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Book review

Secondary Metabolism, Annual Plant Reviews, Vol. 2
Edited by Michael Wink, Sheffield Academic Press, 1999. 358 pp. £79. ISBN 1-84127-007-5

In *Biochemistry of Plant Secondary Compounds* the researcher or post graduate student is faced with the complexity and unsurpassed variety of plant secondary metabolites. Specific chapters, written by leading experts in their fields, include all major classes of compounds, the alkaloids and betalains, the terpenoids (including sterols and cardiac glycosides), the cyanogenic glycosides and glucosinolates (with some emphasis on non proteinogenic amino acids), and last but not least several classes of phenylpropanoids. A companion volume (*Function of Plant Secondary Metabolites and their Exploitation in Biotechnology*) is devoted to the mode of action of these metabolites on humans, animals, and plants. It also relates to the economic impact of secondary metabolites as drug and biotech products.

In a decade, where biochemical analysis of plants is accelerated by rapidly increasing numbers of data from sequencing, cloning and expression of the respective recombinant biosynthetic enzymes, it is difficult to keep up with the latest scientific progress, and sometimes a book is outdated even before it is printed. More than 50% of the data in this volume are referenced by literature not older than five years. However, it is frightening to notice that even these "up to date" reviews in several cases have been outdated by new molecular data.

Overall the book gives a balanced summary on all major secondary metabolites. However, chapters, which not only focus on the brute force of biochemistry, but also manage to cover physiological, nutritional and economic aspects of some secondary metabolites (e.g. the chapter on cyanogenic glucosides) may present a more thorough picture of the individual class of compounds. Fascinated by the progress made in recent years, e.g. on certain classes of alkaloids or terpenoids, one might realize at the same time, how little we know, even on the pure biosynthesis of other compounds, like (furano)coumarins or cardiac glycosides.

The biochemistry of this issue is supported by a critical evaluation of the value of secondary metabolites in taxonomy and phylogeny. In several examples, from alkaloids to (iso)flavonoids the authors point out that chemotaxonomic markers may be beneficial to characterize and distinguish monophyletic clades from each other, preferentially on the family level. However, in many instances on the species and genus level, chemotaxonomic classification only provides a crude framework and is prone to errors. In many cases, plant secondary metabolites and their corresponding biosynthetic enzymes and genes, reflect different life strategies and therefore might not fit into a rigid taxonomic scheme.

Among all this wealth of information I should also mention some critical points. A book of this class should avoid to confuse the reader by a stereochemically incorrectly depicted structure of quercetin and genistin (already in the introduction and again on p. 192). Some others should have been drawn with more care, e.g. regarding binding angles. In addition, a few times the proper terminology is inadequate (e.g. one should use the term *systemic response* on p. 27 to describe alkaloid accumulation). Although most authors are up to date with their references at least until 1998, even 1999, a few important publications, e.g. the cloning and expression of the solanidine-GT by B. Belknap and co-workers in 1997 are not included in the references list.

In summary I can only recommend this issue to anybody working in plant secondary metabolism. This weekend I picked up a new brand of yoghurt in my grocery store, characterized by the addition of *SPP* (Secondary Plant Products) from freeze dried red-wine or green-tea extract. The label explained the benefits of these compounds to human nutrition and health. Finally, I thought, after several decades of research

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and progress on the (bio)chemistry and molecular biology of these compounds, some get public attention — and may be, in the near future, they will also be acknowledged in more depth by the whole scientific community.

Thomas Vogt
Leibniz-Institut für Pflanzenbiochemie, Abt. Sekundärstoffwechsel, Weinberg 3, D-06120 Halle (Saale), Germany