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Physicochemical Properties, Structure and Antioxidant Activity of Pectin from Persimmon (Diospyros kaki): Effect of Extraction Conditions.

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Abstract

Persimmon (*Diospyros kaki Thunb*.) had a global production of around 4.7 million tons. Spain has become the second global producer and the first exporter from Valencia region. Although great efforts have been carried out in post-harvesting techniques and storage conditions to improve the quality and shelf-life of the product, huge amounts of discarded fruit, (about 15-20% of the fruit harvested) is wasted. In the present study, conventional acid extraction was explored for the production of bioactive pectin extracts from persimmon. First, a compositional characterization of different fruit ripeness stages of the residues was done, and immature fruit was selected due to its higher pectin and polyphenol content. Then, a 3-level full factorial design was carried out to study the effect of temperature (70-95 ºC) and pH (0.5-1.5) on the yield, degree of esterification, carbohydrate constituents, phenolic content and antioxidant capacity of the extracted pectin. The determination coefficient (R^2) for the models generated was around 74-98%, advocating a good adjustment for the prediction values. The results showed that both temperature and pH significantly affected the response values. Pectin yield, phenolic compounds and antioxidant activity ranged from 1.37 to 4.5%, 53.26± 2.27 to 111.71 ±9.74 (mg GAE/g pectin) and 0.29 ±0.01 to 2.77 ±0.04 TEAC (Trolox µmol/mg pectin), respectively. degradative effect of very low pH and high temperature heavily influenced the pectin structure, phenolic content, and antioxidant activity. The outstanding antioxidant properties of the bioactive pectin was linked to the substantial quantities of bound polyphenols, resistant to acid extraction at pH≥1. These findings suggest the potential use of this bioactive pectin with non-extractable polyphenols associated to health-promoting properties with remarkable antioxidant activity. Further studies will endorse the potential use of pectin extracted from persimmon fruit as a bioactive compound for wider applications.

Keywords: Antioxidant capacity, Monosaccharide analysis, Pectin extraction, Polyphenolic compounds.

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