

Title Influence of 1-methylcyclopropene on fruit quality in sudachi fruits
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Abstract

Sudachi (*Citrus sudachi* Hort.ex Shirai) is very popular citrus fruit used in Japanese cooking. The fruit have a characteristic aroma and a high concentration of vitamin C. However, it has a relatively short shelf life due to loss of green peel colour at room temperature. Low temperature storage is utilized to extend its shelf life but sudachi fruits are very sensitive to low temperatures that induce chilling injury. Various concentrations of 1-methylcyclopropene (1-MCP), an ethylene action inhibitor, were applied to sudachi fruit to elucidate the changes in quality attributes during storage. Fruit was obtained from Tokushima prefecture, Japan and treated with 1-MCP (0, 0.05, 0.1, 0.25 and 0.5 ppm) for 24 h at 20°C, then placed in perforated polyethylene bags and kept in the dark at 20°C for 15 days. Ethylene production, respiration rate, peel colour (hue angle and visually), weight loss, peel browning and phenolic contents were determined during storage. The 0.1 ppm 1-MCP treated fruit showed the maximum increase in shelf life with peel colour remaining green until 5 days after treatment (DAT). The 0.05 ppm treated fruits also kept their peel colour green until 4 DAT. Fruit treated with 0.25 ppm 1-MCP became yellow at 3 DAT and exhibited only a slight peel browning, while untreated fruits turned yellow at 2 DAT without peel browning. Fruit treated with 0.5 ppm 1-MCP did not show significant yellowing but peel browning appeared at 2 DAT. Peel discolouration developed significantly over the entire surface of the fruit thereafter. Ethylene and carbon dioxide production were markedly higher in 0.5 ppm treated fruit and peaked at 1 DAT. Percentage of weight loss in fruits treated with 0.5 ppm was higher than in other treatment. Phenolic contents were slightly higher in 0.5 ppm treated fruits than in other treatments. Application of low concentrations (0.05 or 0.1 ppm) of 1-MCP improved the maintenance of the green colour very well in sudachi fruit.