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PILASLAK AKRACHALANONT : PREPARATION AND EVALUATION OF LIPOSOME CONTAINING CLOVE OIL. THESIS ADVISORS : ASSOC.PROF.SOMLAK KONGMUANG, Ph.D., ASSIST.PROF POL.CAPT. MALAI SATHIRAPUND, AND ASSOC.PROF. UTHAI SOTANAPHUN, Ph.D. 117 pp.

This research particularly focuses on preparation of liposomes which can efficiently maintain stability and quality of clove oil. The research method used in this study can be divided into five main steps. First, phosphatidylcholine(PC) was purified by chromatographic techniques. Each source of PC was chemically evaluated following to Bartlett's assay and densitometry. Second, liposomes from three different sources of PC (i.e., purified PC from commercial PC(PPC), commercial PC(CPC) and commercial high-purified PC(HPC)) were prepared by using two different methods: thin film method and reverse evaporation. Four different molar ratios of PC to cholesterol: 1:0, 9:1, 7:3 and 1:1 were investigated. Third, size and size distribution control analyzed by extruding liposomes obtained from the two techniques through syringe extruders. Fourth, a physical study of liposome containing clove oil was performed using transmission electron microscopy (TEM), a chemical analysis of eugenol was performed using gas chromatography (GC) and a stability study was performed at a temperature of 4 °C for 3 months. Finally, release of clove oil from liposome was studied using *in vitro* release apparatus.

The research results showed that PPC, CPC and HPC contained 68.67±3.90%, 39.00±4.38% and 70.00±4.25% of PC respectively. The densitometer data of three types of PC were shown to be in the same pattern as those of Bartlett's assay. Thin film method and 1:1 molar ratio of PC to cholesterol showed multilamellar structure in the liposome from every source with size of 204.32±259.82, 246.99±125.16, 243.45±165.76 nm. for PPC, CPC and HPC respectively. The multilamellar structure of liposome analyzed by using TEM showed that liposome from PPC and CPC were similar to that from HPC while liposome prepared by CPC showed incomplete multilamellar structure and high polydispersion index (PI) with size of 200.76±0.58, 200.23±0.19 and 200.35±0.43 nm with extruded PPC, extruded CPC and extruded HPC respectively. The results showed that liposome extruded through a syringe extruder had low PI since size of liposome was controlled by membrane. In addition, results of the chemical study showed that the amount of eugenol contained in the liposome from PPC was nearly equivalent to that contained in the HPC. After storage, in 4 °C for 3 month the morphology of liposome from each type of PC did not change significantly. Liposome prepared by HPC or PPC could maintain eugenol with sustained release pattern within 4 hours were released 87.74%, 77.76% and 74.96% of eugenol, respectively. Thus, PPC could be a good source for liposome as comparing to HPC in term of quality of containing substance and stability.

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