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Contribution ID: **4442** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Solubilization of Hydrophobic Astaxanthin in Water by Physical Association with Phytoglycogen Nanoparticles

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Phytoglycogen (PG) is a naturally occurring polysaccharide produced as compact, highly branched nanoparticles in the kernels of sweet corn. Because PG is biocompatible, non-toxic and digestible, it is attractive for applications involving the delivery of bioactive compounds. In the present study, we evaluate the association of PG with the hydrophobic bioactive astaxanthin (AXT), which is a naturally occurring xanthophyl carotenoid with reported health benefits, e.g., acting as an antioxidant and anti-inflammatory agent. However, the extremely poor solubility of AXT in water presents challenges in realizing its full potential for improving human and animal health. In the present study, we describe a method to improve the effective solubility of AXT in water through its physical association with PG, i.e., without the use of added chemicals such as surfactants. We combine PG dispersed in water with AXT dissolved in acetone, evaporate the acetone, and lyophilize to remove the water. The result is a stable AXT-PG complex that can be readily redispersed in water, with aqueous dispersions of AXT-PG stable for long periods of time (several months at 4℃). Using UV-Vis spectroscopy, we characterize the absorbance due to different aggregation states of the AXT molecules in the AXT-PG complex and this has allowed us to determine the maximum loading of AXT onto PG to be ˜ 10% by mass, with a corresponding maximum effective concentration of AXT in water of ˜ 0.9 mg/mL. Our results demonstrate the promise of using PG as an effective solubilizing and stabilizing agent for hydrophobic compounds in water.

Keyword-1

Phytoglycogen

Keyword-2

Nanoencapsulation

Keyword-3

Astaxanthin

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