

Investigation of the Antioxidant and Antibacterial Activity of Novel Quercetin Derivatives

Shaker A. N. Aljadaan¹ , Rita S Elias^{2,*} , Reham Adnan Al-Anssari^{3,*} 

¹ Department of Pharmaceutical Chemistry, College of Pharmacy, University of Basrah, Basrah, Iraq

² Department of Pharmaceutical Chemistry, College of Pharmacy, University of Basrah, Basrah, Iraq

³ Department of pharmacognosy and medicinal plants, College of Pharmacy, University of Basrah, Basrah, Iraq

* Correspondence: rita_phar@yahoo.com;

Scopus Author ID 35083419300

Received: 28.04.2020; Revised: 1.06.2020; Accepted: 3.06.2020; Published: 8.06.2020

Abstract: Our previous work involved the preparation and characterization of six quercetin derivatives, three of which were novel Schiff bases, while the fourth was a novel ionic salt of iodine. This study involved the investigation of the *in vitro* antioxidant activity against DPPH free radical as well as the *in vitro* antibacterial activity against *Bacillus cereus*, *Salmonella* spp., *Escherichia coli* and *Staphylococcus aureus* of quercetin and its 1-6 derivatives. The results revealed that all the studied quercetin derivatives had shown less antioxidant and antibacterial activity than quercetin itself, except that of compounds 3 and 4, which displayed an improvement in the antibacterial activity against *Escherichia coli* as compared to that of quercetin.

Keywords: Quercetin; antioxidant; DPPH; antibacterial.

© 2020 by the authors. This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Quercetin (Figure 1) is a pentahydroxyflavone that is considered to be one of the most important flavonoids because of its widespread within the food, broad biological actions and versatile physiological effects such as antioxidant, anticancer, antimicrobial, anti-inflammatory, anti-diabetic, prevention of cardiovascular disease, neuroprotective, and anti-obesity activities [1-18].

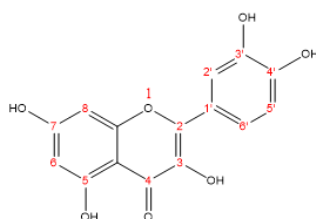


Figure 1. Chemical structure of quercetin.

Schiff bases, on the other hand, involve compounds that bear an imine or azomethine group within their chemical structure [19, 20] (Figure 2) such group has been linked to the biological activity of many compounds, such as antimalarial, antibacterial, antifungal, and antiviral activities [20-22].

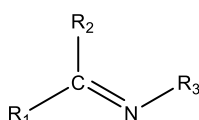


Figure 2. Chemical structure of Schiff base.