

Title           Prevention of *Agaricus bisporus* postharvest browning with tyrosinase inhibitors  
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### **Abstract**

Postharvest browning of *Agaricus bisporus* mushrooms is a severe problem that reduces the shelf life of harvested mushrooms. Mushroom browning occurs mainly as a result of tyrosinase activity, an enzyme belonging to the polyphenol oxidase (PPO) family and known to be a key enzyme in melanin biosynthesis. An ethanolic extract from licorice roots (*Glycyrrhiza glabra*) and [3-(2,4-dihydroxyphenyl propionic acid)] (DPPacid) isolated from fig leaves and fruit have been shown to inhibit tyrosinase activity. Adding these inhibitors to sliced mushrooms had a very strong inhibitory effect on browning, but pre-storage immersion of intact mushroom in the licorice extract did not prevent browning after 8 days storage at 4 °C. By contrast, treatment with DPPacid at 1 µg/mL reduced browning by half. Measurement of inhibitor uptake by mass spectra (MS) and assay of tyrosinase activity indicated that penetration into the mushroom tissue was inadequate for tyrosinase inhibition. Moreover, DPPacid was found to be unstable in the mushroom tissue and within a short time it was, presumably, metabolised.