

Title Effect of heat treatment on strawberry fruit damage and oxidative metabolism during storage
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Abstract

Strawberries (*Fragaria × ananassa* Duch., cv. Selva) were heat-treated in an air oven (45 °C, 3 h). After treatment, the fruit were stored at 0 °C for 0, 7 or 14 d, and then held for 2 d at 20 °C. Respiration rate, hydrogen peroxide level, potassium leakage, antioxidant capacity, ascorbic acid, superoxide dismutase (SOD), ascorbate peroxidase (APX) and pyrogallol peroxidase (POD) activities were measured. Heat-treated fruit showed lower decay and less tissue damage than control fruit as judged by changes in ion leakage, respiration rate and pyrogallol peroxidase (POD). Heat-treated fruit also presented lower levels of H₂O₂ than control fruit during storage. In addition, antioxidant capacity was higher in heat-treated fruit both after 1 d at 20 °C or 7 d at 0 °C. Ascorbate peroxidase (APX) and superoxide dismutase (SOD) activity were not affected immediately after the treatment. However, higher activity was found in heat-treated fruit during storage, indicating that the heat treatment produced changes in the oxidative metabolism of the fruit. Interestingly, the main differences were not observed immediately after the treatment but during the storage. The differential responses observed in the case of heat-treated fruit during storage could protect the fruit against reactive oxygen species generated during senescence or pathogen attack.

Abbreviations: AA, ascorbic acid; APX, ascorbate peroxidase; DPPH, 2,2-diphenyl-1-picrylhydrazyl; EAU, enzyme activity unit; HSP, heat shock protein; NBT, nitro blue tetrazolium; POD, pyrogallol peroxidase; PVPP, polyvinylpyrrolidone; ROS, reactive oxygen species; SOD, superoxide dismutase; TCA, trichloro acetic acid