Research Paper :

Allelepathic Effects of Dried Plant Parts of *Parthenium hysterophorus* L. on Seed Germination and Post Emergence Growth of *Phaseolus mungo* Roxb var. T-9

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SUMMARY

***Parthenium hyterophorus* L., a native of tropical America and invasive to several countries including India was evaluated for its allelopathic potential of dried plant parts *i.e.* root, stem, leaf and reproductive organs on seed germination and post emergence growth of Black gram *Phaseolus mungo* var.T-9. The experiment was conducted in pot conditions. It was observed that reproductive part of *Parthenium* exerted strong allelopathic effects followed by stem, leaf and root on reductions in seed germination at 11 days after sowing were 9.24%, 8.10%, 6.86% and 4.30%, respectively. Post emergence growth was observed at 35 days after sowing. Significant reduction was found in shoot dry weight, root dry weight, nodule dry weight and root nodule number.**

Key words : *Parthenium*, Allelopathy, *Phaseolus mungo*, Seed germination and post emergence growth

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Allelopathy refers to the beneficial or harmful effect of one plant to another plant by the release of chemicals from different plant parts by leaching, root exudation, volatilization, residue decomposition and other processes. Common effects of allelopathy include reduced seed germination and seedling growth. However, known sites of action for some allelochemicals include cell division, pollen germination, nutrient uptake, photosynthesis and specific enzyme function.

Parthenium hysterophorus L. also known as 'carrot weed' , 'congress grass',' white head', 'gajarghas' is a herbaceous, erect and annual plant belonging to the family Asteraceae. *P. hysterophorus* L. has been reported to contain several allelochemicals, like parthenim, kermpferol, p-cumaric acid, caffeic acid etc. (Pickman and Towers, 1982). Organic compounds like phenolic acids and flavonoids have been found to retard the growth of several plants (Mall and Dagar, 1979). *Parthenium* is not only harmful to crops but also causes several diseases to man e.g Asthma, contact dermatitis and loss of weight, eye irritation in dogs and horses (Towers *et al.*, 1977).*Phaseolus mungo* var.T-9 (black gram or urd) a leguminous crop, is highly priced pulse. It is early maturing (80 days), erect, medium, black seeded, recommended as a early crop in *kharif*.

MATERIALS AND METHODS

Fresh samples of root, stem, leaf and reproductive parts of *Parthenium* were collected at random. Samples were dried at 80^0C for 48 hours in oven. Twenty grams of each plant material was mixed separately in one kilogram of sterilized garden soil (neutral clay loam) in earthen pots of 25 cm diameter and 20 cm in depth. Soil was sterilized in autoclave at the pressure of 1.1 kg/cm^2 for 5 minutes. Soil was uniformly fertilized with 16,18 and 12 ppm of urea, diammonium phosphate and muriate of potash. Seeds of *Phaseolus mungo* were thoroughly washed with water to remove dust and dirt and then with mild detergent solution for 5 minutes. The seeds were surface sterilized with 0.1% $HgCl_2$ for 10 minutes and washed with sterilized distilled water, 4 to 7 times. Twenty seeds were sown in each pot and evenly irrigated daily with double distilled water. The experiment was laid out in a randomized complete block design with five replicates and was repeated twice. Germination was recorded at 3, 5, 7, 9 and 11 days after sowing (DAS). Post emergence growth was observed at 35 DAS. For control, seeds were sown in pots with sterilized soil only.

Statistical analysis:

Statistical analysis of data was done wherever necessary. Mean, standard error (SE)