ABSTRACT

Indol - 3yl - acetic acid (IAA) oxidase preparations from sweet potato (*Ipomoea batatas*) tubers showed considerable peroxidase, catecholase and phenol-stimulated IAA oxidase activities, but negligible cofactor-independent IAA oxidase activity. Ageing of freshly excised tuber discs resulted in the development of cofactor-independent IAA oxidase, increased peroxidase and decreased catecholase activities. The pH optima of these enzyme systems as well as the stimulation/inhibition of IAA oxidase activity by phenolics and manganous ion were compared with these properties of enzyme preparations from other sources with particular reference to those from sweet potato roots.

IAA oxidase genesis during ageing could either be stimulated or inhibited by growth hormones or selected modifier compounds of 'in vitro' IAA oxidase activity, depending on the concentration, and except for inhibition by IAA, peroxidase genesis was similarly affected.

Increases of two to six fold were recorded for discs aged in the presence of ethylene (10 µl/l.) Protein synthesis inhibitors prevented the age-induced increases of IAA oxidase/peroxidase, invertase and phenylalanine ammonia lyase activities suggesting a 'de novo' synthesis of enzyme protein.

Qualitative and/or quantitative changes were observed in the isozyme profiles of crude preparations from tuber discs which were either freshly excised or aged either in distilled water or in the presence of various concentrations of each of the hormones: Indoleacetic acid, Gibberellic acid, 6-Benzylaminopurine and Abscisic acid. Variation in the homogenizing media did not influence the isoperoxidase pattern, but only two of the constitutive isozymes were detected in enzyme purified by acetone-precipitation.

Increases on ageing and stimulation/inhibition by IAA were also observed for invertase and phenylalanine ammonia lyase activities in tubers but changes in acid phosphatase activity were insignificant.

The activities of selected enzymes were compared in roots, thick roots and tubers while changes in activity of the IAA oxidizing system in discs from developing, stored, and germinating tubers were examined.