

## Poster

### Development of rice bran oil liposome for using in cosmetics

Suthimaln Ingkatawornwong<sup>a</sup>, Sirirat Pinsuwan<sup>a</sup>, Kittichote Worachotekamjorn<sup>a</sup>, Pariporn Maharachatahtakul<sup>a</sup>  
Chomchan Annuaikit<sup>a</sup>

<sup>a</sup>Department of Pharmaceutical Technology, Faculty of Pharmaceutical Sciences, Prince of Songkla University, Hat-Yai, Songkhla, Thailand 90112

**Introduction.** Rice bran is a component of raw rice that is obtained when it is removed from the starchy endosperm in the rice milling process. Rice bran oil contains many antioxidants such as gamma-oryzanol, tocopherols and tocotrienols. It is a potential source of antioxidant used in cosmetics.

**Objectives.** To develop liposomes of rice bran oil for better skin permeation.

**Methods.** Rice bran oil liposomes were prepared by reverse phase evaporation method. The liposomes were evaluated for their particle size, entrapment efficiency by antioxidant evaluation using the DPPH radical scavenging assay. The stability of liposomes under freeze-thaw condition was evaluated in terms of size and entrapment efficiency. The skin permeation of liposomes was also determined using modified Franz diffusion cell. The permeation was determined in term of antioxidant activity.

**Results.** Four liposome formulations consisting of soybean phosphatidyl choline (SPC):Tween 80 (84:16) total lipid =20  $\mu$ mol, SPC:Tween 80 (84:16) total lipid =30  $\mu$ mol, egg yolk phosphatidyl choline (EPC): cholesterol (CHOL) (7:2) total lipid =30  $\mu$ mol and SPC:CHOL (7:2) total lipid =50  $\mu$ mol were selected. The particle size of all liposome formulations were not more than 600 nm. The percentages of rice bran oil entrapped were 81.28 $\pm$ 7.95, 62.68 $\pm$ 2.23, 87.47 $\pm$ 2.89 and 58.59 $\pm$ 1.74, respectively. However, the formulation of SPC seemed to be more stable than the formulation of EPC. The in vitro skin permeation of all liposome formulations were higher than that of rice bran oil. The highest skin permeation was observed in the liposome with SPC:CHOL (7:2) total lipid =50  $\mu$ mol.

**Conclusion.** Liposomes containing rice bran oil can be formulated in this study. The suitable formulations include SPC:Tween 80 (84:16 weight ratio), EPC (or SPC) :CHOL (7:2 molar ratio) with the total lipid of 20 to 50 mmol. All formulations show appropriate properties in both size and entrapment efficiency. Better skin permeation was observed in all liposome formulations comparing to the pure rice bran oil. The formulation of SPC:CHOL (7:2) with total lipid of 50 mmol showed the highest in vitro skin permeation.

Keywords: Rice bran oil, liposome, antioxidant, skin permeation

#### Selected References

1. Laura, N., Tanja, A., Anna, M.L., Robert, A.M., Vieno, P. 2006 Food Chem., (101): 947-954.
2. Caudia, J., Massima, C., Maria, C., Luisella, P. 2005. Inj. J.Pharm., (299): 146-154.
3. Thomas, A.W., Robert, J.N., Benjamin, W., David, K. 2006. J. Nutrition Biochem., (18): 105-112.

Presenting Author: Suthimaln Ingkatawornwong, [suthimaln.i@psu.ac.th](mailto:suthimaln.i@psu.ac.th)