Preface

Recent advances in science have clarified the role of plant specialized metabolites (classically known as plant secondary metabolites), which should not only be considered as bioactive molecules used for human health but must also be considered as pivotal factors for the global ecosystem. They play a major role in plant life, evolution, and mutualism. To provide the reader with a general view of plant specialized metabolites, it is important to consider both the biochemistry and the functional and ecological roles of these important compounds.

Readers will be fascinated by the fact that ~200,000 specialized metabolites are formed by a wide array of plant metabolic pathways from numerous plant taxa and by learning how other species (including human beings) rely on them. Accordingly, this book provides a wealth of both fundamental knowledge and up-to-date research mostly for undergraduate and graduate students, and scientists in the fields of botany, plant physiology, ecology, pharmacology, and biotechnology.

To meet this goal, we invited several experts to provide the most up-to-date contributions in several fields of study of specialized metabolites. After a brief introductory chapter, a thorough description of the sites of synthesis provides the reader with the basics for understanding the diversity of secretory structures and the biodiversity and the chemotaxonomic significance of specialized metabolites. The biochemistry and the functional roles of specialized metabolites are covered by several chapters, including those on salicylates, alkaloids, cyanogenic glycosides, glucosinolates, glycosylation, and the production of plant volatiles. Biotechnology of specialized metabolites is covered by two chapters, which describe the frontiers of synthetic biology and the production of volatiles by microorganisms. Finally, the role of specialized metabolites in plant communication is described by illustrating models of plant interaction.

The chapters are written in a contemporary fashion, in which functions, metabolism, and physiology are merged to show the reader both the complexity and the comprehensiveness of the topics explored. We are

confident that all of these topics will provide the reader with special insights into the sophisticated nature of the metabolites and their various valuable uses, based on the most recent findings in science.

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