SECONDARY PLANT METABOLISM

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Margaret L. Vickery and Brian Vickery

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PREFACE

Considerable advances in the understanding of secondary metabolism in plants have been made over the past decade. Elucidation of the biosynthetic pathways of secondary metabolites is continuing apace, and, while their function is still open to controversy, it is now widely acknowledged that these compounds are not the metabolic waste products they were once thought to be.

While we have endeavoured to include the most recent results reported in the literature of plant biochemistry, such is the volume of research being undertaken in this subject that the reader is recommended to consult the continuing journals listed in the bibliographies at the end of each chapter to keep abreast of developments in secondary plant metabolism. In particular, subsequent volumes of the Chemical Society's *Biosynthesis* will, it is hoped, continue to give a good coverage of the subject.

Exciting discoveries are continually being made in the field of secondary plant metabolism. Since completion of the manuscript of this book, it has been reported that not only can plants biosynthesise vitamin D₃ (cholecalciferol), once assumed the exclusive preserve of vertebrates, but the biosynthetic pathways forming this compound are similar in both plants and animals.

The overall purpose of our book, *Secondary Plant Metabolism*, is to show that plants do not haphazardly produce a large number of chemical compounds, but that each metabolite is biosynthesised for a definite purpose (although we may not, as yet, have discovered this purpose), and that all products are interrelated according to a complex plan which conserves energy and scarce inorganic nutrients. The format of the book is based on five main biosynthetic routes, namely sugar metabolism, the acetate-malonate pathway, the acetate-mevalonate pathway, the shikimic acid pathway, and metabolites derived from amino acids. An introductory chapter attempts to define primary and secondary metabolism, although in the light of modern work, it is no longer logical to make a clear-cut separation of the two. This chapter also discusses possible functions of secondary metabolites and describes some of the more important uses that man has made of these compounds. A brief introduction to isotopic tracer analysis is included, as this is the tool which more than any other has led to the elucidation of many of the sequences of secondary metabolite biosynthesis. Enzymology is not included, although the isolation and characterisation of the enzymes catalysing a particular biosynthetic step are the only means of proving that such a step takes place. This subject is usually well covered in any good book of biochemistry, however, and it would be superfluous to repeat the information here.

Many attempts have been made using secondary metabolites in the classification of plants, which is traditionally based on morphology. Such attempts have had some success and brief descriptions of examples are included at the end of each chapter or section.

Although this book is mainly concerned with biosynthesis, no description of secondary metabolites would be complete without reference to the ways in which these compounds affect animals, insects and other plants. Such ecological properties are therefore briefly included wherever applicable.

University of Warwick, 1980

M.L.V.
B.V.