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Does reaction of tin with flavonoids diminish the content of flavonoids in canned food?

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Tin-plate is one of the most common flat-steel products, coated on both sides with commercially pure tin and has been used as a robust form of food and beverage packaging. The highest concentrations of tin in foods are found in tinned fruit and vegetables, particularly in acidic food stuffs. Flavonoids, a large group of plant metabolites, are shown to have anti-oxidative activity, free radical scavenging capacity, coronary heart disease prevention, as well as other health benefits. The chemical structure of flavonoids enable forming complex compounds with many metal ions, thus, complex formation with tin (II) ions would be expected. Thus, the aim of this research was to investigate the reaction between two most common flavonoids: Quercetin and Morin and Sn(II) ions under the conditions which are close to those found in tin cans. By UV-VIS and FT-IR spectroscopy we confirmed complex formation, determined the stoichiometric ratio of the reaction by Jobs method, calculated the stability constant at different pH values (from 3 to 8), in different media (30%-70% ethanolic solutions), and at different ionic strengths. Although hydrolysis, as the opposite reaction, may diminish complex formation, daily turbidity measurement verified transparent solutions. Our results pointed out that if the complex is unambiguously formed, what reduce free flavonoids concentration. Since anti-oxidant action of flavonoids is not caused only because of direct free radical scavenging, but also because of chelating metal ion, it can be assumed that chelation of investigated flavonoids with Sn(II) would unequivocal change antioxidant properties of Quercetin and Morin from canned food.

Biography

Milkica Crevar Sakač has completed her PhD at the Department of Medicinal Chemistry, Faculty of Pharmacy (University of Belgrade). She works as Teaching Assistant and Researcher at Department of Medicinal Chemistry.

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