

Title Optimization of controlled atmosphere storage conditions for storability and marketability of green chillies (*Capsicum annuum* L.)

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Abstract

Green chillies (*Capsicum annuum* L.) are cash and versatile vegetable crop having both nutritional and commercial importance. Like all other fruits and vegetables, green chillies are also liable to spoilage, shriveling and wilting under improper storage conditions. Controlled atmosphere (CA) technology can markedly contribute to conserve postharvest quality of green chillies. This study was conducted to evaluate the performance of green chillies under CA conditions (T₁: 0.03% CO₂ & 21 % O₂; T₂: 0% CO₂ & 10% O₂; T₃: 0% CO₂ & 5% O₂; T₄: 0% CO₂ & 2.5% O₂; T₅: 0% CO₂ & 1.0% O₂; T₆: 2% CO₂ & 3% O₂; T₇: 5% CO₂ & 3% O₂; T₈: 8% CO₂ & 3% O₂; T₉: 5% CO₂ & 1.5% O₂; T₁₀: 5% CO₂ & 5% O₂) at storage temperature 0 ± 1°C, 60-70% RH. The fruit were removed from CA storage at periodical interval of two, four, and six weeks, followed by observation on shelf performance. Fruit quality parameters such as % weight loss, % decay, green color retention, firmness, wrinkling and acidity showed highly significant response to CA storage. Results showed that chillies can be successfully stored at 0°C temperature for short time (2 weeks) without CA; however, CA can extend shelf life of chillies up to 6 weeks. Optimum range of CA conditions for chillies was found 3% O₂ + 5-8% CO₂ at 0°C (79% marketable fruit) in which fruits can be stored for up to 6 weeks followed by 3 days shelf life at 20±1°C for marketing. Low temperature injury was observed after three days of shelf life and fruit were found to be unmarketable mainly due to chilling injury and disease outbreaks (*Fusarium* sp, *Alternaria*, *Colletotrichum* and *Rhizoctonia* spp).