ABSTRACT


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The objective of the project was to investigate the various aspects that are involved in engineering resistance to bacterial blight in anthurium. It involved:

(1) - The evaluation of the various protocols which are available for *in vitro* propagation, to determine which of the widely used protocols, best facilitates *in vitro* response on a range of cultivars and is suitable for regeneration of transformants.

(2) - The development of an efficient protocol for agrobacterium mediated transformation, and

(3) - Investigation of the bacterial pathogen in order to propose a suitable gene(s) for use in agrobacterium mediated transformation, as well as a suitable screening technique to evaluate potential transformants.

The results indicated that though there was genotype to medium interaction at initiation, a modification of Pierik’s (1976) protocol is the most appropriate for
in vitro propagation of the cultivars which were investigated. It was also found that shoots and leaves from in vitro produced plants can also be induced to produce callus and eventually plantlets when this protocol is used. There was no evidence of genotype to medium interaction during the proliferation stage of micropropagation, however, it was found that the extent of proliferation was in fact genotype specific.

A modification of the protocol which was proposed by Chen and Kuehnle (1996) for transformation of Anthurium andreanum was found to be less efficient than modifications of the grape protocol proposed by Perl et al. (1996), as well as the protocol which was proposed by Charity pers. comm. (1997), for transformation of etiolated internodes, shoots/cuttings and callus.

Several pathogenic isolates were characterised at the CMI as saprophytic Pseudomonas species. Of the inoculation methods investigated, petiole inoculation of in situ plants was found to be the most appropriate. However, resistance did not appear to be at the level of petiole and leaf, and varied with plant age and leaf age and did not seem appropriate for determining levels of resistance. Alternative strategies for screening are discussed.

Keywords: agrobacterium mediated transformation, Agrobacterium tumefaciens, Anthurium andreanum, bacterial blight, biotechnology, disease resistance, in vitro propagation, Pseudomonas, Acidovorax.