

Title Effect of natural volatile compounds on antioxidant capacity and antioxidant enzymes in raspberries  
Author Korakot Chanjirakul, Shioh Y. Wang, Chien Y. Wang and Jingtair Siriphanich  
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### Abstract

Changes in antioxidant capacity and antioxidant enzyme activities in raspberries (*Rubus idaeus* L.) treated with methyl jasmonate (MJ), allyl isothiocyanate (AITC), essential oil of *Melaleuca alternifolia* (tea tree oil or TTO), and ethanol (EtOH) were studied. All of the natural volatile compounds tested reduced the severity of decay during storage at 10 °C compared to the control. Most of these natural volatile treatments promoted the antioxidant capacity and antioxidant enzyme activities except AITC treatment. The MJ treatment had the highest antioxidant capacity expressed as oxygen radical absorbance capacity (ORAC) values after storage for 7 and 14 days. Raspberry extract from the MJ treatment also showed the highest activity in all antioxidant enzymes, including superoxide dismutase (SOD), guaiacol peroxidase (G-POD), ascorbate peroxidase (AsA-POD), glutathione peroxidase (GSH-POD), glutathione reductase (GR), monodehydroascorbate reductase (MDAR), and dehydroascorbate reductase (DHAR). Moreover, the MJ treatment showed the highest amount of ascorbate (AsA), dehydroascorbate (DHAsA), reduced glutathione (GSH), and oxidized glutathione (GSSG) compared to the other treatments. Even though AITC showed the best result for decay inhibition among all the treatments, it did not increase the antioxidant capacity or the antioxidant enzyme activities. These results indicate that MJ may increase the resistance of tissues to decay through enhancing their antioxidant system and their free radical scavenging capability, while AITC may retard the decay directly by its antimicrobial properties.