

Milk protein and zein coatings over peeled garlic cloves to extend their shelf life

Mehmet Torun and Feramuz Ozdemir

Scientia Horticulturae 291: 110571. (2022)

Abstract

Herein we report the effects of edible protein coated (20 % zein and 15 % milk protein) on the shelf life of peeled garlic cloves monitored for 45 days at 15°C. Color, hardness, weight loss, total sugar content, allicin content and aroma composition were analyzed on first day, followed by 3rd, 6th, 10th, 15th, 30th and 45th days of the storage. Milk protein treated films were quite superior in terms of mechanical properties while zein based films showed better water vapor permeability. Coating treatments preserved color properties as they hindered the entry of oxygen. Control samples had significantly higher weight loss as compared to the coated samples until 30 days and after this period, no statistical difference was observed between coated and uncoated samples. Control samples lost total sugar content almost two times higher than the coated ones. Allicin losses in uncoated samples, coated with zein and milk protein coated films were calculated as 68, 56 and 40 %, respectively at the end of the storage time. Main volatile compounds of garlic samples were identified as methyl allyl disulfide, diallyl disulphide, 2-ethylidene-[1,3]-dithiane, disulfide, 1-propenyl propyl, 3-vinyl-[4H]-1,2-dithiin, 2-vinyl-[4H]-1,3-dithiin and allitridin. The study concluded that loss and decomposition of peeled garlic flavor can be controlled by coating throughout storage. Although the aim was to reveal the variations in the properties during 45 days of storage, especially weight loss and texture results showed that the samples coated with milk protein can be stored for 10 days while zein coated samples can be stored for 15 days at 15°C. The results revealed that, milk protein and zein coatings can be extend the shelf-life of garlic cloves up to 10 and 15 days at 15°C, respectively.