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Preparation of starch nanoparticles loaded with quercetin using nanoprecipitation technique.

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Abstract

Nanoparticles of starches from different botanical origin were prepared by nanoprecipitation using 0.1 M hydrochloric acid as non-solvent. The morphology and the particle size were analyzed using field emission scanning electron microscopy and dynamic light scattering. The nanoparticles were spherical and their sizes vary depending on the origin and the concentration of the starch solution.

Starch nanoparticles loaded with quercetin were prepared. In-vitro release studies of the quercetin from the starch nanoparticles were performed in 35% ethanol as a release medium. The starch origin affects the quercetin loading percentage, the release kinetics and the antioxidant activity of the produced nanoparticles. The starch-quercetin nanoparticles from cereal origin showed the lowest loading percentage and the lowest fraction released of quercetin in comparison with nanoparticles from tuber and legume origin. The release kinetics seem to be controlled mainly by Fickian diffusion which have been revealed fitting the release data to the Peppas-Sahlin model.

Keywords: Starch, Nanoparticles, Quercetin.

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