



## Changes in the physical quality parameters of the lowland transgenic tomato fruit during ripening

Najat M. E.<sup>1</sup>, Zainon M. A.<sup>1</sup>, Maizom H.<sup>2</sup>, Zamri Z.\*<sup>1,2</sup>

<sup>1</sup>School of Bioscience and Biotechnology, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia

<sup>2</sup>Institute of Systems Biology (INBIOSIS), Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia

**Abstract:** Fruit constitutes an important part of the daily diet, thus contributing to its demand in local and worldwide markets. Consumer awareness, relative to food and health, has led to a demand for foods of high nutritional quality. This has encouraged many molecular biologists to study the complexity of fruit ripening so that the plants can be genetically manipulated to enhance the edible quality of the fruits. Tomato fruit from lowland transgenic (RNAi ACO1) line 21 of which have low ethylene production and a long shelf-life of more than 22 days were assessed for nutritional quality, changes in physico-chemical characterization and health-related bioactive compounds. The transgenic fruit were compared with control fruit. The firmness of the transgenic RNAi ACO1 line-21 fruit declined steadily and reached firmness values ( $5.13 \pm 0.12$  N) at 22 d compared to the non-transgenic fruit ( $5.39 \pm 0.22$  N) at 10 d. Both the transgenic and non-transgenic tomato fruit developed a similar colour when fully ripe, with average hue angles of approximately 20 degrees. During ripening, the transgenic RNAi ACO1 tomato fruit exhibited 25% and 1% higher levels of lycopene and  $\beta$ -carotene at red ripe stage respectively, compared to the non-transgenic fruit. Furthermore, the transgenic RNAi ACO1-21 fruit only showed delayed increases in ascorbic acid content without altering its level during normal ripening. In conclusion, the results demonstrated that the antioxidant capacity may be partly responsible for prolonging transgenic tomato shelf life as well as its quality characteristics compared to the non-transgenic tomato fruit.

**Keywords:** Ascorbic acid;  $\beta$ -Carotene; Lycopene; Shelf life; Transgenic tomato fruit.