

**Title** Effect of controlled atmosphere on storability and shelf life and quality of green slender chilies (*Capsicum annuum L.*)

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### Abstract

Green chilies are perishable in nature having limited shelf life and high susceptibility to post harvest problems like shriveling, wilting and pathogenic disorders. This study was intended to optimize the controlled atmosphere storage conditions for green chilies. For this purpose, green mature chilies were sourced from a commercial farm. Fruits were graded and weighed 2kg in plastic crates, which were kept in different storage conditions. The storability of green chilies was tested in a modern Van Amerongen mobile CA lab. from Holland. Storability was tested under four different storage conditions including CA<sub>1</sub> (5°C, 21%O<sub>2</sub>, 0%CO<sub>2</sub>); CA<sub>2</sub> (5°C, 3%O<sub>2</sub>, 15%CO<sub>2</sub>); CA<sub>3</sub> (10°C, 21%O<sub>2</sub>, 0%CO<sub>2</sub>) and CA<sub>4</sub> (10°C, 3%O<sub>2</sub>, 5%CO<sub>2</sub>) with relative humidity 80-90%. Chilies from each treatment were removed two times (i.e. after 3 weeks and 6 weeks of storage) and 4 boxes removed after each storage interval. After storage removal, for shelf life studies, chilies were kept at 15°C and at ambient condition 22°C±1°C, for 1 week. Observation on parameters including weight loss, fruit color, firmness, wrinkling, decay, respiration rate (CO<sub>2</sub> production), ethylene production, ascorbic acid, titratable acidity and total soluble solids (TSS) were made. In case of storage at 10°C, considerable effects on fruit quality and storability were recorded. The fruit subjected to CA<sub>4</sub> at 10°C exhibited comparatively less decay % and wrinkling but more firmness, high TSS and vit C contents as compared to all treatments. Less weight loss, ethylene and CO<sub>2</sub> production and relatively more acidity was recorded in the fruit stored at 10°C at CA<sub>3</sub> conditions. Chilling injury was observed on the fruits stored at 5°C, and it further increased during post storage shelflife studies. High CO<sub>2</sub> also appeared to increase fruit injuries. In another experiment, storage performances of green chilies stored at 0°C with no humidification system, was evaluated and compared with those stored at 5°C and 10°C without controlled atmosphere (CA) conditions. Chilies stored at 0°C with no humidification system showed better storage and shelflife life with significantly less chilling injuries, decay and firmness compared with those stored at 5°C having 80-85% RH. These experiments showed potential for extended storage of chilies by judicious manipulation of gaseous atmosphere, humidity and temperature. The current paper provides a comprehensive account of above studies.