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### Chemical characterization of Iraqi propolis samples and assessing their antioxidant potentials

Ghassan M. Sulaiman<sup>a</sup>, Khulood W. Al Sammarrae<sup>b</sup>, Ali H. Ad'hiah<sup>c</sup>, Massimo Zucchetti<sup>d</sup>, Roberta Frapolli<sup>d</sup>, Ezia Bello<sup>d</sup>, Eugenio Erba<sup>d</sup>, Maurizio D'Incalci<sup>d</sup>, Renzo Bagnati<sup>e,\*</sup>

<sup>a</sup> Department of Applied Sciences, School of Biotechnology, University of Technology, Baghdad, Iraq

<sup>b</sup> Biotechnology Research Centre, University of Al-Nahrain, Baghdad, Iraq

<sup>c</sup> Tropical-Biological Research Centre, College of Science, University of Baghdad, Baghdad, Iraq

<sup>d</sup> Department of Oncology, Mario Negri Institute for Pharmacological Research, Milan, Italy

<sup>e</sup> Department of Environmental Health Sciences, Mario Negri Institute for Pharmacological Research, Via La Masa 19, 20156 Milan, Italy

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#### ABSTRACT

Propolis samples, collected from different geographical locations in Iraq (Baghdad, Dahuk, Mosul and Salah ad-Din), were analyzed and assessed for their anti-oxidant activity. Concentrations of phenolic compounds (flavonoids, phenolic acids and their esters) in propolis were estimated using high performance liquid chromatography coupled to electrospray mass spectrometry. Thirty-eight different compounds were identified and 33 of them were polyphenols. Other compounds were tentatively identified as clerodane diterpenoids, and one was considered unknown. Semi-quantitative measurements showed that phenolic acids and their esters were the predominant constituents in propolis extracts, followed by flavones and flavonols, and then flavanones and dihydroflavonols. Propolis samples were further spectrophotometrically characterized using the Folin–Ciocalteu reagent for the determination of total phenolic compounds. The free radical scavenging activities of propolis samples were also evaluated by using the 2,2-diphenyl-1-picrylhydrazyl assay. The results revealed that propolis extracts exhibited strong free radical scavenging activity.

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