List of Publications
List of Publications


Seminars/Symposia Attended

1. Nominated Young Scientist at the 85th Science Congress, held at Hyderabad, January 1998, in two disciplines viz. Botany and Biochemistry, Biophysics & Molecular Biology and presented papers entitled "Distribution of Certain Hydrogen Peroxide Scavenging Components in Rice Seedlings" and "Etiolation Stimulated Ascorbate Peroxidase Activity in the Leaves of Rice Seedlings" respectively.

2. Nominated Young Scientist at the 86th Science Congress, held at Chennai, January, 1999, in Agricultural Sciences and presented a paper entitled "Changes of Ascorbate peroxidase and Peroxidase Activities at Different Developmental Phases in Rice".

3. Nominated Young Scientist at the 87th Science Congress, held at Pune January, 2000, in Agricultural Sciences and presented a paper entitled "Expression of Substrate Specific Peroxidases in Rice and Eucalyptus Species"

5. Poster entitled “Distribution and Properties of Ascorbate Peroxidase in Rice” presented at the 69th annual meeting of SBC(I), held at Science City, Calcutta, in December, 2000.

Abstracts

Expression of Substrate Specific Peroxidases in Rice and Eucalyptus Species

The pattern of expression of peroxidase (Px) isoymes, linked to various aspects of cellular metabolism, was studied in the leaves of rice and Eucalyptus species and compared with that of pure Horseradish peroxides (HRP). Substrates used for assaying the isoymes were o-dianisidine (characterising the scavenging role), syringaldazine, coniferyl alcohol, NADH (each involved in lignification) and indole acetic acid (involved in auxin metabolism). Both HRP and crude extracts from rice leaves readily acted on all the substrates. Crude extracts from Eucalyptus leaves, however, could recognize only o-dianisidine, coniferyl alcohol, NADH (feeble activity) while an interference was obtained with the syringaldazine assay. The levels of these isoymes were lower in Eucalyptus as compared to rice. Active fractions (w.r.t. o-dianisidine) from Sephadex G-50 of Eucalyptus extract showed very feeble activity with syringaldazine. Indole acetic acid (IAA) oxidase was detected in Eucalyptus sps. only when hydrogen peroxide (H₂O₂) was used in the assay medium while working with G-50 fractions. Addition of H₂O₂ to the assay medium also enhanced the response to IAA of rice Px and HRP. The possible mechanism underlying this differential expression of Px substrates has been discussed.
**Distribution and Properties of Ascorbate Peroxidase in Rice**

Ascorbate peroxidase (As-px) is one of the most important antioxidant enzymes that mediates the removal of hydrogen peroxide (H\textsubscript{2}O\textsubscript{2}), a toxic by-product of cellular metabolism, in conjunction with ascorbate and glutathione in Foyer-Halliwell-Asada cycle. The vital aspect of the enzyme activity is its ability to destroy H\textsubscript{2}O\textsubscript{2} at a concentration, which often escapes the action of other antioxidants. In the present study, we have explored the status of this enzyme in rice in terms of spatial and developmental changes as well as important aspects of the enzyme action. The activity was measured by following the disappearance of ascorbate at 290nm and expressed as specific activity. The enzyme activity was highest in root tissues followed by stem and leaf tissues. The enzyme was also present in the floral organs indicating its protective role against H\textsubscript{2}O\textsubscript{2}. The activity was higher in green flowers during anthesis, and then gradually declined with the development of the seeds. Rice As-px, which showed a pH optimum of 5, retained its activity in the ascorbate-depleted medium. Ammonium sulphate fractionation of the crude homogenate resulted in a total loss of activity. The enzyme was not modulated by light-dark transition. The activity, however, showed impressive stimulation (150%) in dark-grown seedlings, which appeared to be an intrinsic property of the etiolated condition.