

# **Green Chemistry and Sustainable Technology**

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The series Green Chemistry and Sustainable Technology aims to present cutting-edge research and important advances in green chemistry, green chemical engineering and sustainable industrial technology. The scope of coverage includes (but is not limited to):

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- Green technologies for environmental sustainability (carbon dioxide capture, waste and harmful chemicals treatment, pollution prevention, environmental redemption etc.)

The series Green Chemistry and Sustainable Technology is intended to provide an accessible reference resource for postgraduate students, academic researchers and industrial professionals who are interested in green chemistry and technologies for sustainable development.

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Ying Li · Farid Chemat  
Editors

# Plant Based “Green Chemistry 2.0”

Moving from Evolutionary to Revolutionary

 Springer

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# Preface

Plant based chemistry have been used probably since the discovery of fire. Egyptians and Phoenicians, Jews and Arabs, Indians and Chinese, Greeks and Romans and even Mayas and Aztecs all possessed a culture of using plants as source of reagents for cosmetic, perfumery, medicine, food ingredients and products, colors and dyes, and building materials. Until the start of the petroleum era plant-derived biomass was the main source of reagents, ingredients and products for food and non-food applications. The spectacular growth of petroleum-based processes led to a withdrawal from those based on biomass. However, the depletion of fossil resources, upon which the current international industry and economy heavily depends, and environmental considerations force us towards a post-petroleum society. The challenges launched by the environment protection and competitiveness of the globalized world strongly require innovations that break away from the past rather than simple continuity. While green chemistry has given rules for modern chemistry, plant based chemistry could be one of the solutions from the past to the future of humanity as an ecologic and an economic chemistry, and turning to “Plant Based” Green Chemistry 2.0 in the twenty-first century.

This book was prepared by a team of chemists, biochemists, chemical engineers, physicians, and food technologists with an objective to provide an actual picture of current knowledge on “Plant Based” Green Chemistry used at laboratory and industrial scale. It is aimed for professional from industry, academicians engaged into plant-based chemistry and engineering or natural product chemistry researches and graduate level students. Each chapter would be complementary to other chapters and based on presentation of the reputed international researchers and professionals, and would address the latest efforts in the field.

We wish to thank sincerely all of our colleagues who have collaborated in the writing of this book. We hope to express them our scientific gratitude for agreeing to devote their competence and time to ensure the success of this book. We are totally convinced that this book is the starting point of new discipline and for future

collaborations in “Plant Based” Green Chemistry between research, industry and education, covering large applications: perfume, cosmetic, pharmaceutical, food ingredients, nutraceuticals, biofuels, or fine chemicals industries.

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## About the Editors



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**Farid Chemat** is a full Professor of Chemistry at Avignon University, Director of GREEN Extraction Team (innovative techniques, alternative solvents, and original procedures for green extraction of natural products), and co-director of ORTESA LabCom research unit Naturex-UAPV. He received his engineer diploma from University of Blida-Algeria (1990) and his Ph.D. degree (1994) in process engineering from the Institut National Polytechnique of Toulouse-France. After periods of postdoctoral research work with Prolabo-Merck, Rhone-Poulenc and Unilever (1995–1997), he spent two years (1997–1999) as senior researcher at University of Wageningen-The Netherlands. In 1999, he moved to the University of La Réunion-France DOM as assistant professor and since 2006 holds the position of Professor of Food Chemistry at the University of Avignon-France. His research activity is documented by more than 200 scientific peer-reviewed papers, and about the same number of conferences and communications to scientific and industrial meetings, 12 books, 40 book chapters and 14 patents. His main research interests have focused on innovative and sustainable extraction techniques (especially microwave, ultrasound and green solvents) for food, pharmaceutical, bio-energy and cosmetic applications. He is scientific coordinator of “PEEV: Industrial Platform for Green Extraction” and “France Eco-Extraction”, an academic and industrial association, dealing with international dissemination of research and education on green extraction of natural products in academia and industries.

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