

Abstract

Flavor deterioration is a serious problem in dried carrots during storage and is frequently accompanied by water absorption and bacterial growth. To explore the underlying mechanism of flavor deterioration, relationship among water status, exogenous bacterial composition and flavor changes in dried carrots were analyzed at different water activities (a_w , 0.43, 0.67, 0.76 and 0.84). Results suggested that the water molecules mobility significantly increased in the dried carrots at higher a_w levels (0.67, 0.76 and 0.84), this was attributed to the raised content of bound water, rather than immobilized or free water. Consequently, this accelerated microbial growth and flavor deterioration. At $a_w = 0.84$, the characteristic flavor compounds including 2,3-butanediol, pentanoic acid, hexanoic acid, heptanoic acid and nonanoic acid were lost. The disagreeable flavor compounds including terpenes were produced during the storage period. These were the main contributors of flavor deterioration in the dried carrots. Lactic acid bacteria, as the dominant bacteria in dried carrots during storage, were proved to be closely related to the production of *o*-cymene, β -pinene and β -myrcene. Moreover, the emergence of *Pediococcus* spp. was the major factor leading to the increase of γ -terpinene in dried carrots.