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Probiotic liposomes contained heat-killed lactobacillus for anti-aging improvement

Poster 454

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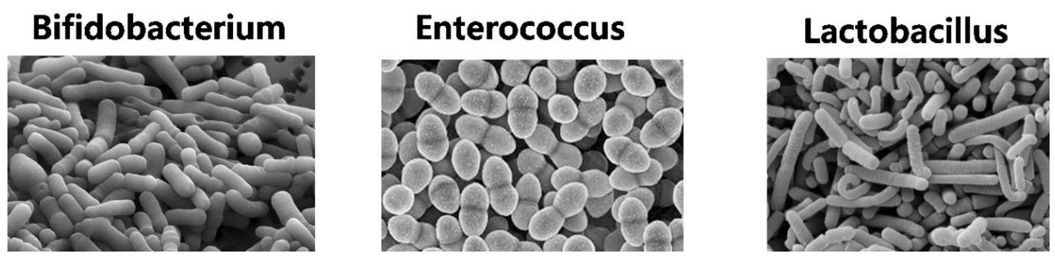
Introduction:

Heat-killed lactic acid bacteria (LAB) consists of insoluble components.
The liposomes using hydrogenated lecithin for stabilization of killed bacteria and transdermal delivery were prepared.
Probiotics are living bacteria that are intended to have health benefits into the body and skin. Good living microorganisms as LAB consume the milk to offer fermented foods as yogurt for body. *Lactobacillus rhamnosus* as is known as beneficial bacteria to strength the skin barrier.



Materials & Methods:

The liposomes were consisted to 1-4% hydrogenated lecithin and physicohemical properties (particle size, zeta potential) of the liposomes were evaluated under various conditions of temperature (4, 25, 50 ℃) for 1 month, which results indicate their stability states. Homogenizer and microfludizer were used for stabilization of heat-killed bacteria including insoluble components into liposomes. The skin permeability of the optimized liposome formulation was investigated using Franz diffusion cells

Fig 1. Images of LAB by optical microscopes

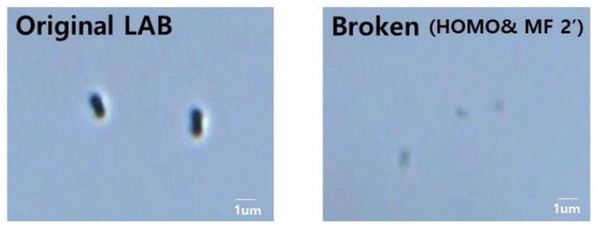
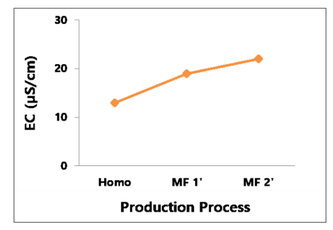


Fig. 2. Electrical conductivity (EC) of destroyed LAB.



Results:

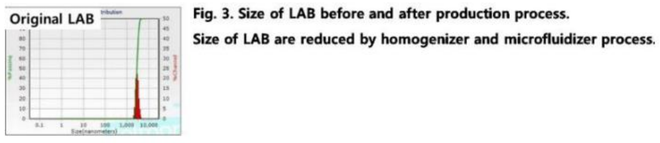


Fig. 3. Size of LAB before and after production process.
Size of LAB are reduced by homogenizer and microfluidizer process.

Number of LAB	Homo	MF 1′	MF 2′
75 billion (Broken LAB)			
750 billion (Non-broken LAB)			

Fig. 5. Size of liposomes composed of phosphatidylcholine (PC).

Ratio of PC	1%	2%	3%	4%
HOMO				
MF 1′	stable	stable		Creaming
MF 2′	stable	stable	stable	–

Fig. 8. Improvement effect of liposome stability by killed LAB in 50 ℃ in 50 ℃ for 12 h.

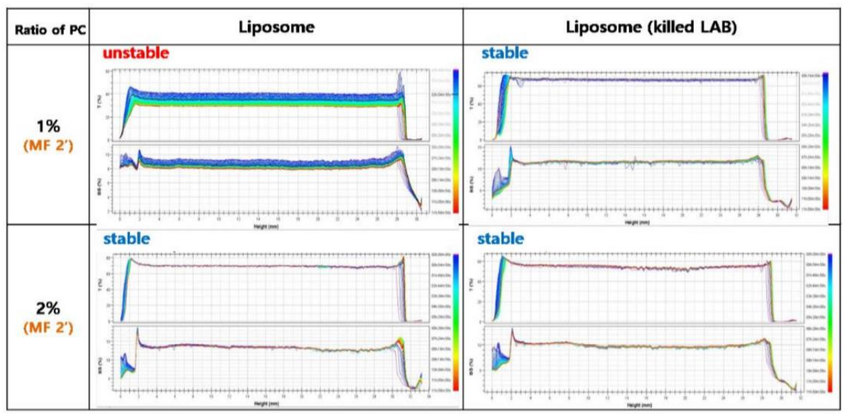


Fig. 4. Formulation Images of liposomes and liposomes containing LAB.

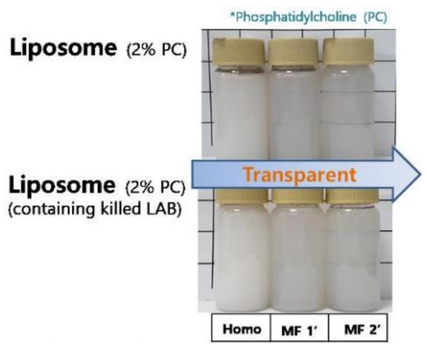


Fig. 6. Size of liposomes before and after containing LAB.

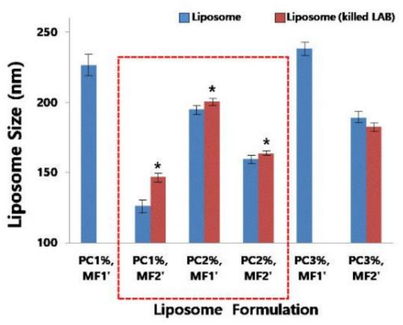


Fig. 7. Zeta potential of liposomes before and after containing LAB.

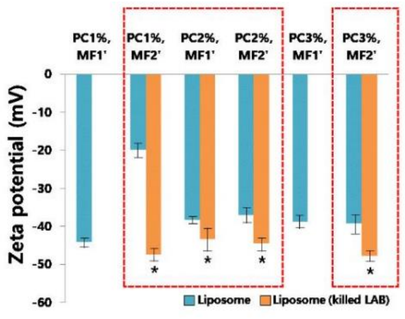
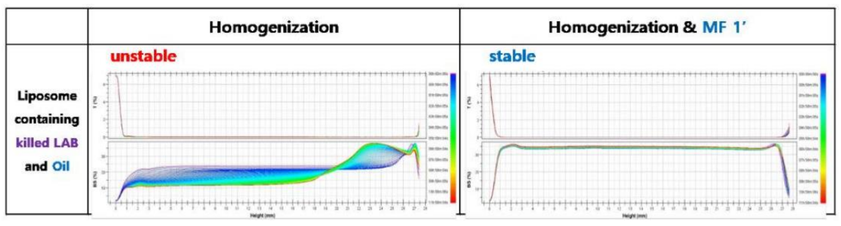


Fig. 9. Enhanced stability of liposome containing oil by microfluidizer in 50 ℃ for 12 h.



Conclusions & Discussion:

The liposomes were consisted to 1-4% hydrogenated lecithin and physicohemical properties (particle size & zeta potential) of the liposomes were evaluated under various conditions of temperature (4, 25, 50 ℃) for 1 month, which results indicate their stability states. Homogenizer and microfludizer were used for stabilization of heat-killed bacteria including insoluble components. These results suggest that the useful information for stabilization of insoluble heat-killed lactobacillus which strength skin barrier and anti-aging as cosmetics agents.

References:

1. *M. J. Cork (1997) The importance of skin barrier function. J. Dermatol. Treat., 8, S7*
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3. *H. Clive (2004) The stratum corneum: structure and function in health and disease, Dermatologic Therapy, 17, 6.*