

Title Volatile components as a tool for monitoring the shelf life of *Agaricus bisporus* under modified atmosphere packaging

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Abstract

Agaricus bisporus (button mushrooms) are the most widely cultivated edible mushrooms. This paper focuses on the analysis of the composition of mushroom volatiles as a tool to monitor shelf life of mushrooms subjected to modified atmosphere packaging. Mushrooms were stored for ten days at various temperatures and under various modified atmosphere packaging treatments using various plastic films. The volatile compounds in *A. bisporus* were isolated by simultaneous distillation/extraction (Likens-Nickerson, LN) method. The identification was performed using GC-MS. Subjective assessment involving a sensory panel was also conducted in order to relate the freshness of mushrooms to volatiles concentration. The best results with regard to mushroom freshness were found at 0°C using following films: a laminate including polyvinylidene chloride (PVDC) + biaxially oriented polypropylene (BOPP) and low density polyethylene (LDPE). The storage revealed that the volatile C₈ compounds 3-octanone decreased significantly throughout the storage trial. Similarly, 1-octen-3-ol, the sulphur compound (2-acetylthiazol), furan, 2-pentyl in mushroom, also showed a substantial decrease during the storage trial. In addition to the results of chemical analysis, the results for sensory assessments: including aroma, whiteness and freshness showed a gradual decrease in these attributes with increasing storage time. These changes could be attributed lipid oxidation products, sulphur compounds and volatile C₈ compounds, as these volatiles exhibited significant variation throughout the storage trial. Eight volatile aroma compounds were identified after analysing the extract by the LN method. Among the most abundant compounds that contribute to the typical flavour of mushrooms are the volatile C₈ compounds, including 1-octen-3-ol and 3-octanone. The volatile compounds were found to make a significant contribution to the flavour of mushrooms.