

Preface

The essential oil is one of the most promising themes that can strongly contribute to the Green Chemistry, not only in research laboratories, but also in various industries and at the teaching level from primary schools to universities. This conclusion was based on two observations. Essential oils are widely used in perfume, cosmetic, pharmaceutical, agricultural, and food industries. It has long been recognized since antiquity to possess biological activities, including antibacterial, antifungal, antiviral, antimycotic, antitoxigenic, antiparasitic and insecticidal properties. A large number of essential oils and their constituents have been investigated for their antioxidant properties in cooked and fresh food products. In recent years, researchers and industries are more focused on the major compounds of essential oils in order to use them as bio-based solvents for extracting valuable metabolites (e.g., fat and lipid, carotenoids, polyphenols) or as reagents (synthons) for newly bio-based chemicals for pharmaceutical, food or cosmetic purposes.

As a main difference from previously published books in this area, readers like chemists in synthesis or analysis, biochemists, chemical engineers, physicians, food and agro- technologists will find a deep and complete perspective regarding essential oils. Following an introduction to the history of essential oils (Chap. 1), Chap. 2 details conventional and innovative extraction techniques. Biological applications in which essential oils have afforded spectacular results are discussed extensively in terms of fundamentals, tests, and applications: antioxidants (Chap. 3), antimicrobials (Chap. 4), and insecticides (Chap. 5). The last two chapters give new directions for research and industry by using major or single components in essential oils as bio-based solvents (Chap. 6) or as green reagents for syntheses (Chap. 7).

We wish to thank sincerely all our colleagues from “GREEN Extraction Team” in Avignon University who have collaborated in essential oil’s applications. We express our thanks to the personnel from Springer who have offered their time and support, especially Dr. Sonia Ojo for her help to make this SpringerBrief possible. On the other hand, we are totally convinced that this book is the starting point for future collaborations in new “green chemistry of essential oils” between research, industry and education.

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