

**RNA interference of 1-aminocyclopropane-1-carboxylic acid oxidase (ACO1 and ACO2) genes expression prolongs the shelf life of Eksotika (*Carica papaya* L.) papaya fruit**

**Abstract**

The purpose of this study was to evaluate the effectiveness of using RNA interference in down regulating the expression of 1-aminocyclopropane-1-carboxylic acid oxidase gene in Eksotika papaya. One-month old embryogenic calli were separately transformed with *Agrobacterium* strain LBA 4404 harbouring the three different RNAi pOpOff2 constructs bearing the 1-aminocyclopropane-1-carboxylic acid oxidase gene. A total of 176 putative transformed lines were produced from 15,000 calli transformed, selected, then regenerated on medium supplemented with kanamycin. Integration and expression of the targeted gene in putatively transformed lines were verified by PCR and real-time RT-PCR. Confined field evaluation of a total of 31 putative transgenic lines planted showed a knockdown expression of the targeted ACO1 and ACO2 genes in 13 lines, which required more than 8 days to achieve the full yellow colour (Index 6). Fruits harvested from lines pRNAiACO2 L2-9 and pRNAiACO1 L2 exhibited about 20 and 14 days extended post-harvest shelf life to reach Index 6, respectively. The total soluble solids contents of the fruits ranged from 11 to 14° Brix, a range similar to fruits from non-transformed, wild type seed-derived plants.

**Keyword:** Eksotika 1 papaya; RNA interference; ACC oxidase; *Agrobacterium* mediated transformation