

Title Real-time microsensors measurement of internal oxygen partial pressure in tomato fruit under hypoxic conditions

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Citation Postharvest Biology and Technology, Volume 52, Issue 2, May 2009, Pages 240-242

Keywords *Solanum lycopersicum*; Postharvest; Oxygen; Internal atmosphere; Controlled atmosphere; Modified atmosphere

Abstract

Internal oxygen partial pressure of tomato (*Solanum lycopersicum* L.) fruit was measured using a pc-controlled, fiber-optic O₂ meter. Tomato fruit were subjected to hypoxic conditions via blockage of gas exchange at the stem end or by controlled atmosphere storage (4 kPa O₂ plus 5 kPa CO₂). Internal O₂ partial pressure was evaluated in distal (i.e., blossom-end) tissue (10-mm depth). In both tests tomato fruit exposed to ambient atmosphere conditions had internal O₂ partial pressure of 18 kPa. Hypoxia was induced following lanolin application to the stem scar, and O₂ partial pressure decreased to 0.3 kPa after 1.5 h. During short-term CA application, the O₂ content of tomato was 1.0 and 0.2 kPa, after 1 and 2 h, respectively. This measurement apparatus shows promise for determining internal O₂ partial pressure in soft fruits as affected by such external conditions as coatings, and modified or controlled atmosphere storage.