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Original Article

The Effect of *Alkanna tinctoria* and *Peganum harmala* Extracts on *Leishmania major* (MRHO/IR/75/ER) *in vitro*

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Abstract:

Background: Cutaneous leishmaniasis is an important health problem caused by *Leishmania spp.* As there is no vaccine, drug treatment is the only way to tackle leishmaniasis. In the present study, inhibitory and killing effects of *Peganum harmala* and *Alkana tinctoria* extracts on amastigotes and promastigotes forms of *Leishmania* were evaluated in-vitro.

Methods: The seeds of *Peganum harmala*, Stems and roots of *Alkana tinctoria* were collected and crude extraction carried out. In this experimental study, *Leishmania major* promastigotes were cultured in RPMI-1640 with 10% FBS at 22-26°C, and infected macrophages with amastigotes were cultured in RPMI-1640 with 10% FBS at 37°C in 5% CO₂. Then the extracts of each plant were added to cultivated parasites and incubated for 3 days. Promastigote and amastigote assay was carried out using counting assay based on growth inhibition.

Results: The results indicated that both extractions can inhibit the growth of promastigotes, and in concentrations of 40µg/ml of *P. harmala*, 200µg/ml of *A. tinctoria*, and 20 µg/ml of equal combination of *P. hamala* and *A. tinctoria* are Inhibitory Concentration (IC₅₀) for parasites growth. By adding these concentrations of the extracts to the infected macrophages in the culture, their effects were separately evaluated. The mean of amastigotes number in macrophages in the culture with *P. harmala*, *A. tinctoria*, combination and control groups were 0.7, 0.7, 0.6, 2.3 amastigotes per macrophage, respectively.

Conclusion: By this method, inhibition of intracellular and extracellular growth of *L. major* was demonstrated suggesting that, plant drugs with efficacy and safe products can be applied as new treatment for cutaneous leishmaniasis.

Keywords:

[Leishmania major](#) , [Peganum harmala](#) , [Alkana tinctoria](#) , [In-vitro](#)

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