The effect of a zinc-algal polysaccharide complex on preventing contamination of food emulsions

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The potential applicability of algae as a bioresource for the sustainable production of foods, cosmetics and pharmaceutical products is virtually unlimited. The exploitation of algal bioresources is timely in light of the current market trend toward a greater reliance on natural products. Among the principal algal sources are red microalgae, which produce unique biochemicals including novel sulfated polysaccharides (PS). In recent years, Arad laboratory has developed the biotechnology for the production of valuable products based on red microalgae with an emphasis on isolated sulfated polysaccharides found in the algal cell wall. The combination of the diverse biological activities of these novel molecules (e.g. antiviral, antioxidant, anti -inflammatory and soothing properties), with their distinctive properties (i.e., composition, structure, rheology and extreme stability), can be exploited across a vast range of applications in the pharmaceutical, cosmetics, and food industries. The red microalga, *Porphyridium* sp., is encapsulated within a negatively charged PS that has unique rheological characteristics which make it an excellent emulsifier. The PS was shown to act as a platform for metal incorporation, taking advantage of its ion-exchange capabilities and its negative charge. In the current study we investigated the combination of emulsifying and antibacterial activities of a Zn-PS complex. It was shown that dairy emulsions and oil-in water emulsions were stable in low concentrations of Zn-PS complex (<0.2% and <500 ppm Zn). The Zn-PS complex was also shown to have higher effect on inhibition of bacterial growth when compared with the algal polysaccharide alone. These results suggest that the Zn-PS complex has significant potential as a novel emulsifier that also inhibits food contamination. Overall, the data support the potential of using functional sulfated polysaccharides from red microalgae to stabilize emulsions and to act as an antibacterial agent in food applications. As such, the sulfated polysaccharide of the red microalga *Porphyridium* sp. is of particular interest. The results of this study may hold important implications for the possible utilization of red microalgal polysaccharides as a novel additive in food manufacturing.

Biography

Irit Dvir completed PhD at the Ben-Gurion University of the Negev, Israel in 1999. She is an expert in the study of algae and its uses in the food industry and as a dietary supplement. Currently she is a Senior Lecturer and Head of the Chemistry and Life Sciences program at Sapir Academic College, Israel. She is a member of the Council of Young Israeli Entrepreneurs and is always looking for original and innovative research projects. She has published papers in reputed international journals. Much of her work is interdisciplinary and extends beyond red microalgae to include nutrition and food manufacturing. Development of novel functional foods that can positively impact health and prevent or treat metabolic diseases such as diabetes and obesity.

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