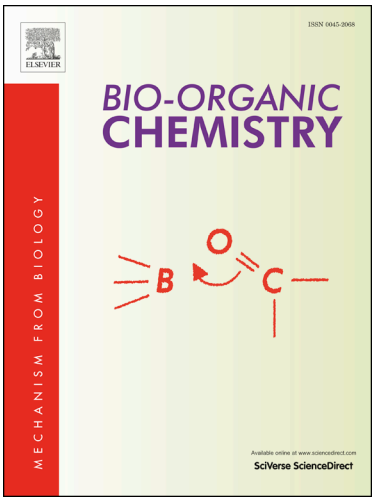

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Synthesis and *in vitro* urease inhibitory activity of benzohydrazide derivatives, *in silico* and kinetic studies

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Abstract: Benzohydrazide derivatives **1-43** were synthesized *via* "one-pot" reaction and structural characterization of these synthetic derivatives was carried out by different spectroscopic techniques such as ^{1}H-NMR and EI-MS. The synthetic molecules were evaluated for their *in vitro* urease inhibitory activity. All synthetic derivatives showed good inhibitory activities in the range of (IC_{50} = 0.87 ± 0.31 - 19.0 ± 0.25 μM) as compared to the standard thiourea (IC_{50} = 21.25 ± 0.15 μM), except seven compounds **17**, **18**, **23**, **24**, **29**, **30**, and **41** which were found to be inactive. The most active compound of the series was compound **36** (IC_{50} = 0.87 ± 0.31 μM) having two chloro groups at *meta* positions of ring A and methoxy group at *para* position of ring B. The structure-activity relationship (SAR) of the active compounds was established on the basis of different substituents and their positions in the molecules. Kinetic studies of the active compounds revealed that compounds can inhibit enzyme *via* competitive and noncompetitive modes. *In silico* study was also performed to understand the binding interactions of the molecules (ligand) with the active site of enzyme.

Keywords: *In vitro* urease inhibitory activity; Benzohydrazide; *In silico* studies; Kinetic studies.

Introduction

Urease (EC 3.5.1.5) is a member of family of amidohydrolase enzymes, it possesses two nickel atoms in its core structure. The conversion of urea into ammonia and carbamate is

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