

Recent Advances in Polyphenol Research

Volume 4

Edited by
Annalisa Romani,
Vincenzo Lattanzio
and Stéphane Quideau



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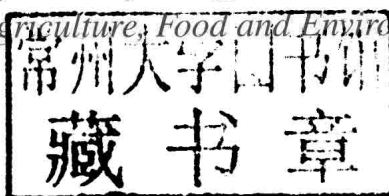
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Recent Advances in Polyphenol Research

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A series for researchers and graduate students whose work is related to plant phenolics and polyphenols, as well as for individuals representing governments and industries with interest in this field. Each volume in this biennial series focuses on several important research topics in plant phenols and polyphenols, including chemistry, biosynthesis, metabolic engineering, ecology, physiology, food, nutrition, and health.

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Dedication

This fourth volume of *Recent Advances in Polyphenol Research* is dedicated to the memory of Edwin Haslam, Professor of Physical-Organic Chemistry at the University of Sheffield, UK, who peacefully passed away at his home in Exeter on October 3, 2013, aged 81. Professor Haslam had been a long-standing and faithful member of Groupe Polyphénols, and was for many of us a model, a helpful mentor, a great colleague, and a friend. His pioneering and outstanding contributions to the field of plant polyphenols were, still are, and will continue to be a great source of knowledge and inspiration.

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Preface

During the last 10 years there has been increasing interest in the study of plant polyphenols and their innumerable roles in a variety of very different contexts. Plant polyphenols are secondary metabolites and constitute one of the most common and widespread groups of substances in plants. Their structural diversity is likely the result of plant adaptive responses to natural selection.

Polyphenols express a large and diverse range of beneficial effects in plants and in humans consuming plant-derived food and beverages. For example, polyphenols are well known for their antioxidation activity, hormone-like behavior, and role as natural neurotransmitters, among many other biological activities. They also provide antimicrobial activity for the plant's own defense against invading pathogens.

The diversity of structures and activities of plant polyphenolic compounds has resulted in the emergence of numerous investigations in various and often interdisciplinary research areas, encompassing scientific domains as diverse as chemistry, biochemistry, biotechnology, ecology, physiology, nutrition and food chemistry, pharmacy and medicine, cosmetics, and textile technology, as well as in quality and environment controls and assessments.

It is thus the aim of the International Conference on Polyphenols, which is a biennial event that is organized under the auspices of Groupe Polyphénols, to provide scientists across disciplines with a forum for sharing new findings and for exchanging views and ideas on polyphenol research at large.

For the first time in its history, in 2012 the 26th International Conference on Polyphenols was organized in Florence, Italy. The interest in polyphenol science at the University of Florence involves many departments, including Pharmaceutical Sciences, Chemistry, Plant Sciences and Ecology, Food Science, and Medicine, as well as The Multidisciplinary Centre of Research on Food Sciences (CeRA – MCRFS) and the laboratory of Commodity Sciences and Quality Control, Environment Assessments and Certification. In these fields, particular attention has been dedicated to functional-food, nutraceutical, and cosmeceutical discoveries and applications.

At the 26th International Conference on Polyphenols, five different main topics were selected for the scientific program:

- (1) *Phenols and Polyphenols Chemistry*: Covering (i) isolation and structural elucidation, and (ii) synthesis, reactivity, and physical-chemical properties.
- (2) *Biosynthesis, Genetics, and Metabolic Engineering*: Dealing with biosynthesis and genetic manipulation.

- (3) *Roles in Plants and Ecosystems*: Covering phenolic functions in plants and correlation with biotic and abiotic stresses.
- (4) *Health and Nutrition*: Focusing on polyphenol metabolism and bioavailability, as well as cancer prevention and perspectives on gender-dependent human health effects.
- (5) *Polyphenols and Drug Discovery*: Including new findings on sources of isolated and standardized polyphenolic fractions and novel epigenetic polyphenol mechanisms.

More than 400 scientists from 42 countries attended the conference in July 2012, with nearly 400 paper contributions, comprising 52 oral communications and 327 poster presentations (Fig. P.1).

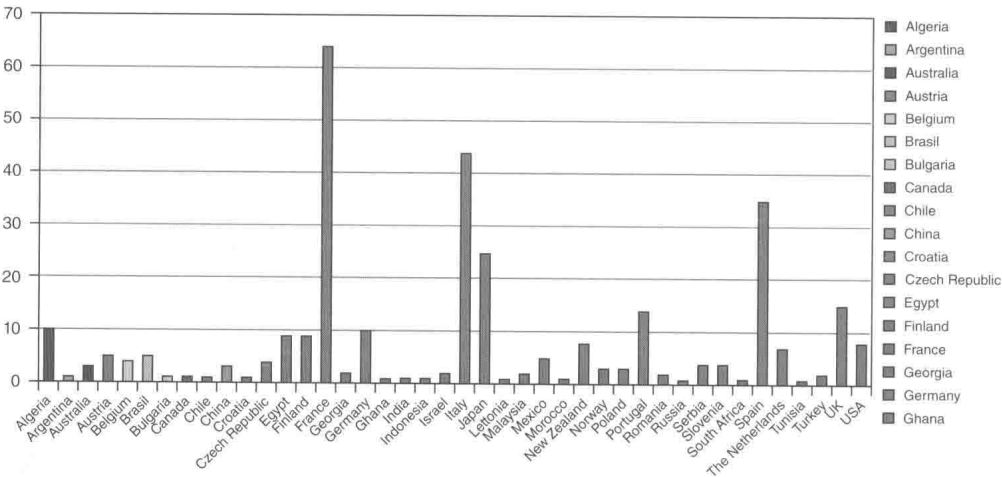


Fig. P.1 Contributions to the 26th International Conference on Polyphenols (number of papers presented) by country.

The success of this 26th edition of the International Conference on Polyphenols would not have been possible without the support of both public and private sponsors. The Scientific and Technological Pole and the Social Pole of the University of Florence, PIN of Prato, the National Council for Research, and several private-company sponsors (Agilent Technologies, BioTech Power, Indena, ISR Ecoindustria, Domus Olea, Force A, Biokyma, PhenoFarm, Dermaresia, Silva Team, Bioscen Future) are gratefully acknowledged.

All of the lectures, oral communications, and ensuing discussions and debates were broadcast live on RadioSpin, the University of Florence webradio, and through Ustation (the Italian university radio stations network), on the other connected university radios of the network. These radiophonic conference proceedings are available in podcasts on the RadioSpin Web site: www.radiospin.it.

Annalisa Romani
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