

Book Reviews

J. Nat. Prod., **1994**, 57 (10), 1470-1471 • DOI:
10.1021/np50112a024 • Publication Date (Web): 01 July 2004

Downloaded from <http://pubs.acs.org> on April 4, 2009

More About This Article

The permalink <http://dx.doi.org/10.1021/np50112a024> provides access to:

- Links to articles and content related to this article
- Copyright permission to reproduce figures and/or text from this article



ACS Publications
High quality. High impact.

Journal of Natural Products is published by the American
Chemical Society, 1155 Sixteenth Street N.W., Washington,
DC 20036

BOOK REVIEWS

Shikimic Acid—Metabolism and Metabolites. EDWIN HASLAM. John Wiley and Sons, Inc., 605 Third Avenue, New York, NY 01058. 1993. xi+387 pp. 15×22.5 cm. \$120. ISBN 0-471-93999-4.

It is not often that one comes across an advanced scientific text which is such a joy to read as is this one. The book is full of quotations, mostly from natural products chemists, some from the great philosophers, and a few (unattributed!) from the *Book of Common Prayer*, which bind the description of shikimic acid and its metabolites into a scientific story of singular and compelling interest. The major part of the book deals with the chemistry and enzymology of the "common pathway" from glucose to chorismate. This is dealt with in great detail, presenting the isolation, structural elucidation, chemistry, detailed stereochemistry, and synthesis of the intermediates in the second chapter, and the enzymology and chemistry of their formation and interconversions in the third chapter. The synthesis, enzymatic and otherwise, of variously labeled intermediates is dealt with in detail, with several alternate synthetic sequences being discussed in many cases, and the stereochemical aspects of their further metabolism are well and clearly presented. The various enzymatic controls exercised over the pathway are considered in detail, and the discovery, significance, and synthesis of inhibitors, where they exist, are included.

Chapter 4 deals with the elaboration of primary and other essential metabolites from chorismate: the three aromatic amino acids, and the minor compounds, e.g., 2,3-dihydroxybenzoic and *p*-aminobenzoic acids; the many modes of metabolism of chorismate, isochorismate, and prephenate are given in clear and full detail. The enzymology and control mechanisms are stressed. Certain aspects of the biosynthesis of lignin, the functioning of phenylalanine ammonia lyase, and the development of the metabolic grid yielding the benzoic and cinnamic acids are also included in this chapter, although to have considered them with the general discussion of secondary metabolism in the following chapter might have been more appropriate.

Chapter 5 gives us a general overview of secondary metabolites derived from shikimate. The chapter is divided into microbial and plant metabolites, and presents some biosynthetic sequences in much detail (ergot alkaloids, flavonoids) and others in brief.

This final chapter does a good job of establishing the central role that the shikimate pathway plays in the life of plants and microorganisms, and makes a fitting end to an excellent book. Anyone interested in natural products will enjoy and should own this book; all our students should be encouraged to read it.

J. MICHAEL EDWARDS, *University of Connecticut*

Handbook of Natural Products Data, Vol. 3, Isoquinoline Alkaloids. Ed. by ATTA-UR-RAHMAN. Elsevier, P.O. Box 211, 1000 AE Amsterdam, The Netherlands. 1994. x+778 pp. 16.5×24 cm. \$428.50. ISBN 0-444-81888-X.

This book purports to be a compendium of the spectral and physical characteristics of about 700 isoquinoline alkaloids. The types covered are the simple isoquinolines, 1-phenylisoquinolines, *N*-benzylisoquinolines, 4-phenylisoquinolines, isoquinolinequinones, benzylisoquinolines, bisbenzylisoquinolines, cularines, canconitrines, quettamines, dibenzopyrrocolines, indenobenzazepines, pavine, and isopavines.

From the Introduction, the material presented appears to have been collected by a group of eight compilers, none of whom evidently had a doctoral degree.

Where the data were taken from excellent preexisting reviews such as those covering the bisbenzylisoquinolines and published mostly in this journal, the presentation is of acceptable quality, although no acknowledgment is ever given of the fact that good reviews on the bisbenzylisoquinolines were already available.

It is when the team of compilers begins to cover scantily reviewed classes of alkaloids, or else tries to add new data to reviews previously published, that serious difficulties develop. There is no real understanding that a racemic compound usually has a melting point different from that of the optically active enantiomers. Optically active alkaloids and their racemic synthetic analogues are all listed as natural products with identical melting points. The anions of quaternary alkaloids are sometimes not specified, although the melting points, optical rotations, and spectral characteristics are duly given. In some instances, the rotation for a synthetic racemate is quoted as $[\alpha]_D 0^\circ$, as if this were of special importance. Many of the structural drawings were just transposed from the original journals with no critical judgment exercised towards rationalizing and systematizing the data. A particularly grievous example is on p. 657 where we are informed that there are two types of isopavine alkaloids, when in reality the two skeletal structures shown simply reflect alternate ways of representing the same structure. A new type of optical isomerism is

apparently conceptualized, as on p. 71, where we read about crystostyline I existing in the (+), (-), (\pm), and (IS) forms, with IS intriguingly remaining unexplained. Alternatively, an alkaloid such as corgoine, with no optical asymmetry, is listed as (\pm)-corgoine on p. 74. In a related vein, the aromatic alkaloid mimosamycine with no asymmetry is duly reported to have $[\alpha]_D -1.8^\circ$ (CHCl_3), with no accompanying explanation.

The references given are also a problem, with the compilers fancying themselves as efficiency experts and streamlining names by never bothering with accents, so that Cavé becomes Cave, Slavík turns into Slavik, Gözler is transformed into Gozler, and Urzúa is Urzua.

In several instances, the absolute configuration of some alkaloids listed should have been obvious by analogy with previously known compounds of similar optical properties and related structures. But in this book the asymmetric centers in question are not specified simply because they were not specified in the original paper. On p. 137, we read about R(-)-N-demethylcolletine, but on p. 148 we are introduced to D(-)-colletine. Do the compilers really mean D or is the D simply an error which should have been R?

The book has been indifferently verified for errors, and received only desultory supervision as is evident from the fact that *Sarcocapnos* becomes *Sarocapnos* (page 151), N-oxides are sometimes rendered as $\text{N}^{\oplus}\text{O}^{\ominus}$, or $\text{N}\rightarrow\text{O}$ or simply $\text{N}^{\oplus}\text{O}^{\ominus}$. Caryachine and its close analogue neocaryachine are classified one as a pavine and the other as an isopavine. To save money, the structural diagrams are by hand rather than being computer-generated, with the result that the double bonds of benzene rings are sometimes omitted. On p. 768, we are informed that there are two types of isoquinolinequinone alkaloids. The first does indeed look like an isoquinolinequinone, but the second appears to be simply a 1,4-cyclohexadiene in ring A. And the list goes on.

It is wrong to let a group of ill-trained compilers undertake an endeavor which is obviously beyond their scientific capabilities. Elsevier must bear some of the responsibility for this inexcusable production, compounded by the fact that its asking price is \$428.50. A natural products compendium should stand up as an exemplar of judicious judgement, accuracy, and reliability. The present volume is sadly lacking in these qualities.

MAURICE SHAMMA, *The Pennsylvania State University*

Humus Chemistry: Genesis, Composition, Reactions, Second Edition. F.J. STEVENSON. John Wiley and Sons, 605 Third Avenue, New York, NY 10158. 1994. xi + 498 pp. 15.5 × 23.25 cm. \$79.95. ISBN 0-471-59474-1.

The book is a second edition of a text by the same name which originally appeared in 1982. The new version takes on the same format as the original, with the addition of two new chapters, one on the application of nmr spectroscopy and analytical pyrolysis to the characterization of soil organic matter (Chapter 11), and the other on the structural basis of humic substances (Chapter 12). Considering the span of twelve years between editions and the advancement of instrumental techniques such as nmr spectroscopy into the arena of agricultural and soil chemistry, a second edition which collates and summarizes this new information should be a welcome sight. A perusal of the reference sections of each chapter reveals that citations as late as 1993 are included, with about 25% of the total references dated later than 1982. The newer references, in most cases, are used to support the statements made in the previous edition. Although verbatim text can be found throughout the book, there are several new sections, tables, and figures in this new edition. Chapters discussing nitrogen transformations (Chapter 4), "Organic Matter Reactions Involving Metal Ions in Soil" (Chapter 16), and "Stability Constants of Metal Complexes with Humic Substances" (Chapter 17) have been extensively rewritten. The book is designed for upper-level undergraduate and graduate students interested in soil chemistry, and suits this audience admirably well. The book should also be helpful for advanced researchers in other disciplines who, for one reason or another, have basic questions concerning the formation and/or composition of humus. As the text is somewhat off the beaten path for readers of the *Journal of Natural Products*, a place will not be made for it in the personal libraries of most natural products chemists. However, due to its auxiliary value, this book should be on the shelves of all libraries which support scientific research efforts in the agricultural and natural sciences.

RICHARD F. HELM, *Virginia Polytechnic Institute and State University*