

Application of Microencapsulation with Edible Film Medium on the Preservation of Royal Jelly

陳俊兒、徐泰浩；張世揚

E-mail: 8701181@mail.dyu.edu.tw

ABSTRACT

Royal jelly is a secretion from the hypopharyngeal and mandibular glands of worker bees, it exhibited antibacterial activity regarding of 10-HDA as an important index for quality determination. Microencapsulation is to utilize polymers molecules through coating/mixing with solid particles or liquid droplets for protecting sensitive components in foods, it could control moisture transfer, oxygen uptake, lipids oxidation and flavor release, as the barrier to keep better preservation state. This study was to evaluate the possibility of microencapsulation in royal jelly with edible film medium including chitosan, carrageenan, α -cyclodextrin and starch mixing with royal jelly by polytroning and lyophilization. Analysis of physicochemical properties, the contents of 10-HDA, total amino acid profiles and microstructure in SEM were examined to royal jelly stored in different temperature and duration. Moisture increasing in the lyophilized royal jelly in association with storage duration resulted in the instability of quality. Both total sugars and 10-HDA decreased in the contents of royal jelly during storage at 37 °C, but no apparent change at low temperature. Curde protein, lipids and pH existed in royal jelly there were no significant differences in relation to storage temperature. Total amounts of amino acids in royal jelly declined with storage elongation of time. Against moist increasing have found in carrageenan treating lyophilized royal jelly compared with the control, and the color change to L value less than the others. In addition, the substantial decline in the rate of total sugars was slow slightly. Microencapsulation with chitosan in the lyophilized royal jelly exhibited higher antibacterial activity, through no advantages in keeping quality stability. Deterioration of royal jelly after lyophilization was attributed primarily to temperature change resulted in maillard reaction possible. The results suggest that carrageenan was the better choice in the tested edible film medium for microencapsulation of royal jelly through lyophilization, especially in aspect to antibrowning and against moist effects.

Keywords : 蜂王漿 ; 微粒被覆技術 ; 可食膜基質

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