Book Reviews

Modern Alkaloids. Structure, Isolation, Synthesis and Biology. Edited by Ernesto Fattorusso and Orazio Taglialatela-Scafati. Wiley-VCH, Weinheim, Germany. 2008. xxiv + 665 pp. 17.5 × 25 cm. ISBN 3527315217. $275.00.

This is a book that should be of interest to anyone in natural products research, particularly those interested in alkaloids. The book contains three sections and a total of 20 chapters, some of which focus on methods and others that focus on specific classes of alkaloids. Section I, "Bioactive Alkaloids", begins with a very good review of the ecological roles of alkaloids. This is a useful chapter for those who want to understand why alkaloids are so abundant in nature and how they act as chemical defense systems. Moreover, there is a good discussion of how these compounds have been studied for their use as therapeutic agents. This section is a good review for those returning to the area and for graduate students with an interest in natural products.

Section I continues with discussions of several classes of alkaloids. Chapter 2 addresses antitumor alkaloids in clinical use or clinical trials. This is an outstanding chapter that serves as an excellent review of the topic. Chapter 3 discusses alkaloids and their bitter taste. This is explained on a chemical defense basis as well as from a sensory point of view. Chapter 4 discusses capsaicin and capsaicinoids, and it asks the question, "Is capsaicin an alkaloid?" This leads to an excellent and entertaining discussion of "What is an alkaloid?" The chapter proceeds to a discussion of several aspects of these compounds in plants and as therapeutic agents, as well as in gastronomy. Chapter 5 discusses glycosidase-inhibiting alkaloids. These are addressed from the aspects of isolation, structure, and application. This chapter also discusses the use of these agents in pharmacological chaperone therapy. Chapter 6 focuses on neurotoxic alkaloids from cyanobacteria. These are environmentally important because of toxic cyanobacterial blooms in water. The chapter details the chemical aspects of the cyanobacterial toxins and is again a very good reference. Chapter 7 discusses the lamellarin alkaloids from marine mollusks and tunicates. These compounds offer several pharmacological/therapeutic possibilities. Chapter 8 introduces the manzamine alkaloids, first isolated from marine sponges. The chapter is very detailed and serves as a complete reference for this class of marine natural products, highlighting their potential as leads in drug discovery. Chapter 9 also addressess marine natural products, focusing on antiangiogenic alkaloids and their potential in cancer research. Chapter 10 covers bromopyrroles as a typical class of marine alkaloids. There is much diversity in this class, and these compounds provide several leads for drug discovery. Chapter 11 provides a discussion of guanidine alkaloids from marine invertebrates. This is a large class, and only selected examples are discussed. However, it is well presented and it cites several reviews for further reading.

Section II, "New Trends in Alkaloid Isolation and Structure Elucidation", comprises three chapters on methodology and structure determination techniques: HPLC, CE, GC, DESI, LC−MS, ^{15}N NMR, and 2D NMR. This is a useful section for those active in the area or for those about to embark on alkaloid research, to further their appreciation of the applications and limitations of each of these methods.

Finally, Section III, "New Trends in Alkaloid Synthesis and Biosynthesis", provides insights into several methods of synthesis and biosynthesis. Chapter 15 describes the involvement of transition-metal-mediated oxidative cyclizations and is a very detailed chapter describing several methods. Chapter 16 discusses camptothecin and some of its analogues, and it is a good review of these important compounds. Chapter 17 describes combinatorial synthetic approaches in the synthesis of alkaloid-like compounds. Chapter 18 addresses the daphniphyllum alkaloids, and it is an excellent review of the topic. Chapter 19 describes the structure and biosynthesis of halogenated alkaloids. The book concludes with a chapter on engineering biosynthetic pathways for production of indolocarbazole families of natural products. This chapter includes a discussion of gene technologies and is a good reference for those interested in this methodology.

Overall, this is a very well developed text that should be included in institutional libraries and in the personal libraries of those involved in alkaloid research. It is not a comprehensive discussion of alkaloids; several classes of medicinal alkaloids are not included. However, the book does provide many good technical sections that would help researchers in developing their own methodology and it provides a vast array of examples of interesting alkaloids and their sources. The book would be of interest to graduate students and specifically to researchers in pharmacognosy and medicinal chemistry. I highly recommend this text.

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