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Evaluation of antioxidant activity and quantification of total flavonoids in extracts of Sweet Granadilla (*Passiflora ligularis*), Cholupa (*Passiflora maliformis*) and Maracuyá (*Passiflora edulis* forma *flavicarpa*)

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Colombia is one of the countries with the greatest diversity of Passifloraceae with 170 species, both wild and cultivated forms; the majority of these are marketed fresh for its pleasant taste. Studies have shown the medicinal properties of the genus *Passiflora*, mainly finding that the herbal parts (leaves and flowers) of this genus possess highly effective bioactive and pharmacological properties. The main objective of this research was to evaluate the antioxidant activity and the content of total flavonoids in *Passiflora ligularis*, *maliformis* and *edulis flavicarpa* form. Antioxidant determination was carried out by the free radical scavenging DPPH methodology, expressing the results in terms of the minimum inhibitory concentration IC₅₀ capable of showing minimum content, which reducing by 50% the incidence of radicals. The results showed that the herbal extracts (leaves and flowers) Granadilla Cholupa and passion fruit, possess antioxidant activity, mainly finding the lowest inhibitory concentration in aqueous extracts of Granadilla's leaves 1.88 mg / ml, while the extracts obtained with water from Cholupa and Maracuya leaves, did not demonstrate to possess sufficient ability to inhibit free radical scavenging activity IC₅₀. Leaf extracts obtained both Cholupa and Maracuya leaves, showed that increasing the percentage of ethanol (35 and 70%) during the extraction process, the minimum inhibitory concentrations IC₅₀ decreased proportionally, showing that ethanol allows more efficient concentrations and more antioxidant potential. The study was also able to determine higher concentrations of total alkaloids by using extracts with 70% ethanol, mainly found in Cholupa's leaves high contents of alkaloids, this represents 4.73 mg Eq Harmin /g dry matter. Similarly in extract leaves obtained with 70% ethanol, higher levels of total flavonoids were shown; registering higher contents by using Maracuya with values reached 15.44 mg Routine Eq / g dry matter.

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Enhancing emulsion stability to environmental stresses using whey protein-tragacanthin interfacial complexes: Comparison of layer-by-layer and mixing methods

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Electrostatic interfacial complexes can be formed around the oil droplets in oil-in-water emulsions using either layer-by-layer (LBL) or mixing methods. The LBL approach involves forming the interfacial complexes after homogenization, whereas the mixing approach involves forming them before homogenization. The objective of this research was to compare the stability of emulsions prepared using these two approaches to environmental stresses when the oil droplets were coated by whey protein isolate (WPI) and tragacanthin (T) complexes. In the mixing approach, the emulsion was prepared by homogenizing an aqueous phase containing WPI-T complexes (0.4:1% w/w) with an oil phase using sonication. In the LBL method, an emulsion containing WPI-coated droplets was formed by sonication; then, it was mixed with a tragacanthin solution to form a final emulsion containing droplets coated by WPI-T complexes (0.4:1 % w/w). The effect of heating, salt addition (50mM NaCl or 17 mM CaCl₂), and freezing-thawing on the stability of the emulsions was investigated. The presence of tragacanthin improved the thermal stability of both mixed and LBL emulsions at pasteurization but not sterilization temperatures. LBL emulsions were also stable against salts. Emulsions containing CaCl₂ had higher apparent viscosity than those containing NaCl, which suggested that the calcium ions induced droplet flocculation. However, the emulsions were still stable to gravitational separation. Moreover, the presence of tragacanthin improved the stability of the LBL emulsions against freezing-thawing. The better stability of the LBL emulsions than the mixed emulsions may be attributed to the depolymerization of the tragacanthin during sonication.

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