

Preface

The books on heterocyclic series “Green Bioactive Heterocycles” consists of 9 volumes till date. Each volume of this series deals with different aspects of bioactive heterocycles. This 8th volume, entitled ‘*Bioactive Five-Membered Heterocycles: Natural Products, Green Synthesis and Bioactivity*’, of the above series focuses on various aspects of five-membered heterocycles and consist of nineteen chapters. All the chapters have exhaustively covered the topics and the corresponding literature.

Five-membered heterocycles have generated significant importance in the pharmaceutical industry. Five-membered heterocycles are widely distributed in many naturally occurring bioactive compounds. In the field of agrochemicals, many compounds with five-membered rings have been used as pesticides or herbicides to protect crops. Many synthetic scaffolds bearing five-membered heterocycles have been reported to possess diverse biological activities such as antimicrobial, anticancer, antiviral and several other bioactivities.

The ever-increasing presence of the five-membered heterocyclic scaffold in drugs and pharmaceuticals has given much impetus to synthetic chemists for discovering and designing efficient ways of synthesizing five-membered heterocyclic scaffolds that have resulted in the development of numerous synthetic strategies and protocols for the synthesis of bioactive five-membered heterocyclic compounds over the years.

This book comprises nineteen chapters.

In the first chapter, Dr. Ali and his co-researchers cover a wide variety of naturally occurring bioactive five-membered heterocycles. In Chapter 2, Kumaraswamy and Rao summarize the recent advances related to the photo-assisted synthesis of various five-membered heterocycles while Prof. S.C. Ameta and his research group compile the literature related to the synthesis of various five-membered heterocycles under the influence of ultrasonic irradiation. In Chapter 4, Nageswar et al. summarize the microwave-assisted synthesis of various tetrazoles. Prof. D.K. Maiti, in Chapter 5, describes the role of various metal-free organocatalysts to construct structurally diverse biologically promising five-membered heterocycles. Solvent-free synthesis of five-membered heterocycles is summarized in Chapter 6 by Prof. S.C. Ameta and his group. Prof. B. Baskar and co-researchers in Chapter 7 exemplified the role of flow chemistry in the sustainable synthesis of bioactive functionalized five-membered heterocycles. Prof. D.K. Maiti compiled the literatures related to the green and sustainable synthesis of bioactive pyrroles and indoles in Chapter 8 and Chapter 9 respectively. Further, some sustainable contemporary methods for the construction of oxazole-decorated heterocycles are mentioned in Chapter 10 by Prof. Reddy and his research group. In Chapter 11, Dr. T. Chatterjee and his group summarized the recent advances in the metal-free synthesis of some novel isoxazoles. Their biological efficacies are also highlighted in this chapter. Prof. D.K. Maiti explored the green and sustainable synthesis of various bioactive thiazoles and carbazoles in Chapter 12 and Chapter 13 respectively. In Chapter 14, Prof. Reddy and his co-researchers covered the

literature related to the sustainable methods for the construction of cyclopentene-decorated five-membered heterocycles. Das and Banik described the role of ascorbic acid as catalyst for the synthesis of five-membered heterocycles in Chapter 15. Dr. A. Hajra, in Chapter 16, highlighted the synthesis of various bioactive imidazo[1,2-*a*]pyridines under greener conditions. Both the Chapter 17 and 18 are related to the selenium-containing bioactive five-membered heterocyclic compounds. Prof. F. Penteadó and his co-researchers described the photon- and electron-mediated alternative synthesis of selenium-decorated five-membered heterocyclic compounds in Chapter 17 whereas Prof. Nageswar compiled the other green methods reported during the last one decade related to the synthesis of selenium-containing bioactive five-membered heterocycles in Chapter 18. At the end, Dr. A. Ali and his group summarized in Chapter 19 the industrial applications of five-membered heterocycles.

All the chapters aimed to present advance information about the five-membered heterocycles with their ever-increasing application in drug design and developments. We are thankful to all the esteemed contributors. We are also thankful to Ms. Hélène Chavaroché (Senior Acquisitions Editor) and the entire editorial team in particular, Ms. Marie Hammerschmidt for their kind support in publishing this volume entitled “*Bioactive Five-Membered Heterocycles: Natural Products, Green Synthesis and Bioactivity*” with De Gruyter GmbH, Berlin/Boston.

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