

Pisanu Nimachaikool : Preservation of Royal Jelly by Freezing and Freeze Drying. Thesis Advisor : Romanee Sanguandeeul, Ph.D., Thesis Co-Advisor : Prof. Siriwat Wongsiri, Ph.D., 79 pp., ISBN 974-578-801-5

The chemical composition and antibacterial action, as the minimum inhibition concentration (MIC), of frozen and freeze dried royal jelly against five species of bacteria, namely Bacillus subtilis TISTR 8, Staphylococcus aureus TISTR 118, Escherichia coli TISTR 371, Lactobacillus bulgaricus TISTR 451 and Lactobacillus plantarum TISTR 541, were investigated. The result showed that frozen and freeze dried royal jelly did not inhibit the growth of L. bulgaricus and L. plantarum while B. subtilis, S. aureus and E. coli were inhibited by both with significant differences between species ($P \leq 0.05$). The antibacterial action of frozen royal jelly was higher than that of freeze dried royal jelly on the same dry weight basis. The effect of using a diluent in freeze dried royal jelly was studied. Lactose, tapioca starch, and lactose mixed with tapioca starch (1:1 weight to weight) were used as diluents at levels of 10, 20 and 30%. The moisture absorption ability of freeze dried royal jelly mixtures was determined. The results showed that royal jelly mixed with lactose had the lowest moisture absorption ability followed by royal jelly mixed with lactose and tapioca starch (1:1) and royal jelly with tapioca starch.

The qualities of frozen royal jelly packed in HDPE during storage at -18°C namely moisture, protein, 10-hydroxy-2-decenoic acid and MIC against B. subtilis were not significantly different after storage for 5 months. Freeze dried royal jelly was packed in PE/Al and HDPE and stored at -18 , 5 and 28°C . Moisture, protein, 10-hydroxy-2-decenoic acid content and MIC against B. subtilis were determined. The results showed that packaging, storage temperature, storage time and the interaction of factors affected the quality of freeze dried royal jelly ($P \leq 0.05$). Moisture content and MIC against B. subtilis of freeze dried royal jelly in PE/Al were lower than in HDPE but the protein and 10-hydroxy-2-decenoic acid were higher. Freeze dried royal jelly stored at -18°C had the lowest moisture content and MIC against B. subtilis but was highest in protein and 10-hydroxy-2-decenoic acid content after storage for 5 months.