Abstract

Water absorption is the dominant factor affecting the quality deterioration of dried *Lentinus edodes*. We therefore analyzed the effect of moisture content and dynamic water status on physical properties of the mushroom stored at water activity (a_w), 0.33, 0.43, 0.67, 0.76, and 0.84 for 50 days. Moisture mobility and water status were analyzed using low-field nuclear magnetic resonance, while hardness and microstructure were determined as texture characteristics. Meanwhile, an electronic nose and headspace solid-phase micro-extraction combined with gas chromatography–mass spectrometry (HS–SPME–GC–MS) were used to analyze the flavor properties of dried *L. edodes*.

The results showed that bound water was the dominant water status in dried *L. edodes*. The content and molecular mobility of bound water increased at a_w = 0.67, 0.76, and 0.84. This contributed to discoloration, hardness loss, and microstructure sparsity of dried *L. edodes*. The increasing content and molecular mobility of bound water aggravated the deterioration of characteristic flavor by reducing acid, aldehyde, and ketone content.

Unlike immobilized or free water, bound water had a critical influence on the quality deterioration of dried *L. edodes* during storage.