Effectiveness of different solvents in obtaining extracts from acerola seeds with antioxidant and antimicrobial potential

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The quest for effective compounds in mitigating food contamination and reducing the incidence of foodborne diseases has emerged as relevant endeavor within the food industry. Natural alternatives for extending the shelf life of food and enhancing their safety have become focus research worldwide. Concurrently, investigations into methods for extracting natural substances from fruits have gained prominence, hold promise for yielding compounds with biotechnological applications. The objective of this study was to assess the efficacy of various solvents in the extraction of bioactive compounds from acerola seeds (*Malpighia emarginata* D.C) and determine its potential as natural antioxidants and antimicrobial agents. The extracts were obtained using the ultrasound-assisted extraction, employing the solvents: acetone, distilled water, and ethanol. Variations in ethanol concentrations (50%, 70%, and 100%) and acidification of the solutions were performed to evaluate their impact on the extraction. The samples underwent of analyses to characterize, including the quantification of phenolic compounds, vitamin C, proteins, antioxidant activity (ABTS and DPPH methods), and antimicrobial activity (agar diffusion technique). All results were submitted to statistical analysis via ANOVA with Tukey's test at a 95% confidence level. Remarkably, extracts obtained using acetone and distilled water exhibited higher concentrations of phenolic compounds, with values of 26.98 and 33.54 mg GAE/100 ml, respectively. Nevertheless, in consideration of the use of environmentally friendly and safe solvents, extractions using distilled water and ethanol at different concentrations, with pH values adjusted or unadjusted to 3 using acetic acid, were conducted. In this context, hydroethanolic solvents demonstrated greater efficiency in the extraction of phenolic compounds with the non-acidified ethanol 50% extract yielding an average value of 35.26 ± 0.38 mg GAE/100 ml. Furthermore, acidification enhanced extraction efficiency. The non-acidified ethanol 50% extract also stood out, with a value of 1.792 ± 0.05 mg of ascorbic acid per 100 ml of sample, as did the determination of antioxidant activity, which recorded values of 1118.22 µmol TE/l by the DPPH method and 2551.29 µmol TE/l by the ABTS method. Protein contents were deemed insignificant. Concerning antimicrobial activity, only the acidified ethanol 70% extract exhibited a significant difference against the indicator microorganism *Lactococcus lactis* ATCC 19435 when compared to the control. Therefore, it can be concluded that hydroethanolic solvents demonstrated greater efficacy in the extraction of compounds of interest, and extracts exhibit potential for use as natural antioxidants.

Key words: waste; biotechnology; sustainability.

Eficácia de diferentes solventes na obtenção de extratos de sementes de acerola com potencial antioxidante e antimicrobiano

Este estudo avaliou a extração de compostos bioativos de sementes de acerola para uso como antioxidantes e antimicrobianos naturais. Solventes hidroetanólicos, especialmente etanol a 50%, destacaram-se na extração eficaz de compostos fenólicos e vitamina C. Os extratos exibiram atividade antioxidante significativa, enquanto as proteínas foram em quantidades insignificantes. Apenas o extrato de etanol a 70% acidificado demonstrou atividade antimicrobiana. Esses resultados sugerem que os solventes hidroetanólicos são ideais para extrair compostos de interesse, tornando os extratos de sementes de acerola promissores como antioxidantes naturais.

Palavras-chave: resíduo; biotecnologia; sustentabilidade.

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