Physico-chemical stability of astaxanthin nanodispersions prepared with polysaccharides as stabilizing agents

ABSTRACT

The emulsification and stabilization ability of four selected polysaccharides, namely, gum Arabic, xanthan gum, pectin and methyl cellulose, in the preparation of water-dispersible astaxanthin nanoparticles using the emulsification-evaporation technique was investigated in this study. The chemical and molecular structure of polysaccharides had significant effects ($p < 0.05$) on the physicochemical properties of the prepared astaxanthin nanodispersions. Among all prepared nanodispersions, sample produced and stabilized using gum Arabic showed the smallest average particle size (295 nm) and highest physical stability. The observed considerable degradation of astaxanthin in the resulting nanodispersions during processing (24–70% w/w) and storage at 10 °C for 30 d (86–96% w/w) illustrated the limited chemical stability of polysaccharide-stabilized nanodispersions.

Keyword: Astaxanthin nanodispersions; Emulsification-evaporation technique; Polysaccharides