

SYNTHESIS, CHARACTERIZATION AND EVALUATION OF ANTIOXIDANT IN-VIVO AND IN-VITRO AND ANTIBACTERIAL FOR N-(3,4- DIHYDROXYBENZYLIDENE) ACETOHYDRAZONE-2-(BENZYLTHIO) BENZIMIDAZOLE

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ABSTRACT : Antioxidant inhibition *in-vitro* and *in-vivo* also antibacterial for N-(3,4-dihydroxybenzylidene) Acetohydrazone-2-(benzylthio) benzimidazole was estimated. Schiff base of 2-mercaptobenzimidazole [2-MBI] was synthesized by following reaction, [2-MBI] was alkylated with benzyl chloride in presence of (alcoholic KOH) to yield compound [1]. The next step was convert compound [1] to salt by reacted with sodium hydride (NaH) in dioxane at (0-5 C⁰). The salt reacted with ethyl chloroacetate to produce compound [2]. Then compound [2] was treated with hydrazine hydrate to yield N-acetohydrazide-2-(benzyl thio) benzimidazole [3]. the last step was the reaction of compound [3] with 3,4-dihydroxybenzaldehyde to afford N-(3,4-dihydroxybenzylidene) Acetohydrazone-2-(benzylthio) benzimidazole compound [4]. The newly synthesized compounds [1-4] were identified by [FTIR, ¹H-NMR and ¹³C-NMR] and their physical properties were measured. Furthermore, the antioxidant inhibition of compound [4] was evaluated *in-vitro* by DPPH radical cation decolorization assays and *in-vivo* by serum catalase activity. Antibacterial activity was estimated for [2-MBI] and compound [4] against two bacteria strains: *Salmonella* and *Staphylococcus aureus*.

Key words : 2-Mercaptobenzimidazole, Schiff's bases, antioxidant, DPPH radical scavenging, Serum catalase activity, antibacterial.

INTRODUCTION

Benzimidazoles are a valuable subunit for the development of pharmaceutical or biological molecules. Benzimidazole and its derivatives are a significant class that have numerous biological activity in the field of pharmaceuticals and drugs (Thakuria and Das, 2008). N-substituted benzimidazole derivatives recently have been reported to show notable antioxidant activity (Archie *et al*, 2017). Antioxidant compounds believed that its play a big part in protect the human body against harmful effect caused by free radical (Saleh *et al*, 2019). Many of the activities of benzimidazole derivatives have not been widely studied like Antioxidant activity. But the compounds having Antioxidant and free radical scavenging properties are considered to be used for the protection or treatment of human diseases like neurodegenerative disorders, atherosclerosis, rheumatoid arthritis and carcinogenesis, because oxygen-derived free radicals such as hydroxyl (OH•), peroxy (ROO•), superoxide (O₂•⁻) and nitric oxide (NO•) plays an important role in causing these diseases (Ayhan-Kilcigil

et al, 2004; Kus *et al*, 2004). Schiff bases are commonly known to be used in the synthesis of many potential drugs. These compounds possess a broad spectrum of biological activities (Gaber *et al*, 2018) such as anti-microbial (Abdel Aziz *et al*, 2018), antibacterial (Torabi *et al*, 2018), anti-inflammatory (Hanif *et al*, 2018), antioxidant (Buldurun *et al*, 2019) as well as antitumor activity (Gaber *et al*, 2019).

MATERIALS AND METHODS

All chemicals used were supplied by Merck, BDH, Fluka and sigma Aldrich chemicals companies. The melting point was recorded using Gallenkamp, electro-thermal melting point apparatus. Infrared spectra were recorded using (FTIR) 8400s Fourier transitions infrared spectrometer Shimadzu, Japan, (KBr) disc in (4000-600) cm⁻¹ spectral range, in the Department of Chemistry, College of Science, University of Baghdad. ¹H-NMR & ¹³C-NMR spectra were recorded on near magnetic resonance Bruker, Ultra-shield (400) MHz, DMSO-d₆ was used as a solvent in Isfahan University, Iran. UV/Vis measurements were performed by means of a UV/