

P385. Bioactive potential and antimicrobial activity of two pomegranate cv peel and seed extracts

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Pomegranate (*Punica granatum* L.) fruit is widely recognized for its high biological activity and benefits to human health. Nevertheless, pomegranate juice extraction generates considerable amounts of peel and seed by-products, because only half of the fruit represents the edible part. Although the juice itself possesses powerful biological capacities, such as antioxidant and antimicrobial activities, the by-products also possess equivalent or superior biological activities. On the other hand, the recovery and valorisation of these wastes will lead to the reduction of their environmental impact that is in line with the desirable models of a circular economy.

The present study aimed to access the antimicrobial activity of pomegranate peel and seed freeze-dried ethanolic extracts against different strains of pathogenic/contaminant and beneficial microorganisms. Two pomegranate cultivars (Wonderful and Acco) from Alentejo region (Portugal), were used as the vegetable material.

Extractions were made using mixtures of EtOH:H₂O (25:75, 50:50 and 75:25 v/v) from dried and ground vegetable material. After extraction, the characterization of the ethanolic extracts obtained from peels and seeds was performed in terms of total phenolic compounds, total flavonoids, antioxidant activity and acetylcholinesterase inhibition activity. Phenolic and flavonoid compounds were expressed as mg GAEq/mg of extract and mg CATEq/mg of extract, respectively. IC₅₀ was used to express the results of antioxidant activity and acetylcholinesterase inhibition activity. The antimicrobial activity of the extracts that revealed the best bioactive potential, was accessed by the disc diffusion assay, the minimum inhibitory and minimum bactericidal concentrations (MIC and MBC).

Peels of both varieties revealed the highest bioactive characteristics, with higher levels of antioxidant activity, phenolics and flavonoids. The solvent EtOH:H₂O 75:25 allowed obtaining extracts with the best correlation between extraction yield and antioxidant activity. All the pomegranate peel extracts showed selective antimicrobial activity against the tested microorganisms and differences in MIC and MBC. Further studies including cell toxicity assays are recommended, if the extracts are intended for food applications.