Title Effect of abiotic stress, high temperature and/or deficient irrigation, during cultivation on chilling stress and storability of oriental melon (*Cucumis melo var.* Makuwa Makino) fruit at low temperature storage

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Abstract

Oriental melon (*Cucumis melo* var. Makuwa Makino) plants were cultivated and exposed to the abiotic stresses of high temperature (38°C for 60hr) and/or deficient irrigation (pF 2.2-2.5) after fruit set. Fruit from these plants were stored and evaluated for several quality attributes during 36 days at 5°C. The deficient irrigation treatment decreased yield, length, and fresh weight of fruit, but high temperature treatment did not. While the fresh weight of fruits treated with abiotic stresses decreased faster than controls, the decrease of fresh weight was only 0.4-0.6% at 5°C. At 5°C production of carbon dioxide, ethylene, and acetaldehyde was suppressed treated with the abiotic stresses in at 5°C. Concentrations of these 3 gases in the 40mm ceramic film fruit packages were lower at 5°C following abiotic stress treatments than in controls. Electrolyte leakage of fruit flesh less in abiotic stressed fruit than in control fruit after 36 days at 5°C. Before and after 5°C storage, generally, fruit exposed to preharvest abiotic stress treatments generally maintained higher firmness, ascorbic acid and a-tocopherol contents than non-stressed fruit. Shelf life of oriental melon fruits treated with these abiotic stresses was extended from 1 to 6 days. Abotic stresses increased activity of catalase and peroxidase, as well as concentrations of the antioxidants; ascorbic acid and a-tocopherol in oriental melon fruits.