

Bioactive Ingredients from Custard Apple By-products for Nutraceutical Applications

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Abstract

From agricultural production until food consumer, tons of food are thrown away. It is estimated that, globally, approximately on third of the produced food is wasted at some point in the food chain (FAO, 2011). One solution to this problem could be the application of circular bioeconomy models which allow the use of these byproducts to reduce waste and promote sustainability. Many food byproducts, mainly from fruits and vegetables, are part of the initial raw material and may contain substances of interest that have made them ideal for developing of added value products due to the fact that peels and seeds from this food group contain a great variety of bioactive compounds such as polyphenols that are characterized by having biological properties (Ben-Othman et al., 2020). For this reason, the objective of this study was to use the non-edible parts of the custard apple (*Annona cherimola*) to obtain bioactive ingredients with nutraceutical applications. To do this, the levels of bioactive compounds and their activity in peel and seeds were identified and evaluated from hydroalcoholic extracts by high-performance liquid chromatography coupled to mass spectrometry and antioxidant and anti-inflammatory capacity assays. As a result, custard apple peel and seeds were found to be a natural source of procyanidins and other phenolic compounds. However, peel had a higher phenolic content than seeds. The main phenolic compounds identified in peel were catechins and procyanidins, while flavonoids and organic acids were mainly identified in seeds. For the determination of the antioxidant and anti-inflammatory capacities, it was observed that both peel and seeds showed high potential. In conclusion, custard apple byproducts, specially peels, can be interesting bioactive ingredients for the production of nutraceuticals due to their biological properties providing added value to human health.

Keywords: revalorization, byproducts, circular bioeconomy, custard apples, bioactive compounds, nutraceuticals

References

- FAO. (2011). Pérdidas y desperdicio de alimentos en el mundo - Alcance, causas y prevención. In Roma. <https://doi.org/10.3738/1982.2278.562>
- Ben-Othman, S., Jôudu, I., & Bhat, R. (2020). Bioactives from agri-food wastes: Present insights

and future challenges, *Molecules*, 25, 3 <https://doi.org/10.3390/molecules25030510>

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