

Comparative study of effect of *Lantana camara* extract of different parts on seed germination of *Parthenium hysterophorus* L.

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SUMMARY

Extracts of leaf, stem, flower and fruit of *Lantana camara* inhibited the seed germination of *Parthenium hysterophorus* clearly indicated that the allelochemicals present in the extracts adversely affected the seed germination. Maximum seed germination was observed in control. Leaf extract was found to exhibit maximum allelopathy followed by stem, flower and fruit extracts.

Key words : *Lantana camara*, *Parthenium hysterophorus*, Allelochemical, Seed germination

Weeds pose a serious problem to farmers throughout the world reducing yield and quality of crops. *Parthenium hysterophorus* L. also known as American weed or carrot grass. *Parthenium hysterophorus* (Asteraceae), a native of West Indies and Central and North America. It is an exotic weed and was introduced in India along with food grain under PL 480 scheme. The weed was reported for the first time in India 1956 (Rao, 1956).

Parthenium hysterophorus is a problematic weed to human and floral diversity. It is commonly spread road sides, waste lands, marshy lands and fertile lands. A plant can produce more than 20,000 seeds which require bare soil to germinate without any dormancy.

Parthenium is an allergic plant and its pollen can cause allergic reactions such as respiratory problems, weight loss, swelling, contact dermatitis etc. *Parthenium* produces several allelochemicals such as alkaloids, parthenin, kaempferol, p-coumaric acid, caffeic acid (Towers *et al.*, 1977). *Parthenium* inhibits the seed germination and growth of other plants.

Lantana camara is one of the ten worst weeds of the world and is a serious weed in 14 crops in 47 countries. However, allelopathic effects on crops have been studied least (Narwal, 1994). Various allelochemicals present in different parts of *Lantana camara* and has allelopathic effect against agronomic crops and it is one of the most toxic weeds in the world (Holm and Herberger, 1969). The leaf extract of *Lantana camara* produced an inhibitory effect on growth of *Parthenium* (Ravindra *et al.*, 2008). Allelopathic effect induced by *Lantana camara* inhibits

growth of other vegetation as well as seed germination.

Because *Parthenium* is a toxic weed has become a serious threat to plant biodiversity and environmental safety and its control at the first stage (seed germination) is very essential. Allelochemicals of *Lantana camara* were used to inhibit seed germination of *Parthenium* which is an ecofriendly method.

Present paper deals the effect of various concentrations of stem, leaf, flower and fruit extract of *Lantana camara* on germination of seeds of *Parthenium*.

MATERIALS AND METHODS

Fresh material of *Lantana camara* was collected from Chitrakoot, Satna (M.P.). 100 g each leaf, stem, flower and fruit chopped in small pieces and crushed in the pestle mortar. 100g each of leaf, stem, flower and fruit was soaked in 150 ml double distilled water for 24 hrs. The final volume of liquid extracted was 200 ml for all the specimens.

The extract of each specimen was filtered with ordinary filter paper. A total of 98 ml of double distilled water was added to 2 ml of extract to make 2% solution. Similarly all the concentrations (2,5,10,15,20,25,30,40 and 50%) were prepared by adding appropriate amount of double distilled water.

50 seeds were spread in Petri-dishes containing Whatman's filter paper, moistened with different concentrations of leaf, stem, flower and fruit extracts of *Lantana camara*.

Observation were recorded at 3rd, 5th and 8th day.

RESULTS AND DISCUSSION

The results obtained from the present investigation are presented in Table 1 and 2.

Extracts of leaf, stem, flower and fruit of *Lantana camara* adversely affected the seed germination of

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Table 1 : Effect of different concentrations of leaf, stem, flower and fruit extracts of *Lantana camara* on seed germination of *Parthenium hysterophorus* on 3th 5th and 8th days

Concentration in %	3 days				5 days				8 days			
	LLE	LSE	LFLE	LFE	LLE	LSE	LFLE	LFE	LLE	LSE	LFLE	LFE
Control	25	25	25	25	28	28	28	28	32	32	32	32
2%	1	2	3	6	2	3	5	7	4	6	8	10
5%	0	1	2	3	1	2	3	6	3	5	6	9
10%	0	0	1	2	0	1	2	4	2	3	5	7
15%	0	0	0	1	0	0	1	3	1	2	4	6
20%	0	0	0	0	0	0	0	2	0	1	2	4
25%	0	0	0	0	0	0	0	1	0	0	1	3
30%	0	0	0	0	0	0	0	0	0	0	0	2
40%	0	0	0	0	0	0	0	0	0	0	0	1
50%	0	0	0	0	0	0	0	0	0	0	0	0

LLE: *Lantana* leaf extract, LSE: *Lantana* stem extract, LFLE: *Lantana* flower extract, LFE: *Lantana* fruit extract

Table 2 : Mean value of effect of different concentration of leaf, stem, flower and fruit extracts of *Lantana camara* on seed germination of *Parthenium hysterophorus* on 3th, 5th, 8th days

Concentration in %	Mean values			
	LLE	LSE	LFLE	LFE
Control	56.55%	56.55%	56.55%	56.55%
2%	6.66%	6.68%	10.66%	15.32%
5%	4.66	5.32%	6.66%	13.3%
10%	1.32%	2.66%	5.32%	8.66%
15%	0.66%	1.32%	3.32%	6.66%
20%	0	0.66%	1.32%	4%
25%	0	0	0.66%	2.66%
30%	0	0	0	1.32%
40%	0	0	0	0.66
50%	0	0	0	0

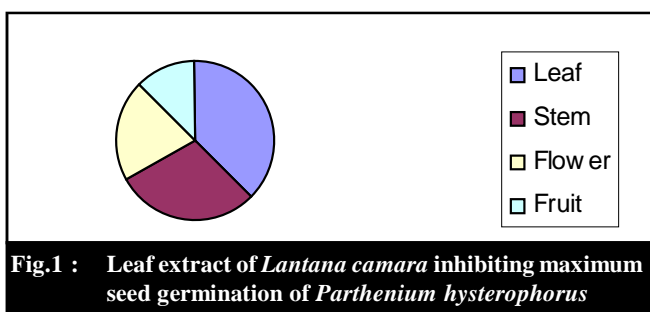
LLE: *Lantana* leaf extract, LSE: *Lantana* stem extract, LFLE: *Lantana* flower extract, LFE: *Lantana* fruit extract

Parthenium hysterophorus.

Observation recorded in Table 1 indicates that maximum seed germination was in control. With the increase in concentration of *Lantana* extracts the percentage of seed germination was decreased.

However, it was found that with the increase of time period 3, 5 and 8 days, the percentage of germination increased.

Leaf extract of *Lantana* inhibited maximum seed



germination followed by stem, flower and fruit. Allelochemicals were present in increasing order leaf > stem > flower > fruit.

However, with increase in concentration, percentage of seed germination was decreased but by increasing time period percentage of seed germination increased.

Responsible allelochemicals of *Lantana camara* for this inhibitory effect are triterpinoids, lantadene A, lantadene B, camaric acid, camaraside, camaracinic acid, flavonoids, ursolic acid, palmitic acid etc. but triterpenoids compounds was more toxic to other allelochemicals.

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