



## COMPARATIVE CYTOTOXICITY OF *GLYCYRRHIZA GLABRA* ROOTS FROM DIFFERENT GEOGRAPHICAL ORIGINS AGAINST IMMORTAL HUMAN KERATINOCYTE (HaCaT), LUNG ADENOCARCINOMA (A549) AND LIVER CARCINOMA (HepG2) CELLS

Norazah Basar<sup>\*1,2</sup>, Olayinka Ayotunde Oridupa,<sup>1,3</sup> Kenneth J. Ritchie,<sup>1</sup> Lutfun Nahar,<sup>1</sup>  
Nashwa Mostafa M. Osman,<sup>1</sup> Angela Stafford,<sup>4</sup> Habibjon Kushiev,<sup>5</sup> Asuman Kan,<sup>6</sup>  
and Satyajit D. Sarker<sup>1\*</sup>

<sup>1</sup>Medicinal Chemistry and Natural Products Research Group, School of Pharmacy and Biomolecular Sciences, Faculty of Science, Liverpool John Moores University, James Parsons Building, Byrom Street, Liverpool L3 3AF, England, UK

<sup>2</sup>Department of Chemistry, Faculty of Science, Universiti Teknologi Malaysia, 81310 Johor Bahru, Johor, Malaysia

<sup>3</sup>Department of Veterinary Physiology, Biochemistry and Pharmacology, Faculty of Veterinary Medicine, University of Ibadan, Ibadan, Nigeria

<sup>4</sup>ADAS UK Ltd., Rosemaund, Preston Wynne, Hereford HR1 3PG, UK

<sup>5</sup>Gulistan State University, Gulistan, Uzbekistan

<sup>6</sup>Selçuk University, Selçuk-Konya, Turkey

\*Corresponding author: [norazah@kimia.fs.utm.my](mailto:norazah@kimia.fs.utm.my)

*Glycyrrhiza glabra* L. (Fabaceae), commonly known as ‘liquorice’, is a well-known medicinal plant. Roots of this plant have long been used as a sweetening and flavouring agent in food and pharmaceutical products, and also as a traditional remedy for cough, upper and lower respiratory ailments, kidney stones, hepatitis C, skin disorder, cardiovascular diseases, diabetes, gastrointestinal ulcers and stomach ache. Previous pharmacological and clinical studies have revealed its antitussive, anti-inflammatory, antiviral, antimicrobial, antioxidant, immunomodulatory, hepato- and cardio-protective properties. While glycyrrhizin, a sweet-tasting triterpene saponin, is the principal bioactive compound, several bioactive flavonoids and isoflavonoids are also present in the roots of this plant. In the present study, the cytotoxicity of the methanol extracts of nine samples of the roots of *G. glabra*, collected from various geographical origins, was assessed against immortal human keratinocyte (HaCaT), lung adenocarcinoma (A549) and liver carcinoma (HepG2) cell lines using the *in vitro* 3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyl tetrazoliumbromide (MTT) cell toxicity/viability assay. Considerable variations in levels of cytotoxicity were observed among various samples of *G. glabra*.