

**ABSTRACT**

Studies on the *in vitro* propagation of *Averrhoa carambola* L.

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Investigations were carried out to (a) develop a method for the regeneration of plants of *A. carambola* L. from seedling tissue, (b) trace the process of morphogenesis histologically, (c) identify any somaclonal variants from among the regenerated plants and (d) propagate an adult plant through the axillary bud culture technique.

Initial tests were conducted with a new growth medium formulation (MJ<sub>1</sub>) either alone or supplemented with benzylaminopurine (BAP), N<sup>6</sup>-(2-isopentyl) adenine (2iP) or kinetin at 5.0  $\mu\text{Ml}^{-1}$ , subsequently the BAP supplemented medium was used for *de novo* shoot regeneration from seedling stem internodal tissue. Two other formulations (MJ<sub>2</sub> and MJ<sub>3</sub>) were used for *de novo* shoot regeneration from adult internodal tissue. Results indicate that the use of BAP may not be advantageous for axillary shoot proliferation from more mature explant tissues.

A basal MJ<sub>2</sub> medium was utilised for the promotion of axillary shoot development in adult nodes. Shoots were regenerated *de novo* from seedling and adult stem internodal explants. A new rooting method was developed for the shoots regenerated from seedling tissue but shoots regenerated from adult material did not root.

Histomorphological studies were conducted to investigate the effects of the different growth regulator treatments and to trace the process of morphogenesis in BAP treated seedling explants. The different growth regulators produced qualitatively different effects when used at similar concentrations and three separate morphogenetic pathways may have uncovered in the BAP treated explants.

Variant plants were identified through the use of starch gel electrophoresis (SGE) and sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE) analyses.