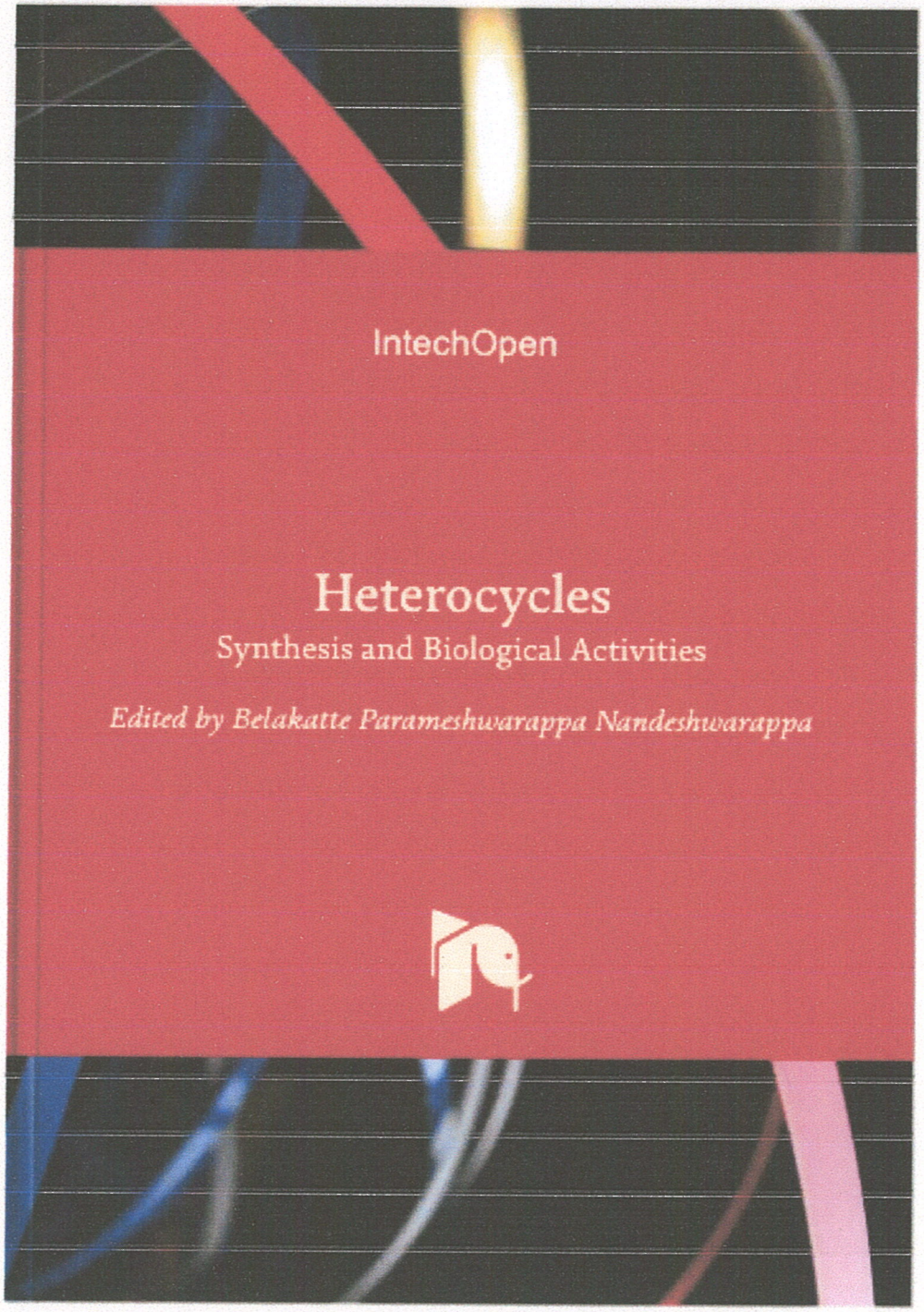

Published: June 10th 2020

DOI: 10.5772/intechopen.78709

ISBN: 978-1-83880-624-8

Print ISBN: 978-1-83969-003-7

eBook (PDF) ISBN: 978-1-83880-625-5

Chapter

Potent Antibacterial Profile of 5-Oxo-Imidazolines in the New Millennium

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Abstract

Pharmaceutics and therapeutics industries enforced chemists to seek/discover antibacterial novel heterocycles owing specific bioactivity and innate characteristics significance. This chapter summarized potent antibacterial profile of 5-oxo-imidazolines in the new millennium as an antibacterial against Gram-positive and Gram-negative bacteria viz. *B. thuringiensis*, *S. aureus*, *E. coli*, and *E. aerogenes* is presented in this chapter. 5-(H/Br benzofuran-2-yl)-1-phenyl 1H-pyrazole-3-carbohydrazides are condensed with 4-(arylidene)-2 phenyloxazol-5(4H)-one in acetic acid at elevated temperature to yield product 5-(H/Br benzofuran-2-yl)-N-(4-arylidene-5-oxo-2-phenyl-4,5-dihydroimidazol-1-yl)-1-phenyl-1H-pyrazole-3-carboxamides. Different substrates like 4-(arylidene)-2-phenyloxazol-5(4H)-one allowed to react with benzaldehyde hippuric acid to yield 5-oxo-imidazolines/ 5-oxo-4,5-dihydroimidazole. All synthesized 5-oxo-imidazolines were characterized via elemental analysis and FT-IR, ^{1}H-NMR and mass spectra techniques. All 5-oxo-imidazolines assayed in vitro for inherent antimicrobial activity at different concentration against stated bacterial strains and compared with standard chloramphenicol. 5-Oxo-imidazolines (**3a** and **3c**) with 125 μg/mL concentration showed excellent antibacterial profile against Gram-positive bacteria, *B. thuringiensis*, while other derivatives at different concentrations showed moderate antibacterial activity against Gram-positive bacteria, *S. aureus* and *B. thuringiensis*. Gram-negative bacteria like *E. coli* and *E. aerogenes* are tested at higher concentration (1000, 500, and 125 μg/mL) and found good-to-moderate antibacterial activity. Tested products found non-active against *E. aerogenes* for 125, 61, and 31 μg/mL concentration also inactive at conc. 31 μg/mL against *E. coli*.

Keywords: antibacterial, Gram positive/negative, *B. thuringiensis*, *S. aureus*, *E. coli*, *E. aerogenes*, 5-oxo-imidazoline, azlactones, medicinal

1. Introduction

Imidazole is a planer five-member ring with molecular formula $C_3N_2H_4$, containing three carbon atoms and two nitrogen atoms in 1 and 3 skeletal positions as depicted in **Figure 1**. This is an aromatic heterocyclic ring that's classified as a diazole family owing non-adjacent nitrogens in its skeleton.