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Received 10 August 1984

CONSTITUENTS OF *RUDBECKIA SEROTINA*

THOMAS G. WADDELL,* SANDRA K. ELKINS

Department of Chemistry, University of Tennessee at Chattanooga, Chattanooga, Tennessee 37402

TOM J. MABRY, JOHN A. NORRIS, and AYHAN ULUBELEN

Department of Botany, University of Texas, Austin, Texas 78713

Rudbeckia serotina Nutt. (Compositae) is a folk medicinal herb (1,2) that has not been chemically investigated. We report here that the CH_2Cl_2 extract of the aerial parts of *R. serotina* contains the flavonols 3,3′,4′,5-tetrahydroxy-6,7-dimethoxyflavone (eupatolitin) (3), 3,4′,5-trihydroxy-6,7-dimethoxyflavone (eupalitin) (3), and 3,4′,5-trihydroxy-3′,6,7-trimethoxyflavone, along with sodium salicylate. 3,4′,5-Trihydroxy-3′,6,7-trimethoxyflavone has been synthesized (4) but, to our knowledge, has not previously been reported from natural sources (5). It is interesting to note that the flavonol constituents of the closely related species *Rudbeckia hirta* (6,7) are not identical (8) to the *R. serotina* flavonols.

A standard work-up of *R. serotina* for alkaloids yielded a trace amount of a basic fraction which was a complex mixture of components according to tlc analysis. This alkaloid fraction remains to be investigated.

EXPERIMENTAL

PLANT MATERIAL.—Collections were made along eastbound I-24 at the Nickajack Dam exit, 20 miles west of Chattanooga, TN. The plant was identified by Dr. Gene S. Van Horn, Department of Biology, UTC, and a voucher specimen (Rs-ND61572-TGW) is filed in the UTC herbarium.

EXTRACTION AND ISOLATION.—Air-dried, powdered aerial parts of *R. serotina* (2.56 kg) were exhaustively extracted with CH_2Cl_2 in a Soxhlet apparatus. The concentrate (56.7 g) was triturated with hot petroleum ether, and the petroleum-ether-insoluble fraction was treated with hot EtOH-H_2O, 1:3. The clarified aqueous solution was repeatedly extracted with CH_2Cl_2 to give the final extract (8.96 g). Chromatography of this material on silica gel gave, in order of elution, 3,4′,5-trihydroxy-3′,6,7-trimethoxyflavone (3 mg) (4), eupalitin (6 mg) (3), and eupatolitin (81 mg) (3). Rechromatography of the eupatolitin mother liquors gave sodium salicylate (3 mg).

Full details of isolation and identification of compounds are available on request from the senior author. All compounds were identified by standard spectral data, derivative preparation, and direct comparison with authentic samples.

ACKNOWLEDGMENTS

Acknowledgment is made to the Donors of the Petroleum Research Fund administered by the American Chemical Society, for support of this research. We also wish to thank Dr. Thomas Harris, Donald W. Lowe, L. Jay Stewart, Dr. Paul H. Gebert, David L. Tait, William L. Lee, J. Michael Bookout, Voreata Waddell, William Turner, and George E. Dawn, for their contributions to this report. T.J.M. acknowledges the Robert A. Welch Foundation Grant F-130 for support.

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Received 15 August 1984

BOOK REVIEWS

Biosynthese niedermolekularer Naturstoffe. HORST ROBERT SCHÜTTE, VEB Gustav Fisher Verlag, Villengang 2, 6900 Jena, DDR, 1982. 176 pp., 17 x 24 cm. 36 DM. (approx. $20).

This book is another volume in the series "Bausteine der modernen Physiologie." It is a survey of natural products—although not complete—and the pathways leading to these compounds and is based on a lecture and seminar series the author has given at his home institution. The introductory chapter describes, in two pages, coenzymes and high energy compounds; enzymes and gene expression (two pages); distinction between primary and secondary metabolism and ecological importance of secondary natural products (two pages); and biosynthetic methods, which proposes to use mass spectrometers to analyze incorporation of stable isotopes but does not even mention nmr as a potentially better tool to accomplish this.

The second chapter covers the biosynthesis of amino acids, including the shikimic acid pathway. Following this are two short chapters on nicotinic acid formation and porphyrin biosynthesis. Chapter 5 discusses pyrimidine, purine, and related compounds (in seven and one-half pages). Polyacetate formation and the isoprenoid pathway are covered together in one chapter and, together with chapter 7 on phenylpropanoid metabolism, make up the bulk of the book. The next three short chapters deal with amino acids that are generally not found in proteins; a four-page summary of nonribosomal peptide synthesis, including penicillin and cephalosporin synthesis; and the biosynthesis of cyanoglycosides. The last chapter deals with the biosynthesis of most of the known alkaloids.

In general, the discussions of the biosynthetic pathways are treated with few details. No mechanisms are listed. In addition, some of the pathways, as, for example, indole alkaloid, quinolizidine alkaloid, and ergot alkaloid formation, are not up to date. The references are compiled at the end of the book and are not referenced in the text, but rather are listed by title; they are mostly review articles. A most annoying aspect is the scarcity of references listed. For example, the 27-page chapter on alkaloids lists 15 references, the latest one from early 1981. Many topics are not referenced at all. Information concerning regulation of the pathways is not included.

This paperback book, written in German, can be recommended as a general reference for looking up a particular pathway. However, because of the lack of sufficient references, it would be difficult to follow up a particular topic in the literature. Similarly, the author proposes that the book is of particular value for advanced students in biology, biochemistry, chemistry, pharmacy, medicine, and agriculture. This, however, is not the case in view of the fact that little, if any, mechanisms are listed and no experimental proofs or details of metabolic pathways are discussed.

PETER F. HEINSTEIN, *School of Pharmacy and Pharmacal Sciences, Purdue University*