



Abstract

Introduction: *Gundelia tournefortii* L. is one of the most famous plants used in Palestine for its traditional curative and nutritive properties. **Aim:** Hence, the current study aimed to evaluate the cytotoxic, antiproliferative and apoptosis-inducing effects of *G. tournefortii* aqueous extract against human hepatocellular carcinoma cells (HCC).

Methods: *Gundelia tournefortii* was prepared in extracts of water, methanol and DMSO. The perturbation of the DNA cell cycle of HCC (Hep3B cell line) was investigated using propidium iodide (PI) staining assay, while apoptosis was estimated by staining with Annexin-V and PI by the flow cytometry. In addition, α -fetoprotein, a tumor marker was used to assess cytotoxic effect.

Results: Among other extracts, DMSO extract should the most potent in reducing tumor marker levels of α FP with an average concentration of 88 ± 10.54 ng/ml, whereas control samples yielded an average concentration of 386.34 ± 23.68 ng/ml. DMSO extract showed remarkable results in modifying cell-cycle progression, mostly by arresting the G2-M phase and restore the naïve state of the cells. Moreover, apoptotic activity (Annexin-V+/PI-) was mostly enhanced by water extracts; from $49.33 \pm 2.08\%$ in control samples to $55.67 \pm 6.03\%$ in water samples. These data reflect the fruitful effect of *G. tournefortii* as anticancer agent.

Conclusions: Our results identified interesting cytotoxic, anti-proliferative and apoptotic effect of *G. tournefortii*. This suggests that *G. tournefortii* could be a promising future cancer remedy. Further *in-vivo* studies are highly recommended for thorough investigation.

Keywords: *Gundelia tournefortii*; Cytotoxic; Antiproliferative; Apoptosis-inducing.