



Abstract

As it was observed the aqueous, methanol, acetone and hexane fractions of the (RS) roots decreased the secretion of the alpha-fetoprotein in the liver cancer cells with the acetone fraction being the most potent inhibitor with an average of $237\% \pm 12.5$ compared to the average of the untreated cells which was $4066.6\% \pm 202$. The hexane fraction was the most effective in diminishing apoptosis with an average of $14.5\% \pm 1.6$, compared to $49\% \pm 2$ the average of the untreated cells. In the case of inhibiting cell cycle progression, it was recognized that methanol fraction seems to be the most powerful amplifier of the (RS) effect, as it increased the proportion of the cells with an average of $24.5 \pm 2.2\%$, compared to $7.4\% \pm 1.8$ in the Doxorubicin (DOX). That means it decreased the cell proliferation rate by prolonging the G2-M phase thus slowing the progression of cancer. All of these data suggest that (RS) roots extracts have anti-cancer properties. The (RS) roots four solvents fractions have potential anticancer agent and it could be used as a promising source for functional food, nutraceutical, and pharmaceutical application industries.