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Antimicrobial and antioxidant potential of natural extracts obtained by green technologies

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The increasing demand for natural bioactives with antioxidant and antimicrobial properties has led to the development of sustainable extraction methodologies. These compounds are not only sought after for their potential health benefits but also for their utility in extending the shelf life of various products, reducing the reliance on synthetic additives.

Green extraction methods, including supercritical fluid extraction, microwave-assisted extraction, ultrasound-assisted extraction, and enzyme-assisted extraction, have gained prominence due to their environmentally friendly nature and high efficiency in obtaining bioactive compounds. Moreover, green solvents, such as supercritical carbon dioxide, water, ionic liquids, and deep eutectic solvents, have become increasingly popular due to their inherent environmentally friendly characteristics, low toxicity, and ability to enhance the extraction efficiency of bioactive compounds from various sources.

This review focuses on the green extraction techniques employed to obtain natural extracts containing bioactive compounds from various sources and their subsequent evaluation for antioxidant and antimicrobial efficacy. The review explores the underlying principles of these extraction methods and highlights their advantages in terms of reduced solvent usage, shorter extraction times, and improved selectivity. The review also covers the broad spectrum of microorganisms, including bacteria, fungi, and viruses, against which these bioactives have shown promising antimicrobial activity. Finally, it provides an overview on the potential applications of obtained natural extracts.

Keywords: natural extracts, bioactives, green technologies, antimicrobial effect, antioxidant effect

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