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Preparation of niosomes containing sericin and evaluation of their physicochemical and antimicrobial properties

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Background and Aims: New drug delivery systems such as microparticulate systems are utilized for intracellular delivery of chemicals. One type of these systems is niosomes which are categorized as vesicular systems and essentially composed of non-ionic surfactants and cholesterol. In the present study, the entrapment and antibacterial properties of silk protein, sericin, was evaluated.
Methods: In this study, non-ionic surfactant vesicles (niosomes) from three sorbitan esters (Span 20, 40 and 60) and cholesterol encapsulating sericin were prepared by film hydration method. In vitro characterization of niosomes including microscopical observation, size distribution measurement by laser light scattering method, release of sericin in phosphate buffered saline (PBS), pH 7.4 and Minimum Inhibitory Concentration (MIC) determination of free and entrapped protein against E.coli and St. aureus were evaluated.
Results: Log-normal size distribution was observed for all prepared niosome formulations. Generally, the release of sericin was best fitted by Baker & Lonsdale model indicating a diffusion based release of protein. MIC of free and encapsulated sericin had no significant difference. Morphological study of vesicles revealed different shape and size niosomes which were more as MLVs (Multi Lamellar Vesicles).
Conclusions: Niosomes can be used for controlled release of sericin. However more studies on in vivo and cell cultures such as mouse macrophages (J774) will be required in future studies.

Keywords: Sericin; Niosome; *E. coli*