ABSTRACT

Studies on *in vitro* Propagation of *Pachyrhizus erosus* (L.) Urban

Wendy Carol Forbes

This study was undertaken to determine the potential for clonal propagation, and *de novo* plant regeneration of *Pachyrhizus erosus* (L.) Urban. The factors which influenced the *in vitro* development and proliferation of axillary shoots, callus initiation and production from leaf explants, *de novo* initiation and development of adventitious shoots from leaf and seedling tissues, initiation and development of roots, and establishment of *in vitro* cultured plantlets to the external environment were studied.

Shoot development from nodal explants was promoted by several cytokinins, with BAP and Zeatin being more effective than others. Optimum production was achieved when shoots were maintained on Benbadis (Sørensen pers. comm. 1990) medium supplemented with BAP 0.1 mg l^{-1}. Shoot development from axillary meristems at the proximal area of cotyledons was also evident when explants were cultured on identical medium.

The stimulation of adventitious bud induction was found to be explant dependent. Epicotyl explants removed from aseptically germinated seedlings were more inclined to organogenesis than hypocotyl and leaf explants. Adventitious shoot development and multiplication was possible when buds were transferred from initiation media unto SL2 medium supplemented with BAP 0.1 mg l^{-1}.

The gaseous composition of the culture atmosphere was found to influence leaf development of *in vitro* produced shoots. Leaf development was suppressed in culture systems that allowed for the accumulation of ethylene.

Rooting of *in vitro* produced shoots was influenced by the auxin type used. NAA was most effective in stimulating adventitious roots on shoots produced from axillary meristems, whereas IAA stimulated a better rooting response with adventitious shoots.

The study indicates that clonal propagation from nodal stem cuttings, and *de novo* shoot regeneration by organogenesis is possible.