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PHYTOPHARMACEUTICALS FOR ALZHEIMER'S DISEASE TREATMENT: SALVIA OFF. LOADED NANOSTRUCTURED LIPID CARRIERS

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Combining the current knowledge of phytotherapy and pharmaceutics, nanostructured lipid particles (NLC) loaded with freeze dried *Salvia off. L* methanolic extract (FSE) for efficient Alzheimer's disease treatment could be engineered. The aim of the study was to determine the influence of quantity of hydrophilic surfactant upon NLC-FSE physico-chemical and biopharmaceutical properties and their possible correlation with antioxidant activity.

Four samples (S5-S8) of NLC-FSE were prepared by solvent evaporation method. Lipid phase consisted of phospolipon 90H (kindly donated by Phospholipid, Germany) as solid lipid and oleic acid as liquid lipid in ratio of 2.3:1. Total lipids along with FSE were dissolved in ethanol as organic solvent (1:0.11:20, respectively). Aqueous phase was composed of mixed water solution of 0.5% Poloxamer 407 and 1.1% (S5), 2% (S6), 2.8% (S7) and 3.4% (S8) of Tween 80. Ratio of lipid to aqueous phase was 1:2. Physico-chemical and biopharmaceutical properties were determined, as well as antioxidant activity.

Surface morphology, particle size and size distribution, zeta potential and protein-binding properties were discussed elsewhere. Increased quantity of Tween 80 resulted with decreased encapsulation efficiency (79.74%, 62.17%, 48.94% and 47.9% for S5, S6, S7 and S8, accordingly) probably due to the smaller particle size, as well as higher solubilisation of FSE thus promoting its partitioning into the outer water phase. *In vitro* dissolution studies indicated prolonged FSE release for 24 h - 44.98%; 24.17%, 20.52% and 18.77% for S5, S6, S7 and S8, respectively. Comparing the values of correlation coefficient of different kinetics models, the best fit was established for the Peppas and Sahlin model, where values of k1 and k2 indicated dominance of Fickian diffusion and insignificant effect of case II transport. Results of modified ORAC assay indicated that highest antioxidant activity was associated with fastest FSE release.