

Title Ozone gas exposure to extend shelf-life of tomatoes in hot and humid region
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Abstract

India, of late has been producing large quantities of fresh fruits and vegetables, however, the post harvest losses have been an impediment in keeping average consumption of fresh fruits and vegetables low. Excessive microbial loads is one of the major spoilage agent. Study reported here considered Ozone (O₃) exposure for short duration as sanitization agent for tomatoes. O₃-in-air having concentrations between 20-50 ppm were used to reduce microbial load and thus extend shelf. Green mature tomatoes were exposed to pre-decided O₃- air mixtures in airtight acrylic containers. After the O₃ was depleted (half life of O₃ in air at 30°C typically 6 hrs) the tomatoes were stored in airtight conditions. Microbial counts were determined before and after treatment. Respiration rates were measured in terms of CO₂ generated in mgkg⁻¹ hr⁻¹ to co-relate with shelf-life determined by weight loss and visible decay. Results obtained are :

- (i) The untreated tomatoes (control) started spoilage from 5th day and the respiration rates started accelerating vis-à-vis treated tomatoes with O₃.
- (ii) Microbial count on tomato surface was reduced by 2 log cycles with 20 ppm of O₃ and by 4 log cycles using O₃ of 35-50 ppm. The corresponding shelf-life enhancement of 1.1 times, 4.2 times and 5.6 times was observed with O₃ of 20, 35 and 50 ppm, respectively.
- (iii) Weight loss during storage for treated tomatoes was found to be lower as compared to untreated tomato samples during a storage period of 4-16 days.

In conclusion, the preliminary experimental work on exposing tomatoes to O₃-in-air proposes great potential for enhancing shelf-life of tomatoes stored in hot and humid weather. This work will guide the pilot experiments for ozone treatment of tomatoes and other vegetables.