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Cytotoxicity and anti-angiogenesis effects of *Rhus coriaria, Pistacia khinjuk, Pistacia vera* gum extract

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Background: Angiogenesis, formation of new blood vessels, play an important role in some disease such as cancer and its metastasis. Using angiogenesis inhibitors therefore, is one of the ways for cancer treatment and prevention of metastasis. Medicinal plants have a major role in the treatment of some disease. Based on information obtained from other studies, oleo gum resin extracts of three plants, *Rhus coriaria* L., *Pistacia vera* L. and *Pistacia khinjuk* Stoks. all from Anacardiaceae family selected to evaluate their cytotoxic and angiogenic effects.

Materials and Method: Oleo gum resins of *R. coriaria*, *P. vera* and P. *khinjuk* obtained from bark of these plants; freezed in -70°C, ground into powder, then extracted by methanol for 24 h. Extracts were concentrated to yield 61.7, 80.6 and 76 % (w/w), respectively. GC and GC/MS used to analyze essential oil of resins. Cytotoxic effect of extract had been evaluated at different concentration (1, 10, 20, 40, 80, 100 µg/ml) against HUVEC (normal cell line) and Y79 (cancer cell line) using MTT assay. In vitro tube formation on matrigel base was used to evaluate angiogenic effect in the presence of increasing concentration (50, 100, 250 µg/ml) of extracts. VEGF was used as angiogenesis stimulator.

Results and Discussion: GC results shows α-pinene and β-pinene were the major component of all obtained extracts of plants. According to the MTT assay results, extract of R. coriaria resin was more cytotoxic than two other extracts (IC50, 9.1±1.6 versus 9.8±2.1 and 12.0±1.9 for P. vera and P. *khinjuk*, respectively.) Tube formation assay also showed that extract of R. *coriaria* resin inhibited angiogenesis more than other tested extracts. Cytotoxic effects of extracts were significantly higher against Y79 as a cancer cell than HUVEC as a normal cell line. It could be concluded that *R. coriaria* resin is a potent cytotoxic and anti-angiogenesis natural product against cancer cells and worth to be a good candidate for future studies.

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