter-specific difference in the level of the enzyme activity. It may be added that the former species grows to a much larger size than the latter, and is perhaps a more active fish. The higher level of enzyme activity observed in the tissues of *O. striatus* may be related, beside other factors, to the specific metabolic activity and demand of the fish. It indicates that the potential for carrying out the reactions catalyzed by this enzyme is much greater in this particular species.

The functional significance of 5'-nucle-

otidase, as revealed by its distributional pattern, in fish tissues has been pointed out earlier (Jafri *et al.*, 1970). Briefly stated, this enzyme which is so well distributed in animal tissues may be directly concerned with the function of regulating the cycles of Inorganic phosphorus and AMP, and these may be associated with metabolism, neutrality regulation, absorption etc. AMP, in addition, serves as a building block for biological polymers like RNA and DNA, and as a co-factor for various enzymatic reactions. The enzyme, 5'-nucleotidase, may thus play an important role in biological systems.

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