Characterization of *Vaccinium myrtillus* leaf extract-loaded liposomes

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INTRODUCTION: *Vaccinium myrtillus* L. leaves contain bioactive components, such as polyphenols, stilbenes, iridoid glycosides, fatty acids, and fibers [1]. However, polyphenols possess low solubility, stability, and bioavailability, thus the encapsulation of the mentioned active principles in different carriers is necessary [2]. Liposomes are widely used as a carrier for the encapsulation, preservation, and controlled release of polyphenols in various products [3]. Therefore, the aims of the presented research are the development and characterization of *V. myrillus* leaf extract-loaded liposomes *via* the determination of encapsulation efficiency, particle size, polydispersity index (PDI), zeta potential, and mobility.

EXPERIMENTAL: The liposomes with encapsulated extract were prepared employing the proliposome procedure [3]. Encapsulation efficiency was indirectly calculated by the polyphenol concentration determined in the supernatant. Particle size, PDI, zeta potential, and mobility were measured by the photon correlation spectroscopy in Zetasizer. Every measurement was examined three times at 25°C.

RESULTS AND DISCUSSION: The encapsulation efficiency of polyphenols was >85 %. The liposomes contained only phospholipids resulting in a more rigid membrane [4] providing the prevention of the leakage of the encapsulated polyphenols, as well as a higher encapsulation efficiency. The diameter and PDI of the liposomes were 5408.7±56.4 and 0.249±0.049 nm, respectively confirming that higher liposomal vesicles possessed lower PDI values [4]. The zeta potential and mobility were -5.02±0.25 mV and -0.315±0.016 µmcm/Vs, respectively. Zeta potential possessed negative values that are related to the exposure of the phosphate group lying in an outer plane concerning the choline groups [4]. The mobility of liposomes represents a function of the size, zeta potential, and lipid composition. The liposomal vesicles with lower membrane fluidity also show low mobility. The changes in the mobility of the liposomes were attributed to the membrane fluidity and ability to deform. Additionally, when flavonoids (also presented in *V. myrtillus* extract) are adsorbed at the surface of the liposomes, it can decrease their mobility [5].

CONCLUSIONS: The beneficial effects of bioactive principles from *V. myrtillus* leaves on human health and their sensitivity highlight the application of liposomal particles as a carrier for *V. myrtillus* extract and their potential implementation in foods, functional foods, pharmaceutics, and cosmetics.

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