Essential Oils: An Overview of Extraction Methods and Food Applications

Giuseppina Crescente[1, #], Aziz Bouymajane[2, #], Giovanni Cascone[1], Giuseppe Squillaci[2], Alessandra Morana[2], Stefania Moccia[1, *]

[1] National Research Council, Institute of Food Sciences (ISA), 83100, Avellino, Italy;

[2] National Research Council, Research Institute on Terrestrial Ecosystems (IRET), 80131, Napoli, Italy

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[*] Address correspondence to this author at the National Research Council, Institute of Food Sciences (ISA), 83100, Avellino, Italy; Tel: +39-0825-299423; E-mail: stefania.moccia@isa.cnr.it[#] *These authors contributed equally to this work.*

ABSTRACT

Essential oils are naturally extracted plant constituents that are characterized by their volatility, which in turn is associated with distinctive smell and fragrance characteristics. They consist of a mixture of different molecules, generally terpenes, and can be extracted from many parts of plants, such as leaves, buds, flowers, seeds, bark, roots, twigs, herbs, wood, and fruits. Several methods of extracting essential oils are available, including conventional methods and advanced techniques, each with its advantages and disadvantages. As a result, advanced methods are more suitable than conventional ones due to their environmental friendliness, high yield and efficiency, shorter extraction time, and low energy consumption. Further, essential oils possess antimicrobial properties due to the high concentration of chemical compounds that act through a variety of mechanisms, resulting in a synergistic action. Due to their antimicrobial properties, essential oils could play a role in maintaining food security by inhibiting the growth and proliferation of microorganisms in food. However, their low water solubility, as well as their instability, limit their application. To this purpose, several delivery systems have been discussed as strategies to overcome their application drawbacks. In the end, the choice of the appropriate extraction method and delivery systems can be a link between their traditional use and promising applications in several fields.

Keywords: Antimicrobial activity, delivery systems, edible coating, essential oils, extraction methods, food preservation, pathogenic bacteria, terpenes.