

Effect of *Peganum harmala* on germination and emergence of *Anthemis nobilis* L.

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Abstract

Peganum harmala L. (Zygophyllaceae) is a herb native to dry area .Total alkaloid content of *P. harmala* varied between 2 and 5% . The alkaloids harmol, harmine and harmaline in *P. harmala* extracts have a wide spectrum of pharmacological actions. Alkaloids are inhibitors of photophosphorylation in spinach chloroplasts(1). Two research works were conducted with plant above ground biomass and root of *Peganum harmala*, each with five extract concentrations of 0, 1, 3, 5 % (V/V) in laboratory, and in greenhouse condition five plant material levels of 0, 2, 5, 10 and 20% (W/W) of the above two treatments tested on germination and growth of *Anthemis nobilis* L. In laboratory ,root of *P.harmala* had more negative impact on seed germination, radicle and plumule lengths of *A. nobilis* than the above ground biomass. Germination percentage, radicle and plumule lengths were reduced with increasing extract concentration. Root extract with 3% concentration imposed more reduction in germination percentage than above ground biomass extract with similar concentration (2,3,4). Root of *P.harmala* imposed maximum reductions in plumule and radicle lengths and their ratio compared to the above ground biomass. Extract concentrations of 0.5 ,1 and 5% reduced radicle and plumule lengths significantly compared to their control, and maximum reductions was noted at 5% concentration. Interaction effect of plant biomass and concentration showed that the root inhibition of *P. harmala* was more than the above ground biomass. Root treatment with 0.5% concentration reduced radicle length and plumule length of *A. nobilis* more than above ground biomass treatment with similar concentration(2,3,4). A significant adverse effect on root growth similar to the aerial growth was reported due to allelopathic action resulting in a considerable negative effect on length and biomass of the roots. Root is the most directly exposed to the allelopathic conditions and therefore, it is likely to have significant more negative impacts in root than the above ground plant parts. Germination percentage, plant height, root length, above ground and root dry weights of *A. nobilis* in soil(greenhouse condition) were reduced significantly with increasing plant material levels of *P. harmala*, as they reduced significantly in treatments of 2 and 20% concentrations compared to their controls(1,2,4,) Root treatment with 2% level imposed more significant reduction in germination, root length, above ground and root dry weights of *A. nobilis* compared to above ground biomass with similar level in soil.

Keywords: *P.harmala*, *A.nobilis* L, growth

1-Kartal, M.,M. L. Altun and S. Kurucu.2003.HPLC method for the analysis of harmol, harmalol, harmine and harmaline in the seeds of *Peganum harmala* L. J. Pharmaceutical and Biomedical Analysis.31(2):263-269.

2-Jianxin, L. and Z. Guolin. 2004. Effects of substance extracted from *peganum multisectum* Maxim Bobr on growth of Maize. Journal of the Northwest Agriculture. 3: 48-53.

3-Gen-wang, W, L. Janxin, Z. Guo-lin, W. Gen, L. Jian-th, Z. Gue-lin. 2005. The effects of substance extracting from *peganum multisectum* Bobr on seed germination, vitality and metabolism of oat. Yichun College Journal.4:18-24.

4-Jianxin, L. and Z. Guo-lin. 2007. Allelopathy of *peganum multisectum* Bobr on edible pea. China Ecological Agriculture Journal. 1: 24-32.