

ABSTRACT

In this thesis, the tissue culture propagation of Xanthosoma sagittifolium (L.) Schott (Araceae) was described. The following were investigated:-

1. effects of different explants, auxins and cytokinins, and culture environment on callus initiation.
2. effects of various concentrations of auxins and cytokinins and gibberellic acid on organ formation.
3. effects of constant and reducing auxin levels on callus formation and differentiation.
4. hardening of plantlets in different potting mixtures.

Results indicated that most bud explants callused in liquid media (full strength) supplemented with α -naphthalene acetic acid (NAA)/6-benzyladenine (6-BA) at molar concentrations of $1.0 \times 10^{-5/6/7}$, incubated at 8h light/16h dark.

Kinetin, 6-BA, and 6-(benzylamino)-9-(2-tetrahydropyranyl)-9H purine (PBA), and indole-3-acetic acid (IAA), indole-3-butyric acid (IBA) and NAA were combined in Murashige and Skoog revised medium (half strength) for organ formation. Of the hormone combinations used, the basal medium with no hormone supplement produced the most shoots after 3 and 5 months of culture.

Histological investigations showed that constant rather than reducing levels of NAA were most effective for the differentiation of root primordia in liquid cultures. Root primordia differentiated at the abaxial and adaxial mesophyll of callused bud scales.

In the green-house, both potting mixtures of sand:coir (1:1 v/v) and sand:peat:Perlite (2:2:1 v/v/v) were suitable for plantlet hardening and there were no major differences between the potting mixtures.

Suggestions for further improvement and applications of the technique were outlined.