

Influences of mushroom fruiting body maturity stage and post-harvest storage on the natural antioxidant ergothioneine and antioxidative properties of selected mushroom varieties

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Ergothioneine is a safe and effective antioxidant. Mushrooms are one of the best natural sources of ergothioneine. Evaluating bioactive properties at different stages of mushroom fruiting body maturity is important to archive the ideal stage for consumption concerning nutritional value. In this study, we examined the influences of maturity stage and post-harvest storage conditions on the contents of ergothioneine and total phenolics, as well as antioxidant capacities of three edible mushrooms, *Grifola frondosa*, *Lentinula edodes* and *Flammulina velutipes*. Mushroom specimens were harvested at four different developmental stages (S-1, S-2, S-3, and S-4). A HPLC post-column reaction analysis was used for the quantitative determination of ergothioneine. The content of total phenolics and antioxidant activity were determined spectrophotometrically. For *G. frondosa*, the highest contents of ergothioneine and total phenolics as well as antioxidant activity were observed at the S-1; the contents of ergothioneine and total phenolics were 4 and 1.5 times, respectively higher than those of S-4. For *L. edodes*, the highest contents of antioxidative compounds and antioxidant activities were observed at S-4. Differently, maturity stage did not affect the antioxidative compounds as well as antioxidative properties of the *F. velutipes*. Ergothioneine was quite stable under refrigerated storage conditions at 4°C up to 12 days. The results obtained from the present study must be useful to find the proper stage to achieve better functional and nutritional properties.

Biography

Han Nguyen is a candidate for Ph.D. in Food Science and Technology at the Tokyo University of Marine Science and Technology, Japan. His Ph.D. study deals with development of the analysis and evaluation of antioxidative properties as well as the application of the natural antioxidant ergothioneine in food and biological materials. He was honored Master's Degree in Applied Marine Biotechnology and Engineering in 2010 from the Gangneung-Wonju National University, Korea where he focused on the isolation and identification of certain bioactive compounds from marine resources. He has published several book chapter and peer-reviewed research articles in international journals.

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