

## Abstract

**Background:** *Chiliadenus montanus* is one of the oldest traditional plants used by Bedouins of An-naqab desert region of Palestine to treat various communicable and non-communicable diseases. The goals of the present investigation were to fingerprint the chemical composition, liver cancer DNA cell cycle perturbation, antioxidant and antimicrobial capacities of *Chiliadenus montanus* (CM) plant.

**Methods:** Four solvents fractions of (CM) plant were phytochemically estimated quantitatively and qualitatively and evaluated their activity against DNA cell cycle of liver cancer cells using propidium-iodide (PI) staining, while apoptosis activity was estimated by staining with Annexin-V by the flow cytometry. The antimicrobial activity was assessed through broth microdilution method on seven bacterial pathogens and one fungal strain. Moreover,  $\alpha, \alpha$ -diphenyl- $\beta$ -picrylhydrazyl (DPPH) free radical scavenging assay was utilized to evaluate the antioxidant efficacy of (MC) four solvents fractions.

**Results:** In the case of the qualitative analysis of (CM) four solvent fractions, it was recognized that the methanol and aqueous fractions are rich in phytochemical classes. In particular, the methanol fraction contained phenols, flavonols, and tannins with the total flavonols content reaching a high percentage of  $53.5 \pm 1.25$  mg QUE/g. Also, the aqueous fraction contained a high content of the flavonols reaching up to  $48.47 \pm 1.22$  mg QUE/g, it also contained phenols, but it did not have tannins. The (CM) plant solvent fractions showed antioxidant activity. As it was noticed, the methanol and aqueous fractions had the highest free radical scavenging properties with  $IC_{50}$  values of  $18.2 \pm 0.16$  and  $13.5 \pm 0.44$   $\mu$ g/ml, respectively compared to Trolox which had an antioxidant  $IC_{50}$  value of  $3.23 \pm 0.92$   $\mu$ g/ml. Meanwhile, the (CM) plant methanol, hexane, and acetone fractions showed great antimicrobial activity against the screened microbial pathogens, especially the methanol and